Partners in UK offshore wind

MONA OFFSHORE WIND PROJECT

Technical Engagement Plan Appendices Part 1 (A to E)

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F01

Image of an offshore wind farm

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Document status

Version	Purpose of document	Authored by	Reviewed by	Approved by	Review date
F01	Application	RPS	Mona Offshore Wind Ltd	Mona Offshore Wind Ltd	Feb 2024

Prepared by:

RPS

Prepared for:

Mona Offshore Wind Ltd.

Contents

Appendix A: Evidence Plan Steering Group

A.1. Steering group overview

Table A.1: Overview of Steering group consultation materials.

Date	Consultation	Information provided
16 November 2021	Steering group meeting 1	Meeting minutes (A.2.1)
13 December 2021	Steering group meeting 2	Meeting minutes (A.3.1) Response from Natural England regarding the meeting minutes (A.3.2)
14 December 2021	Steering group meeting 2.5	Meeting minutes (A.4.1)
20 July 2022	Steering group meeting 3	Meeting minutes (A.5.1) Mona LSE Screening Methodology Paper for Consideration (A.5.2) Response from NRW regarding meeting minutes and LSE Screening Methodology Paper (A.5.3) Response from JNCC regarding LSE Screening Methodology Paper (A.5.4)
14 February 2023	Steering group meeting 4	Meeting minutes (A.6.1)
29 June 2023	Steering group meeting 5	Meeting minutes (A.7.1) Response from Natural England regarding the meeting minutes (A.7.2) Morgan and Mona updated HRA Methodology Note (A.7.3)
17 October 2023	Steering group meeting 6	Meeting minutes (A.8.1) Response from Natural England regarding the meeting minutes (A.8.2) Response from the Planning Inspectorate regarding the meeting minutes (A.8.3) Response from Cefas regarding the meeting minutes (A.8.4) Response from JNCC regarding the meeting minutes (A.8.5) Response from NRW regarding the meeting minutes (A.8.6)

A.2. Steering group meeting 1

A.2.1 Meeting minutes

MINUTES OF MEETING

Security Classification: Project External

Partners in UK offshore wind

MOM Number	:	20211116_Morgan and Mona EP_EP Steering Group	**REV. No.** :	F02
MOM Subject	:	Morgan and Mona Evidence Plan Steering Group Meeting 1		

MINUTES OF MEETING

MEETING DATE	:	16/11/2021
MEETING LOCATION	:	Microsoft Teams
RECORDED BY	:	[redacted](RPS)
ISSUED BY	:	[redacted](RPS)

PERSONS PRESENT:

- [redacted] – bp (LH)
- [redacted] – bp (MP)
- [redacted] – RPS (AB)
- [redacted] – RPS (KL)
- [redacted] - RPS (ST)
- [redacted] – NRW (LR)
- [redacted] – NRW (KN)
- [redacted] – Natural England (MK)
- [redacted] – Natural England (LB)
- [redacted] – Natural England (AuB)
- [redacted] – Natural England (EH)
- [redacted] MMO (JS)
- [redacted] – MMO (SJ)
- [redacted] – JNCC (JW)
- [redacted] – Planning Inspectorate (RH)

ITEM NO:	DISCUSSION ITEM:	Responsible party	Date
1.	**Introductions** (presented by KL) RH- On behalf of the Planning Inspectorate I will take high level notes for the meeting and record any section 51 advice.		

2.	**About the project** (presented by LH) bp are working with EnBW to develop the Morgan and Mona offshore wind farms as two separate projects. These sites were awarded as part of the The Crown Estate's Round 4 offshore wind leasing round. Currently they are at preferred bidder status. The intention is for both projects to be developed as fixed bottom offshore wind farms. They will be developed on similar but slightly staggered timescales and will be under separate consent applications. The Mona project is aiming to be operational in 2028 and the Morgan project is aiming for to be operational a year after. **Project context** The project names have changed from Yellow North to Morgan and from Yellow South to Mona. Mona is mostly within Welsh offshore waters and is currently anticipated to make grid connection in Wales, if a radial grid connection is granted, although the project is waiting for a confirmed grid connection offer from National Grid. Morgan is within English waters and is anticipated to make grid connection at a north-west English site, although grid connection location is to be confirmed. At the moment the applicant is awaiting a decision on the Offshore Transmition Network Review which will inform the grid connection for both projects. Both Mona and Morgan projects are targeting the 2025 CfD round. **Key Dates** Both projects are currently at pre-scoping stage. The scoping reports for both projects are to be submitted in March 2022. The intent is to have each project submission offset by a week as per the Planning Inspectorate's preference. The applicant is currently undertaking pre-scoping engagement including local authority engagement. Throughout 2022 the applicant will progress with consenting and both offshore and onshore surveys, noting that. the applicant has already commenced overwintering bird surveys on both projects. The applicant has kicked off a maritime navigation engagement forum this week. The applicant aims to publish the Preliminary Environmental Information Report (PEIR) towards end of next year with formal consultation scheduled for early 2023. The Mona Development Consent Order (DCO) application is currently planned to be submitted in October 2023 and the Morgan DCO planned forJanuary 2024.		

3.	**Evidence Plan process** (presented by KL) The Evidence Plan (EP) process has been developed following the Planning Inspectorate and Defra guidance. The applicant has also considered draft guidelines provided by Natural England [1]. The EP has historically been HRA focused however in line with recent best practice, the applicant proposes to extend this to include the EIA process for ecology topics, including designated sites such as SSSIs and MCZs. The applicant is proposing to carry out a single EP process for both projects. The applicant has received some comments on use of a single EP for both projects. The projects will have separate agreement logs to account for the differences between the projects ahead of the DCO applications. There are several reasons for this approach: • the projects are being progressed together so logistically it makes sense to progress the EP as one. • Cumulative impacts can be considered together across the projects. • There are also resourcing benefits e.g., for Expert Working Groups (EWGs). It reduces the meeting burden. Meeting minutes will also note any differences between the projects. RH - RH can see the logic in having one EP process. However, what happens if one project has a significant issue in a particular topic and this takes up all the discussion time at the expense of the other project/topics? KL - Historically where this has happened before the issue has been separated into separate meetings to avoid taking up attendees time when the discussion may not be relevant to all. As the projects are so close to each other, the two projects will be considered together in terms of cumulative assessments. RH - As long as the flexibility is there is accommodate that. The EWG should not focus on only the key issues; other issues should be considered which need discussion and information collected. KL - It is understood that flexibility is important. The applicant can plan out the required meetings at this stage, but the applicant acknowledges that flexibility is required and if necessary, further topics will be discussed in separate meetings.		

1 Natural England (2021) Expectations for pre-application engagement and best practice guidance for the evidence plan process.

4.	**Roles and responsibilities** (presented by KL) The EP process is led by the applicant. The responsibility for updating the EP is with the applicant, with feedback from the relevant consultees. KL will chair the EWG and steering groups. ST will act as secretariat. KL and ST are to be included on all correspondence. One of the comments that the applicant recieved on the EP Template was that roles and responsibilities for each stakeholder should be included in the EP, to clearly define the mandate of each organisation within each jurisdiction. The applicant will update the EP based on this comment. The applicant has put together a broad plan for engagement with the steering group- noting that this is subject to progress based on how the project progress.	RPS to update the EP to include the roles and responsibilities from each organisaiton.	17/12/21

5.	**Evidence Plan Steering Group** (presented by KL) The purpose of the Evidence Plan Steering Group is to monitoring progress of the EP. Meetings will provide key project updates and will includean update on timescales to ensure resourcing during these periods are managed. The EP Steering Group will guide and inform the EP process. The group will meet at key milestones during the project program for Mona and Morgan. Timescales presented during this meeting are indicative. The December 2021 EP Steering Group meeting will discuss the cable route selection study. The applicant does not currently have a date for the second meeting. All organisations in this group meeting were sent a Microsoft form to collect availability for the second EPSG, please can all organisations respond by CoB today so a date for this can be selected. The third EP Steering Group meeting will be timed around the period of scoping submission or the scoping opinion. The applicant can propose dates, however we are open to suggestions on timings. RH - Regarding meeting timing around scoping. It will be tricky for the Planning Inspectorate to meet during the scoping process. The Inspectorate has to provide comments based on the information in the scoping report, not outside discussions. The Inspectorate would prefer to meet slightly after the scoping opinion is issued. MK - After the scoping opinion has been issued normally works best as during the consultation phase consultees will need to devote resources to scoping. In addition, advice can get out of sync and it is not advisable to end up providing comments on information that has not been formally submitted. KL - Noted that after scoping opinion is a good time for the third EP Steering Group meeting and to highlight key issues for stakeholders. KN - The people present from NRW represent the advisory function of NRW. If the applicant is looking for someone from the Marine Licencing team to attend, they will need to contact this team separately to get NRW's opinion from a regulatory perspective.	All to respond to Microsoft Form to give availability for the second EP Steering Group meeting LH and KL to invite NRW Marine Licensing representative to join the EPSG	Complete Complete

6.	**EWG** (presented by KL) Remits will be tweaked for each EWG to make it specific for each topic e.g. approach to underwater noise modelling for marine mammals. The EP will be updated and circulated prior to the first EWG. Broad approach to EWGs: • Information circulated to EWG minimum 2 weeks ahead of meeting. • Meeting is held with attendees prepared to comment on materials provided. • Full meeting minutes will be taken agreement logs will be compiled where matters are agreed, and after each meeting the minutes and agreement log will be circulated and then agreed. The agreement log will be updated and appended to the DCO application. MK - In relation to the Habitats Regulations derogation example, if the intention is to cover the wider designations in the EP, MK advised the applicant to look at the MCZ Stage 2 assessment and Measures of Equivalent Environmental Benefit (MEEB) requirements. This may not be required based on the cable routes but it might need to be included in the benthic assessment. KL - Noted, that will apply and will be included. RH - The Environment Act 2021 was passed earlier this week and contains a requirement for 10% net gain. This is not legaly binding until after 2025 for NSIPs. Thought needs to be given to how the applicant intends to commit to Net Gain prior to the legal mechanisms being in place to allow the applicant to gain land through compulsory acquisition if required? KL- Net gain on onshore is something that is typically applied so the applicant will be looking into this for onshore infrastructure. MP - The applicant is having those conversations at the moment, however the projects are at such an early stage these discussions have been high-level. These discussions will continue and the applicant will engage with stakeholders on this topic through the EP process. EH - A consultation is coming out early next year on how marine net gain could be introduced and calculated. Nick White is the lead in NE on this workstream. MP- The applicant will get in touch with Nick White for further information. KL - The applicant has already been in touch with all statutory nature conservation bodies (SNCBs) regarding survey scopes so the first EWG meeting will involve bringing those discussions under the EP process and outlining what data might be further required. The applicant can also provide an update on the progress of current surveys and data analysis.	RPS to update EP and circulate. RPS to update the EP to include reference to MCZ Stage 1 and Stage 2 assessments bp to contact Nick White regarding consultation on marine net gain All organisations	17/12/21 17/12/21 Complete 03/12/21

	Each organisation to identify who their point of contact for each EWG. The first EWG will be early next year.	to identify who their point of contact is for each EWG outlined in the EP.	

7.	**Progress to agreement** (presented by KL) The EP process is iterative. The applicant will agree as much as possible during pre-application phase. Meetings will be held at key stages for each topic e.g. where a key section of data has been analysed or preliminary modelling undertaken. The idea is for consultees to provide feedback as early as possible. MK – In terms of review time for consultees in the EP, these general timescales are fine. However sometimes two weeks review time might not be sufficient for a large report. MK advised that consuntees need to be aware of what the material is that is that they are being asked to look at. When documents are circulated it would be worth setting out what their purpose is e.g. are they for information only or does the applicant want specific comments. If consultees are sent a working draft of a document and the intention is to present an updated one at the EP meeting, then the consultees should be informed when the first draft is provided to avoid confusion and so they are aware of the level of detail required for the review. KL - The applicant will provide clarity on the content and purpose of any information shared. KN – Similar comment to MK above. Two weeks review time might not be sufficient for a large report. An explanation of where the information is coming from is useful and timelines for documents to be provided would also be useful. KL - In terms of written feedback, it would be great if these could be provided at the time of the relevant meeting, although this would not be expected. The applicant would not expect all advice to be given during the meetings. If documents are provided 2 weeks in advance of meetings and written responses can be provided 2 weeks after the meeting, there is an effective 4 week turnaround for written comments. However, specific timescales for written feedback will be tailored for each meeting or deliverable during the Evidence Plan process to ensure deadlines are realistic. LR - Agree with previous comments re. review times. To add, in the EWGs there is no mention of seascape, landscape and visual impact assessment (SLVIA), water quality or WFD. Water Quality and WFD may be incorporated into other areas, but useful to understand where SLVIA will be considered? KL - In terms of SLVIA., the applicant noted that this topic was included in the draft guidance that NE (see footnote [1]) circulated. The applicant is of the view that keeping the EP limited to the ecological receptors is more appropriate. The applicant has discussed internally, and decided that a line needs to be drawn around the remit of the Evidence Plan.. By including SLVIA the remit could become too large. These topics will be covered as part of the wider EIA assessment, scoping and PEIR consultation.	RPS to have internal discussion regarding the inclusion of SLVIA in the EP process	03/12/21

	RH - On other projects it is not uncommon for these topics to be covered in the Evidence Plan EWGs as wider discussions are had. The applicant might want to have particular sessions on these topics. KL - The applicant acknowledges that there is some overlap between onshore ecology and SLVIA, it will be considered again internally. RH - The EP process was developed with the Habitats Regulations in mind. Recently the remit has extended out to other significant topics. This is something that has taken up examination time previously. AB - The applicant is carrying out a similar process for other topics outside the EP process e.g. shipping and navigation, aviation and onshore topics. The applicant plans to retain the original remit of the EP and for other topics we are using road maps where applicable. EH – Suggest these roadmaps are captured in a ways of working document RH - RH advised that others beyond the local authorities included in those road maps may be interested in SLVIA.	The applicant to discuss engagement roadmaps internally and feed back to the EP Steering Group	17/12/21
8.	**Next steps** (presented by KL) AuB - NE would generally provide the issues and comments log to the Planning Inspectorate along with the advice on application. KL - Can the issues and risks log be provided during the pre-application consultation? This might be useful to sit alongside the Statements of Common Ground (SOCG). MK - This is something that has been started recently, for East Anglia One offshore windfarm onwards. MK will think about how this can be provided in advance. There should not be any surprises as issues will be discussed in the EWG. RH – While it is important that the SoCG outlines what has been agreed (i.e. common ground) the key to these are that the areas of divergence between the stakeholder and the applicant are clearly set out. MK - In the figure provided in the EP, it looks like there is a compressed timeline between the PIER and the DCO application. This is a challenging timescale. PEIR consultation can throw up a lot of issues. Compressed timelines at this stage have resulted in projects looking at longer timescales for the DCO application. This is a significant step. KL - This is a presentation issue. Late 2022 is the PEIR submission timescale and autumn 2023 for DCO application of the first project.	MK to provide an example risk and issues log and a Statement of Common Ground	Complete
9.	**Close of meeting**		

A.3. Steering group meeting 2

A.3.1 Meeting minutes

MINUTES OF MEETING

Security Classification: Project Internal

Partners in UK offshore wind

MOM Number	:	20211213_Morgan and Mona EP_EP Steering Group	**REV. No.** :	F01
MOM Subject	:	Morgan and Mona Evidence Plan Steering Group Meeting 2 - Session 1		

MINUTES OF MEETING

MEETING DATE	:	13/12/2021
MEETING LOCATION	:	Microsoft Teams
RECORDED BY	:	[redacted] (RPS)
ISSUED BY	:	[redacted] (RPS) [redacted] (RPS)

PERSONS PRESENT:

- [redacted] – bp (LH)
- [redacted] – bp (MP)
- [redacted] – bp (WD)
- [redacted] – Wood (LG)
- [redacted] - RPS (CR)
- [redacted] – RPS (NS)
- [redacted] – RPS (KL)
- [redacted] - RPS (ST)
- [redacted] – Natural England (MK)
- [redacted] – Natural England (AuB)
- [redacted] – Natural England (EH)
- [redacted] – MMO (JS)
- [redacted] – MMO (SJ)
- [redacted] – JNCC (JW)
- [redacted] Planning Inspectorate (GB)
- [redacted] – Planning Inspectorate (HT)
- [redacted] – Environment Agency (LL)

ITEM NO:	DISCUSSION ITEM:	Responsible party	Date
1.	**Introduction** KL- This meeting is to introduce the cable route study for Morgan and Mona, to procure high level feedback on the cable routing process and to identify any red flags. It is not the Applicant's intention to provide the full slides following the meeting, as per the email from KL on 10-Dec-21. Further information will be provided, and more detailed consultation will take place next year when the projects have their grid connections. We will also be holding this meeting tomorrow with NRW, who were unable to attend today.		

	GB - On behalf of the Planning Inspectorate I will take high level notes for the meeting and record any section 51 advice.		
2.	**Overview of the Projects** (Presented by MP) bp are working with EnBW to develop the Morgan and Mona offshore wind farms as two separate projects. These sites were awarded as part of the The Crown Estate's Round 4 offshore wind leasing round. Currently they are at preferred bidder status. The intention is for both projects to be developed as fixed bottom offshore wind farms. They will be developed on similar but slightly staggered timescales and will be under separate consent applications. The Mona project is aiming to be operational in 2028 and the Morgan project is aiming to be operational a year after. At the moment the applicant is awaiting a decision from the Offshore Transmission Network Review (OTNR) which will inform the grid connection for both projects. **Key Dates** Both projects are currently at pre-scoping stage. The scoping reports for both projects are planned to be submitted at the end of March 2022. The intent is to have each project submission offset by a week as per the Planning Inspectorate's preference. The applicant is currently undertaking pre-scoping engagement including local authority engagement. Throughout 2022 the applicant will progress with consenting and both offshore and onshore surveys. Local authority engagement and fisheries engagement have begun. The applicant has also kicked off a maritime navigation engagement forum. The applicant aims to publish the Preliminary Environmental Information Report (PEIR) towards the end of 2022 with formal consultation scheduled for early 2023. The Mona Development Consent Order (DCO) application is currently planned to be submitted in October 2023 and the Morgan DCO planned for January 2024. **Evidence Plan process** (presented by KL) The Evidence Plan (EP) process has been developed following the Planning Inspectorate and Defra guidance. The applicant has also considered draft guidelines provided by Natural England [1]. The EP has historically been HRA focused however in line with recent best practice, the applicant proposes to extend this to include the EIA process for ecology topics, including designated sites such as SSSIs and MCZs.		

[1] Natural England (2021) Expectations for pre-application engagement and best practice guidance for the evidence plan process.

	The applicant is proposing to carry out a single EP process for both projects. The applicant has received some comments on use of a single EP for both projects. The projects will have separate agreement logs to account for the differences between the projects ahead of the DCO applications. Meeting minutes will also note any differences between the projects. **Roles and responsibilities** (presented by KL) The EP process is led by the applicant. The responsibility for updating the EP is with the applicant, with feedback from the relevant consultees. **Evidence Plan Steering Group** (presented by KL) The purpose of the Evidence Plan Steering Group is to monitor progress of the EP. Meetings will provide key project updates and will include an update on timescales to ensure resourcing during these periods are managed. The EP Steering Group will guide and inform the EP process. The group will meet at key milestones during the project programme for Mona and Morgan. A meeting is planned for February/March 2022 when the Point of Interconnection (POI) for the projects are known, to provide detailed information on the cable route selection study. An additional meeting is planned for April/May 2022 to coincide with the provision of the Scoping Opinion. The Environmental Agency (EA) has been included in this Steering Group meeting and the next steering group meeting as a key onshore stakeholder with an interest in the cable routing study. Otherwise, they will be included in the onshore ecology EWG. **EWG** (presented by KL) Remits will be tweaked for each EWG to make it specific for each topic e.g. approach to underwater noise modelling for marine mammals. The EP will be updated and circulated prior to the first EWG. Broad approach to EWGs: • Information circulated to EWG minimum 2 weeks ahead of meeting. • Meeting is held with attendees prepared to comment on materials provided. • Full meeting minutes will be taken, and agreement logs will be compiled where matters are agreed, and after each meeting the minutes and agreement log will be circulated and then agreed. The agreement log will be updated and appended to the DCO application. Consultation on the WFD will be taken outside of the EPWG process through the pre-application phase as part of scoping and section 42 consultation. If required, it can be discussed in the EWGs, with MHWS being the limit between offshore and onshore EWGs, however at the moment the Applicant considers that it should be adequately addressed through consultation.		

	LL- What are the limits between the onshore and offshore EWG topics remits? KL-Habitats and species that can be found from MHWS landwards will be taken forward in the onshore EWGs, while those found from MHWS seawards will be discussed in the offshore EWGs. For example, sand dune habitats are considered under onshore EWGs while saltmarsh habitats are considered under offshore EWGs. Benthic habitats can occur in the intertidal area up to MHWS, therefore would fall under the BE, MP and FSE EWG. There will be some double counting between onshore and marine planning limits as onshore planning limits go down to MLWS. LL- The EA would be interested in migratory fish and WFD receptors, these are offshore considerations not onshore. The EA would like to be included in the BE, PP, FSE EWG. The EA interest extends beyond the mean high water mark for some receptors. KL- Yes, the EA can be included in that EWG. The Applicant hopes to set up the EWGs to start in February 2022. KL- The Applicant wanted to ask the MMO if they would provide a contact for Cefas to invite them to the EWG when they are set up. SJ- Generally developers do not talk directly to Cefas, the MMO will be their point of contact. The MMO will open consultation with Cefas in the new year when the projects have a grid connection. For the EWG, the Applicant should invite the MMO and let them know that they would like Cefas to be invited and which topics the meeting is for. The MMO will then forward the invite to the relevant member of Cefas. The MMO will manage this interface. GB- Is there any intention of including non-ecological topics in the EP process e.g. archaeology? KL- The remit of the EP was discussed in the first steering group meeting when NRW queried whether it should include SLVIA. The Applicant is of the view that keeping the EP limited to ecological receptors is more appropriate. The Applicant has discussed internally and decided that a line needs to be drawn around the remit of the Evidence Plan. By including non-ecology topics, the remit could become too large. These topics will be covered as part of the wider EIA assessment, scoping and PEIR consultation. The Applicant is carrying out a similar process for other topics outside the EP process e.g. shipping and navigation, aviation, and onshore topics. The Applicant plans to retain the original remit of the EP and for other topics use road maps where applicable. **Cable Routing Study Introduction** (Presented by KL) When the Projects reach scoping submission, the intention is that they will each have a single grid connection and therefore only one POI for Morgan and one for Mona. At the moment there are six POIs,four for Mona and two for Morgan. There are a number of route corridors being developed for each POI, within each scoping search area. At this time, the Applicant is not asking for detailed feedback on the indicative routes as there are many indicative routes, most of which	RPS to include the EA in the BE, PP, FSF EWG. RPS to request Cefas involvement in EWGs.	Complete When EWGs are being set up

	will fall away once there is a decision on the POIs by National Grid. The purpose of this meeting is to introduce the cable routing study, to illustrate the search areas and indicative routes and request high level feedback on any particularly sensitive receptors and the approach to the cable route study. We are not requesting detailed feedback on the routes at this time.		
3.	**Cable Routing Study** (presented by LG) The cable routing study is a technical GIS data driven study. The study looked at the six POIs and considered a number of options for each POI. The aim was to find technically feasible and the least environmentally constrained routes. It was not possible to avoid all constraints, but the study used a number of guiding principles. The site selection for the array was undertaken previously for the round 4 application processes. There will always be a substation within the array, and this is where the cable route selection process started from. There are a number of possible landfall location options for each POI. These projects might have a large variety of landfall types due to the variation in the coastline topography in this area. Onshore cable routing will be installed to the onshore substation before the cable provides power to the national grid. The study did not compare POI against POI as the choice of POI will be driven by the National Grid. **Guiding principals** The project has taken several guiding principals into account during the cable route selection process: • The Crown Estate Cable Route Protocol (2019). • Holford Rules. • Natural England and JNCC advice for offshore cabling for Round 4 projects. • Natural Resources Wales advice for offshore cabling for Round 4 projects. • Design for community. The Holford rules have been considered with the assumption that all cables will be buried wherever possible. This is for the whole length of cable, onshore and offshore. No pylons have been considered for this project. Trenchless technologies will be used where required e.g. HDD underneath roads. The NE/JNCC advice on the mitigation hierarchy has been considered by minimising interaction with nature conservation designations. Where sites cannot be avoided, the study has tried to find the shortest overlap possible between the cable route and the designated sites. However, in some cases there have been other constraints which have meant that the shortest route across the designated site was not feasible. The Project design principals are designed for communities, they are technical design considerations to allow the project to cause as little disruption as possible. Urban areas have been excluded for the cable route selection study. Proximity to residences and other developments has also been considered for the substations.		

	Substations will be as close to the POI as possible however they may need to be a few km away due to other constraints e.g. roads.		
4.	**Site selection process** (presented by LG) The Applicant started the cable route selection study with very wide search areas. Constraints were categorised as hard or soft constraints. Hard constraints were no-go areas e.g. offshore platforms, aggregate areas and urban areas. The constraints were all mapped to exclude hard constraints and to understand the distribution of soft constraints. This was used to find the cable routes of least constraint. Landfall and substation location options were investigated by sending people out to these locations and taking detailed notes e.g. the state of the coastal defences, any other developments that are not visible from satellite imagery etc. The constraints were weighted to give a greater weighting to the constraints that have a greater bearing on the decision making process. Spatial mapping was used to interrogate the constraints e.g. to measure the length of a cable route through specific constraints. This enabled one route to be compared against another and each route was scored against each constraint. This gives each route option a ranking on how it compares against the other options therefore allowing identification of the preferred route. Reasonable alternatives have also been presented as we are looking for very early feedback and will be looking for more detailed feedback when the POI for each project is known. It will be possible to go back to the mapping stages of the selection study following stakeholder feedback.		
5.	**Identified constraints** (presented by LG) Each POI has several landfall options, except Bodelwyddan, which has only one landfall option. There are SPAs around the entire North Wales and English coast in this area therefore it has been impossible to completely avoid them. The Flyde MCZ blocks the coast in front of the Penwortham POI therefore the shortest route through the MCZ has been used. However, a detailed look at the distribution of the designated benthic habitats within the MCZ will be done of the POI chosen by NG and this may identify a different route as being the one least constrained. The Connah's Quay route goes through the narrowest point of the Dee Estuary SAC. In some places, there are multiple designations for the same habitats, however these have been considered separately. The northern indicative route for Kirkby goes through a nature reserve, this is designated for its dune system. This coastline is very constrained with large urban areas and Ministry of Defence (MOD) areas. The only open space is designated. This landfall is not the only option for this POI and it is understood that going through this designation is not ideal; the Applicant is open to consultation and consideration for this location if it becomes the POI for Morgan. The routes have also avoided other operational and round 4 projects e.g. the Cobra project. Consultation will be undertaken with those		

	developers. There is also a large amount of oil and gas activity to the north of the Cobra project. The Wylfa POI is adjacent to the Wylfa power station. The coastline in this area is designated as an AONB. The AONB has a gap where the power station is, therefore the indicative route at this location does not interact with the AONB. However, it has been given due consideration as any development would be visible from the AONB.		
6.	**Questions** MK- All of these routes have some potential environmental impacts and/or have significant constraints. Thinking about the mitigation hierarchy, is there any consideration of reducing impacts by taking a joint cable to shore for the two projects? LH- This is something we have considered, however it has not been taken forward due to grid constraints. The Applicant looked at the grid network and could not find a scenario where the 3GW from both project could be integrated into the grid at a single POI. The Applicant has been looking at collaboration with other developers as an option to minimise cable routes into shore, in particular with another round 4 developer. There has not been any conclusions to these discussions, but it is being considered. LG- In addition, the scale of the infrastructure that would be required for a 3GW option e.g., number of cables, size of cable trench, size of substation would be significantly larger than for one project. Provides a different set of environmental problems. MK- Any options that reduce the overall level of cable are worth exploring further. We are expecting something from the holistic network design (HND) in the new year. Is there a risk that the result of that takes the project in a different direction with different cable options? Is this being considered? LH- Yes there is a risk that this will affect the cable route options. This is the same for all the round 4 projects, given the process and Government targets for 2030. The Applicant has had to make some assumptions around the outcomes of the HND. Rather than wait for the HND results, constraints work has started to mitigation the effect of the HND on project timelines. It is possible that the project will not end up with one of the grid connections currently being studied. EH- Why have the Welsh landfall/POIs not been considered for Morgan e.g. Wylfa? LG- We did look at this early on however a strategic decision was made by bp/EnBW to split the options, so Morgan went to England and Mona went to Wales. The routes to the POI options not presented here did not scope as well on the environment constraints scoping process. LH- As we do not have clarity from National Grid, in order to manage workload and number of options, the Applicant focused the export		

	cable routes towards the POIs for the country within which water they are located in. MK- Liverpool Bay SPA is difficult to avoid however the Applicant could look at areas of greater sensitivity with the SPA for future refinement work. In addition, Natural England would need to see better maps of the onshore SPAs to provide advice. KL- We would look at providing more detailed maps and requesting detailed feedback prior to the next meeting in February/March when we know what the POIs are. EH- Highlighted that there is a tidal lagoon power station being considered near the Connah's Quay option. LH- We are aware of this. MK- Is the Applicant anticipating that the Morgan project will get a POI in England and Mona will get a POI in Wales? Has this been confirmed by grid? LH- It could be that they both end up with POIs in Wales or England however, the POIs for each project that we have been studying are what the Applicant has assumed to be the most viable, based on the little information proivded by NG to date.		
7.	**Next steps** (presented by KL) Could all consultees give some thought to the broad process presented today, to confirm that the process is acceptable and/or to identify any red flags in the process. When the Applicant knows the POIs for both projects, the Applicant will produce a paper on the POI options and circulate to the EP Steering Group. This will be with the aim of getting written feedback on the indicative routes. This will be followed by another steering group meeting in late February/early March 2022 to discuss this feedback. This feedback will then inform the final cable route for the projects. Scoping will present the broader scoping search area as these indicative routes are still a work in progress. Refinement of the route will be subject to further consultation post-scoping. MK- Does the Applicant want something in writing following this meeting? KL- We will circulate meeting minutes within a week. It would be useful if the attendees could provide initial feedback on the following, during or after the meeting: • Broad approach to the Cable Routing Study, including advice/guidance and principles. • High level feedback on any particularly sensitive receptors/red flags within the Search Areas.	Attendees to provide initial feedback.	21/01/2022

	SJ- The MMO would want to discuss the paper on the selection POIs with Cefas. The MMO would need to give Cefas 4 weeks to for them to provide comments. KL- This aligns with the ways of working document and timescales that were presented in the first Steering Group meeting. LL- The EA would be interested in seeing the slides with the timescales on. Happy for the Applicant to cut out the sensitive information and just provide the slides with the project timescales on. K- Yes that can be done. MP- We can also share the slides for the first SG meeting. GB- What is the rationale behind the scoping reports being submitted only a week apart and not submitted at the same time? It might make it easier on consultees or it might not. LH- This request came from previous consultation with the Planning Inspectorate. GB- If there is a large cross over between the spatial extent of project then it may cause problems for the Plannning Inspectorate to know which project comments relate to. However, these presented scoping search areas look spatial separate therefore this may be less of a concern for the Planning Inspectorate. A stagger may help the resourcing of consultees commenting on the project as well. LH- We will consider it further.	RPS to provide slides from 1st SG meeting and timelines slides form 2nd SG meeting to the EA. Bp/EnBW to consider 1 week stagger on Scoping submission.	22/12/2021 22/03/2021
8.	**Close of meeting**		

A.3.2 Response from Natural England regarding the meeting minutes

Date: 20 January 2022
Our ref: DAS/UDS A000566 / 376487
Your ref: Morgan and Mona Evidence Plan Steering Group Meeting 2 – Cable Routeing Study Introduction

[redacted]
BP Alternative Energy Investments Limited

c/c [redacted]
RPS

BY EMAIL ONLY

Customer Services
Hornbeam House
Crewe Business Park
Electra Way
Crewe
Cheshire
CW1 6GJ

0300 060 3900

Dear [redacted]

Discretionary Advice Service (Charged Advice) - UDS A000566
Contract Reference: BP EnBW Morgan and Mona Offshore Wind Farm
Consultation: Evidence Plan Steering Group Meeting 2 - Cable Routeing Study Introduction

This advice is being provided as part of Natural England's Discretionary Advice Service in accordance with the Quotation and Agreement dated 17 May 2021 to BP Alternative Energy Investments Limited.

The following advice is based upon the information presented in the Evidence Plan Steering Group Meeting 2 (attended on 13 December 2021) which included a presentation by Dr. Kevin Linnane from RPS and subsequent meeting notes provided on the 22nd Dec 2021 by Samantha Tuddenham.

Natural England were asked to provide advice upon:

1. Broad approach to the Cable Routing Study, including advice/guidance and principles;
2. High level feedback on any particular sensitive receptors / red flags within the Search Areas.
3. Timings of the submission of the scoping reports

1. Broad Approach to Cable Routing Study

The general approach to reviewing the impact of potential cable routes is supported and Natural England welcomes the guiding principles (as set out in the Evidence Plan Steering Group Meeting) used to support the work of this study. It would be a useful addition to records to include some sort of justification for their alignment, particularly where conflicting constraints have been identified (i.e. where the shortest route through designated sites has not been taken forward).

2. High level feedback on particular sensitivities

The Conservation of Habitats and Species Regulations 2017 and The Conservation of Offshore Marine Habitats and Species Regulations 2017

From the information presented on the potential cable route corridors there is potential for the development to impact on the following Special Areas of Conservation (SAC), Special Area of Protection (SPA) and Ramsar sites:

- Ribble and Alt Estuaries SPA and Ramsar Site;
- Sefton Coast SAC;
- Dee Estuary SAC;
- Dee Estuary SPA and Ramsar Site;
- River Dee and Bala Lake SAC.

Natural England publishes full details of protected sites and the designated features they protect on Natural England's Designated Sites View, this includes conservation advice packages where available[1] and maps. Regarding marine sites, the Advice on Operations section of the conservation advice packages identifies the pressures of certain activities on the designated features. This may be helpful in recognising specific pressures, and in aiding understanding of the sensitivity of the features to that pressure. Please be aware that where low risk pressures/low sensitivities are identified, this may not specifically mean it is low risk in relation to the designated site, as this will need to be determined through consideration of site-specific factors. To assist this consideration, where they are available the Supplementary Advice on Conservation Objectives (SACO) sets out a series of attributes that describe the conditions required to meet the conservation objectives.

As highlighted in the report 'Natural England and JNCC advice on key sensitivities of habitats and Marine Protected Areas in English Waters to offshore wind farm cabling within Proposed Round 4 leasing areas' (2019)[2] consenting and installation issues have largely been due to their impacts on habitat features, protected in their own right or as supporting habitats for species. This report provides more detail about the potential pressures and sensitivities relating to cabling and is a useful resource. It is currently being updated so additional comments on sites highlighted as part of the Cable Routeing Study and their sensitivities, including National Nature Reserves, are set out within Appendix 1: Designated Site Sensitivities.

Marine Mammals
Marine Mammals listed in Annex II if the Habitats Directive include:

- Harbour porpoise (*Phocoena phocoena*);
- Bottlenose dolphin (*Tursiops truncatus*);
- Common (harbour) seal (*Phoca vitulina*); and
- Grey seal (*Halichoerus grypus*).

The most commonly recorded cetaceans close to the Lancashire coast are harbour porpoise, followed by short-beaked common dolphin and bottlenose dolphins.

There are several areas commonly used as haul-out areas close to the cable corridor on the Dee, such as the well-established area for young male grey seals off Hilbre Island in the Dee Estuary and another site lies to the north of the Fleetwood coastline on south Walney Island.

Although sites within the project are designated within England are not designated for grey seals, common seals and bottlenose dolphin these populations could be linked with sites designated for these features in Wales and Ireland, this would need to be explored as part of the Habitats Regulations Assessment for the project.

Marine and Coastal Access Act 2009
The proposed cable routes have the potential to impact on the following Marine Conservation Zones:

- Fylde MCZ
- Ribble Estuary MCZ

Details on site features and the Conservation Advice Package these MCZs are accessible on Natural England's Designated Sites View.

Wildlife and Countryside Act 1981 (as amended)
In most cases the Sites of Special Scientific Interest (SSSIs) which underpin an internally designated site above mean low water have the same features however in some cases the SSSIs have a broader range

[1] Currently available for Sefton Coast SAC, Ribble and Alt Estuaries SPA, Mersey Estuary SPA, Mersey Narrows and North Wirral Foreshore SPA, and Fylde MCZ.
[2] Natural England and JNCC advice on key sensitivities of habitats and Marine Protected Areas in English Waters to offshore wind farm cabling within Proposed Round 4 leasing areas. September 2019.

of features so it is advised that the citations for SSSIs are referred to, these are available on Designated Sites View.

National Nature Reserves
National Nature Reserves are some of the most important sites in the UK for wildlife and geology, in England declared by Natural England under the National Parks and Access to the Countryside Act 1949 and the Wildlife and Countryside Act 1981.They are managed primarily for their habitats and species, or geological or geomorphological features, but also provide great opportunities for people to experience nature and provide 'outdoor laboratories' for research.

There are three NNRs in the study area; Ribble Estuary, Cabin Hill, and Ainsdale Sand Dunes. Additional details regarding their importance are provided in Appendix 1.

Additional Considerations- England Coast Path
Natural England has a duty to provide coastal access on foot around the whole of the English coast. The development of the onshore element of the cable corridor should take into account any impacts on this route on both a permanent and temporary basis and mitigate for the effects.

3. Timings of the submission of scoping documents

Whilst a short timeline between the submission of scoping documents appears to be acceptable at this stage the submission of two NSIP projects within a close time frame in the longer term may want to be revised depending on the complexity of issues further evidence and studies raise as this may result in resourcing issues for specialists for Statutory Nature Conservation Bodies.

It was set out in the Evidence Plan Steering Group Meeting 2 that there is the aim to publish the Preliminary Environmental Information Report (PEIR) for early formal consultation in early 2023. This would only allow for one full year of overwintering bird survey data (surveys starting in winter 2021) to be presented. Natural England highlight the risk that the second year of data collection could have potential to change the conclusions, which could cause potential delays to the project. In addition, Natural England have previously advised (Natural England reference: DAS/UDS A000566 / 374171, dated 12 November 2021) that two years of survey effort is the minimum expected evidence standard for bird data, and seeks confirmation that the timetable set out for DCO submission allows for this evidence standard.

For clarification of any points in this letter, please contact me using the details provided below.

Yours sincerely

[redacted]
Strategic Coastal Lead Adviser
Coast and Marine Team
Cheshire, Greater Manchester, Merseyside & Lancashire Area Team
[redacted]

☒ The advice provided in this letter has been through Natural England's Quality Assurance process.

The advice provided within the Discretionary Advice Service is the professional advice of the Natural England adviser named below. It is the best advice that can be given based on the information provided so far. Its quality and detail is dependent upon the quality and depth of the information which has been provided. It does not constitute a statutory response or decision, which will be made by Natural England acting corporately in its role as statutory consultee to the competent authority after an application has been submitted. The advice given is therefore not binding in any way and is provided without prejudice to the consideration of any statutory consultation response or decision which may be made by Natural England in due course. The final judgement on any proposals by Natural England is reserved until an application is made and will be made on the information then available, including any modifications to the proposal made after receipt of discretionary advice. All pre-application advice is subject to review and

revision in the light of changes in relevant considerations, including changes in relation to the facts, scientific knowledge/evidence, policy, guidance or law. Natural England will not accept any liability for the accuracy, adequacy or completeness of, nor will any express or implied warranty be given for, the advice. This exclusion does not extend to any fraudulent misrepresentation made by or on behalf of Natural England.

Cc commercialservices@naturalengland.org.uk

Appendix 1: Designated Site Sensitivities

Liverpool Bay Special Protection Area (SPA)
The conservation advice package for Liverpool Bay SPA is currently been updated since the site was extended and new features were added to the citation in 2017. The current published Regulation 35 package for the site is out of date and does not include reference to the site extension or new features. The up to date citation and Conservation Objectives are available on Natural England's Access to Evidence Catalogue [3]. Natural England, Natural Resources Wales and the Joint Nature Conservation Committee are currently working together to publish a Regulation 37 package in April 2022 (subject to sign off) to include the new features. Given the size of Liverpool Bay SPA when considering development it is advised that areas of greatest sensitivity are identified and avoided.

The Sefton Coast Special Area of Conservation (SAC)
This site comprises one of the largest and most diverse dune systems in England. The site is designated for a wide range of dune features and displays both rapid erosion and active shifting dunes with a substantial stretch of the dune system fronted by shifting dunes. Much of the SAC has public access and includes two National Nature Reserves, five championship golf courses and a military training camp. This means that most of the SAC has either full public access, or is adjacent to public rights of way and is already at risk from high levels of disturbance. In addition, there are already existing cables (i.e. fibre optics) along this stretch of coastline which would need to be taken into consideration. Natural England note that the maps presented in the meeting Sefton Coast SAC was not displayed on the map of the SACs that were impacted by potential cable routes, this should be updated to include this site.

Ribble and Alt Estuaries SPA and Ramsar
This site supports large numbers of overwintering and breeding bird species bird species that use the extensive areas of sensitive saltmarsh and mudflats which are highly sensitive to disturbance . Part of the southern edge near the mouth of the estuary has undergone managed realignment to create additional supporting habitat. Cabling through any of these areas would risk extensive damage to these supporting habitats. The site has some important cockle fisheries, and military activity as well as some industry. Part of the site overlaps with the Sefton Coast SAC.

Dee Estuary SAC, and Dee Estuary SPA/ Ramsar
The Dee Estuary SAC was primarily designated for its extensive saltmarsh and intertidal mud and sand flats. As the highly sensitive saltmarsh extends across most of the SAC/SPA it would be difficult to micro-site cables around this and Horizontal Directional Drilling (HDD) could also be difficult to achieve due to the extent of the feature. In addition the Dee Estuary has River Lamprey and Sea Lamprey as Annex 2 qualifying features and consideration to the impacts on these migratory fish of the cable construction and operation should be taken into account. Sea lamprey and river lamprey use the estuary as part of a migratory route to the River Dee. Sea and river lampreys spend their adult life in the sea or estuaries but spawn and spend the juvenile part of their life cycle in rivers.

Additionally, the SPA/Ramsar site supports large numbers of designated overwintering and some breeding bird species which would be highly sensitive to disturbance. Currently the majority of activity is on the coastal fringe of the sites, with some industry and small amount of fisheries, these constraints will need to be considered in narrowing the location of the cable corridor.

Dee Estuary and Bala Lake SAC
This site is designated for Atlantic Salmon as a primary Annex 2 species and both River and Sea Lamprey as Annex 2 qualifying features, these migratory fish features should be considered for potential impact disturbance from noise during construction, operation and decommissioning as well as any impact of electromagnetic disturbance from the cable when in operation.

Fylde Marine Conservation Zone (MCZ)
This site is designated for subtidal mud and subtidal sand, with the depth of the seabed within the site

[3] Natural England's Access to Evidence European Site Conservation Objectives for Liverpool Bay / Bae Lerpwl SPA (UK9020294)

ranging from almost being exposed on low tide (approximately 35 cm depth) to 22 metres at its deepest. The sediment habitats are known to support rich bivalve mollusc populations and the site also includes important nursery and spawning grounds for several commercially important fish species including sole (*Solea solea*), plaice (*Pleuronectes platessa*) and whiting (*Merlangius merlangus*).

Ribble Estuary MCZ
This site is designated for Smelt (*Osmerus eperlanus*) and that consideration to the migratory fish feature should be considered for potential impact disturbance during construction.

Ribble Estuary National Nature Reserves (NNR)
The NNR is formed of a large managed realignment are of restored saltmarsh as well as mud and sad flats and coastal grasslands, with the Ribble estuary is on the of the most important sites for overwintering wildfowl in the UK sited along a key migration route.

Ainsdale Sand Dunes NNR
The sand dune habitats that make up this site support many locally or regionally rate plant species, as well as natterjack toad, red squirrel, sand lizard and great-crested newts being found on the site. The sites supports a network of public footpaths and is a popular area for recreation.

Cabin Hill NNR
Is the smallest of the three NNRs, and consists of embryo dunes, yellow dunes, fixed dunes, wet slacks, flower-rich grassland, dune pasture and deciduous woodland. The shore provides feeding and roosting grounds for many migrating and over-wintering birds. Both Common lizard and sand lizard are found on the site.

A.4. Steering group meeting 2.5

A.4.1 Meeting minutes

MINUTES OF MEETING

Security Classification: Project Internal

Partners in UK offshore wind

MOM Number	:	20211214_Morgan and Mona EP_EP Steering Group	**REV. No.** :	F02
MOM Subject	:	Morgan and Mona Evidence Plan Steering Group Meeting 2 – Session 2		

MINUTES OF MEETING

MEETING DATE	:	14/12/2021
MEETING LOCATION	:	Microsoft Teams
RECORDED BY	:	[redacted]
ISSUED BY	:	[redacted] (RPS) / [redacted] (RPS)

PERSONS PRESENT:

- [redacted] – bp (MP)
- [redacted] – bp (WD)
- [redacted] – Wood)
- [redacted] – RPS (CR)
- [redacted] – RPS (NS)
- [redacted] – NRW (LR)

ITEM NO:	DISCUSSION ITEM:	Responsible party	Date
1.	**Introduction** NS- This meeting is to introduce the cable route study for Morgan and Mona, to get very high level feedback on the cable routeing process and to identify any red flags. It is not the Applicants intention to provide the full slides, as per the email from KL on 10-Dec-21. Further information will be provided, and more detailed consultation will take place next year when the projects have their grid connections. This presentation was also held yesterday with the JNCC, MMO, PINS, NE and EA, who were unable to attend today.		
2.	**Overview of the Projects** (Presented by NS) bp are working with EnBW to develop the Morgan and Mona offshore wind farms as two separate projects. These sites were awarded as part of the The Crown Estate's Round 4 offshore wind leasing round. Currently they are at preferred bidder status. The intention is for both projects to be developed as fixed bottom offshore wind farms. They will be developed on similar but slightly staggered timescales and will be under separate consent applications. The Mona project is aiming to		

	be operational in 2028 and the Morgan project is aiming to be operational a year after. At the moment the applicant is awaiting a decision from the Offshore Transmission Network Review (OTNR) which will inform the grid connection for both projects. **Key Dates** Both projects are currently at pre-scoping stage. The scoping reports for both projects are planned to be submitted at the end of March 2022. The intent is to have each project submission offset by a week as per the Planning Inspectorate's preference. The applicant is currently undertaking pre-scoping engagement including local authority engagement. Throughout 2022 the applicant will progress with consenting and both offshore and onshore surveys. Local authority engagement and fisheries engagement have begun. The applicant has also kicked off a maritime navigation engagement forum. The applicant aims to publish the Preliminary Environmental Information Report (PEIR) towards the end of 2022 with formal consultation scheduled for early 2023. The Mona Development Consent Order (DCO) application is currently planned to be submitted in October 2023 and the Morgan DCO planned for January 2024. **Evidence Plan process** (presented by NS) The Evidence Plan (EP) process has been developed following the Planning Inspectorate and Defra guidance. The applicant has also considered draft guidelines provided by Natural England [1]. The EP has historically been HRA focused however in line with recent best practice, the applicant proposes to extend this to include the EIA process for ecology topics, including designated sites such as SSSIs and MCZs.		
	The applicant is proposing to carry out a single EP process for both projects. The applicant has received some comments on use of a single EP for both projects. The projects will have separate agreement logs to account for the differences between the projects ahead of the DCO applications. Meeting minutes will also note any differences between the projects. **Evidence Plan Steering Group** (presented by NS) The purpose of the Evidence Plan Steering Group is to monitor progress of the EP. Meetings will provide key project updates and will		

[1] Natural England (2021) Expectations for pre-application engagement and best practice guidance for the evidence plan process.

	include an update on timescales to ensure resourcing during these periods are managed. The EP Steering Group will guide and inform the EP process. The group will meet at key milestones during the project programme for Mona and Morgan. A meeting is planned for February/March 2022 when the Point of Interconnection (POI) for the projects are known, to provide detailed information on the cable route selection study. An additional meeting is planned for April/May 2022 to coincide with the provision of the Scoping Opinion. The Environmental Agency (EA) was included in yesterday's Steering Group meeting with the JNCC, MMO, PINS and NE, and will be included in the next Steering Group meeting as a key onshore stakeholder with an interest in the cable routeing study. Otherwise, they will be included in the onshore ecology EWG. **EWG** (presented by NS) Remits will be tweaked for each EWG to make it specific for each topic e.g., approach to underwater noise modelling for marine mammals. The EP will be updated and circulated prior to the first EWG. Broad approach to EWGs: • Information circulated to EWG minimum 2 weeks ahead of meeting. • Meeting is held with attendees prepared to comment on materials provided. • Full meeting minutes will be taken and agreement logs will be compiled where matters are agreed, and after each meeting the minutes and agreement log will be circulated and then agreed. The agreement log will be updated and appended to the DCO application. **Cable Routeing Study Introduction** (Presented by LG) When the Scoping Reports get submitted, the intention is that they will each have a single grid connection and therefore only one POI for Morgan and one POI for Mona. At the moment there are six POIs, four for Mona and two for Morgan. There are a number of routes corridors being developed for each POI, within each scoping search area. At this time, the Applicant is not asking for detailed feedback on the indicative routes as there are many indicative routes, four of which are anticipated to fall away once there is a decision on the POIs by National Grid. The purpose of this meeting is to introduce the cable routing study, to illustrate the search areas and indicative routes and request high level feedback on any particularly sensitive receptors and the approach to the cable route study. We are not requesting detailed feedback on the routes at this time.		
3.	**Cable Routing Study** (presented by LG) The cable routeing study is a technical GIS data driven study. The study looked at the six points of interconnection and considered a number of options for each POI. The aim was to find technically		

	feasible and the least environmentally constrained routes. It was not possible to avoid all constraints but the study used a number of guiding principles. The site selection for the array was undertaken previously for the round 4 application processes. There will always be a substation within the array, and this is where the cable route selection process started from. There are a number of possible landfall location options for each POI. These project might have a large variety of landfall types due to the variation in the coastline topography in this area. Onshore cable routing will be installed to the onshore substation before the cable provides power to the national grid. The study did not compare POI against POI as the choice of POI will be driven by National Grid. **Guiding principals** The project has taken several guiding principals into account during the cable route selection process: • The Crown Estate Cable Route Protocol (2019). • Holford Rules. • Natural England and JNCC advice for offshore cabling for Round 4 projects. • Natural Resources Wales advice for offshore cabling for Round 4 projects. • Design for community. The Holford rules have been considered with the assumption that all cables will be buried wherever possible. This is for the whole length of cable, onshore and offshore. No pylons have been considered for this project. Trenchless technologies will be used where required e.g., HDD underneath roads. The NE/JNCC advice on the mitigation hierarchy has been considered by minimising interaction with nature conservation designations. Where sites cannot be avoided, the study has tried to find the shortest overlap possible between the cable route and the designated sites. However, in some cases there have been other constraints which have meant that the shortest route across the designated site was not feasible. The Project design principals are designed for communities, they are technical design considerations to allow the project to cause as little disruption as possible. Urban areas have been excluded for the cable route selection study. Proximity to residences and other developments has also been considered for the substations. Substations will be as close to the POI as possible however they may need to be a few km away due to other constraints e.g., roads.		
4.	**Site selection process** (presented by LG) The Applicant started the cable route selection study with very wide search areas. Constraints were categorised as hard or soft constraints. Hard constraints were no-go areas e.g., offshore platforms, aggregate areas, and urban areas. The constraints were all mapped to exclude hard constraints and to understand the distribution of soft constraints.		

	This was used to find the cable routes of least constraint. Landfall and substation location options were investigated by sending people out to these locations and taking detailed notes e.g., the state of the coastal defences, any other developments that are not visible from satellite imagery etc. The constraints were weighted to give a greater weighting to the constraints that have a greater bearing on the decision making process. Spatial mapping was used to interrogate the constraints e.g., to measure the length of a cable route through a specific constraints. This enabled one route to be compared against another and each route was scored against each constraints. This gives each route option a ranking on how it compares against the other options therefore allowing identification of the preferred route. Reasonable alternatives have also been presented as we are looking for very early feedback and will be looking for more detailed feedback when the POI for each project is known. It will be possible to go back to the mapping stages of the selection study following stakeholder feedback.		
5.	**Identified constraints** (presented by LG) Each POI has several landfall options except Bodelwyddan which has only one landfall option. There are SPAs around the entire North Wales and English coast in this area therefore it has been impossible to completely avoid them. The Flyde MCZ blocks the coast inform of the Penwortham POI therefore the shortest route through the MCZ has been used. However, a detailed look at the distribution of the designated benthic habitats within the MCZ will be done of the POI is chosen by NG and this may identify a different route as being the one least constrained. The Connah's Quay route goes through the narrowest point of the Dee Estuary SAC. In some places, there are multiple designations for the same habitats however these have been considered separately. The northern indicative route for Kirkby goes through a nature reserve, this is designated for its dune system. This coastline is very constraints with large urban areas and Ministry of Defence (MOD) areas. The only open space is designated. This landfall is not the only option for this POI and it is understood that going through this designation is not ideal, the Applicant is open to consultation and consideration for this location if it becomes the POI for Morgan. The routes have also avoided other operational and round 4 projects e.g., the Cobra project. Consultation will be undertaken with those developers. There is also a large amount of oil and gas activity to the north of the Cobra project. The Wylfa POI is adjacent to the Wylfa power station. The coastline in this area is designated as an AONB. The AONB has a gap where the power station is, therefore the indicative route at this location does not interact with the AONB. However, it has been given due consideration as any development would be visible from the AONB.		

6.	**Next steps** (presented by NS) Could all consultees give some thought to the broad process presented today, to confirm that the process is acceptable and/or to identify any red flags in the process. When the Applicant knows the POIs for both projects, the Applicant will produce a paper on the POI options and circulate to the EP Steering Group. This will be with the aim of getting written feedback on the indicative routes. his will be followed by another steering group meeting in late February /early March 2022 to discuss this feedback. This feedback will then inform the final cable route for the projects. Scoping will present the broader scoping search area as these indicative routes are still a work in progress. Refinement of the route will be subject to further consultation post-scoping. LR- To note that NRW are here under the advisory service and are not representing the NRW marine licensing team. We understand that the Applicant has already contacted the marine licensing team who responded that they do not need to be a regular consultee at this time. NS- would it be for the Applicant to get the marine licensing team involved when appropriate or would NRW take on that role? LR- This would be for the Applicant to request their input when appropriate. <u>Post meeting comment:</u> LR confirmed that the preferred course of action is that the Applicant requests NRW-MLT input as appropriate to maintain separation between functions for marine developments. The Applicant extended an invite to NRW-MLT for attendance at the SG meetings, and they declined. LR- Will these slides be made available? NS- Due to the large amount of optionality and the uncertainty around the POIs, we will not be providing the slides with the figures on at this time. We can provide the slides without the figures. LR- The NRW advice referred to (Natural Resources Wales advice for offshore cabling for Round 4 projects) is currently an advisory note, and is being updated to guidance and will be circulated when ready. We would also advise the project to review the conservation advice packages for the relevant designated sites. NS- will this update involve changes or updates to the advice? LR- It will provide greater detail and an additional section on fish, but no specific changes to advice. <u>Post meeting note:</u> LR confirmed the guidance will have an additional section on Marine and Estuarine Fish and include reference to EIA and HRA. NS- Will this be coming out in draft form for developers to look at as most round 4 developers are currently already undertaking their site selection process? LR- We are unsure at this time if it will be coming out in draft form and the timing of issuing this document, but we can check and confirm. <u>Post meeting comment:</u> NRW cannot share a draft copy ahead of	Attendees to provide initial feedback RPS to provide redacted slides from 2nd EPSG meeting. LR to provide likely dates of guidance issue and if it will be available in draft earlier.	21/01/2022 Complete 21/01/2021

	approval, but the guidance will be provided as soon as it is available. Key messages will not change for the receptrs covered in the advice note and therefore recommended that the Applicant continues to refer to the existing advice note in the meantime and other guidance referred to during the meeting. KN- It was mentioned that overhead lines are not being considered and HDD will be considered. Will there be detailed HDD feasibility studies undertaken? There have been examples where HDD has not been successful in some environments. CR- The Applicant would address this once we know which POI will be progressed and where the projects will connect into the National Grid. The Applicant would look at where the key HDD areas are, where the projects are relying on HDD to install the cables, then feasibility studies would probably be undertaken in those locations (although not all HDD locations). NS- The projects may carry HDD and open trench options through the pre-application process until the point where the project has enough confidence that HDD is feasible and can be committed to. NS- The Applicant received comments in the meeting on 13 December 2021 on collaboration options. The Applicant is looking at collaboration options with the Morecambe round 4 project. This will largely depend on the POIs chosen so there are no conclusions on this yet, but the discussions are ongoing. LR-NRW had an initial meeting with the Applicant on the Connah's Quay landfall option in which NRW highlighted potential high-level constraints with this site e.g. shellfish and bathing water designations; the Dee Estuary cockle fishery managed by NRW; invasive non-native species and biosecurity etc. These constraints will need to be considered for this area. NS- It would be useful to see minutes from this meeting.	MP to provide meeting minutes from initial meeting with NRW	Complete
7.	**Close of meeting**		

A.5. Steering group meeting 3

A.5.1 Meeting minutes

MINUTES OF MEETING

Security Classification: Project Internal

Partners in UK offshore wind

MOM Number	:	20220720_Morgan and Mona SG	**REV. No.**	:	F02
MOM Subject	:	Morgan and Mona Evidence Plan Steering Group meeting 3.			

MINUTES OF MEETING

MEETING DATE	:	20/07/2022
MEETING LOCATION	:	Microsoft Teams
RECORDED BY	:	[redacted] (RPS)
ISSUED BY	:	[redacted] (RPS)

PERSONS PRESENT:

- [redacted] – bp (GV)
- [redacted] – bp (MP)
- [redacted] – bp (WD)
- [redacted] – RPS (KL)
- [redacted]
- [redacted] – Natural England (AuB)
- [redacted] - Natural England (LB)
- [redacted] - Natural England (MK)
- [redacted] – JNCC (JW)
- [redacted] – NRW (LR)
- [redacted] - Planning Inspectorate (GB)
- [redacted] - Planning Inspectorate (HT)
- [redacted] - MMO (JS)
- [redacted] - MMO (DN)

APOLOGIES:

ITEM NO:	DISCUSSION ITEM:	Responsible party	Date
1.	**Project update (presented by WD)** bp are working with EnBW in a 50/50 partnership (the Applicants) to develop the Morgan and Mona Offshore Wind Projects. Morgan is the northern project located in in English waters, and Mona is the southern project located mostly in Welsh waters. Together, they will have a combined capacity of 3GW. Subject to consent, Morgan and Mona will be delivered on similar but slightly staggered timescales and will be under separate consent applications. The Mona project is aiming to be operational in 2028 and the Morgan project is aiming to be operational in 2029. The Morgan and Mona Offshore Wind Projects are being developed as separate DCOs with separate landfalls.		

	The Applicant is looking to sign The Crown Estate (TCE) Agreement for Lease this year. We now have final clarity from the National Grid regarding the results of the Pathway to 2030 Holistic network Design which has provided the onshore grid connection points for the Morgan and Mona Offshore Wind Projects. Mona will have a grid connection at the existing Bodelwyddan National Grid substation. Morgan will have a shared grid connection at the existing Penwortham National Grid substation with the Morecambe Offshore Wind Project which is bring progressed jointly by Cobra and Floatation Energy. The two projects will share an onshore and offshore cable corridor however the projects will remain electrically separate. This means we have had to separate the Morgan generation and transmission assets. The Morgan (generation assets only) scoping report has been submitted to the Planning Inspectorate and the Applicant is working with Morecambe to deliver a joint scoping report, PEIR and DCO application for the transmission assets. The Morgan (generation assets only) and Mona (generation and transmission assets) PEIR submission will be at the end of Q1 2023. The Morgan (generation assets only) PEIR has been aligned with the Mona PEIR to allow the Applicant to properly consider the cumulative effects between the projects. This alignment is expected to continue to application. GV – Given the information just provided and with reference to the agenda item to present slides on the site selection process for the Morgan offshore cable corridor, the Applicant is in the process of setting up the collaboration with Cobra and Flotation Energy. As a result, the Applicant will not be presenting information for this standalone application for the Morgan/Morecambe transmission assets. Furthermore, it is believed that a separate Evidence Plan process is required for the Morgan/Morecambe transmission asset application. Details will be sent out for this as soon as is practicable. The Applicant will look to make meetings as efficient as possible between the three development applications, by, for example, scheduling meetings to occur on the same day. MK- What is the intention regarding the programme for the Morgan/Morecambe transmission assets application submission. Will there be an Environmental Statement that covers the Morgan Offshore Wind Project in its entirety? GV- The Applicant is currently discussing this internally. For the Morgan/Morecambe transmission assets application, firstly a section 35 direction request will need to be submitted to the Secretary of State to determine whether the Morgan/Morecambe transmission assets can be granted consent under the Planning Act 2008. The Applicant has looked to align the Mona and Morgan generation assets applications so that the cumulative effects can be fully considered. However, this has been become more challenging with the requirement for collaborative transmission assets. The Applicant will update the steering group on the programme once finalised. MK- The Applicant needs to consider the accidental “salami slicing” of the project that two applications for Morgan may create. In addition,		

	there are issues surrounding having different timescales for potential consent and construction of the generation and transmission assets. GV- The Morgan Scoping document (introductory section) gives a good explanation regarding why the Applicants has proceeded with submission of the Morgan (generation assets only) scoping report, one of the reasons being, for example, to maximise the time available to engage with stakeholders on resolving potential effects.		
2.	**Offshore Cable Corridor route selection (presented by GV)** This is a high-level overview. Detailed information on the site selection process will be presented within the site selection and consideration of alternatives chapter of the PEIR. Due to the Offshore Transmission Network Review (OTNR), National Grid (NG) could not initially provide a grid connection offer against the originally agreed programme. In order to mitigation the potential impacts of this on programme and the ability for Mona to potentially contribute to the 2030 Government targets for offshore wind energy, scoping reports were prepared against four potential points of interconnection (POI) to the grid. In March 2022 NG indicated a strong likelihood for POI at Bodelwyddan. NG confirmed grid connection at Bodelwyddan in May 2022. Wood were commissioned to undertake the site selection work and carried out a phased approach to the export cable route identification. 'Show stopper' constraints were identified early and then a process of constraints mapping and refinements where undertaken. Key technical constraints for the export cable route included: • Sufficient corridor width (1.5km) for up to 4 export cables with sufficient separation distance to avoid the risk of damage to neighbouring cables during installation and repair • Minimise cable and pipeline crossings • The total route length (beyond 100km an HVDC connection would likely be required rather than HVAC, and would require more onerous infrastructure) and technically feasible landfall location and onshore route options • The ability to install using most common installation techniques. Key environmental constraints include: • SPAs (Liverpool Bay, Anglesey Terns, Lavan Sands / Conway Bay, Dee Estuary) • SACs (Menai Strait and Conwy Bay, Dee Estuary, North Anglesey Marine) • Annex 1 type Sandbanks and reefs • Existing wind farms, export cables and proposed Awel-y-Mor project • Oil & Gas; Milom Gas Field and gas pipelines • Shipping & Navigation: Anglesey/Liverpool TSS, east of Anglesey anchorages, Irish Sea ferry routes.		

	Initially the Applicant considered four offshore cable routes between the Mona Offshore Wind Project and Bodelyddan; one route to the west of the proposed Awel Y Mor array area,and three routes passing through the gap between Gwynt y Mor east and west, but the routes going through the gap were rejected during review due to significant technical constraints associated with Gywnt-y-Mor wind farm and export cables, Milom gas pipeline, other wind farm infrastructure and congested landfall options. The selected export cable route to the west of Awel-y-Mor has a perpendicular crossing of the vessel Traffic Separation Scheme, it passes through the Liverpool Bay SPA. Due to the proximity of the Constable Bank to the Menai Straights and Conwy Bay SAC, the cable route unavoidably crosses the edge of Constable bank at its western periphery and Menai Straightts and Conwy Bay SAC at its eastern periphery. It avoids Awel-y-Mor, other windfarms and associated export cables, avoids the unofficial anchorage to the east of Anglesey, it avoids Lavan Sands/Conway Bay SPA and the North Anglesey Marine SAC. Benthic and geophysical surveys for the proposed Offshore Cable Corridor are currently underway. These surveys will also include drop down video surveys to identify any sensitive or Annex I benthic habitats. KL- Data for the Mona Offshore Cable Corridor won't be included in the PEIR, only in the final application. The Applicant will present the initial findings of the surveys though the expert working groups at the earliest opportunity next year. LR- The Mona Offshore Cable Corridor crosses the Constable Bank which is an Annex I sandbank feature. NRW would advise that the Constable Bank is avoided. NRW would also advise that sandwave clearance should not occur on the bank and rock protection for cables should not be placed on the banks or in close vicinity. Sandbanks are an important feature of the sediment budget to protect the coast from waves. Also noting that there are important species associated with sandbanks which may also be affected by cable installation. NRW will provide formal comments after the meeting. LR- The Mona Offshore Cable Corridor also goes through the Menai Strait and Conwy Bay SAC. It may be in close proximity with the reef features of that SAC. NRW would advise that all reef features of the SAC are avoided by micrositing the cables. No rock protection should be placed within the SAC. The Pensarn Beach SSSI should be listed as a key environmental constraint. The vegetative shingle bank feature should be considered as an Annex I feature. Cables within the intertidal area could need protection and this could impede the sediment transport regime which is key to the SSSI feature. GV- The Mona Offshore Cable Corridor is approximately 90km long therefore there isn't any scope for increasing this length to avoid the Constable Bank and SAC and due to their proximity to one another, there is little space to allow this practically. The geophysical and	**NRW to provide comments on the Mona export cable route, including concerns**	**Completed**

	benthic data currently being collected will inform the need for cable micrositing and mitigation if required. Kl- The ongoing surveys will identify any reef features and pre-construction surveys will be carried out which will inform the final micrositing of cables around reef features if they are recorded. HT- If the benthic data won't be presented in the PEIR, how will the Applicants ensure stakeholders have enough time to consider the data before application to ensure matters aren't brought into the examination. KL- There is extensive desk top data for the area and a lot of the assessment will be included in the PEIR. The PEIR will cover any comments raised during the EWGs or in the Scoping Opinion. The intention is to add in the site-specific data and refined the assessment presented in PEIR. The Applicant would look to engage with the EWG while the PEIR is being updated to ensure they understand the results of the site-specific surveys and what the implications are for the assessment presented in PEIR. HT- How long will it be between when the results of the site-specific survey are presented and the application. GV- Until the data collection is complete, we cannot provide a timescale for compilation of the analysis and presentation of the results. However, the Applicant understand the need for there to be sufficient time to consult on this. GB- This has been brought up in other examinations and the Applicant needs to carefully consider the timescales for this. GV- The Applicant will consult on the results of the site-specific surveys as soon as they are available for external distribution.	**regarding Constable Bank.**	
3.	**LSE screening methodology (presented by KL)** These slides will present the approach to identifying site and species where there is potential for likely significant effect. The slides are presenting the same information as was sent to the steering group in a technical note a few weeks ago. For ornithology, the approach is only broadly described, and this will be looked at again in greater detail once more work has been carried out on the baseline characterisation, Collision Risk Modelling (CRM) and displacement modelling. So the first step we use considers three criteria to identify relevant European sites. This is a general approach for all receptor groups. 1. that the project boundary overlaps with Site 2. that qualifying interest features (particularly mobile species) have ranges which overlap the Project boundaries 3. that sites/features occur in the Zone of Impact (ZoI) of impacts associated with the Projects. <u>Annex I habitats</u>		

	Criterion 1- It is anticipated that one site will be screened in on the bases of Criterion 1 for the Morgan/Mona Offshore Wind Projects. Criterion 2-There are no European sites which meet this criterion for Annex I benthic habitats. Criterion 3-ZOI for indirect effects will be based on one mean spring tidal excursion in the vicinity of the Morgan/Mona Offshore Wind Project prior to Physical Processes modelling. One mean tidal excursion equates to approximately 9km in the northeast and southwest direction and 3km in the northwest/southeast direction from the Mona Array Area and 7km in a northeast/southwest direction and 2km in a northwest/southeast direction in relation to the Mona Cable Corridor. For the purposes of LSE screening, a precautionary approach will be adopted, and this buffer has been increased to 15km. <u>Sites designated for Annex II diadromous fish</u> Criterion 1- There are no European sites which meet this criterion for Annex II diadromous fish. Criterion 2- The approach will consider the potential for disruption to migration (i.e. barriers to migration) of diadromous fish, including Atlantic salmon, to/from natal rivers. For the purposes of LSE screening, a precautionary approach will be adopted using a buffer of 100km in line with guidance from the Plan Level HRA (The Crown Estate, 2021). Sites located just outside the 100km buffer will be included. E.g. sites flow into the eastern Irish Sea and 100km buffer and therefore may have potential connectivity with the Morgan/Mona Offshore Wind Project. Criterion 3- Given the large buffer proposed for criterion 2 it is not anticipated that any additional European sites with Annex II diadromous fish as qualifying features, beyond those already identified for criterion 2 will be screened in. LR- NRW noted that with reference to the Crown Estate Round 4 HRA principles, a 100km buffer is used for most diadromous fish except Atlantic Salmon and Fresh Water Pearl Mussel which use a Regional Areas Approach. KL- Can NRW provide this advice in their response to the meeting minutes, RPS will look at this to ensure all relevant sites where there is a credible impact pathway are considered. *Post meeting note: NRW (A) advise that The Crown Estate Round 4 HRA principles are adopted in their original form. This comment was querying the presented interpretation of the principles with regards to Atlantic Salmon and Fresh Water Pearl Mussel. Section 3.6.17 – 3.6.23 Migratory Fish and Freshwater pearl mussel and Figure 3.1 Proposed regional boundaries for Atlantic salmon of the principles, outline a 'Regional Areas Approach' for Atlantic salmon and Fresh Water Pearl Mussel.*	**NRW to provide more detail on the recommended approach for Atlantic Salmon and pearl mussel.**	**Completed**

	Marine mammals Annex II marine mammal species likely to occur in the vicinity of the Morgan/Mona Offshore Wind Project and therefore considered in the LSE screening (based on Digital Aerial surveys): • Harbour porpoise *Phocoena phocoena* • Bottlenose dolphin *Tursiops truncatus* • Grey seal *Halichoerus grypus* • Harbour seal *Phoca vitulina*. Criterion 1-There are no sites with Annex II marine mammal species as qualifying features which overlap with the Morgan/Mona Offshore Wind Project. Criterion 2-Screening distances considers NRW advice on use of marine mammal management units in HRA. Criterion 3- Given the large buffers proposed above for both cetaceans and pinnipeds in criterion 2, the ZOI for key impacts are anticipated to be well within this area. Therefore no additional sites will be screened in for further consideration on the basis of this criterion. The Applicant has an action from the marine mammal EWG to look at the foraging ranges and marine mammal management units used for grey seals, with particular reference to the Carter et al. study for seals, including tracking data. Sites will be considered within the marine mammal management units but only screened it if the sites closer to the Morgan/Mona Offshore Wind Project are screened in. *Post meeting note: As outlined in NRWs Position Statement, where there is evidence of a credible risk, all sites within the management unit should be screened in for LSE, but the Appropriate Assessment should concentrate on the closest sites first. If AEOSI can be ruled out for the closest/most relevant sites then it can (more than likely) be ruled out for more distant sites. Please refer to the more detailed minutes following the 2nd Marine Mammal EWG*. Sites designated for Annex I habitats (onshore) Criterion 1- There are no European sites with relevant qualifying Annex I habitats (onshore) which overlap with the Morgan/Mona Offshore Wind Projects and so no sites will be screened in for further consideration on this basis. Criterion 2- There are no European sites which meet this criterion for Annex I habitats and so no sites will be screened in for further consideration on this basis. Criterion 3- The ZOI for such indirect effects associated with the onshore elements of the Morgan/Mona Offshore Wind Project is defined as 350m based on guidance from the Institute of Air Quality Management (IAQM) and The Highways Agency 2007. 350m is		

	considered an adequate buffer to capture all indirect effects associated with the Morgan/Mona Offshore Wind Project. Initial identification for Annex II species (onshore) It is considered that any European sites located more than 30 km from the Morgan/Mona Offshore Wind Projects are sufficiently far for there to be no risk to an Annex II terrestrial species. A buffer of 10km is considered for lesser horseshoe bats based on a home range (between summer and winter roosts) of 5-10 km (Collins et al 2016 cited: Bat Conservation Trust / BMT Cordah Ltd, 2005). The nearest SAC is located well outside of this buffer and therefore not considered further. A buffer of 2km is considered for great crested newt (e.g. English Nature 2001). The nearest SACs are located well outside of this buffer (e.g. >20 km) and therefore not considered further. European Otter Criterion 1- There are no European sites with relevant qualifying Annex I habitats which overlap with the Morgan/Mona Offshore Wind Project. Criterion 2- Otters can have relatively large home ranges and can travel considerable distances in one night, particularly during dispersal (e.g. more than 20 km, cited in Chanin 2003; or an estimated average home range of 27 km, Harris et al. 1995, cited in Chanin 2003). Therefore sites within 27 km will be considered for LSE. Criterion 3- No additional European sites with Annex II otter as qualifying features, beyond those already identified for criterion 2, are therefore screened in for further consideration on the basis of criterion 3. Initial Identification for Onshore Ornithological Features SPAs (and Ramsar sites) with onshore waterbird qualifying features will be identified using expert knowledge and evidence from the literature on migratory routes and foraging range of waterbirds. This will be based on judgement of the sites location and surrounding SPAs designated for wintering waterbirds. A precautionary approach will be taken with sites within 50km of the cable landfall being considered as a starting point. Offshore ornithology SPAs (and Ramsar sites) which have the potential to be affected by the Morgan/Mona Offshore Wind Project are those which: • Overlap with the location of the Morgan/Mona Offshore Wind Project, or with the area in which potential effects could extend	**RPS to provide clarification on the tool used for considering sites with offshore**	**Completed**

	• Include seabird qualifying features that use the waters in and around the Morgan/Mona Offshore Wind Project (e.g. for foraging) • Include qualifying features which may fly through the area of the Morgan/Mona Offshore Wind Project during migration. The SPAs (and Ramsar sites) will be considered under the following categories: • Marine SPAs • Breeding seabird colony SPAs (and Ramsar sites) • SPAs (and Ramsar sites) with migratory waterbird qualifying features • Other SPAs (and Ramsar sites) which are located within the ZOI of the Morgan/Mona Offshore Wind Project. MK- What tool is the Applicant using for assessing potential impacts on migratory seabirds and waterbirds? Is it the BTO SoSS tool. KL- We will need to check this with the RPS ornithologists. To provide confirmation in the meeting minutes. *Post meeting clarification – the SoSS tool is being used for migratory species*. LR- NRW would advise that until the data analysis on the survey's results is completed that all Welsh SPAs and SSSIs should be included in the scope. KL- Would this be regardless of the criterion e.g. foraging ranges and location of the waterbird features. LR- We agree with the approach in general and the criteria, but we advise that all relevant SPAs and SSSIs are kept in scope. NRW to provide further detail and clarification on this. KL- The applicant would like to be sure that what is provided at PEIR focuses on the key sites and is proportionate. Further refinement of the sites considered will be discussed with the EWGs. GB-The pre-screening is very far reaching, and the Planning Inspectorate is confident that this can be captured. The Planning Inspectorate would encourage to keep the screening and assessment to credible pathways that have the potential to give rise to significant effects rather than theoretical pathways. If all pathways are included, then this gives rise to a very long list. The aim of this process is to get to likely significant effects. GB - The screening process is iterative, but the Inspectorate has experienced screening reports submitted at application that aren't completely up to date with the rest of the project. Please ensure that all documents submitted with the application are up to date and consistent with each other. The structure of the screening report is led by receptor type however the appropriate assessment needs to make a conclusion for the entire site which may have a number of qualifying features from the different receptor groups.	**ornithology features** **NRW to provide further detail and clarification on SPAs and SSSIs to be included in the LSE screening**	**Completed**

	KL noted the comments by the Inspectorate and confirmed that the Information to Support Appropriate Assessment will include consideration of the effects of the project on the site as a whole. MK noted that the application should also give consideration to identification of a wider set of designated seabird sites, including SSSIs and MCZs. KL noted that MCZs would be fully considered in the MCZ Assessment and would look to screen sites on a similar basis. SSSIs will be treated similarly as part of the EIA.		
4.	**Scoping opinion (presented by KL)** The Applicant wanted to give the steering group an opportunity to raise anything from the scoping opinion for Mona and Morgan. The Applicant has been working through the response to Mona and will be providing a response where required in addition to including comments in the PEIR. MK- Please ensure that the regulator has all the information needed to consider all elements of the project, across transmission and generation assets. Particularly important for Morgan – this is noted in NE's scoping response where we draw on 'lessons learnt' from the Triton Knoll OWF case.		
5.	**NEXT STEPS** The next steering group meeting will focus on the Morgan cable route selection and how the Applicant is going to engage on the process with the Morgan/Morecambe project.		
6.	**Close of meeting**		

A.5.2 Mona LSE Screening Methodology Paper for Consideration

Partners in UK offshore wind

MORGAN AND MONA OFFSHORE WIND PROJECTS

LSE Screening Methodology Paper for consideration by the Mona and Morgan Evidence Plan Steering Group

07 July 2022
F01

Partners in UK offshore wind

Document status

Version	Purpose of document	Authored by	Reviewed by	Approved by	Review date
F01	Final	RPS	RPS	bpEnBW	06/07/2022

Approval for issue

[Name]	[Signature]	[Date]

Prepared by:	Prepared for:
RPS	**Morgan/Mona Offshore Wind Ltd.**

Contents

Tables

Glossary

Term	Meaning
Development Consent Order (DCO)	An order made under the Planning Act 2008 granting development consent for one or more Nationally Significant Infrastructure Project (NSIP).
Mona Scoping Report	The Mona Scoping Report that was submitted to The Planning Inspectorate (on behalf of the Secretary of State) and Natural Resource Wales (NRW) for the Mona Offshore Wind Project.
Morgan Scoping Report	The Morgan Scoping Report that was submitted to The Planning Inspectorate (on behalf of the Secretary of State) for the Morgan Offshore Wind Project.
Environmental Statement	The document presenting the results of the Environmental Impact Assessment (EIA) process for the Mona Offshore Wind Project.
Mona Offshore Wind Project	The Mona Offshore Wind Project is comprised of both the generation assets and offshore and onshore transmission assets and associated activities
Morgan Offshore Wind Project	The Morgan Offshore Wind Project is comprised of both the generation assets and offshore and onshore transmission assets and associated activities.
Mona Array Area	The area within which the wind turbines, foundations, inter-array cables, interconnector cables, offshore export cables and offshore substation platforms (OSPs) forming part of the Mona Offshore Wind Project will be located.
Morgan Array Area	The area within which the wind turbines, foundations, inter-array cables, interconnector cables, offshore export cables and offshore substation platforms (OSPs) forming part of the Mona Offshore Wind Project will be located.
Morgan Array Scoping Boundary	The Preferred Bidding Area that the Applicant was awarded by The Crown Estate as part of Offshore Wind Leasing Round 4.
Mona Array Scoping Boundary	The Preferred Bidding Area that the Applicant was awarded by The Crown Estate as part of Offshore Wind Leasing Round 4.
Morgan Offshore Cable Corridor	The corridor located between the Morgan Array Area and the landfall up to Mean High Water Springs (MHWS), in which the offshore export cables and the offshore booster substation will be located.
Morgan Offshore Transmission Infrastructure Scoping Search Area	The area that was presented in the Morgan Scoping Report as the area encompassing and located between the Morgan Array Scoping Boundary and the landfall up to Mean High Water Springs (MHWS), in which the offshore export cables and any offshore booster substation will be located.
Mona Offshore Transmission Infrastructure Scoping Search Area	The area that was presented in the Mona Scoping Report as the area encompassing and located between the Mona Potential Array Area and the landfall up to Mean High Water Springs (MHWS), in which the offshore export cables and any offshore booster substation will be located.
Morgan Onshore Transmission Infrastructure Scoping Search Area	The area that was presented in the Morgan Scoping Report as the area located between Mean High Water Springs (MHWS) at the landfall and the onshore National Grid substation, in which the onshore export cables, onshore substation and other associated onshore transmission infrastructure will be located.
Mona Onshore Transmission Infrastructure Scoping Search Area	The area that was presented in the Mona Scoping Report as the area located between Mean High Water Springs (MHWS) at the landfall and the onshore National Grid substation, in which the onshore export cables, onshore substation and other associated onshore transmission infrastructure will be located.
Mona Offshore Cable Corridor	The corridor located between the Mona Array Area and the landfall up to Mean High Water Springs (MHWS), in which the offshore export cables and the offshore booster substation will be located.
Mona Onshore Cable Corridor	The corridor located between Mean High Water Springs (MHWS) at the landfall and the Mona onshore substation, in which the onshore cable route will be located.
Morgan Onshore Cable Corridor	The corridor is located between Mean High Water Springs (MHWS) at the landfall and the Morgan onshore substation, in which the onshore cable route will be located.
Morgan 440kv Cable Corridor	The corridor from the Morgan onshore substation to the National Grid substation.
Mona 440kV Cable Corridor	The corridor from the Mona onshore substation to the National Grid substation.
Morgan Onshore Infrastructure Search Area	The area within which the ancillary onshore infrastructure forming part of the Morgan Offshore Wind Project will be located.
Mona Onshore Infrastructure Search Area	The area within which the ancillary onshore infrastructure forming part of the Mona Offshore Wind Project will be located.
Offshore Booster Substation	The offshore booster substation (also known as mid-point reactive power compensation substation), located within the Mona/Morgan offshore cable corridor, and required in High Voltage Alternating Current (HVAC) transmission systems only.
Offshore Substation Platform (OSP)	The offshore substation platforms located within the Morgan Array Area will transform the electricity generated by the wind turbines to a higher voltage allowing the power to be efficiently transmitted to shore. The offshore substation platforms located within the Mona Array Area will transform the electricity generated by the wind turbines to a higher voltage allowing the power to be efficiently transmitted to shore.
Applicant	Morgan Offshore Wind Limited/ Mona Offshore Wind Limited.
Wind turbines	The wind turbine generators, including the tower, nacelle and rotor.
Inter-array cables	Cables which connect the wind turbines to each other and to the offshore substation platforms. Inter-array cables will carry the electrical current produced by the wind turbines to the offshore substation platforms.
Interconnector cables	Cables that may be required to interconnect the Offshore Substation Platforms in order to provide redundancy in the case of cable failure elsewhere.

Term	Meaning
Intertidal area	The area between Mean High Water Springs (MHWS) and Mean Low Water Springs (MLWS).
Landfall	The area in which the offshore export cables make contact with land and the transitional area where the offshore cabling connects to the onshore cabling.
Local Authority	A body empowered by law to exercise various statutory functions for a particular area of the United Kingdom. This includes County Councils, District Councils and County Borough Councils.
Local Highway Authority	A body responsible for the public highways in a particular area of England and Wales, as defined in the Highways Act 1980.
Non-statutory consultee	Organisations that an applicant may choose to consult in relation to a project that are not designated in law but are likely to have an interest in the project.
The Planning Inspectorate	The agency responsible for operating the planning process for Nationally Significant Infrastructure Projects (NSIPs).
Relevant Local Planning Authority	The Relevant Local Planning Authority is the Local Authority in respect of an area within which a project is situated, as set out in Section 173 of the Planning Act 2008. Relevant Local Planning Authorities may have responsibility for discharging requirements and some functions pursuant to the Development Consent Order, once made.
Statutory consultee	Organisations that are required to be consulted by an applicant pursuant to the Planning Act 2008 in relation to an application for development consent. Not all consultees will be statutory consultees (see non-statutory consultee definition).
The Secretary of State for Business, Energy and Industrial Strategy	The decision maker with regards to the application for development consent for the Mona Offshore Wind Project. The decision maker with regards to the application for development consent for the Morgan Offshore Wind Project.
Evidence Plan	The Evidence Plan is a mechanism to agree upfront what information the Applicant needs to supply to the Planning Inspectorate as part of the Development Consent Order (DCO) applications for the Mona/Morgan Offshore Wind Project.
Evidence Plan Expert Working Group (EWG)	Expert working groups set up with relevant stakeholders as part of the Evidence Plan process.
The Northern Wales and Irish Sea Bidding Area	The Northern Wales and Irish Sea Bidding Area was one of four Bidding Areas identified by The Crown Estate through the Offshore Wind Leasing Round 4 process.
Preferred Bidding Areas	The Applicant identified two Preferred Bidding Areas (Morgan and Mona) within the Northern Wales and Irish Sea Bidding Area. In February 2021, The Crown Estate awarded the Applicant the right to develop up to 1.5GW of wind capacity within each of the two Preferred Bidding Areas.
Maximum design scenario	The scenario within the design envelope with the potential to result in the greatest impact on a particular topic receptor, and therefore the one that should be assessed for that topic receptor.
Marine licence	The Marine and Coastal Access Act 2009 requires a marine licence to be obtained for licensable marine activities. Section 149A of the Planning Act 2008 allows an applicant for a DCO to apply for 'deemed marine licences' as part of the DCO process. In addition, licensable activities within 12nm of the Welsh coast require a separate marine licence from NRW. A separate marine licence is required for the offshore export cables and related works located within and between the Mona Array Area and the landfall at MHWS.
Draft NPS	The draft national policy statements for energy that are undergoing consultation.
NPS	The current national policy statements published by the Department of Energy and Climate Change in 2011.
Offshore Wind Leasing Round 4	The Crown Estate auction process which allocated developers preferred bidder status on areas of the seabed within Welsh and English waters.
Special Protection Area	Special Protection Areas (SPAs) are selected to protect one or more rare, threatened or vulnerable bird species listed in Annex I of the Birds Directive, or certain regularly occurring migratory species.

Acronyms

Acronym	Description
BDMPS	Biologically Defined Minimum Population Scales
EIA	Environmental Impact Assessment
EWGs	Expert Working Group
HRA	Habitat Regulations Assessment
IAQM	Institute of Air Quality Management
IMWWG	Inter-Agency Marine Mammal Working Group
ISAA	Information to Support an Appropriate Assessment
LSE	Likely Significant Effect
MHWS	Mean High Water Springs
MLWS	Mean Low Water Springs
MU	Management Unit
OSPs	Offshore Substation Platform
PEIR	Preliminary Environmental Impact Assessment Report
SAC	Special Area of Conservation
SOSS	Strategic Ornithological Support Services
SPA	Special Protection Area
SSC	Suspended Sediment Concentration

Acronym	Description
ZOI	Zone of Influence

Units

Unit	Description
%	Percentage
km	Kilometres

1 LSE SCREENING METHODOLOGY PAPER

1.1 Introduction

1.1.1 Purpose of the technical note

1.1.1.1 This technical note provides a summary of the methodology to be used for the Likely Significant Effects (LSE) Screening stage of the Habitats Regulations Assessment for both the Mona and Morgan Offshore Wind Projects. The purpose of the note is to outline the process that will be undertaken to identify relevant European sites that will be screened for LSE as part of the Habitats Regulations Assessment, and to allow this approach to be agreed with the Evidence Plan Steering Group prior to consultation on the Preliminary Environmental Impact Report (PEIR).

1.1.1.2 It should be noted that this technical note does not list sites considered for LSE, a full list of sites will be presented separately in the full LSE Screening report for the Morgan and Mona Offshore Wind Projects.

1.1.2 Project overviews

Mona Offshore Wind Project

1.1.2.1 The Mona Offshore Wind Project encompasses the following as per the Mona Offshore Wind Project Environmental Impact Assessment Scoping Report[1]:

- Mona Array Area: The area within which the wind turbines, foundations, inter-array cables, interconnector cables, offshore export cables and offshore substation platforms (OSPs) forming part of the Mona Offshore Wind Project will be located
- Mona Offshore Cable Corridor: The corridor located between the Morgan Array Area and the landfall up to Mean High Water Springs (MHWS), in which the offshore export cables and the offshore booster substation will be located
- Mona Onshore Cable Corridor: The corridor located between Mean High Water Springs (MHWS) at the landfall and the Mona onshore substation, in which the onshore cable route will be located.

Morgan Offshore Wind Project

1.1.2.2 The Morgan Offshore Wind Project encompasses the following as per the Morgan Offshore Wind Project Environmental Impact Assessment Scoping Report[2]:

- Morgan Array Area: The area within which the wind turbines, foundations, inter-array cables, interconnector cables, offshore export cables and offshore substation platforms (OSPs) forming part of the Mona Offshore Wind Project will be located.

1.1.2.3 In line with the Morgan Offshore Wind Project Environmental Impact Assessment Scoping Report the Applicant prepares for delivering a coordinated grid connection with the Morecambe Offshore Wind Farm. The scoping search area for the coordinated offshore and onshore transmission assets is currently being defined and is therefore not considered in the LSE Screening methodology at this stage.

1.1.3 Process for identifying sites and features

1.1.3.1 To facilitate the identification of the European sites and features to be considered in the LSE screening for the Morgan and Mona Offshore Wind Projects, a pre-screening of sites has been undertaken. This is considered to be appropriate due to the large spatial scale of the Morgan and Mona Offshore Wind Projects, the wide ranging nature of many of the features of European sites which may be affected (e.g. birds and marine mammals) and therefore the number of European sites which could potentially be affected.

1.1.3.2 The criteria adopted for the initial identification of European sites are outlined in Table 1.1. This approach takes account of the location of the European sites (including Ramsar Sites) in relation to the Morgan and Mona Offshore Wind Projects, the anticipated zone of influence (ZOI) of potential impacts associated with the Morgan and Mona Offshore Wind Projects, and the ecology and distribution of qualifying interest features.

1.1.3.3 Table 1.1 outlines the order of consideration given to the criteria used for the identification of the list of sites to be taken forward for determination of LSE. Initial consideration is given to whether there is a physical overlap between the Morgan and Mona Offshore Wind Projects and any European sites; all sites with an overlapping boundary are screened in to be taken forward for determination of LSE.

1.1.3.4 Pre-screening criterion 2 next identifies any European sites, not already screened in using criterion 1, where there is an overlap between the Morgan and Mona Offshore Wind Projects and the range of any qualifying mobile species of the site. All sites where the Morgan and Mona Offshore Wind Project boundary overlaps with the range of one (or more) of its features, are taken forward for determination of LSE.

1.1.3.5 Criterion 3 identifies any European sites, not already screened in by criterion 1 or 2, where the potential ZOI of the Morgan and Mona Offshore Wind Projects overlaps with a European site and/or qualifying interests of the site (as per section 4). For ornithology receptors, consideration is also given to a range of factors that inform the likely extent to which the different qualifying features will occur on the Morgan and Mona Offshore Wind Project sites (e.g. scarcity of records of the relevant species during the baseline surveys.

[1] https://infrastructure.planninginspectorate.gov.uk/wp-content/ipc/uploads/projects/EN010137/EN010137-000011-EN010137%20-%20Scoping%20Report.pdf

[2] https://infrastructure.planninginspectorate.gov.uk/wp-content/ipc/uploads/projects/EN010136/EN010136-000039-Morgan%20Offshore%20Wind%20Farm%20-%20EIA%20Scoping%20Report.pdf

Table 1.1: Criteria for initial identification of relevant European sites

Order of consideration	Criteria used for initial identification of relevant European sites
1	The site boundaries of the Morgan/Mona Offshore Wind Projects overlap with one or more European sites.
2	European or Ramsar site with qualifying mobile features/species (e.g. Annex I birds, Annex II marine mammals, migratory fish, otter) whose range (e.g. foraging, migratory, overwintering, breeding or natural habitat range) overlaps with the Morgan/Mona Offshore Wind Projects.
3	European sites and/or qualifying interest features located within the potential ZOI of impacts associated with the Mona Offshore Wind Project (e.g. habitat loss/disturbance, noise and risk of collision).

1.1.3.6 The outcome of this initial screening will be that sites where there is no potential for LSEs due to lack of potential overlap of receptor-impact pathway to occur are excluded from further consideration in this report. Sites not excluded on the basis of any of the criteria outlined in Table 1.1 (i.e. where there is a potential for a receptor-impact pathway to occur) will be taken forward for determination of LSE.

1.1.3.7 It should be noted that the LSE Screening may be updated, as appropriate, during the pre-application phase of the Project to account for site specific survey data, detailed assessments and stakeholder feedback which may result in some features or sites being excluded from consideration in the Appropriate Assessment, due to a lack of LSE. Any such updates would be discussed and agreed with the Evidence Plan Steering Group and Expert Working Groups (EWGs) as appropriate.

1.1.4 Legislation and Guidance

1.1.4.1 The LSE Screening Methodology outlined in this document has drawn upon a number of information sources, Habitats Regulations Assessment (HRA) principles, regulations and guidance documents, including:

- The Infrastructure Planning (Environmental Impact Assessment) Regulations 2017 (as amended) (the 2017 EIA Regulations)
- The Planning Inspectorate Advice Note Seven: Environmental Impact Assessment: Preliminary Environmental Information, Screening and Scoping (The Planning Inspectorate, 2020a)
- The Habitats Regulations Assessment Handbook (DTA Publications Limited, 2016)
- The Crown Estate Plan Level HRA
- Feedback received from the Mona and Morgan Evidence Plan Process to date.

1.2 Identification of European Sites and features

1.2.1.1 This section provides the approach to identifying European sites (including Ramsar Sites), and their features, for which there is the potential for connectivity with the Morgan/Mona Offshore Wind Projects, using the criteria outlined in Table 1.1, and therefore those which should be taken forward for consideration of LSE.

1.2.1.2 Each of the following receptor groups are considered in turn:

- Annex I habitats (offshore and coastal) (see section 1.2.2)
- Annex II diadromous fish species (see section 1.2.3)
- Annex II marine mammals (see section 1.2.4)
- Annex I habitats (onshore) (see section 1.2.5)
- Annex II species (onshore) (see section 1.2.6)
- Annex I marine ornithological features (see section1.2.7)
- Annex I onshore ornithological features (see section1.2.8).

1.2.2 Sites designated for Annex I habitats (offshore and coastal)

1.2.2.1 The following section details the stepwise process to identify the European sites with relevant Annex I habitats (offshore and coastal) to be taken forward for detailed determination of LSE based on the methodology and criteria outlined in section 1.1.3 and Table 1.1.

1.2.2.2 The approach adopted will focus on the Annex I benthic habitat qualifying interest features for which there is considered to be a potential for impact as a result of the Morgan/Mona Offshore Wind Projects. Whilst only these qualifying interest features will be screened in for further consideration, it is acknowledged that the Competent Authority must undertake the LSE screening, and any subsequent appropriate assessment, at the site level and not for individual qualifying interest features.

Initial identification for Annex I habitats (offshore and coastal)

Criterion 1

1.2.2.3 Criterion 1 for the identification of European or Ramsar sites for Annex I habitats offshore and coastal (i.e. below MHWS)[3] to be taken forward for consideration of LSE considers those sites which overlap with the offshore and coastal boundaries of the Morgan/Mona Offshore Wind Projects.

Criterion 2

1.2.2.4 Criterion 2 considers European or Ramsar sites with qualifying mobile features/species whose range (e.g. foraging, migratory, overwintering, breeding or natural habitat range) overlaps with the Morgan/Mona Offshore Wind Projects.

[3] For the purpose of LSE Screening, Annex I habitats offshore and coastal encompass those below MHWS, listed as 'Marine, coastal and halophytic habitats' by JNCC, https://sac.jncc.gov.uk/habitat/

Criterion 3

1.2.2.5 Criterion 3 considers European or Ramsar sites and/or qualifying interest features which are located within the potential ZOI of impacts associated with the Morgan/Mona Offshore Wind Projects. There is the potential for indirect effects to sites designated for Annex I habitats as a result of impacts associated with increased Suspended Sediment Concentrations (SSC) arising from construction activities or from changes to the hydrodynamic regime as a result of the presence of offshore infrastructure associated with the Morgan/Mona Offshore Wind Projects.

1.2.2.6 The extent of these impacts is considered likely to extend beyond the boundaries of the Morgan/Mona Offshore Wind Projects.

1.2.2.7 The ZOI for such indirect effects associated with the offshore elements of the Morgan/Mona Offshore Wind Projects is typically defined from the outputs of physical processes modelling to determine, for example, the fate of sediments resuspended during the construction process. Physical processes modelling will be undertaken for the Morgan/Mona Offshore Wind Projects to inform the Environmental Impact Assessment (EIA) and Information to Support the Appropriate Assessment (ISAA); however this will not have been carried out at LSE Screening stage. Therefore, a buffer of one mean spring tidal excursion has been considered to inform this area.

1.2.2.8 One mean tidal excursion in the vicinity of the Morgan/Mona Offshore Wind Projects equates to approximately 9km in the northeast and southwest direction and 3km in the northwest/southeast direction from the Array Areas and 7km in a northeast/southwest direction and 2km in a northwest/southeast direction in relation to the Cable Corridors. For the purposes of LSE screening, a precautionary approach will be adopted, and this buffer has been increased to 15km. This buffer is considered to be sufficiently precautionary to capture all sites likely to be in the ZOI from indirect effects associated with construction activities.

1.2.3 Sites designated for Annex II diadromous fish

1.2.3.1 The following sections detail the approach to identifying the European sites with relevant Annex II diadromous fish species to be taken forward for detailed determination of LSE based on the methodology and criteria outlined in section 1.1.3 and Table 1.1.

1.2.3.2 The approach adopted will focus on the Annex II diadromous fish qualifying interest features for which there is considered to be a potential for impact as a result of the Morgan/Mona Offshore Wind Projects. Whilst only these qualifying interest features will be screened in for further consideration, it is acknowledged that the Competent Authority must undertake the LSE screening, and any subsequent appropriate assessment, at the site level and not for individual qualifying interest features.

Initial identification for Annex II fish

Criterion 1

1.2.3.3 Criterion 1 considers European or Ramsar sites which overlap with the boundaries of the Morgan/Mona Offshore Wind Projects.

Criterion 2

1.2.3.4 Criterion 2 considers European or Ramsar sites with qualifying mobile features/species whose range (e.g. foraging, migratory, overwintering, breeding or natural habitat range) overlaps with the Morgan/Mona Offshore Wind Projects.

1.2.3.5 There is the potential for activities associated with the construction, operation and maintenance and decommissioning of the Morgan/Mona Offshore Wind Projects to result in impacts on Annex II diadromous fish species at a distance from the European sites for which they are qualifying interest features on the basis that these species are mobile and utilise both freshwater and marine environments throughout their life cycles. A precautionary approach to the identification of relevant sites will be adopted in order to capture all sites with the potential for connectivity with the Morgan/Mona Offshore Wind Projects, and in particular to consider the potential for disruption to migration (i.e. barriers to migration) of diadromous fish (including but not limited to Atlantic salmon) to/from natal rivers (river of origin). For the purposes of LSE screening, a precautionary approach has been adopted using a buffer of 100km. After consideration of the likely migratory routes and distances for diadromous fish as outlined in ABPmer (2014), 100km is considered an appropriate buffer, in line with guidance from the Plan Level HRA (The Crown Estate ,2021). Given the location of the project within the eastern Irish Sea it is unlikely that any Special Areas of Conservation (SACs) outside the 100km buffer would be affected by any of the predicted impacts, as migratory routes of Annex II fish species associated with those SACs would be unaffected by the Morgan/Mona Offshore Wind Projects. However, in line with a precautionary approach, sites located just outside the 100km buffer (i.e. River Bladnoch SAC and Solway Firth SAC for the Mona Offshore Wind Project) will also be included. For example, sites which flow into the eastern Irish Sea and 100km buffer and therefore may have potential connectivity with the Morgan/Mona Offshore Wind Projects. SACs (i.e. comprising rivers and estuaries) beyond this buffer are not connected to the eastern Irish Sea (e.g. flow into the Atlantic Ocean, Celtic Sea or western Irish Sea) and therefore diadromous fish associated with these sites are unlikely to interact with the Morgan and Mona Offshore Wind Projects and as such will not lead to a LSE

Criterion 3

1.2.3.6 Criterion 3 considers European or Ramsar sites and/or qualifying interest features which are located within the potential ZOI of impacts associated with the Morgan/Mona Offshore Wind Projects (e.g. habitat loss/disturbance, noise and risk of collision). Given the large buffer proposed for criterion 2 above (100km), the ZOI for key impacts to migratory fish species (i.e. underwater noise, habitat loss and increased SSC) are anticipated to be well within this range. It is not anticipated that any additional European sites with Annex II diadromous fish as qualifying features, beyond those already identified for criterion 2, will be screened in for further consideration on the basis of criterion 3.

1.2.4 Sites designated for Annex II marine mammals

1.2.4.1 Based on data collected to date during aerial surveys and information on marine mammal species in the Irish Sea from desk based studies for the Morgan/Mona Offshore Wind Projects, the Annex II marine mammal species likely to occur in the

vicinity of the Morgan/Mona Offshore Wind Projects and therefore considered in the LSE screening are:

- Harbour porpoise *Phocoena phocoena*
- Bottlenose dolphin *Tursiops truncatus*
- Grey seal *Halichoerus grypus*
- Harbour seal *Phoca vitulina.*

1.2.4.2 The following species were included in the Mona and Morgan Offshore Wind Project Scoping Reports and therefore have the potential to occur within the Morgan and Mona Offshore Wind Project areas, however these species are listed under Annex IV rather than Annex II of the EC Habitats Directive and therefore do not have SACs designated for them and will therefore be assessed within the marine mammal PEIR chapter and are not considered further within this document:

- Minke whale *Balaenoptera acutorostrata*
- White beaked dolphin *Lagenorhynchus albirostris*
- Short beaked common dolphin *Delphinus delphis*
- Risso's dolphin *Grampus griseus.*

Initial identification for Annex II marine mammals

1.2.4.3 The following sections detail the stepwise process to identify the European sites with relevant Annex II marine mammals as qualifying features to be taken forward for detailed determination of LSE based on the methodology and criteria outlined in section 1.1.3 and Table 1.1.

1.2.4.4 The approach will focus on the Annex II marine mammal qualifying interest features for which there is considered to be a potential for impact as a result of the Morgan/Mona Offshore Wind Projects. Whilst only these qualifying interest features will be screened in for further consideration, it is acknowledged that the Competent Authority must undertake the LSE screening, and any subsequent appropriate assessment, at the site level and not for individual qualifying interest features.

Criterion 1

1.2.4.5 Criterion 1 considers European or Ramsar sites which overlap with the boundaries of the Morgan/Mona Offshore Wind Projects. There are no sites with Annex II marine mammal species as qualifying features which overlap with the Morgan/Mona Offshore Wind Projects, therefore it is anticipated that no sites will be screened in for further consideration for marine mammals on the basis of this criterion.

Criterion 2

1.2.4.6 Criterion 2 considers European or Ramsar sites with qualifying mobile species whose range (e.g. foraging, migratory, overwintering, breeding or natural habitat range) overlaps with the Morgan/Mona Offshore Wind Projects. There is the potential for activities associated with the construction, operation and maintenance and decommissioning of the Morgan/Mona Offshore Wind Projects to result in impacts on Annex II marine mammal species at distance from the sites for which they are qualifying interest features on the basis that these are highly mobile species which potentially forage and migrate over wide areas. The relevant ranges for the different marine mammal receptors are discussed in the following paragraphs.

Harbour porpoise

1.2.4.7 A precautionary approach to the identification of relevant sites for harbour porpoise will be adopted in order to capture all sites with the potential for connectivity with the Morgan/Mona Offshore Wind Projects based on criterion 2. On this basis, it has been considered that sites with harbour porpoise as qualifying interest features which are located within the same Management Unit (MU) defined by Inter-Agency Marine Mammal Working Group (IMWWG) (2015)) as the Morgan/Mona Offshore Wind Projects will be screened for LSE. For harbour porpoise all sites within the Celtic and Irish Seas MU will be considered.

Bottlenose dolphin

1.2.4.8 A precautionary approach to the identification of relevant sites for bottlenose dolphin will be adopted in order to capture all sites with the potential for connectivity with the Morgan/Mona Offshore Wind Projects based on criterion 2. On this basis, it has been considered that sites with bottlenose dolphin as qualifying interest features which are located within the same MU defined by IMWWG (2015) as the Morgan/Mona Offshore Wind Projects will be screened for LSE. For bottlenose dolphin therefore all sites within the Irish Sea MU will be considered.

Grey seal

1.2.4.9 All SACs designated for grey seals located within the same Seal MUs (SCOS, 2020) as the Morgan/Mona Offshore Wind Projects (i.e. the Wales MU, North West England MU, SW Scotland and Northern Ireland MU) will be screened for LSE. A screening range of 100km has also been adopted to identify sites with grey seal as a qualifying feature for inclusion in the assessment of LSE, which is based on the latest advice regarding the typical foraging range of this species from haul out sites (SCOC, 2018). No additional sites were identified within this range.

Harbour seal

1.2.4.10 All SACs designated for harbour seal located within the same seal MUs (SCOS, 2020) as the Morgan/Mona Offshore Wind Projects (the Wales and North West England MU) will be considered in the LSE screening report. In addition, a screening range has been applied to identify sites for inclusion in the assessment of LSE for harbour seal which is based on the typical foraging range of this species. Harbour seals tend to make relatively short foraging trips from haul out sites and the latest Special Committee on Seal (SCOS) report (SCOS, 2020) states that harbour seals typically forage at distances of 40 to 50km from haul out sites. Although some individuals do occasionally make longer trips, these are often associated with young animals dispersing from sites and are therefore not considered to indicate likely repeated connectivity between European sites and the Morgan/Mona Offshore Wind Projects.

1.2.4.11 The screening process for harbour seal includes any European site where the species is considered as a qualifying feature.

Criterion 3

1.2.4.12 Criterion 3 considers European sites and/or qualifying interest features which are located within the potential ZOI of impacts associated with the Morgan/Mona Offshore Wind Projects (e.g. habitat loss/disturbance, noise and risk of collision). Given the large buffers proposed above for both cetaceans and pinnipeds in criterion 2, the ZOI for key impacts to marine mammals (i.e. underwater noise and changes to prey species) are anticipated to be well within this area. It is anticipated that no additional European sites have marine mammal species as qualifying features, beyond those already identified for criterion 2. Therefore, no additional sites will be screened in for further consideration on the basis of this criterion.

1.2.5 Sites designated for Annex I habitats (onshore)

1.2.5.1 The following section details the stepwise process to identify the European sites with relevant onshore Annex I habitats, above MHWS[4], to be taken forward for detailed determination of LSE based on the methodology and criteria outlined in section 1.1.3 and Table 1.1.

1.2.5.2 The approach focusses on the Annex I habitat qualifying interest features for which there is considered to be a potential for impact as a result of the Morgan/Mona Offshore Wind Projects. Whilst only these qualifying interest features will be screened in for further consideration, it is acknowledged that the Competent Authority must undertake the LSE screening, and any subsequent appropriate assessment, at the site level and not for individual qualifying interest features.

Initial identification for Annex I habitats (onshore)

Criterion 1

1.2.5.3 Criterion 1 for the identification of European or Ramsar sites to be taken forward for consideration of LSE considers those sites which overlap with the boundaries of the Morgan/Mona Offshore Wind Projects. There are no European sites with relevant qualifying Annex I habitats which overlap with the Morgan/Mona Offshore Wind Projects site.

Criterion 2

1.2.5.4 Criterion 2 considers European or Ramsar sites with qualifying mobile features/species whose range (e.g. foraging, migratory, overwintering, breeding or natural habitat range) overlaps with the Morgan/Mona Offshore Wind Projects. There are no European sites which meet this criterion for Annex I habitats and so no sites will be screened in for further consideration on this basis.

Criterion 3

1.2.5.5 Criterion 3 considers European or Ramsar sites and/or qualifying interest features which are located within the potential ZOI of impacts associated with the Morgan/Mona Offshore Wind Projects. There is the potential for indirect effects to sites designated for onshore Annex I habitats as a result of airborne pollutants associated with construction or decommissioning activities.

1.2.5.6 The ZOI for such indirect effects associated with the onshore elements of the Morgan/Mona Offshore Wind Projects is defined as 350m. According to guidance from the Institute of Air Quality Management (IAQM), an assessment of air pollutant impacts is required where there are sensitive receptors within 350m of the Morgan/Mona Offshore Wind Projects site. The guidance also states an assessment for ecological receptors should consider an impact zone of up to 50m from the site boundary. The Highways Agency 2007 refers to a 200m impact zone for ecological receptors in internationally (and nationally) designated sites. Therefore, a precautionary approach of 350m has been adopted, which is considered large enough to encompass all direct and indirect impacts on Annex I habitats (onshore) associated with the Morgan/Mona Offshore Wind Projects.

1.2.6 Sites Designated for Annex II species (onshore)

1.2.6.1 The following section details the results of the stepwise process to identify the European sites with Annex II species (onshore) as a feature, to be taken forward for detailed determination of LSE based on the methodology and criteria outlined in section 2.4 and Table 2.1.

1.2.6.2 With regard to Annex II terrestrial species, only SACs for otter are located within species-relevant ZOI, and therefore only otter will be considered in the LSE Screening Report. For bats, a ZoI of 10km is considered appropriate, based on a 5-10km typical home range (between summer and winter roosts) (Collins *et al.,* 2016 cited: Bat Conservation Trust/BMT Cordah Ltd, 2005),the closest SAC for lesser horseshoe bats is located approximately 20km away and therefore outside of the ZOI. For great-crested newt *Triturus cristatus* 2km is considered an appropriate buffer due to most great crested newt activity being recorded within 250m of a breeding pond, and dispersal distances being up to around 1.3km (e.g. English Nature 2001), the closest SAC located is approximately 23km from the Morgan/Mona Offshore Wind Projects. As such, only otter are considered further.

1.2.6.3 The approach adopted for this LSE screening report focusses on the Annex II otter qualifying interest features for which there is considered to be a potential for impact as a result of the Morgan/Mona Offshore Wind Projects. Whilst only these qualifying interest features will be screened in for further consideration, it is acknowledged that the Competent Authority must undertake the LSE screening, and any subsequent appropriate assessment, at the site level and not for individual qualifying interest features.

Initial identification for Annex II otter

Criterion 1

1.2.6.4 Criterion 1 considers European or Ramsar sites which overlap with the boundaries of the Proposed Development. As there are no European sites with Annex II otter as

[4] For the purpose of LSE Screening, Annex I habitats onshore encompass those above MHWS, listed as 'Coastal sand dunes and continental dunes' by JNCC, https://sac.jncc.gov.uk/habitat/

qualifying features which overlap with the Proposed Development, no sites are screened in for further consideration for otter on the basis of this criterion.

Criterion 2

1.2.6.5 Criterion 2 considers European or Ramsar sites with qualifying mobile features/species whose range (e.g. foraging, migratory, overwintering, breeding or natural habitat range) overlaps with the Proposed Development.

1.2.6.6 Otters can have relatively large home ranges and can travel considerable distances in one night, particularly during dispersal (e.g. more than 20km, cited in Chanin 2003; or an estimated average home range of 27km, Harris *et al* 1995, cited in Chanin 2003). However, territories and distances travelled can vary considerably depending on the resources available.

1.2.6.7 Therefore, there is some potential for activities associated with the Proposed Development to result in impacts on Annex II otter at a distance from the European sites for which they are qualifying interest features, on the basis that these species are mobile and utilise both aquatic and terrestrial habitats throughout their life cycles.

1.2.6.8 Sites within the 27km buffer will therefore be considered further.

Criterion 3

1.2.6.9 Criterion 3 considers European or Ramsar sites and/or qualifying interest features which are located within the potential ZOI of impacts associated with the Proposed Development (e.g. habitat loss/disturbance). Given the large buffer associated with criterion 2 above, the ZOI for key impacts to otter are anticipated to be well within this range. No additional European sites with Annex II otter as qualifying features, beyond those already identified for criterion 2, are therefore screened in for further consideration on the basis of criterion 3.

1.2.7 Sites designated for marine ornithological features

Initial identification for marine ornithological features

Defining the qualifying features and sites: broad-scale considerations

1.2.7.1 Birds present in offshore waters and potentially affected by the construction, operation and decommissioning of the Morgan/Mona Offshore Wind Projects will be predominantly seabirds (defined for this report as auks, gulls, terns, gannets, skuas, shearwaters, petrels, cormorants and divers) and seaducks. These species have the potential to be present in the vicinity of the Morgan/Mona Offshore Wind Projects during the breeding and non-breeding seasons (including the spring and autumn passage periods). Other bird species that may be affected by the Morgan/Mona Offshore Wind Projects include those which may fly through the area of the Morgan/Mona Offshore Wind Projects during their spring and/or autumn migration (or passage) periods (e.g. waterbirds), and any other species which may use the intertidal habitats or the inshore or offshore waters which are potentially affected by the Morgan/Mona Offshore Wind Projects.

1.2.7.2 Based on the above, it is considered that (in relation to marine ornithology) the Special Protection Areas (SPAs) (and Ramsar sites) which have the potential to be affected by the Morgan/Mona Offshore Wind Projects are those which:

- Overlap with the location of the Morgan/Mona Offshore Wind Projects, or with the area in which potential effects from the Morgan/Mona Offshore Wind Projects could extend (e.g. displacement effects extending beyond the boundary of the array area)
- Include seabird qualifying features that use the waters and habitats in and around the Morgan/Mona Offshore Wind Projects (e.g. for foraging)
- Include qualifying features which may fly through the area of the Morgan/Mona Offshore Wind Projects during migration.

1.2.7.3 The SPAs (and Ramsar sites) which meet these different criteria are outlined below under the categories of:

- Marine SPAs
- Breeding seabird colony SPAs (and Ramsar sites)
- SPAs (and Ramsar sites) with migratory waterbird qualifying features (subsequently termed migratory waterbird SPAs for convenience, with waterbirds defined for this report as waders, ducks, geese, swans, grebes, divers, gulls, terns and cormorants)
- Other SPAs (and Ramsar sites) which are located within the ZOI of the Morgan/Mona Offshore Wind Projects.

Marine SPAs

1.2.7.4 Marine SPAs located within the initial area of search will also be considered for LSE. Where there is overlap with the SPA, all qualifying features of the SPA will be considered for determination of LSE.

Breeding SPAs

1.2.7.5 Seabird species may have large foraging ranges during the breeding season (Table 1.2, Woodward *et al.*, 2019). Therefore, the Morgan/Mona Offshore Wind Projects could potentially have an effect on seabird qualifying features from a large number of SPA breeding colonies. Indeed, the area within which it is located may be used by these qualifying features when foraging or when commuting between the colony and foraging areas. Furthermore, seabird qualifying features from SPA breeding colonies may use, or fly through, the area occupied by the Morgan/Mona Offshore Wind Projects during the non-breeding season, when these populations are widely distributed and not constrained by the need to return to the colony.

1.2.7.6 To determine the breeding seabird colony SPAs which may have connectivity with the Morgan/Mona Offshore Wind Projects, those SPAs located in UK Western Waters, the English Channel and Ireland will be considered.

Table 1.2: Mean maximum foraging ranges of breeding seabirds (from Woodward *et al.*, 2019)

*No SD available for mean maximum value.

**Mean value without SD – no mean maximum value available.

Species	Mean maximum foraging range (km) ± 1 Standard Deviation (SD)	Maximum foraging range (km)
Red-throated diver *Gavia stellata*	9.0*	9
Leach's storm-petrel *Oceanodroma leucorhoa*	657.0**	N/A
European storm-petrel *Hydrobates pelagicus*	336.0*	336
Northern fulmar *Fulmarus glacialis*	542.3 ± 657.9	2736
Manx shearwater *Puffinus puffinus*	1346.0 ± 1018.7	2890
Northern gannet *Morus bassanus*	315.2 ± 194.2	709
European shag *Phalacrocorax aristotelis*	13.2 ± 10.5	46
Cormorant *Phalacrocorax carbo*	25.6 ± 8.3	35
Black-legged kittiwake *Rissa tridactyla*	156.1 ± 144.5	770
Black-headed gull *Chroicocephalus ridibundus*	18.5*	19
Common gull *Larus canus*	50.0*	50
Great black-backed gull *Larus marinus*	73.0*	73
Herring gull *Larus argentatus*	58.8 ± 26.8	92
Lesser black-backed gull Larus fuscus	127.0 ± 109	533
Sandwich tern *Thalasseus sandvicensis*	34.3 ± 23.2	80
Little tern *Sternula albifrons*	5.0*	5
Arctic tern *Sterna paradisaea*	25.7 ± 14.8	46
Common tern *Sterna hirundo*	17.6 ± 9.1	30
Roseate tern *Sterna dougallii*	12.6 ± 10.6	23.9
Great skua *Stercorarius skua*	443.3 ± 487.9	1003
Arctic skua *Stercorarius* parasiticus	2 ± 0.7***	NA
Razorbill *Alca torda*	88.7 ± 75.9	313 (191)*
Common guillemot *Uria aalge*	73.2 ± 80.5	338 (135)*
Black guillemot *Cepphus grylle*	4.8 ± 4.3	
Atlantic puffin *Fratercula arctica*	137.1 ± 128.3	383

Connectivity in the breeding season

1.2.7.7 The initial stage in establishing potential connectivity during the breeding season will involve determining whether either the Morgan/Mona Array Area or Offshore Cable Corridors are within (i) the mean maximum foraging range plus 1 SD of each qualifying feature from each of the SPAs and (ii) the maximum foraging range of each qualifying feature from each of the SPAs (Table 1.2, Woodward *et al.*, 2019).

Seabird connectivity in the non-breeding season and migration periods

1.2.7.8 As well as true pelagic seabirds (e.g. gannet, fulmars and auks), other species that spend part of their annual life cycle at sea (e.g. divers, gulls and seaducks) are present during the non-breeding season and migration periods.

1.2.7.9 Seabird species that are breeding interest features at SPA sites further north or west of the Morgan/Mona Offshore Wind Projects may pass through the area or reside in the area in winter. The identification of migrating corridors and wintering areas for seabirds can be drawn from the Migration Atlas (Wernham *et al.*, 2002) and the Eurasian African Migration Atlas (Franks *et al.,* 2022). Furthermore, the Strategic Ornithological Support Services (SOSS)-05 report for The Crown Estate (Wright *et al.,* 2012) details bird migration routes for key migratory birds in relation to offshore wind developments (Round 3, Round 1 and 2 and Scottish Territorial Waters developments). Furness (2015) presents the total number of birds present in all UK territorial waters during the defined season (e.g. migration periods and winter) for each spatially distinct Biologically Defined Minimum Population Scales (BDMPS) e.g. UK Western Waters.

1.2.7.10 However, most seabirds (i.e. northern fulmar, Manx shearwater, petrels and auks) are dispersive in their migration rather than following migratory corridors, and the above guidance is therefore limited. With the advance of modern telemetry, there is a better understanding of seabird migration routes and the use of wintering areas, although it is difficult to generalise movements and usage given the relatively low sample size of tracked birds.

1.2.7.11 Nevertheless, there is potential for breeding interest features at SPA colonies along the Irish Sea or from further north (i.e. west and north coast of Scotland) to travel through and winter in the Mona Array Area. Colonies located in the 'UK Western Waters' BDMPS defined by Furness (2015) will be included. This BDMPS excludes seabird colonies in the northeast coast of Scotland and Orkney and Shetland. As the 'UK Western Waters' BDMPS excluded colonies in the Republic of Ireland, seabird colonies on the east coast of Ireland have been included for consideration in the LSE Screening.

Migratory waterbird SPAs (and Ramsar Sites)

1.2.7.12 The British Isles are located along the East Atlantic Flyway - a migration route that connects bird species' breeding sites to wintering sites (Boere *et al*., 2006). Therefore, the British Isles are of key importance for many over-wintering and migrating birds that move through the area in large numbers during the spring and autumn passage periods. Whilst some bird species will follow the coastline during their migration journey, other groups of species (e.g. waders) will undertake long journeys across open seas, often flying at high altitudes depending on the weather conditions. Wildfowl species are known to follow a coastal route during their migration (when in sight of the land). However, many wildfowl species do undertake open-sea movements to reach their wintering or moulting grounds (e.g. Shelduck (*Tadorna tardorna)* (Green *et al*., 2019)).

1.2.7.13 Periodic numbers of waterbirds (e.g. wildfowl and waders) may therefore pass through the Morgan/Mona Offshore Wind Projects in spring and autumn. Many of these migrants will originate from the Arctic and sub-Arctic regions (e.g., Iceland and Scandinavia) and winter at SPA sites in the UK. Although migration occur over a broad front and often at high altitude at sea, there is a potential for migratory waterbirds to cross the Morgan/Mona Offshore Wind Projects twice per year. The connectivity is more likely to occur with SPA sites the nearest to the Morgan/Mona Offshore Wind Projects, as it is assumed that migration routes will be broader and more dispersed with increased distance to/from the wintering sites. There are several wetland sites with wintering and passage interest features along the Welsh and English Coast.

1.2.7.14 SPAs with migratory waterbird qualifying features will be identified by conducting a thorough review of the SPAs and associated qualifying features within the vicinity of the Morgan/Mona Offshore Wind Projects and consideration of whether the direction of migratory pathways could have the potential to interact with the Morgan/Mona Offshore Wind Projects. Broadly, a buffer of approximately 100km will be used to identify sites, although the decision to screen sites into the LSE will depend on the location of the Proposed Development relative to migratory routes for the relevant qualifying interest features.

Other SPAs (and Ramsar sites) within the ZOI

1.2.7.15 The potential ZOI of impacts associated with the Morgan/Mona Offshore Wind Projects (e.g. habitat loss/disturbance, noise and risk of collision) is considered to be limited to the area within 2km of the Morgan/Mona Offshore Wind Projects for most bird species, which is the area over which displacement effects are potentially considered to occur. This may extend to considerably greater distances for some species, notably red-throated diver, which shows particular sensitivity to various sources of anthropogenic disturbance (e.g. Mendel *et al*., 2019, Dorsch *et al*., 2020).

1.2.7.16 For the Mona Offshore Wind Project other than the Liverpool Bay SPA (considered above under marine SPAs), no SPAs or Ramsar sites occur within 2km of the Morgan/Mona Offshore Wind Projects.

1.2.8 Sites designated for onshore ornithological features

1.2.8.1 The following section details the results of the stepwise process to identify the European sites with onshore ornithological features, to be taken forward for detailed determination of LSE based on the methodology and criteria outlined in section 1.1.3 and Table 1.1.

1.2.8.2 The approach adopted for the LSE screening report will focus on the onshore ornithology qualifying interest features for which there is considered to be a potential for impact as a result of the Morgan/Mona Offshore Wind Projects. Whilst only these qualifying interest features will be screened in for further consideration, it is acknowledged that the Competent Authority must undertake the LSE screening, and any subsequent appropriate assessment, at the site level and not for individual qualifying interest features.

Initial identification for onshore ornithological features

Special Protection Areas (SPAs) designated for wintering and passage waterbirds

1.2.8.3 From the low water to the high-water mark, the onshore export cable corridor passes through intertidal habitats. Above the high-water mark, agricultural habitats (arable fields and pasture with hedgerows) dominate the potential onshore export cable corridors to the substation.

1.2.8.4 Although the intertidal habitats and coastal habitats do not overlap with SPAs designated for wintering or passage waterbirds, there is potential for waders and wildfowl from adjacent SPAs to use the intertidal habitats during the passage and wintering periods. Waders are known to be faithful to feeding and roosting sites in winter (Van de kam, 2004). There is however some variability between species (e.g. roosting sites Rehfisch *et al*., 2003) and some inter-individual availability (e.g. territorial versus non-territorial birds). As competition increases and resources are being depleted on the intertidal habitats, waterbirds might need to forage outside their preferred areas to maintain their daily energy requirement. As a result, there is potential for less favoured areas (e.g. outside the SPAs) to be used by birds in winter.

1.2.8.5 As birds move through the SPA sites during the passage period, they can also stop and feed in a range of locations outside the SPAs. Coastal pastures and wet marshes outside the boundary of the SPAs can also be used by waterbirds as alternative or complementary foraging areas. Pink-footed geese in particular can travel long distances from their roosting sites (>50km) to feed in agricultural habitats.

1.2.8.6 SPAs (and Ramsar sites) with onshore waterbird qualifying features will be identified using expert knowledge and evidence from the literature on migratory routes and foraging range of waterbirds. This will be based on judgement of the sites location and surrounding SPAs designated for wintering waterbirds. A precautionary approach will be taken with sites within 50km of the cable landfall being considered as a starting point.

1.3 Summary

1.3.1.1 In summary, this note has outlined the proposed methodology which will be carried out in the LSE Screening Report for the Morgan and Mona Offshore Wind Projects. The screening methodology and associated buffers have been determined on a receptor specific basis and are considered to ascertain a high enough level of precaution to ensure that all relevant European sites are considered, and LSE is assessed. The note allows the opportunity for engagement and discussion by the Evidence Plan Steering Group on the methodology outlined, and for an approach to

LSE Screening to be agreed prior to consultation on the Preliminary Environmental Impact Report (PEIR).

1.4 References

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A.5.3 Response from NRW regarding meeting minutes and LSE Screening Methodology Paper

Morgan & Mona Offshore Wind Projects: Cable Route Selection and Likely Significant Effects Screening

[redacted]
Senior Marine Advisor

22nd August 2022

Introduction

This advice is provided in response to the Cable Route Selection slides within the Morgan and Mona Project Evidence Plan Steering Group Meeting 3 Slide Presentation, and the LSE Screening Methodology Paper presented for consideration by the Mona and Morgan Evidence Plan Steering Group Meeting 3.

NRW advice in this document is provided (under a Discretionary Advice Service agreement) in respect of a proposal which will require an application for which Natural Resources Wales is a Statutory Consultee.

The customer acknowledges that the content of any advice or assistance provided by NRW is advisory only and that it shall not be deemed to bind or in any other way restrict NRW in performing its statutory functions.

The recipient acknowledges that:

- any advice given or materials or documentation provided by NRW do not constrain or bind NRW in respect of its statutory functions or its role as a statutory consultee or any decision NRW may make in relation to any application for a licence or permit;
- any advice given by NRW does not bind NRW in respect of any future representations it may make as statutory consultee or any decision NRW may make in relation to any application for a licence or permit;
- any views or opinions expressed by NRW are without prejudice to the consideration NRW may be required to give to any application or any future representations as statutory consultee or any decision NRW may make in relation to any application for a licence or permit;
- the final decision as to any representations made by NRW as statutory consultee will be based on all the relevant information available to NRW at the time it makes such representations;
- NRW cannot and does not give any guarantee as to the representations it may make as statutory consultee; and,
- any advice given by NRW may be overtaken by changes in available information, law, policy and guidance relevant to the subject matter of the advice.

Advisors Consulted:

Marine Protected Sites
Marine and Coastal Physical Processes
Benthic Ecology
Marine Ornithology
Marine & Estuarine Fish
Marine Water Quality
Terrestrial Ecology (Protected Sites and Species)

Advice

Marine and Coastal Physical Processes

LSE Screening:

- NRW (A) agree with the LSE Screening Methodology criteria that have been provided with respect to Marine and Coastal Physical Processes.

Cable Route Selection:

- NRW (A) advise that Constable Bank which is an Annex I Sand Bank feature (outside an SAC) is avoided. NRW (A) note that the final cable route selection crosses directly over the sand bank feature. Sandbanks are important to the sediment budget and have a direct role in protecting the coastline from wave attack. Constable Bank is an area of active sand transport. Alteration to the sand bank through sand wave clearance, or scour through cable protection measures could alter the equilibrium conditions of the sand bank and potentially alter the sediment supply to beaches at the coast.

- NRW (A) advise that sand wave clearance should be avoided on Constable Bank as well as placement of cable protection on the bank or adjacent to the bank, which could indirectly alter the morphodynamics of the sand bank feature. NRW (A) reiterate that sandbanks are Annex I habitats that support a wide range of species upon which the conservation objectives of an SAC may be based, all of which can be sensitive to disturbance and changes in morphology. NRW (A) advise that these features are avoided where possible within Welsh SACs.

- NRW (A) encourage the applicant to engage early on with NRW to discuss any potential cable protection that might be placed before and/or after the feature as potential indirect impacts to the morphodynamics of the feature will also need to be considered.

- NRW's advice on Annex I features outside SACs is as follows:

  NRW advises that competent authorities and project promoters should also consider, as far as is reasonably possible, impacts on Habitats Directive Annex I habitats outside of protected sites, to help ensure compliance with the requirements of the Directive. The overarching aim of the Habitats Directive is to achieve favourable conservation status (FCS) of Annex I habitats, and this aim relates to the entire occurrence of a habitat type within its natural range rather than applying only to the occurrences within the SAC network. We therefore consider that the impacts of development or activities on

'undesignated' Annex I habitat outside SACs should be assessed and adverse effects minimised or mitigated as far as possible. In addition, Article 10 of the Directive acknowledges the importance of improving the ecological coherence of the Natura 2000 network, and encourages the management of features which support the migration, dispersal and genetic exchange of wild fauna and flora, both within and outside the Natura 2000 sites.

Benthic Ecology

LSE Screening:

- NRW (A) agree with the LSE Screening Methodology criteria that have been provided with respect to Benthic Ecology.

Cable Route Selection:

- Regarding potential impacts on Annex I Sandbank outside SACs, namely Constable Bank, as outlined above, NRW encourages the applicant to avoid routing through this feature and advises that impacts to this feature are avoided as much as possible i.e. no cable protection to be placed on the feature. Please refer to NRW advice on Annex I features outside SACs, as outlined in the Marine and Coastal Physical Processes Section above.

- Regarding the proposed cable route through the Menai Strait and Conwy Bay SAC, it appears from our feature layers that the cable route may potentially overlap and/or be in very close proximity to Annex I Reef, a feature designated for the Menai Strait and Conwy Bay SAC. NRW (A) advise that the cable route is micro-sited to avoid impacts to any potentially sensitive features within the SAC. Ideally, NRW (A) would advise avoidance of the Menai Strait and Conwy Bay SAC if there remains scope to do so. NRW (A) also advise that no cable rock protection is placed within the SAC.

Marine Mammals

- Discussions on LSE Screening with respect to Marine Mammals is currently on-going via the Marine Mammal Expert Working Group.

Marine Ornithology

LSE Screening:

Key Issues

- It is likely that all Welsh SPAs and SSSIs with marine or estuarine bird features should be scoped in at this stage, until surveys are complete and data analysis has been finalised.

Detailed comments

- NRW (A) advise that all designated sites with named features whose foraging ranges fall within the mean maximum foraging range +1 standard deviation (Mean Max +1SD) in Woodward et al 2019, should be scoped in and included in the screening process. This

represents a relatively quick and straightforward approach to establishing connectivity between a proposal's location and a site's qualifying features, as is required to establish likely significant effects. However, there is the possibility that using this approach could miss out some colonies, therefore a sense check will also need to be done to ensure that all colonies where there is a potential for likely significant effect are included at the screening stage. Assessments should always be based upon the best and most up to date evidence available. Potential impacts on wintering bird features and the potential impacts on birds migrating to and from designated sites, along with estuarine SPA and SSSI features which could be affected by collision risk on migration, should also be included in scoping and screening. Due to the location of the proposed work it is likely that all Welsh SPAs and SSSIs with marine or estuarine bird features should be scoped in at this stage, until surveys are complete and data analysis has been finalised.

Marine and Estuarine Fish

LSE Screening:

In Section 1.2.3.5 of the LSE Screening Methodology, the applicant states the following:

'*After consideration of the likely migratory routes for diadromous fish as outlined in ABPmer (2014), 100km is considered an appropriate buffer, in line with guidance from the Plan Level HRA (The Crown Estate, 2021).*

NRW (A) note that with reference to The Crown Estate Round 4 HRA principles, specifically *Section 3.6.17 – 3.6.23 Migratory Fish and Freshwater pearl mussel*, and *Figure 3.1 Proposed regional boundaries for Atlantic salmon (from ABPmer (2014), cited in ABPmer (2018))*, that a 100km buffer is used for most diadromous fish except Atlantic Salmon and Fresh Water Pearl Mussel, which use a 'Regional Areas Approach'.

NRW (A) advise that The Crown Estate Round 4 HRA principles are adopted in their original form, or that further justification is provided if they are not.

Marine Water Quality

Cable Route Selection:

- With respect to Marine Water Quality, consideration will need to be given to the impact of the development on Bathing Waters and WFD Water Bodies.

- With reference to the proposed Cable Route Selection, there are no designated Shellfish Water Protected Areas, Nitrate Vulnerable Zones or Urban Waste Water Treatment Directive (UWWTD) sensitive areas (eutrophic). There is a UWWTD sensitive area (bathing water) – Rhyl – but this will be considered via inclusion of Bathing Waters.

- Designation of these areas are unlikely to hinder development, but they must be considered in the environmental assessments. Further information can be found online at Water Watch Wales: Water Watch Wales (naturalresourceswales.gov.uk) (Select Cycle 3 for the recent classifications). Annual updates on Bathing Water information are available at Find a bathing water (data.gov.uk).

Terrestrial Ecology

LSE Screening:

- NRW (A) concur with the assessment and conclusions presented with respect to Otter.
- NRW (A) concur with the assessment and conclusions presented with respect to Great Crested Newt.

Cable Route Selection:

- The Steering Group Slides including the Cable Route Selection, do not appear to identify Traeth Pensarn SSSI as a 'key environmental constraint'. The applicant is correct that the SSSI would not be included in the context of designated Natura 2000 Sites, however, Vegetated Shingle Ridge is an Annex 1 habitat, even if it is not designated as such, and should therefore be a consideration.
- It is not possible to determine from the map provided whether the cable route (up to 1.5 km width) will come onshore within the SSSI or to the side of the SSSI. Excavations for a cable onshore may therefore damage the feature of the SSSI. If undergrounded with a landward out point, the cables within the intertidal would possibly need some form of protection, which may impede the sediment movement critical to the maintenance of the SSSI feature. There is therefore potential for direct and indirect impact on the SSSI feature. It would be useful to discuss the landfall / point of interconnection proposals in more detail as early as possible / via the relevant Expert Working Group.

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A.5.4 Response from JNCC regarding LSE Screening Methodology Paper

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Date: 22 August 2022

Dear [redacted]

Mona and Morgan Offshore Wind Projects, LSE Screening Methodology Paper: Version F01

Thank you for consulting JNCC on the EnBW and bp Morgan and Mona Offshore Wind Projects LSE Screening Methodology Paper, (Version F01), dated 7 July 2022, which we received on 7 July 2022.

The JNCC advice contained within this minute is provided (under a Discretionary Advice Service agreement) as part of our advisory role relating to nature conservation in UK offshore waters (beyond territorial limit). We have subsequently concentrated our comments on aspects of the documents that we believe relate to offshore waters.

Any advice or assistance provided by JNCC via our Discretionary Advice Service is advisory only, and with reference to the General terms and conditions for DAS chargeable services, JNCC excludes any warranty that the advice provided by its officers represents JNCC's opinion or otherwise binds JNCC when acting as a Statutory Consultee.

The documents reviewed are;

- LSE Screening Methodology Paper for consideration by the Morgan and Mona Evidence Plan Steering Group (Version F01, dated 7 July 2022)

The advice below relates to:

- **Sites designated for Annex I habitats (offshore)**
- **Sites designated for Annex II Marine Mammals**
- **Sites designated for marine ornithological features**

Sites designated for Annex I habitats (offshore)

JNCC are content with the LSE Screening Methodology in respect to Annex I habitats and have no comments at this time.

Sites designated for Annex II Marine Mammals

JNCC are content with the LSE Screening Methodology in respect to marine mammals and have no comments at this time.

Sites designated for marine ornithological features

Table 1.2 Manx shearwater foraging range mean max + 1SD is 1346.8 ± 1018.7km.

Table 1.2 Black-headed gull foraging range max is 18.5km.

Table 1.2 Common tern foraging range mean max + 1SD is 18 ± 8.9km.

Table 1.2 Roseate tern foraging range max is 24km.

Table 1.2 For razorbill we advise the use of the foraging range within appendix 1 of Woodward et al 2019 which excludes data from Fair Isle where foraging range may have been unusually high as a result of reduced prey availability during the study year. Razorbill foraging range mean max + 1SD is 73.8km ± 48.4km and max is 191km.

Table 1.2 For guillemot we advise the use of the foraging range within appendix 1 of Woodward et al 2019 which excludes data from Fair Isle where foraging range may have been unusually high as a result of reduced prey availability during the study year. Guillemot foraging range mean max + 1SD is 55.5km ± 39.7km and max is 135km.

Table 1.2 Black guillemot foraging range max is 8km.

1.2.7.15 Note the SNCB advice on the spatial extent of displacement impacts to seaducks and diver species other than red-throated diver is 4km, and the spatial extent of displacement impacts to red-throated diver is 10km, making the potential ZOI at least 10km.

Please contact me with any questions regarding the above comments.

Yours sincerely,

[redacted]

Offshore Industries Adviser

Email: [redacted]

Telephone: [redacted]

A.6. Steering group meeting 4

A.6.1 Meeting minutes

MINUTES OF MEETING

Security Classification: Project External

Partners in UK offshore wind

MOM Number	:	20230214_Morgan and Mona SG	**REV. No.**	:	F02
MOM Subject	:	Morgan and Mona Evidence Plan Steering Group meeting 4.			

MINUTES OF MEETING

MEETING DATE	:	14/02/2023
MEETING LOCATION	:	Microsoft Teams
RECORDED BY	:	[redacted] (RPS)
ISSUED BY	:	[redacted]

PERSONS PRESENT:

- [redacted] – bp (GV)
- [redacted] – bp (MP)
- [redacted] – bp (LH)
- [redacted] – EnBW (IK)
- [redacted]
- [redacted]
- [redacted]
- [redacted] – RPS (AP)
- [redacted] – JNCC (JW)
- [redacted]
- [redacted] – MMO (GR)
- [redacted] – MMO (AP)
- [redacted] – Natural England (EW)
- [redacted] – Natural England (LB)
- [redacted] – Planning Inspectorate (HT)
- [redacted] – Planning Inspectorate (EC)
- [redacted] – Planning Inspectorate (AD)
- [redacted] – Planning Inspectorate (EP)
- [redacted] – Planning Inspectorate (KN)

APOLOGIES:

ITEM NO:	DISCUSSION ITEM:	Responsible party	Date
1.	**<u>Project update (presented by MP)</u>** The Applicant is planning to submit the Mona and Morgan Generation Preliminary Environmental Information Reports (PEIR) end of March/ April 2023. Statutory consultation will then take place in April and May 2023. We have increased the duration of statutory consultation to 47 days taking into account the Easter holidays so we hope this will give stakeholders time to read and respond to the PEIRs.		

	Post meeting note: The Mona and Morgan Generation PEIRs will be submitted mid-April. Only the first year of data from the digital aerial surveys was available to feed into the Morgan Gen PEIR. The surveys end in March 2023 and the full two years of data will be incorporated into the Environmental Statement to accompany the DCO application. The Applicant has reviewed 18 months of surveys and are not expecting any noticeable change from the first year of data. A small section of the intertidal area within the red line boundary was not surveyed in 2022 but an intertidal phase 1 walkover survey will be undertaken in spring/ summer 2023 to cover this area and results included in the Environmental Statement. The benthic subtidal ecology baseline and assessment of the Mona Offshore Cable Corridor in the PEIR relied on desk top data as the site-specific data collection was undertaken in 2022 and the analysis was not available to inform the PEIR. The data will be included in the Environmental Statement. The Applicant will consult with the Expert Working Group (EWG) in summer 2023 to provide an update on the site-specific data and to confirm if there are any changes to the assessment as a result of the second year of data. The Applicant has included gravity base foundations in the Project Design Envelope considered for the PEIR. These foundations were not included in the EIA scoping report however following review of the site-specific ground data the Applicant identified the requirement for further flexibility in foundation options. Suction bucket jackets remain as the maximum design scenario for almost all assessments with the exception of one impact for physical processes relating to the offshore substation platform foundations only (for turbines, suction bucket foundations were the maximum design scenario).		
2.	**<u>PEIR consultation- EWGs (presented by KL)</u>** The focus now is on the approach to agreement as part of the EPP remit and building towards the statement of common ground that will be submitted with or soon after the application for consent. When you read the PEIR we would appreciate it if you could think about agreement on the baseline and assessments, keeping in mind the agreements we are aiming for, for the application – see Evidence Plan Template Remit and Inputs as presented on the slides. If you do not agree with what is in the PEIR, please focus on what the Applicant can provide to get agreement. It is important to note that the HRA and EIA process are a step in the process to agree how the Applicant can build these projects with minimal impact to the environment. The Applicant is looking to get as much agreement as possible before the application. HT- What level of agreement has currently been reached on offshore ornithology apportioning and displacement rates. These have taken up a lot of time in examination of other offshore wind projects. We would	**Steering group to consider the agreements on the baseline and assessments that the Applicant is aiming for the application when reading the PEIR.**	**Q2 2023**

	recommend that an agreement is reached before examination, where possible. KL- In general, we have good agreement on the broad approach to baseline characterisation and assessment (e.g. modelling input parameters etc.). The Applicant has a few actions to look at between the PEIR and the Environmental Statement. We also have good progress with the EWG for parameters used in the assessment. HT- If agreement cannot be reached before the application for development consent is submitted, the Inspectorate advises the Applicant to submit alternative versions of the assessment using the parameters preferred by each party as it is probable that this would otherwise be sought during an Examination.		
3.	**LSE Screening methodology (Presented by KL)** We discussed the approach to LSE screening with the steering group in July 2022. We described the slightly different approach that has been taken for the Mona and Morgan Gen PEIRs. Following this, we have had clear feedback from stakeholders on the approach to LSE Screening and therefore would like to discuss a compromise approach for the final application. Approach taken in the PEIR is that the apportioning assessment has been used to identify the SPAs and qualifying features where a risk of LSE could not be excluded. Where mortalities were <1 individual they were screened out from the assessment as LSE could be ruled out alone and in-combination. Where mortalities identified from apportioning were >1 individual, these sites were screened in, with a particular focus on 'in combination' effects. Where mortality was <1 these sites were screened out. This is based on the worst-case scenario where the layers of conservatism in the displacement and CRM analysis as well as the maximum design parameters used (e.g. for displacement the maximum mortalities associated with the greatest displacement, up to 70% displacement, and the greatest mortality rates, up to 10%) should ensure a precautionary approach. If more realistic/ less conservative assumptions are made (e.g. lower displacement and mortality rates), the numbers of birds affected are reduced considerably. For those sites that have been taken forward to the appropriate assessment i.e. where there is the potential for more than one bird to be affected, only very small numbers have been identified both in absolute numbers and as a proportion of the background mortality for the relevant SPAs (see slide showing mortalities for guillemot at Lambay Island and Ireland's Eye SPAs). These are against background mortalities of hundreds or thousands of individuals per annum (i.e. therefore the in-combination impacts are well within background variation). If all sites with potential connectivity with the Mona and Morgan Generation Offshore Wind Projects were screened in, the Information to Support Appropriate Assessment (ISAA) would be exceptionally long with a large number of tables presenting very small mortality numbers.		

	In the approach adopted for PEIR, the Applicant is looking to develop a proportionate HRA, responding to well known and acknowledged criticisms of the HRA process and making the assessment more accessible for stakeholders. As flagged by the offshore ornithology EWG, in terms of an audit trail, the apportioning numbers that have been used to screen out SPAs are set out in the HRA Stage 1 screening document. As such future projects can undertake a full in-combination assessment that includes mortality estimates from the Mona and Morgan Generation Offshore Wind Projects. We have had feedback from stakeholders in the offshore ornithology EWG that this approach to LSE screening is not what has been applied to other wind farms historically. The Applicant is therefore suggesting a compromise solution, noting that the approach for PEIR will be as previously set out. For the HRA Stage 1 screening and ISAA to be submitted with the application for consent, the Applicant will look to take a more traditional approach to the HRA Stage 1 screening while trying to control the level of detail in the ISAA. We would look to screen on the basis of the foraging ranges (as is typically undertaken for UK offshore wind farms). We would also look to screen SPAs and qualifying features out, where it can be demonstrated that there will be 0 mortalities (i.e. through CRM, displacement or apportioning e.g. fulmer and Manx shearwater and collision risk modelling. See slides). The Applicant is proposing to undertake a "two step" integrity test. The first step would be to undertake a high level initial assessment within the ISAA, using the apportioning paper to present where there is no risk of adverse effects on integrity on an SPA and not including a detailed assessment against the conservation objectives for each low risk SPA (e.g. using a brief, tabulated approach to concluding no adverse effects on integrity). The Mona and Morgan Generation Offshore Wind Projects have been suitably located; seabirds numbers across the sites area generally low therefore we expect a good number of SPAs to fall into this low risk category, that is, most if not all of the SPAs and features which were screened out at LSE in the PEIR. In the second step, a more detailed assessment would then be undertaken on the SPAs where there is a greater risk of adverse effects on integrity (likely to be limited to in-combination effects). Requested Feedback: • Please can the Steering Group provide feedback to these meeting minutes to indicate if a compromised solution (outlined above) would be acceptable in principle – this would allow us to work on restructuring the LSE Screening and ISAA. • While reviewing the PEIR could stakeholders provide feedback on which SPAs would be worth taking forward to the detailed assessment within the ISAA (i.e. second step integrity test). HT- The conservation objectives of each site need to be considered for each SPA taken forward to assessment. The Planning Inspectorate will	**Steering group to provide feedback on whether a compromised solution to the ISAA assessment would be acceptable in principle.** **While reviewing the PEIR**	Complete

	take this away and provide feedback. We appreciate the efforts to seek a proportionate approach to the assessment. *Post meeting note*: Actioned by the Inspectorate in s51 advice available on the National Infrastructure Planning project pages. LR- NRW will consider what has been proposed. Initial thoughts are that this may be a good way of working through the SPAs, but requires further discussion with our ornithologists. Will this be discussed at the offshore ornithology EWG next week? KL- It wasn't on the initial agenda but we can add it. HT- Has there been any feedback on how the avian bird flu outbreak has affected the validity of the site-specific surveys. KL- It was touched on at the last offshore ornithology EWG meeting but it is unknown what implications the bird flu might have. We have reviewed the 18 month data report for Mona and Morgan and we cannot see any large changes to abundances; the numbers of birds are broadly similar to those recorded in the first year of data. Although there were a small number of observations of dead birds during the surveys. It is unknown how the bird flu will affect the conclusions of the assessment as it is unknown how the Irish Sea colonies have been affected. HT- If there is agreement with NRW/NE on how the avian flu should be considered in the assessment it is recommended this is included within the application.	**stakeholders to provide feedback on which SPAs would be worth taking forward to the detailed assessment within the ISAA** **RPS to add this discussion topic to the ornithology EWG**	Q2 2023 Completed
4.	**<u>Next Steps (presented by KL)</u>** Next steps: • Meeting minutes to be circulated 2 weeks following the SG meeting. The next steering group meeting will be organised in summer 2023 to discuss the section 42 response and updates for the Environmental Statement.		
5.	**<u>Cable route site selection study- Mona (Presented by LH)</u>** Some information on the cable route site selection has been presented in a previous steering group meeting. However, we can now discuss it in more detail as the Applicant is no longer under confidentiality restrictions associated with the Round 4 Offshore Wind Leasing Process. The Applicant has given due consideration to various guidance during the site selection and consideration of alternatives process. These include but are not limited to: • NRW export cable guidance for Round 4 developers • TCE Cable Route protocol (2019) • Export Cable Region Assessment (2022) (required mitigation under Plan Level HRA) Full details of the guidance that has been considered is set out in the site selection chapter of the PEIR.		

	The site selection processes started with a constraints analysis to identify 'show stopper' constraints and refinement of constraints mapping through RAG analysis and workshops. The Mona Offshore Cable Corridor is subject to a number of hard constraints which translated into a number of unviable options. Key technical constraints included having a 1.5km wide cable corridor, although this increases as it enters then Mona Array Area to allow for flexibility of where the offshore export cables enter the Mona Array Area. The Applicant is looking to refine this area to ensure the application for consent covers as small an area of seabed as possible. The Applicant has sought to reduce the number of cable crossings and total length of the Mona Offshore Cable Corridor. The landfall considerations included technical feasibility of landfall locations and onshore routing options. The Applicant has also taken into account any publicly available information from feedback on the Awel Y Mor site selection process as the Mona Offshore Wind Project has a very similar point of interconnection. A landfall search area was established between Llandulas and Prestatyn on North Wales coast. The primary landfall locations assessed were Llandulas, Llandulas east, Belgrano and Rhyl. The intertidal area at Belgrano required crossing the Gwynt y Mor offshore wind farm cables in the nearshore environment. There is limited space in that area therefore this option was not considered viable. The Rhyll landfall was discounted as this landfall was selected for the Awel y Mor offshore export cable landfall. The Applicant looked at whether the same landfall could be used but it there is not enough space for both sets of cables. The Llandulas east landfall interacts with the Pensarn SSSI and other significant construction works in the area, which meant that there also is not enough space for additional cables in this location. The Llandulas landfall avoids putting cables though the SSSI and the Applicant is also looking to avoid the *Sabellaria alveolata* reef in the intertidal area at this landfall. The export cable will go under the hard constraints that run along the whole section of that coastline e.g. the road, railway and the historical landfill site. Further detail on the assessment for each landfall option has been provided in the PEIR site selection chapter. <u>Mona Offshore Cable Corridor</u> This area of the Irish Sea is very constrained with significant constraints in the offshore environment including environmental designations and other sea users. The Applicant identified four potentially viable routes between the Mona Array Area and the Bodelwyddan National Grid Substation. The potential routes either went through the gap between the two halves of the Gwynt y Mor array area or to the west of the Gwynt y Mor array area. Any options to the east of Gwynt y Mor were discounted during review due to significant technical constraints associated with		

	anchorage area, export cables crossings, other wind farm infrastructure and designated sites. The routes through the centre of the Gwynt y Mor array area were discounted due to the pipeline already in that location taking up all available space. The route to the west of the Gwynt y Mor array area was taken forward for further development. The Mona Offshore Cable Corridor crosses the shipping lanes between Anglesey and Liverpool perpendicularly. It crosses the Awel y Mor Agreement for Lease area but is outside of the area for which they have applied for development consent. It passes through the Liverpool SPA (unavoidable), Constable Bank at the western end and through the corner of Menai Strait and Conwy Bay SAC. It avoids the mapped features of Menai Strait and Conwy Bay SAC (e.g. reefs) and it avoids the Lavan Sands / Conway Bay SPA and the North Anglesey Marine SAC. In relation to Constable Bank and the Menai Strait and Conwy Bay SAC, the specific location of the Mona Offshore Cable Corridor was chosen as if it moved further east then it encroaches further on the main body of Constable Bank and if it moves further west then it encroaches on the mapped features of the SAC. HT- What is Constable Bank? KL- A large sandbank which qualifies as an Annex I habitat. The sandbank is outside of an SAC so it is not a HRA consideration but the Applicant has had feedback from NRW that efforts should be made to reduce the impact on this feature. LR- It would be useful to have the four options laid out in the PEIR site selection chapter and presentation of the constraints associated with each. LH- Yes this will be laid out within the PEIR site selection chapter. If you have any feedback on the site selection chapter please let us know so we can build on it for the Environmental Statement.		
6.	**<u>Engineering considerations Constable Bank and the Menai Strait and Conwy Bay SAC (presented by KL and IK)</u>** KL presented an overview of PEIR assumptions. While the Mona Offshore Cable Corridor does overlap the Menai Strait and Conwy Bay SAC it doesn't overlap with areas of historically mapped reef features. This will be confirmed through the site-specific surveys carried out in summer 2022. The current indication is that the Mona Offshore Cable Corridor does not overlap with any reef habitats but full analysis of geophysical and benthic ecology (seabed imagery and grab sampling) is still being undertaken. For the purpose of the PEIR we have assumed that up to 14km of the cable corridor will be installed within the SAC. This 14km is made up of 4 cables, each 3.5km long (which is likely to be precautionary). We have assumed that all cables could require sandwave clearance and that up to 20% would require cable protection. The same assumptions for cable protection and sandwave clearance have been made for the cables going through Constable Bank. This is the maximum design		

	scenario and is a conservative estimate as site specific survey data were not available during PEIR drafting. However, this will be refined using site-specific survey data for the Environmental Statement. IK presented slides on cable installation methodologies included in PEIR. When the Applicant has the site-specific data, we will select the most appropriate cable burial methodology. The Applicant is looking to bury the cable wherever possible and only use cable protection where burial and remedial burial has not been successful. The preference is to use cable ploughs which have a smaller impact on the seabed compared to other technologies. Pre-lay plough may also be used, which is a form of ploughing with a larger seabed impact. Both will be considered and their use will depend on ground conditions. The PEIR also considered jet trenching and mechanical ploughing for harder ground conditions. Area of seabed close to the shore and close to Constable Bank are not expected to require large amounts of cable protection, but we are investigating this via site specific survey data. Even if we are not able to achieve burial with the plough, then jet trenching would be used before cable protection. KL noted that no cable crossings are required in the SAC or Constable Bank so there is no required cable protection associated with asset crossings. The PEIR considers sandwave clearance. The Applicant would prefer to use cable burial equipment to achieve cable burial rather than requiring sandwave clearance. Pre-lay plough may be used in Constable Bank, the trenches are generally very small, likely up to 3m at the top and 0.5m at the bottom. Further refinement to burial methods and the requirement for sandwave clearance will be done once the 2022 survey data has been analysed. Once the 2022 survey data has been analysed, the Applicant will undertake a cable burial risk assessment to determine the depth of burial required and look at the risks to the export cable for external activities and other sea users. There are new trenchers coming on to the market that allow trenching in harder ground conditions (which may be more relevant for offshore areas of the Mona Offshore Cable Corridor). The Applicant will select contractors for cable burial in order to meet the requirements of the ground conditions. The Applicant is looking to avoid using cable protection where possible. JI- If the project can minimise cable protection that would be NRWs preference. We appreciate the effort the project is putting into reducing the cable protection proposed. JI- When is the PEIR going to be submitted? LH-The PEIR for both Mona and Morgan Gen is being submitted end of March/ April so it will likely be with stakeholders in April. Consultation will run through April and May.		
7.	**Close of meeting.**		

A.7. Steering group meeting 5

A.7.1 Meeting minutes

MINUTES OF MEETING

Security Classification: Project External

Partners in UK offshore wind

MOM Number	:	20230629_Morgan and Mona SG	**REV. No.**	: F02
MOM Subject	:	Morgan and Mona Evidence Plan Steering Group meeting 5		

MINUTES OF MEETING

MEETING DATE	:	29/06/2023
MEETING LOCATION	:	Microsoft Teams
RECORDED BY	:	[redacted] (RPS)
ISSUED BY	:	[redacted] (RPS)

PERSONS PRESENT:

- [redacted] – bp (GV)
- [redacted] – bp (SR)
- [redacted] – bp (PC)
- [redacted] – RPS (KL)
- [redacted] - RPS (ST)
- [redacted] – JNCC (JW)
- [redacted] – MMO (AP)
- [redacted] – Natural England (EW)
- [redacted] – Natural England (KB)
- [redacted] – Planning Inspectorate (EP)
- [redacted] – NRW (LR)
- [redacted] – NRW (RN)

APOLOGIES:

ITEM NO:	DISCUSSION ITEM:	Responsible party	Date
	Project updates (presented by GV) Statutory consultation on the Mona and Morgan Generation PEIRs ended on 4th June. The Applicant appreciates all the feedback; we are currently reviewing all the responses and how they can be addressed. From the statutory consultation feedback and parallel activities, the Applicant has been considering a number of project updates. There are several updates to the project description envelope that are expected to be included in the application. The Applicant is looking to reduce the Mona Array Area and the Morgan Generation Array Area. They are expected to be reduced from what was presented in PEIR and lie wholly within the array areas presented in the PEIR. The Mona Array Area is anticipated to be reduced by approximately 33% and lie wholly within Welsh offshore waters. The Morgan Array Area is anticipated to be reduced by approximately 10%. The primary driver for these		

	reductions is shipping and navigation, specifically ensure safety of navigation. The need for changes for the project design envelope has been highlighted through engagement with a number of the ferry companies in the Irish Sea. The reductions have also been driven through consultation with aviation and other sea users receptors. The layout principles for both Mona and Morgan Generation are expected to be updated to increase the spacing requirements between offshore structures, the specific updates will be communicated in due course. These updates are to address concerns from commercial fisheries. The Applicant is anticipating that monopile foundations will be removed from the project design envelope. The foundations options remaining will be gravity base or jackets (which may be pin piled or suction bucket foundations). This is being driven by the ground conditions. The Applicant expect there to be a mixed foundation solution taken forward to the application, likely to be a mix of jacket and gravity base foundations. The smallest wind turbine option is being removed from the project design envelope due to feedback from the supply chain that this turbine option won't be available at the time of construction. The rotor diameter will therefore also increase from 280m to 320m and this is also based on feedback from the supply chain on the parameters for the wind turbines that will be available at the time of construction. *Post meeting note: The rotor diameter will increase from 280m to 320m not 340m. The slide deck has been updated (attached) accordingly.* The Applicant is also reviewing the parameters for the design envelope following the statutory consultation responses. Any updated parameters will be fully explained and justified within the application. EP- Is the Mona offshore cable corridor also wholly within Welsh waters. GV- Yes, the Mona Array Area is entirely within Welsh offshore waters and the Mona Offshore Cable Corridor is within Welsh offshore and inshore waters.		
	<u>LSE screening and ISAA approach (presented by KL)</u> This slide is a repeat of what has been presented in previous EWGs. It summarises the updated approach to the HRA screening and ISAA that was sent to the steering group and offshore ornithology EWG in May 2023. The applicant is looking for feedback on if this approach is acceptable for the application. LR- NRW agree with the updated HRA methodology for the project alone assessment. We would like it acknowledged that this methodology has been agreed for the Mona and Morgan Generation assets project only and advice may differ for other		

	offshore wind farm projects. The methodology set out in the note sent to the EWG does not address impacts to non-breeding birds. NRW disagree that this updated HRA methodology is appropriate for the in-combination assessment. Sites with less than 1% baseline mortality should still be considered for the in-combination assessment. Step 1 of the integrity test relies on the magnitude of impact. This does not take into account conservation objectives that aren't linked to the magnitude of impact e.g. distribution of features. For these features this approach may not be suitable. KL- Thank you for providing initial comments, we can discuss the detail with the Offshore Ornithology EWG. KB- Natural England have similar comments to NRW, as the projects have high connectivity and low magnitude of effect you would end up screening in a lot of sites with a very small impact so we are broadly contact with the updated approach. There are two concerns which are regarding the screening of non breeding birds and screening out sites with less than 1% mortality for in-combination effects. KL- Could you provide you high level comments in writing today so we can discuss them with the ornithologists ahead of the offshore ornithology EWG? JW- JNCC are also aligned with NRW and Natural England's comments. EP- Can Natural England, JNCC and NRW include the Planning Inspectorate when providing their feedback on the updated HRA methodology. KB/LR/JW- Yes this should be fine. *Post meeting note- Initial feedback from Natural England, JNCC and NRW included as an appendix to these minutes*.	**NE, NRW and JNCC to provide written feedback on HRA approach following close of the meeting.**	29/06/2023 (completed, see below)
	<u>Section 42 responses (presented by KL)</u> The Applicant and RPS have been working through all the S42 responses, looking to the project design envelope and the environmental assessment. There were a couple of key responses that we wanted to raise to the steering group; these will also be discussed with the EWGs. There was several requests for the project to undertake assessments for historic projects where quantitative information required to include them in the cumulative and in-combination assessments is not available. The cumulative and in-combination assessment can only be undertaken on publicly available data and it may not be appropriate to undertake analysis for other projects. There is also no precedent for that type of analysis. Noted that Natural England had a suggested approach they would like to discuss in the Ornithology EWG – for discussion at next EWG. The IoM offshore windfarm is in the early stage of the planning process and we expect the scoping report to be published in the autumn. We will incorporate the information in the public domain		

	into the cumulative and in-combination assessment for Mona and Morgan Generation, in line with the Tiered approach. There were a few comments on the site specific data available to be included in the PEIR. The benthic data for the Mona Offshore Cable Corridor and the zone of influence for the Mona and Morgan Array Areas will be presented in the July EWG. For marine mammals and offshore ornithology, the 24 months of survey data for Morgan Generation will be presented and discussed in the October EWG meetings for those topics. Natural England provided comments on the Morgan Generation and the Morgan and Morecambe Offshore Wind Farms: Transmission Assets (Transmission Assets) applications to ensure that a whole project assessment is undertaken. Are there specific topics or receptors that are of particular concern for the cumulative assessment for Morgan Generation and the Transmission Assets together? The Applicant is considering how human topic cumulative impacts are addressed and we have strategies for those impacts. KB- Mobile species e.g. Offshore ornithology and marine mammals would be the key receptors of concern. KL- For Morgan Generation, we will be undertaking a whole project assessment within the cumulative effects assessment (CEA). The Transmission Assets will be included within the CEA as a separate section so it clearly presents the impact of the Morgan Offshore Wind Project as a whole project. We can only base the CEA on information in the public domain. These projects are subject to separate consent applications so there will always be difficulty regarding what information is available at the time of application. However, that is why the tiered approach to CEA was developed and adopted and we feel the approach set out in the slides adequately addresses the concerns raised. We will circulate the slides after the meeting so you can review the approach to CEA in full. Please can the stakeholders provide their feedback in writing with the meeting minutes. SR- Does this provide reassurance that the project is being considered as a whole? KB- How it is set out is clear but we will need to review in more detail before providing any feedback. EP- The Planning Inspectorate will consider the proposed approach and provide any comments in writing. How will changes between PEIR and the application be considered? SR- The majority of changes made as projects move from PEIR to application are to refine parameters so impacts are likely to reduce. Therefore basing the CEA on a project PEIR may be a more conservative approach.	**Stakeholders to provide their feedback on the approach to the CEA for Morgan Generation**	Complete

	KL- This a challenge across offshore wind projects. Incorporating changes from PEIR to application for CEA projects is challenging as they are separate consent applications and we have to use information in the public domain. LR- Are there any further indications of what the timescales for these projects are. KL- The Transmission Assets is expecting to publish its PEIR in autumn 2023, Mona and Morgan Generation are expected to apply for consent in Q1 2024. LR- Do you know what the lag between Mona and Morgan Generation will be? GV- We don't know what the lag between the two projects will at this point, they are both scheduled for Q1 2024. SR- The Transmission Assets application for consent is likely to be Q3 2024.		
	<u>Agreement logs (presented by KL)</u> The latest agreement logs were circulated in May and it would be useful if stakeholders could review their positions within those agreement logs and update them now the PEIR has been reviewed. Parallel to that the Applicant and RPS are working through the statutory consultation responses and looking at where we consider agreement has been reached. If stakeholders can provide feedback on agreement logs to date following the EWGs, we will circulate the meeting minutes two weeks after the meeting but the agreement logs may be a week or so behind that to incorporate the statutory consultation feedback. JW- To clarify, you are asking stakeholders to take the most recent agreement logs and update them with the information to date. KL- Yes. In the current agreement logs there are a lot of agreements with caveats for when the detail could be read in the PEIR. Can these historic comments be updated based on review of the PEIR to provide an updated position on the previous agreements.	**Stakeholders to provide updated EWG agreement logs to reflect the information provided in the PEIR.**	Complete
	<u>Next Steps (presented by KL)</u> KL noted that meeting minutes are to be circulated 2 weeks following the meeting, with agreement logs circulated after the meeting minutes. Next Steering Group meeting planned for October 2023. **<u>Any other Business</u>** KB noted that there may not be an ornithology specialist from Natural England at the Offshore Ornithology EWG on 30 June. As such, feedback will be provided in writing.		

	SR queried whether other ornithology specialists would be attending from other SNCB organisations. JW and LR confirmed this would be the case.		

Appendix – Initial feedback on the updated HRA methodology

A.7.2 Response from Natural England regarding the meeting minutes

Date: 27 July 2023
Our ref: DAS/UDS A009203 442336
Your ref: Morgan and Mona Steering Group 05 29th June 2023

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cc [redacted]
RPS

BY EMAIL ONLY

Dear [redacted]

Discretionary Advice Service (Charged Advice): UDS A009203
Development proposal: Morgan Generation and Mona Offshore Windfarm
Consultation: Morgan and Mona Steering Group 05

This advice is being provided as part of Natural England's Discretionary Advice Service (DAS) in accordance with the Quotation and Agreement dated 23rd May 2023 to Morgan Offshore Wind Limited & Mona Offshore Wind Limited.

The following advice forms Natural England's response to the meeting minutes provided for the Morgan and Mona Steering Group 05 attended by Natural England on 29th June 2023.

Natural England were asked to provide feedback on the following points:

- The approach to the CEA for Morgan Generation

Detailed comments

Cumulative and in-combination assessments

Natural England understands the approach being taken for the CEA for Morgan Generation. However, we retain concerns associated with stranded assets during the consenting process (ref: 435658/436243). In particular, if there are significant changes to the Transmission Assets following the PEIR consultation, there is a concern that these won't have been considered in the Morgan and Mona Generation Assets CEA at the time of Application.

Natural England have secured funding for a project to quantify displacement and collision impacts from all relevant extant offshore wind farms using contemporary assessment methods projects. We anticipate the project can prioritise the assessment of Irish Sea projects to facilitate a more comprehensive cumulative and in-combination assessment of relevant Round 4 and Round 5 projects.

Natural England will keep the Applicant up to date as far as possible in terms of timelines and outputs from this work, and their potential application for the assessments of the Morgan and Mona OWFs. Given the accelerated timelines for submission, this project may not deliver data to enable gap-filling of relevant impacts in time for the cumulative effects assessment. Thus, Natural England would welcome further discussion and consideration of this issue through the EWG. A qualitative assessment/consideration of unknown impacts may be an appropriate compromise.

For clarification of any points in this letter, please contact me using the details provided below.

Yours sincerely,

[redacted]
Marine and Coastal Lead Adviser
Coast and Marine Team
Cheshire to Lancashire Area Team
[redacted]

☒ The advice provided in this letter has been through Natural England's Quality Assurance process

The advice provided within the Discretionary Advice Service is the professional advice of the Natural England adviser named below. It is the best advice that can be given based on the information provided so far. Its quality and detail is dependent upon the quality and depth of the information which has been provided. It does not constitute a statutory response or decision, which will be made by Natural England acting corporately in its role as statutory consultee to the competent authority after an application has been submitted. The advice given is therefore not binding in any way and is provided without prejudice to the consideration of any statutory consultation response or decision which may be made by Natural England in due course. The final judgement on any proposals by Natural England is reserved until an application is made and will be made on the information then available, including any modifications to the proposal made after receipt of discretionary advice. All pre-application advice is subject to review and revision in the light of changes in relevant considerations, including changes in relation to the facts, scientific knowledge/evidence, policy, guidance or law. Natural England will not accept any liability for the accuracy, adequacy or completeness of, nor will any express or implied warranty be given for, the advice. This exclusion does not extend to any fraudulent misrepresentation made by or on behalf of Natural England.

Cc commercialservices@naturalengland.org.uk

Annex 1
European Protected Species

A licence is required in order to carry out any works that involve certain activities such as capturing the animals, disturbance, or damaging or destroying their resting or breeding places. Note that damage or destruction of a breeding site or resting place is an absolute offence and unless the offences can be avoided (e.g. by timing the works appropriately), it should be licensed. In the first instance it is for the developer to decide whether a species licence will be needed. The developer may need to engage specialist advice in making this decision. A licence may be needed to carry out mitigation work as well as for impacts directly connected with a development. Further information can be found in Natural England's 'How to get a licence' publication.

If the application requires planning permission, it is for the local planning authority to consider whether the permission would offend against Article 12(1) of the Habitats Directive, and if so, whether the application would be likely to receive a licence. This should be based on the advice Natural England provides at formal consultation on the likely impacts on favourable conservation status and Natural England's guidance on how the three tests (no alternative solutions, imperative reasons of overriding public interest and maintenance of favourable conservation status) are applied when considering licence applications.

Natural England's pre-submission Screening Service can screen application drafts prior to formal submission, whether or not the relevant planning permission is already in place. Screening will help applicants by making an assessment of whether the draft application is likely to meet licensing requirements, and, if necessary, provide specific guidance on how to address any shortfalls. The advice should help developers and ecological consultants to better manage the risks or costs they may face in having to wait until the formal submission stage after planning permission is secured, or in responding to requests for further information following an initial formal application.

The service will be available for new applications, resubmissions or modifications – depending on customer requirements. More information can be found on Natural England's website.

A.7.3 Morgan and Mona updated HRA Methodology Note

Partners in UK offshore wind

MORGAN GENERATION AND MONA OFFSHORE WIND PROJECTS

HRA Methodology Update

Image of an offshore wind farm

05 May 2023
F01

Document status

Version	Purpose of document	Authored by	Reviewed by	Approved by	Review date
F01	Issue to stakeholders	RPS	bpEnBW	bpEnBW	05/05/2023

Prepared by:	Prepared for:
RPS	**Morgan and Mona Offshore Wind Ltd.**

Contents

Acronyms

Acronym	Description
AEOI	Adverse Effect on Integrity
HRA	Habitats Regulations Assessment
ISAA	Information to support and Appropriate Assessment
LSE	Likely Significant Effect
PEIR	Preliminary Environmental Impact Assessment
SPA	Special Protection Area

Units

Unit	Description
%	Percentage

1 HRA METHODOLOGY UPDATE

1.1 Introduction

1.1.1.1 The benefits of a proportionate Habitats Regulations Assessment (HRA) for all parties are well understood. The approach undertaken for ornithology Stage 1 HRA Screening in the Preliminary Environmental Information Report (PEIR), set out the Applicant's aim to develop a proportionate Habitats Regulations Assessment (HRA), in response to the well-known and acknowledged criticisms of the HRA process whilst making the assessment more accessible for stakeholders. However, the feedback from stakeholders in the offshore ornithology Expert Working Group (EWG) was that this methodology is not what has been applied to other wind farms historically. The Applicant is therefore proposing a compromise solution for the Stage 1 HRA Screening and Stage 2 (Information to Support Appropriate Assessment (ISAA)) to be submitted with the application for development consent.

1.1.1.2 This technical note provides a summary of the proposed ornithology HRA methodology for both the Mona and Morgan Generation Offshore Wind Projects. The purpose of this note is to outline the process that will be undertaken within the HRA Stage 1 Screening and the Stage 2 ISAA and seek approval for this method with the Evidence Plan Steering Group prior to drafting the HRA to be submitted with the application for consent. This note is for the offshore ornithology EWG members to consider and to also use to update the offshore ornithology EWG agreement logs as appropriate, while reviewing this technical note alongside the PEIR for the Morgan Generation and Mona Offshore Wind Projects.

1.1.1.3 It should be noted that this technical note does not list the sites considered, a full list of European sites will be presented separately in the fully updated Stage 1 HRA Screening reports for the Morgan and Mona Offshore Wind Projects.

1.2 Stage 1 HRA Screening

1.2.1.1 For the Stage 1 HRA Screening, the Applicant will look to take a more traditional approach whilst aiming to manage the level of detail included in the Stage 2 ISAA. The Applicant will undertake a preliminary screening based on the foraging ranges from Special Protection Areas (SPAs) with breeding colonies (as is typically undertaken for UK offshore wind farms), with an LSE Screening matrix presented for each SPA within the relevant foraging range. However, in order to ensure a proportionate Stage 2 ISAA which focusses on the key SPAs and associated features of importance; where it can be demonstrated that there will be zero mortalities (i.e. zero mortalities will be considered as 0.0, a 0.2 figure will not be rounded down to 0) of breeding birds (i.e. through collision risk modelling and/or displacement assessments and subsequent apportioning to individual SPAs) the associated qualifying feature will be screened out of further assessment.

1.2.1.2 All sites and features where mortalities associated with collision or displacement are predicted to be more than zero (>0) will be screened in for further assessment in the ISAA. The evidence to support these conclusions (i.e. numbers of bird mortalities apportioned to individual SPAs) will be set out in the individual LSE Screening matrices (as per the approach in PEIR).

1.3 Stage 2 ISAA

1.3.1.1 For the HRA Stage 2 ISAA, the Applicant is proposing to undertake a 'two step' integrity test as discussed with the Evidence Plan Steering Group and the offshore ornithology EWG. This will involve a high level initial step 1 assessment to determine those SPAs with low risk (further information on 'step 1 for 'low risk' SPAs is provided below in paragraph 1.3.2.1) of Adverse Effect on Integrity (AEOI), and a more detailed step 2 assessment for those SPAs where there is greater risk of an AEOI.

1.3.2 Integrity test: step 1

1.3.2.1 Step 1 will involve a high level initial assessment using the apportioning assessment to present where there is low risk of AEOI of an SPA. If the predicted magnitude for the project alone is <1% of the baseline mortality of the reference population for a qualifying feature, then a high level assessment will be presented and a conclusion of no AEOI can be made. For those deemed 'low risk' SPAs, a high-level assessment will be provided against the conservation objectives (e.g. a brief, tabulated approach to concluding no AEOI). As discussed with the EWG (to be agreed via this note), this level of detail is deemed sufficient if the predicted magnitude is <1% of the baseline mortality of the reference population. In these cases, it will be concluded that the predicted magnitude will not affect the achievement of the conservation objectives for the SPA and as a result will not have an adverse effect on the integrity of the SPA.

1.3.2.2 Based on information presented within the PEIRs, impacts from the Mona and Morgan Generation Offshore Wind Projects on SPAs and associated ornithological features from displacement and collision are generally low and therefore the Applicant is anticipating that a large number of SPAs will fall into this low risk category, that is, most if not all of the SPAs and features which were screened out at the Stage 1 HRA Screening Stage in the PEIRs.

1.3.2.3 If the predicted magnitude is >1% of the baseline mortality of the reference population for a qualifying feature, then further consideration will be given to the magnitude of the likely effect, including the contribution of impacts from other plans and projects, in-combination. In this case an AEOI cannot be ruled out and the SPA and associated qualifying features will be progressed to the Integrity test: step 2, outlined in paragraph 1.3.3.1 below. This approach broadly follows the same approach as that followed for other DCO applications (e.g. Hornsea Four), although as set out above, the Applicant would look to streamline this process (e.g. by tabulating information for ease of review).

1.3.3 Integrity test: step 2

1.3.3.1 In the second step, a more detailed assessment will be undertaken on the SPAs where there is a greater risk of AEOI (likely to be focussed on in-combination effects). As outlined above in paragraph 1.3.2.3 these will be for European sites where the predicted magnitude is >1% of the baseline mortality of the SPA reference population for a qualifying feature. Step 2 will then follow a similar process to that undertaken to the Stage 2 ISAA submitted with the PEIR, and will use further detailed information from collision risk modelling assessments, displacement assessments and Population Viability Analysis (where required for particular species/sites) to examine against each conservation objective for the relevant SPAs in order to make a conclusion with regard to adverse effects on integrity.

A.8. Steering group meeting 6

A.8.1 Meeting minutes

MINUTES OF MEETING

Security Classification: Project External

Partners in UK offshore wind

MOM Number	:	20231017_Morgan and Mona SG	**REV. No.**	:	F02
MOM Subject	:	Morgan and Mona Evidence Plan Steering Group meeting 6			

MINUTES OF MEETING

MEETING DATE	:	17/10/2023
MEETING LOCATION	:	Microsoft Teams
RECORDED BY	:	S. Tuddenham (RPS)
ISSUED BY	:	K. Linnane (RPS)

PERSONS PRESENT:

- Miriam Parish – bp (MP)
- Sarah Randall – bp (SR)
- Paul Carter – bp (PC)
- Kevin Linnane – RPS (KL)
- Samantha Tuddenham - RPS (ST)
- Jillian Whyte – JNCC (JW)
- Adam Price – MMO (AP)
- Megan Stroudley – MMO (MS)
- Elliott Waltho – Natural England (EW)
- Kathleen Bealby – Natural England (KB)
- Emily Park – Planning Inspectorate (EP)
- Leonie Richardson – NRW (LR)

ITEM NO:	DISCUSSION ITEM:	Responsible party	Date
1	**<u>Project updates (presented by MP)</u>** Following responses to the Mona and Morgan Generation Preliminary Environmental Information Report (PEIR), the project design envelope has been reviewed and updated. The Mona and Morgan array areas have been reduced in size, mainly in response to shipping and navigation and commercial fisheries consultation. The slide (slide 5) provides links to the offshore newsletters for Mona and Morgan Generation that were published in September 2023 and present key offshore updates. The minimum spacing between offshore infrastructure has been increased to 1,400 m both within and between rows. The maximum number of wind turbines has been reduced from 107 to 96 for both Mona and Morgan Generation. The rotor diameter of the largest wind turbine has increased from 280 m to 320 m for both Mona and Morgan Generation. Monopiles have been removed from the list of foundation options included in the project design envelopes. Gravity base foundations and jackets on suction buckets or pin piles (drilled or driven) are retained.		

	No cable protection higher than 70 cm will be installed within in the Menai Strait and Conwy Bay SAC. The percentage of export cable requiring cable protection has been reduced to not exceed 10% of the total length within the SAC. Additionally, no more than a 5% reduction in water depth will occur at any point along the export cables without prior written approval from the Licensing Authority in consultation with the MCA. In addition, we can confirm that the Mona export cables will be installed under the intertidal area from below MLWS to above MHWS onshore via trenchless techniques. Open-cut trenching within the intertidal area has been removed for the project design envelope. This will remove any direct impact to the clay and piddock habitat in the intertidal area. The project has also made a significant reduction to the volume of seabed preparation material in the Mona and Morgan Generation Array Areas and the Mona Offshore Cable Corridor. EP- Do you know if the applications will be submitted towards the beginning or the end of Q1 and Q2 2024? PC- Ideally in the middle of those time frames, middle of Q1 for Mona but we cannot commit to timeframes at the moment. EP- And for Morgan? SR- Morgan will be submitted within Q2 2024, hopefully fairly close to Mona.		
2	**<u>Approach to LSE screening (Presented by KL)</u>** The approach on breeding birds has been agreed, where the apportioning shows 0 birds impacted from a SPA, we will screen those birds out within the Stage 1 screening report, otherwise they will be taken forward to the Information to Support Appropriate Assessment (ISAA). This methodology does not apply to SPA where the conservation objectives are not related to populations that are affected by displacement or collision. The approach to these SPAs (e.g. Liverpool Bay SPA) has not been updated, this will be clarified in the updated HRA methodology note. The approach the projects are adopting for birds during the non-breeding season is based on feedback from Natural England and NRW. The approach is based on the Morecambe PEIR and we are also aware that this approach has been used for the Berwick Bank Offshore Windfarm. The approach starts with the BDMPS areas, and SPAs within foraging ranges of breeding colonies of the BDMPS populations. Where the non-breeding bird population of an SPA contributes less than 1% of the BPMPS population, LSE will be screened out. Where the non-breeding bird population of an SPA contributes 1% or more of the BPMPS population, the SPA will be taken through to the ISAA. This approach means that the key	**The Applicant to issue the final updated HRA methodology note**	Complete

	SPAs that contribute the regional population are included in the assessment. Following the HRA Stage 1 Screening, we have the Step 1 and Step 2 AEOI test to the ISSA. So for Step 1 we'll do a 'high level' assessment of AEOI. This High level assessment is likely to be tabulated. The ISAA Step 1 is likely to include a table for the project alone assessment which will be <1% for all species with a clear conclusion of no AEOI. Step 1 will include another table for each feature/species, with the project alone number and the other plans/projects considered cumulatively. This will have more accompanying text because of the uncertainties associated with some of the older projects. The project has received advice from Natural England on how older offshore wind projects should be included in the cumulative and in-combination assessments. We will include Morgan Generation and Morecambe Generation in Mona's cumulative/in-combination assessment as these assessments have been undertaken recently following the best practice advice and they have recent assessments in the public domain. The area of complexity comes from the older projects which may not have done full apportioning, baseline data is not available (e.g. the very old ones) etc. Natural England advised in a previous EWG that a Natural England project was being commissioned to help provide these answers; but unfortunately that project will not be available in time to inform the Applications. For the other projects, we are looking into how we can include a quantitative assessment but there is likely to be some qualitative text and caveats. We may present collisions risk numbers in the tables but if they are not apportioned in the original cumulative projects assessment then would need to flag in the table that there are uncertainties associated with these numbers (e.g. they may be over-conservative). It may also not be appropriate to quantify effects of some historic projects, especially where they are very old. For projects that are already part of the baseline e.g. for a project that is 15 years old and pre-dates the designation of an SPA and the SPA population counts. The current baseline mortality against which impacts are measured would therefore already include the mortality from these older projects as they are ongoing impacts. We are looking at the advice from Natural England; our ornithology specialists are considering the advice. We will need to get back to the EWG on what we can do on this and our approach for the final applications. However, it is the project's intention to consider these historic projects in the CEA where possible to ensure there are no gaps in the CEA, but context is important to ensure we're not overestimating impacts. Further, it might not be appropriate to assess quantitatively for projects without the	**The Applicant to consider how to include a quantitative assessment for older offshore wind projects in the CEA (but there is likely to be some qualitative text and caveats)**	Ongoing

	modelling being originally presented in the ES/HRA for these projects. KL-The Applicant would not want to redo assessment for other projects where the information was not originally presented in the ES/HRA. EP: Is there a cut of date between projects that are part of the baseline and what is included in the cumulative assessment? KL- That is good question and not one we have an answer to at the moment. It is something that we will be considering alongside the Natural England advice. We will pick this up with the ornithology EWG, potentially in a separate meeting when the Applicant has had time to consider the advice. SR: Some older projects don't have much information in their project description and EIA so to make an informed decision on impacts would be very difficult and almost impossible to undertake CRM for these projects. KL- The industry is definitely really interested in the Natural England project to determine the numbers for older projects. Unfortunately the dates will not allow us to include these in the applications, we wouldn't want to pre-empt these results. EP: Will the results of the Natural England project be ready for the examination? SR: That is what the projects were expecting but the email from Natural England yesterday suggested that that it will not be ready for examination and would be expected towards the end of 2024 or 2025. KL: We will follow up with the offshore ornithology EWG with the updated HRA methodology with the final updates to the methodology from stakeholder comments. We have agreed the methodologies with the EWG but we would like to get it in writing. SR: We have received legal advice on the structure of the ISAA which is very long due to the nature of the document and that we are now screening lots of additional sites and a lot of additional information. We are aware that it is important to keep all of the information together but we would like to split the ISAA up into three sections. These will take the form of three separate PDFs for each section but will be parts of the ISAA rather than separate documents. Would this approach be acceptable for the steering group? KL: Part 1 of the ISAA would provide an overview of the HRA in general, background information and methodologies. Part 2 would present the assessment on SACs and part 3 would present the assessment of SPAs. This structure would make it more accessible as ornithology would be in one section and specialists can go to the section they are most interested in. It will form one part of the application but this format will make producing it and reviewing it easier. In addition, it will make the report easier to download and	**The Applicant to consider if a further EWG is required to discuss approach to the CEA**	Complete

	scroll through. The integrity matrices would form an appendix to these. EP: In principle, this format sounds helpful, a good idea and sensible. I will take this away and ask for feedback from the Planning Inspectorate lead advisor for the projects. *Post meeting note: As requested, the Inspectorate has provided advice on this matter which will be published as s51 advice on the Morgan and Mona project pages of the National Infrastructure Planning website.* KL: We can provide a link to the Berwick Bank RIAA which followed this approach on its structure (see below). LR: This sounds reasonable and a link to the Berwick Bank RIAA would be helpful. AP: MMO has no comments on this. KB: We agree with this approach in principle but would like to see the Berwick Bank example. *Post meeting note: The Berwick Bank RIAA can be found here:* [redacted]	**Stakeholders to confirm that the Mona and Morgan Generations ISAAs can be split into parts.**	Complete
3**3**	**<u>Piling Strategy (presented by KL)</u>** Site Integrity Plans have historically been applied to projects in the Southern North Sea (SNS), in particular those within or close to the SNS SAC, which is designated for Harbour Porpoise. In these SIP's there are defined thresholds for cumulative effects of piling – 10% in a particular season, or 20% on a particular day. Mona and Morgan Generation are not predicted to reach the 10% area threshold for the nearest harbour porpoise SAC (i.e. North of Anglesey Marine SAC), either alone or in-combination with other projects. As such, a SIP, similar to those used in the Southern North Sea SAC, is not considered appropriate to manage underwater sound impacts. At PEIR, outstanding concerns were raised with respect to: • Bottlenose dolphin populations, including those associated with Welsh SACs; • Cumulative concerns about impacts of piling on cod spawning; • Concerns about piling impacts on herring spawning. The Applicant is looking to agree a mechanism (similar to SIPs) that allow us to agree an approach to managing of underwater sound impacts post consent, when more details of the project construction for the individual projects, and more detail on cumulative projects in the region is known. We are considering a Piling Strategy (name TBC) to do this. Also worth noting that underwater sound impacts (particularly in relation to cumulative impacts) were also flagged in the Awel y		

	Mor consent decision and the Awel y Mor applicant and NRW are still in discussions on the marine licence. The Piling strategy would allow the projects to focus on underwater sound for multiple receptors (fish and marine mammals). If this is acceptable for the steering group then we can put together an outline plan to be included with the application so the stakeholders and Secretary of State can have confidence that this will be effective and agreed post consent. The piling strategy would set out the detailed project design pre-construction (e.g. the number of foundations that will need piling may be reduced, hammer energies may be revised etc.) as the application collects more information on the ground conditions. It will contain more environmental information e.g. cod and herring stock or spawning grounds. These have previously been used post-consent in discussion on underwater sound impacts. The impact assessments within applications assume all the piling is occurring at the same time and therefore you end up with a large, conservative assessment. In reality, all cumulative projects may not be piling at the same time therefore the cumulative impacts will likely be reduced from what has been assumed in the final applications. This has been the experience for SIPs where impacts have been reduced due to phasing of projects. The Piling strategy will set out potential mitigation options which could be employed if there are residual concerns about the cumulative impacts of underwater noise following refined project design. These are often agreed in principle at the application stage with final agreement achieved post consent with the final project design. The main advice the applicant is looking for is whether this approach would be acceptable. We are trying to put forward a process where the projects can continue towards consent and the detail can be discussed post-consent when further information is available. If there is general agreement on this approach then we can discuss it in further detail with the EWGs. An example Piling Strategy was shown on slide 12 from a Scottish project, but these would be developed to be project specific and would include consideration of cumulative projects and timing of these. LR: NRW Advisorywelcome the Piling strategy approach, the outline Table of Contents and the intention to consider noise abatement as an option for management and mitigation.. This would help address the concerns highlighted at PEIR. EP: In principle this sounds good, we would be looking to make sure it accounts for the worst case scenario and therefore, that any altering of the project design post any consent would only decrease impacts. For cumulative scenarios, there should be consideration of concurrent piling and cumulatively with UXO detonation as well.	**Stakeholders to confirm whether the Piling strategy is an acceptable approach to manage underwater sound impacts**	Complete

	KL: The applications looking at different scenarios, both the temporal and spatial worst case scenario. There is a lot of precaution built into the assessment. EP: You mentioned about having a draft Piling Strategy. When would this be available? KL: We would need to look at the programme, we would definitely submit an outline during the examination but we would need to consider what is possible with the application. The Applicant would look to consult on the draft ahead of the examination. SR: It would definitely be a draft rather than an outline plan as the project wouldn't have the detail required at examination. The project parameters would not be refined down to the point of final design. EP: An Examining Authority is likely to be looking for evidence of consultation and agreement with the SNCBs on the content of the draft/ outline Piling Strategy.. *Post meeting note: As requested, the Inspectorate has provided further advice on the Piling Strategy approach, which will be published as s51 advice on the Morgan and Mona project pages of the National Infrastructure Planning website.* KL: Yes the Applicant would also be looking for agreement with the SNCBs. SR: Does the MMO have any thoughts on this approach? It would be good to hear your thoughts as you have experience on SIPs in the North Sea. AP: Initially this looks like a good approach but I will take this away and discuss it with Cefas. KL: If you want to pass the slides and meeting minutes on to Cefas then we are happy for you to do that. JW: There are no objections from JNCC but I will take this away for the marine mammal specialists to consider. KB: Agree that we are happy with this in principle I will take this away for the marine mammal specialists to consider.		
4	**<u>Agreement logs (presented by KL)</u>** We have had a benthic EWG last week and an offshore ornithology EWG later this week and we will be re-circulating the agreement logs. There have been lots of recent written correspondence with the EWGs and there are items that the Applicant now thinks we can get agreement on. In addition, we want to map out the progress towards agreement on conclusions and mitigation. The Applicant is aware that there are issues that will be still under discussion for the final application as we anticipate that you will		

	want to see the detail included in the final application to support the conclusions (flagged in agreement logs a “under discussion”). The applicant is asking stakeholders if some items can now be agreed based on discussions since PEIR (flagged in agreement logs as “can this be agreed”. These are items for the project alone based on the PEIR and updates that the project has made since PEIR. The Applicant is not looking for agreement on everything but we are looking to close out as much as possible. If there are items that the specialists want to add or items that they want to split out in the agreement logs then please feed that back to us. The agreement logs will form a framework for the statements of common ground.		
5	**<u>Next steps</u>** The meeting minutes will be circulated two weeks following this meeting.		

A.8.2 Response from Natural England regarding the meeting minutes

Date: 14 November 2023
Our ref: DAS/UDS A009203 456624
Your ref: Morgan and Mona Steering Group 06 17th October 2023

[redacted]

[redacted]

RPS

BY EMAIL ONLY

Dear [redacted]

Discretionary Advice Service (Charged Advice): UDS A009203
Development proposal: Morgan Generation and Mona Offshore Windfarm
Consultation: Morgan and Mona Steering Group 06

This advice is being provided as part of Natural England's Discretionary Advice Service (DAS) in accordance with the Quotation and Agreement dated 23rd May 2023 to Morgan Offshore Wind Limited & Mona Offshore Wind Limited.

The following advice forms Natural England's response to the meeting minutes provided for the Morgan and Mona Steering Group 06 attended by Natural England on 17th October 2023.

Natural England were asked to provide feedback on the following points:

- Stakeholders to confirm that the Mona and Morgan Generation ISAAs can be split into parts
- Stakeholders to confirm whether the Piling strategy is an acceptable approach to manage underwater sound impacts

Detailed comments

Splitting the ISAAs

Splitting of the ISAAs may have happened in other OWF projects. It sounds like this decision ultimately lies with the Planning Inspectorate. From Natural England's perspective, if the reason for splitting it is due to the file size rather than changing the methodology of the assessment, we think this would be acceptable. We advise that it is as reader friendly as possible and clear which documents/figures are being referred to throughout. Ultimately, we'd be happy to go with the Planning Inspectorate's decision for this.

Piling Strategy

Natural England welcomes the Piling strategy approach as it addresses some of our concerns raised from the PEIR. It is hoped that it will produce more accurate assessments which will allow for more appropriate mitigation measures to be put in place.

Natural England also welcomes the comparison with the previous assessment. However, from the Table of Contents that was presented with the Piling strategy, it says that the strategy will be compared with the 2012 assessment. Natural England would like to clarify if this is meant to say 2021 rather than 2012?

For clarification of any points in this letter, please contact me using the details provided below.

Yours sincerely,

[redacted]

☒ The advice provided in this letter has been through Natural England's Quality Assurance process

The advice provided within the Discretionary Advice Service is the professional advice of the Natural England adviser named below. It is the best advice that can be given based on the information provided so far. Its quality and detail is dependent upon the quality and depth of the information which has been provided. It does not constitute a statutory response or decision, which will be made by Natural England acting corporately in its role as statutory consultee to the competent authority after an application has been submitted. The advice given is therefore not binding in any way and is provided without prejudice to the consideration of any statutory consultation response or decision which may be made by Natural England in due course. The final judgement on any proposals by Natural England is reserved until an application is made and will be made on the information then available, including any modifications to the proposal made after receipt of discretionary advice. All pre-application advice is subject to review and revision in the light of changes in relevant considerations, including changes in relation to the facts, scientific knowledge/evidence, policy, guidance or law. Natural England will not accept any liability for the accuracy, adequacy or completeness of, nor will any express or implied warranty be given for, the advice. This exclusion does not extend to any fraudulent misrepresentation made by or on behalf of Natural England.

[redacted]

Annex 1
European Protected Species

A licence is required in order to carry out any works that involve certain activities such as capturing the animals, disturbance, or damaging or destroying their resting or breeding places. Note that damage or destruction of a breeding site or resting place is an absolute offence and unless the offences can be avoided (e.g. by timing the works appropriately), it should be licensed. In the first instance it is for the developer to decide whether a species licence will be needed. The developer may need to engage specialist advice in making this decision. A licence may be needed to carry out mitigation work as well as for impacts directly connected with a development. Further information can be found in Natural England's [redacted] publication.

If the application requires planning permission, it is for the local planning authority to consider whether the permission would offend against Article 12(1) of the Habitats Directive, and if so, whether the application would be likely to receive a licence. This should be based on the advice Natural England provides at formal consultation on the likely impacts on favourable conservation status and Natural England's [redacted] on how the three tests (no alternative solutions, imperative reasons of overriding public interest and maintenance of favourable conservation status) are applied when considering licence applications.

Natural England's pre-submission Screening Service can screen application drafts prior to formal submission, whether or not the relevant planning permission is already in place. Screening will help applicants by making an assessment of whether the draft application is likely to meet licensing requirements, and, if necessary, provide specific guidance on how to address any shortfalls. The advice should help developers and ecological consultants to better manage the risks or costs they may face in having to wait until the formal submission stage after planning permission is secured, or in responding to requests for further information following an initial formal application.

The service will be available for new applications, resubmissions or modifications – depending on customer requirements. More information can be found on [redacted]

A.8.3 Response from the Planning Inspectorate regarding the meeting minutes

Enquiry:

The Inspectorate attended an online Steering Group for the Morgan Generation Assets and Mona Offshore Wind Projects. The meeting provided a project update and an update on the approach to the Habitats Regulations Assessment (HRA), as well as an overview of progress and agreement reached as part of the Expert Topics Groups. The Applicant also outlined its proposed approach to manage underwater noise impacts on fish and marine mammals (a Piling Strategy) and requested any comments on this approach.

Advice given:

The Applicant proposed that the Information to Inform an Appropriate Assessment (ISAA) report is split into three parts, to assist with production and navigation of the document. Part 1 of the ISAA would provide an overview of the Habitats Regulations Assessment (HRA) in general, background information and methodologies. Part 2 would present the assessment of effects on Special Areas of Conservation (SACs) and part 3 would present the assessment of effects on Special Protection Areas (SPAs).

The Inspectorate considers this is an acceptable approach, subject to clear cross referencing being provided between the different parts of the ISAA (as required).

The Applicant outlined why it does not consider a Site Integrity Plan (SIP) (including defined thresholds for cumulative effects of piling - 10% in a particular season, or 20% on a particular day) to be appropriate to manage underwater noise impacts from Mona and Morgan Generation. The Applicant stated that Mona and Morgan Generation are not predicted to reach the 10% area threshold for the nearest harbour porpoise SAC (i.e. North of Anglesey Marine SAC), either alone or in-combination with other projects.

The Applicant is instead looking to agree a mechanism (similar to SIPs) that would allow it to agree an approach to managing underwater noise impacts post consent, when more details of the project construction for the individual projects and more detail on cumulative projects in the region is known. The Applicant is considering a "Piling Strategy" (name TBC) as a method of achieving this. The Piling Strategy would set out potential mitigation options which could be employed if there are residual concerns about the cumulative impacts of underwater noise following refined project design. The Applicant noted such matters are often agreed in principle at the application stage with final agreement achieved post consent with the final project design. The Applicant stated that it could potentially provide an outline plan for draft document review during the pre-application phase, so the stakeholders and Secretary of State can have confidence that this will be effective and agreed post consent.

The Inspectorate considers the approach set out by the Applicant to be acceptable in principle. It advised the Applicant to ensure its approach accounts for the worst case scenario and therefore, that any altering of the project design post any consent would only decrease impacts. Cumulative scenarios should include consideration of concurrent piling and detonation of Unexploded Ordnance (UXO). However, the Applicant should make efforts to discuss and agree the approach (including the content of the draft/ outline Piling Strategy) with relevant consultation bodies including Natural England, Natural Resources Wales and the Marine Management Organisation and should justify the approach taken in the HRA Report.

Any assumptions used in the definition of applicable worst case scenarios should be explained in the ES.

The Applicant was not able to commit to submitting a draft/ outline Piling Strategy with the Development Consent Order (DCO) application at this time, but confirmed it would look to consult on the draft Piling Strategy ahead of an Examination and that it would be submitted during the Examination. The Inspectorate advised that an Examining Authority is likely to look for evidence of consultation and agreement with the Statutory Nature Conservation Bodies on the content of the draft/ outline Piling Strategy.

Section 55 of the Planning Act 2008 (Regulation 5(2) of the Infrastructure Planning (Applications: Prescribed Forms and Procedure) Regulations 2009 refers) requires that the DCO application must be accompanied by sufficient information that will enable the Secretary of State to make an appropriate assessment of the implications for European sites if required by Regulation 48(1) of the Habitats Regulations. The Inspectorate advises that if the Piling Strategy is being relied upon to mitigate impacts on European site(s), the draft/ outline Piling Strategy should be provided with the DCO application. This could otherwise present a risk that the application for development consent may not be accepted for Examination.

If the Piling Strategy is not being relied upon to mitigate impacts on European site(s), where possible the Applicant should submit a draft/ outline Piling Strategy with the DCO application, as it is possible that this would otherwise be sought by an Examining Authority prior to commencement of an Examination.

A.8.4 Response from Cefas regarding the meeting minutes

From: [redacted]
To:
Subject: [redacted]eration Sixth Steering Group - response from CEFAS UWN Team
Date: 17 November 2023 16:48:22
Attachments: [redacted]

[redacted]

Following the above meeting we forwarded the slides and questions sent over on to the CEFAS UWN Team for their comment. Please see below:

I have reviewed the following document: 'Morgan and Mona offshore wind Projects Steering Group meeting 6 PowerPoint slides, dated October 2023'.

I have discussed the proposed approach of a Piling Strategy with our noise team. We would be interested to hear Natural England's views on this, specifically the applicant's view that a SIP is not considered appropriate to manage noise impacts.

I note in the accompanying slides that "*Mona and Morgan Generation are not predicted to reach the 10% area threshold for the nearest harbour porpoise SAC (i.e. North of Anglesey Marine SAC), either alone or in-combination with other projects*". What about the 20% daily disturbance threshold?

If a Piling Strategy is agreed as the preferred approach, then it would be helpful to set out in advance the conditions under which noise abatement, for example, will be required, so that there is a clear set of boundaries within which the developer will be working. This approach would still allow for the construction planning to evolve, but it would also give confidence that appropriate safeguards are in place at the stage of giving consent to the project, rather than leaving it to time-pressured discussions (which is too often the case) after consent has been granted.

Many thanks

[redacted]

Enabling sustainable growth in our marine area

The MMO ‘call for evidence - MMO assessment of fishing impacts in marine protected areas - Stage 2’ is now open. To respond please go to Citizen Space: https://consult.defra.gov.uk/mmo/call-for-evidence-stage-2/

To receive information from the MMO’s Marine Conservation Team regarding marine protected areas in England, please email “Contact me” to [redacted]

A.8.5 Response from JNCC regarding the meeting minutes

From: [redacted]

Subject: RE: Morgan Mona steering group meeting 5
Date: 23 November 2023 15:56:45
Attachments: image001.png
image002.png

[redacted]

I've had feedback from our marine mammal specialists regarding the proposed Piling Strategy and can confirm that, having discussed this internally and with NRW, JNCC are content with the approach proposed.

Many thanks for your patience on this one.

Kind regards,

[redacted]

A.8.6 Response from NRW regarding the meeting minutes

From: [redacted]

Subject: RE: Morgan Mona steering group meeting 5
Date: 13 November 2023 13:58:27
Attachments: 20231017_Morgan Mona_SG05 MoM_DRAFT F01 NRW Comments.docx

[redacted]

Please find attached minor NRW amendments on the minutes from the Mona / Morgan Steering Group Meeting 5. Please also note the following:

- NRW Advisory confirm we are content for the Mona and Morgan Generation ISAAs to be split into 3 parts, but note it would be useful to be able to easily navigate between the documents through e.g. an overarching contents page with links to the separate sections.
- NRW Advisory welcome the Piling Strategy approach, the outline Table of Contents and the intention to consider noise abatement as an option for management and mitigation, and we anticipate the approach will help address concerns raised at PEIR. We believe further discussion on the Piling Strategy will be conducted through the Marine Mammal EWG, but it would be useful to have advanced warning of when / an indication of whether it will be discussed at the start / end of the meeting to enable our Fish Specialist to also input to the discussion.

Kind regards,

[redacted]

Appendix B: Evidence Plan Benthic Ecology, Fish and Shellfish and Physical Processes EWG

B.1. Benthic ecology, Fish and shellfish and Physical processes EWG overview

Table B.2: Overview of Benthic ecology, Fish and shellfish and Physical processes EWG consultation materials.

Date	Meeting	Information provided
17 February 2022	BE, FSF, PP EWG meeting 1	Meeting minutes (B.2.1) Response from Natural England regarding the meeting minutes (B.2.2) Response from the Environment Agency regarding the meeting minutes (B.2.3) Response from the MMO regarding the meeting minutes (B.2.4) Response from JNCC regarding the meeting minutes (B.2.5) Provision of Intertidal Survey Scope (B.2.6) Morgan and Mona Benthic Survey Scope of Works Report (B.2.7) Response from JNCC regarding the Benthic Survey Scope of Works Report and Provision of Intertidal Scope (B.2.8) Response from Natural England regarding the Benthic Survey Scope of Works Report and Provision of Intertidal Scope (B.2.9) Response from NRW regarding the Benthic Survey Scope of Works Report and Provision of Intertidal Scope (B.2.10) Response from NRW - Rhiannon Modiolus survey North Anglesey (2015) (B.2.11)
29 November 2022	BE, FSF, PP EWG meeting 2	Meeting minutes (B.3.1) Response from Natural England regarding the meeting minutes (B.3.2) Response from Cefas regarding the meeting minutes (B.3.3) Response from JNCC regarding the meeting minutes (B.3.4) Response from NRW regarding Low Resemblance Stony Reef (B.3.5)
14 March 2023	BE, FSF, PP EWG meeting 3	Meeting minutes (B.4.1)
11 July 2023	BE, FSF, PP EWG meeting 4	Meeting minutes (B.5.1) Response from Natural England regarding the meeting minutes (B.5.2) Mona and Morgan Generation Offshore Wind Projects Physical Processes Environmental Statement Modelling Strategy (B.5.3) Response from JNCC regarding the Physical Processes Modelling Strategy (B.5.4) Responses and advice note from NRW regarding the Physical Processes Modelling Strategy (B.5.5)

Date	Meeting	Information provided
		Email from RPS regarding the herring larval approach and the herring larval heatmap (B.5.6) Response from NRW regarding the herring larval heat/contour mapping (B.5.7)
12 October 2023	BE, FSF, PP EWG meeting 5	Meeting minutes (B.6.1) Response from NRW regarding the meeting minutes (B.6.2) Provision of Benthic subtidal and intertidal ecology technical report (B.6.3) NRW comments on Benthic subtidal and intertidal ecology technical report (B.6.4)
07 December 2023	BE, FSF, PP EWG meeting 6	Meeting minutes (B.7.1) Response from Cefas regarding the meeting minutes (B.7.2)
-	BE, FSF, PP EWG agreement log	Agreement log (B.8)

B.2. Benthic ecology, Fish and shellfish and Physical processes EWG meeting 1

B.2.1 Meeting minutes

MINUTES OF MEETING

Security Classification: Project Internal

Partners in UK offshore wind

MOM Number	:	20220217_Morgan and Mona EP_BE, FSF, PP EWG01	**REV. No.** :	F02
MOM Subject	:	Morgan and Mona Evidence Plan Benthic, fish and shellfish and physical processes expert working group meeting 1.		

MINUTES OF MEETING

MEETING DATE	:	17/02/2022
MEETING LOCATION	:	Microsoft Teams
RECORDED BY	:	[redacted] (RPS)
ISSUED BY	:	[redacted] (RPS)

PERSONS PRESENT:

- [redacted] – bp (GV)
- [redacted] – bp (MP)
- [redacted] – bp (WD)
- [redacted] – RPS (KL)
- [redacted] – RPS (AP)
- [redacted] – RPS (NS)
- [redacted]
- [redacted] – Natural England (EH)
- [redacted] – MMO (JS)
- [redacted] – MMO (SJ)
- [redacted] – JNCC (JW)
- [redacted] - Environment Agency (SK)
- [redacted] – NRW (LR)
- [redacted] – NRW (JI)
- [redacted] – NRW (IN)
- [redacted] – Cefas (RB)
- [redacted] – Cefas (GE)
- [redacted] – Cefas (PM)
- [redacted] – Cefas (RB)
- [redacted] – TWT (EB)

ITEM NO:	DISCUSSION ITEM:	Responsible party	Date
1.	**Introduction** (Presented by KL) KL- This meeting is the first expert working group for benthic, fish and shellfish and physical processes for Morgan and Mona. So far, two Evidence Plan (EP) Steering Group (SG) meetings for the projects have been held in November and December to introduce the project and get the EP up and running.		

	First few slides provide an introduction to the project, including how we envisage the EWG working. The RPS topic specialists will then run through the current surveys for their topic and any feedback we have already received on the current surveys.		
2.	**Overview of the Projects** (Presented by WD) bp are working with EnBW in a 50/50 partnership (the Applicants) to develop the Morgan and Mona offshore wind farms which are being progressed as two separate projects. These sites were awarded as part of The Crown Estate's Round 4 offshore wind leasing round and arecurrently at 'preferred bidder' status, subject to completion of the plan-level Habitats Regulation Assessment (HRA). The intention is for both projects to be developed as fixed bottom offshore wind farms. Morgan is the northern project located in in English waters, and Mona is the southern project located mostly in Welsh waters. Together, they will have a combined capacity of 3GW. Morgan and Mona will be developed on similar but slightly staggered timescales and will be under separate consent applications. The Mona project is aiming to be operational in 2028 and the Morgan project is aiming to be operational in 2029. **Key dates** Both projects are currently at pre-scoping stage. The Applicants are working on the basis that The Crown Estate (TCE) will conclude the plan-level HRA in spring 2022. The Applicants will then be in a position to sign the agreement for lease for seabed rights. Due to the size and nature of both projects, Morgan and Mona are both considered Nationally Significant Infrastructure Projects (NSIPs). The Applicants intend to submit separate Development Consent Order (DCO) applications for Morgan and Mona. Mona will also require a Welsh marine licence and the Applicants are in discussion with NRW Marine Licensing Team on the remit of this marine licence. Currently the Applicants are targeting the 2025 Contract for Difference (CfD) round, noting the recent announcement on annual CfD rounds. The scoping reports for both projects are planned to be submitted April 2022. The intent is to have each project submission offset by a week as per the Planning Inspectorate's preference. The Applicants are currently undertaking pre-scoping engagement including local authority engagement. Throughout 2022 theApplicants will progress with pre-application activities including both offshore and onshore surveys. Local authority engagement and fisheries engagement have begun. The Applicants have also established a maritime navigation engagement forum. The Applicants aim to publish the Preliminary Environmental Information Report (PEIR) towards the end of 2022 with formal consultation scheduled for early 2023. The Mona DCO application is currently planned to be submitted in Q4 2023 and the Morgan DCO planned for Q1 2024.		

	Indicative export cable corridor The Applicants anticipate that there will be two Points of Interconnection (POIs), one for Morgan on the northwest coast of England and one for Mona on the north Wales coast. At the moment the Applicants are considering a number of POI options. The decision on the location of the POI for each Project is determined by National Grid and at this time we do not know where the POI will be. Once the Applicants have clarity around this, they will present this information to the SG. The Applicants have received feedback from TCE that scoping must be carried out on the full preferred bidder areas. This is to ensure consistency between the TCE plan- level HRA and the round 4 scoping reports. The Applicants have refined down the preferred bidding area for Mona and are not currently looking to develop the northern section (the so called "dinosaur's head"). The figure on the slides shows the area currently considered as the Mona Potential Array Area, however scoping will be undertaken on the larger Mona preferred bidder area (including the "dinosaur head"). **Evidence Plan process** (presented by KL) The Evidence Plan (EP) process has been developed following the Planning Inspectorate and Defra guidance. The Applicants have also considered draft advice provided by Natural England [1]. The EP process is a mechanism for the Applicants to agree with the stakeholders what is needed to be included with the consent application and to discuss any issues or concerns. The aim is to agree as much as possible during the pre-application phase so only key issues are left for examination. The EP has historically been HRA focused however in line with recent best practice, the Applicants propose to extend this to include the EIA process for ecology topics, including designated sites such as SSSIs and MCZs. The Applicants are proposing to carry out a single EP process for both projects. The projects will have separate agreement logs to account for the differences between the projects ahead of the DCO applications. Meeting minutes will also note any differences between the projects.		
	EWG (presented by KL) The EWGs will discuss key topics for the EIA and HRA so we are only left with key issues at examination. The EP Template has been circulated prior to the first EWG. The EP Template was issued to the SG early last year for comments and has been updated following their comments. If there are any other comments, please let us know in writing after the meeting. The Applicants are seeking to agree the remit of the EWG following this meeting.		

[1] Natural England (2021) Expectations for pre-application engagement and best practice guidance for the evidence plan process.

	The indicative timeline of the EWG meetings is subject to change (particularly the latter meetings) but this gives stakeholders an indication of the number of meetings and expected timings to inform their resourcing over this time. Broad approach to EWGs as set out in the Ways of Working (WoW) document circulated prior to the meeting: • Information circulated to EWG 2 weeks ahead of meeting. • Meeting is held with attendees prepared to comment on materials provided. • Full meeting minutes will be taken, and agreement logs will be compiled where matters are agreed, and after each meeting the minutes and agreement log will be circulated. • Minutes and agreement logs to be returned/agreed within 2 weeks following receipt, alongside written comments on documents submitted. The agreement logs and meeting minutes will ultimately be appended to the DCO application.		
3.	**Benthic Ecology** (presented by AP) The aim of this section is to provide a recap and summary of the benthic ecology surveys that have been undertaken to date. This section will provide an overview of the preliminary outputs of these surveys and how the Applicants are taking on board stakeholder comments in the surveys being undertaken this year. Benthic subtidal surveys were undertaken in June to September 2021. 35 combined grab and drop-down video (DDV) samples, 2 DDV only stations and 9 sediment chemistry samples were taken within the Morgan Array Scoping Boundary. 51 combined grab and DDV samples, 10 DDV only stations and 16 sediment chemistry samples were taken within the Mona Array Scoping Boundary. The grab samples are currently with the laboratory being analysed for macrofauna, particle size analysis and DNA metabarcoding. The results of the survey will assist characterisation of the seabed sediments and habitats. Initial analysis has been undertaken on the DDV data. Sediments in the Morgan Array Scoping Boundary ranged from sand to muddy sandy gravels. Sediments in the Mona Array Scoping Boundary ranged from slightly gravelly sand to muddy sandy gravel with some isolated areas of cobbles. The majority of sample stations were characterised as circalittoral mixed sediments. These preliminary results from the DDV will be combined with the grab sample results to provide a comprehensive habitat characterisation which will be presented with the technical report as part of the PEIR. Key comments from stakeholders on the scope of the 2021 benthic survey included the absence of site-specific sampling with the zone of influence (ZOI). This has now been defined as one tidal excursion from the Array Scoping Boundary. A benthic subtidal survey will be undertaken in spring/summer 2022 to take samples with the ZOI for both projects and therefore characterise the area that may be		

	affected by the construction of the projects through increased suspended sediments and sediment deposition. The 2022 ZoI benthic survey will include both grab sampling and DDV samples. Sample density is likely to be similar to that undertaken across the Array Scoping Boundaries in 2021. The 2022 benthic surveys will also resample roughly 15% of the samples taken in the 2021 survey. Locations will be selected after the results of the 2021 survey are known and will likely target any sensitive habitats. A benthic subtidal survey will be undertaken in summer 2022 for the export cable corridor for each project. This survey will be timed to coincide with the geophysical survey and a sample plan will be prepared, and discussed with the EWG, in advance. The intention is to consult on the benthic survey scope through correspondence rather than through a specific meeting. A Phase 1 intertidal walkover survey will be undertaken at each of the selected landfalls (when known) to identify species and habitats present. JI- NRW would like to have consultation on the export cable corridor. We would want to know why the route has been chosen and what has been considered within the process to choose the route. KL- At the moment the projects do not have defined cable routes. The POI for each project will be determined by National Grid. In parallel, the Applicants have been investigating potential POIs and there has been some cable routeing investigations undertaken to allow the Applicants to proceed with the POIs at the earliest opportunity once they have been identified by National Grid. The intention is to consult with the SG to discuss the export cable corridor, and the scoping report will detail the POI and a wider cable search area. The Applicants will further provide the SG with the rational for identification of the proposed export cable corridor from within the wider cable search area. JI- Will this go through the SG or the EWG. It is important that NRW get early sight of this process. KL- The intention is to engage through the SG, and it will be up to the representatives from each organisation if they decide they need technical advice from within their organisations. We will provide advanced notice on when the benthic scope of works will be available for comments. The scope of works for the export cable corridor may be more generic than for the ZOI survey, and will include principles that could be applied to any export cable corridor (e.g. x number of samples will be taken per xx km of export cable corridor). EH- NE and JNCC have been working on best practice guidance which will be published on a NE SharePoint site next week to inform external stakeholders. This guidance will be relevant to any benthic, fish and marine mammal surveys you are planning/ undertaking. The Applicants should review this guidance. KL- We have had early site of this draft guidance, and the EP template has taken it into account. AP has also reviewed the draft benthic survey guidance.		

4.	**Physical processes** (presented by NS) There are two pathways to consider for physical processes, the impact on physical processes themselves and the impact of changes in physical processes on other features e.g. benthic and fish and shellfish. The assessment will be underpinned by a numerical modelling study to provide quantified data for physical processes and interdependent receptors. Data will be applied for the model definition, model calibration and validation, and for environmental assessment. The assessment would use the model to characterise the baseline and to model the projects impacts. This would relate to both longer term changes due to the presence of the infrastructure, and construction activities which tend to be shorter term impacts such as increased suspended sediment concentrations. Operation and maintenance activities will also be considered. The study area is generally quite modest i.e. one or two tide excursions, whereas the numerical model considers a wider domain and will capture any potential impacts that may go beyond this area. The insert figure on the slides shows the kind of model domain that will be used. There is already a large amount of data in the public domain that RPS will make use of when designing the model to be used. The model will also incorporate the site-specific survey data e.g. the geophysical and benthic data. This will provide additional data and ground truth the desktop data. JI- Has there been a gap analysis done for characterisation of bathymetry and sandwave fields in the area? NS- RPS are carrying this out at the moment. The initial results suggest that desktop data coverage is very good. JI agreed that there is a lot of data available in this part of the Irish Sea which is a positive for the project. JI- Will the model be high resolution i.e. capable of modelling cable and scour protection? NS- Yes, the model will be high enough resolution to account for things like scour protection. JI-What model are you using? NS- The MIKE modelling software will be used. JI- Will the model be 2D or 3D? NS- 2D. JI- Would the model be updated to be 3D if impacts extended into the Dee Estuary? NS- The intention at the moment is to keep the model as 2D as we would not expect impacts to be that widespread. However there is flexibility in the software to make a 3D model if this is required. JI		

	noted a potential issue with density stratified conditions in the Dee Estuary, but that can be looked at as the assessment is progressed. ***NRW post meeting note**- In addition to NRW's Marine Physical Processes Guidance to Inform EIA: marine-physical-processes-guidance-to-inform-environmental-impact-assessment-eia.pdf (cyfoethnaturiol.cymru) NRW Advisory recommend reviewing the paper Anthropogenic Mixing of Seasonally Stratified Shelf Seas by Offshore Wind Farm Infrastructure (Dorrell et al.2021) – https://arxiv.org/abs/2112.12571 (arxiv.org). We also note that Guy Walker-Springett [redacted]@bangor.ac.uk) is currently doing his PhD research at Bangor University looking at sediment transport primarily around Constable Bank, but may be able to help with regards availability of additional relevant information.*		
5.	**Fish and Shellfish Ecology** (presented by KL) This is a run through of the preliminary results of the benthic and geophysical survey which are relevant to fish and shellfish. The full results will be presented within the fish and shellfish technical report of the PEIR. The benthic and geophysical data provide a general understanding of the seabed habitats e.g. through the particle size analysis (PSA). Initial PSA results show that there is a higher proportion of mud in the Mona Array Scoping Boundary which makes it less suitable for sandeel and herring. Morgan has a higher sand proportion therefore is more suitable for sandeel, but a high proportion still looks unsuitable for herring. There is a lot of desktop data available with site-specific sampling undertaken for a lot of the neighbouring wind farms. Some have also undertaken pre and post construction monitoring. RPS will look at mapping the fish spawning and nursery habitats with Agri-Food and Biosciences Institute (AFBI) data to get further refinement on the boundaries of these areas. The full list of desk-top data sources will be within the scoping report and the technical report within the PEIR. However, let us know now if you think of any that are missing. IN- The ZOI was shown as one tidal excursion. For a lot of fish species, underwater noise may be a key impact. Noise contours may go outside one tidal excursion therefore impacts may go beyond that definition of the ZOI. KL- Yes, in terms of characterising the area, we have site specific survey data, but the rest of the characterisation will be based on desk top data and will cover a much wider area than one tidal excursion. IN- It would be worth looking at the Cefas PELTIC surveys. GE- Walney and Ormond have a lot of data from surveys there. The resources listed look appropriate. Landings and VMS data for the region would also be a good source of data for the region. Approach to herring and sandeel habitat is good. Cod would also be good to specifically look at for piling noise impacts. Elasmobranchs e.g. basking sharks around the IoM may be present. This would be something that the IoM would have more information on (rather than Cefas).		

	KL - Noted, thank you for highlighting those points. If basking sharks come up in aerial surveys, we will also include that as well. GE- In terms of migratory fish, particularly at the north coast of Wales and coast of Cumbria there are some SACs and MCZ for lamprey and salmon. Cefas would advise that the underwater noise assessment treats fish as a static receptor rather than a fleeing receptor for spawning fish within the spawning season. KL- Thanks for highlighting this, it will be considered when underwater noise modelling is looked at in more detail. ***NRW post meeting note***- *NRW Advisory support this approach and further advise that where fish are modelled as fleeing receptors, the fleeing speed and time-frames should be evidence-based and species-specific.* CR- The fish and shellfish main receptors in the region will be scallops and nephrops. KL- Noted, thanks. We will be working closely with the commercial fisheries specialist, who have good links to the scallop fisheries around the IoM. CR- Bangor and IoM also have surveys for scallop fisheries.		
6.	**Next Steps** (Presented by KL) Confirmation on POIs from National Grid. Timing for the benthic SoW will be available in more detail in the next few weeks. It is expected to be with you in the next month or two. Scoping scheduled for April 2022. The Applicants would look for agreement on the following points following the meeting: • Agreement on the Remit and Inputs to the EWG (as set out in Section 4.2 of the Evidence Plan Template). • Agreement on Ways of Working Documents, including timescales. • Agreement on broad approach to future surveys - that previous feedback has been taken into account in future scope. • Agreement on broad approach to characterisation for benthic ecology. • Agreement on broad approach to characterisation for fish and shellfish ecology. Agreement on broad approach to characterisation for physical processes.	**The Applicants to clarify when the benthic scoping of work will be ready for the EWG to review** **All- to fill in agreement log to provide progress of agreement for each of the points listed.**	11/03/2022 11/03/2022
7.	**Close of meeting**		

B.2.2 Response from Natural England regarding the meeting minutes

Date: 10 March 2022
Our ref: DAS/UDS A000566 / 381723
Your ref: Benthic ecology, fish and shellfish, and physical processes EWG01

[redacted] and [redacted]
BP Alternative Energy Investments Limited

c/c [redacted] and [redacted]
RP

BY EMAIL ONLY

Customer Services
Hornbeam House
Crewe Business Park
Electra Way
Crewe
Cheshire
CW1 6GJ

0300 060 3900

Dear [redacted]

Discretionary Advice Service (Charged Advice) - UDS A000566
Contract Reference: BP EnBW Morgan and Mona Offshore Wind Farm
Consultation: Benthic ecology, fish and shellfish, and physical processes EWG01

This advice is being provided as part of Natural England's Discretionary Advice Service in accordance with the Quotation and Agreement dated 17 May 2021 to BP Alternative Energy Investments Limited.

The following advice is based upon the information presented in the Benthic Ecology, Fish and Shellfish Ecology and Physical Processes Expert Working Group (EWG) Meeting 1 (attended on 17 February 2022) and subsequent meeting notes provided on the 25 February 2022 by Samantha Tuddenham.

Natural England were asked to provide advice upon:

1. Agreement on the remit of the EWG;
2. Agreement on Ways of Working document;
3. Agreement on board approach to future surveys;
4. Agreement on board approach to baseline characterisation.

1. Agreement on the remit of the EWG;

Natural England provided comment on the draft Evidence Plan, via a comments log, on 4 November 2021. It was our view that the Evidence Plan set out the basic framework of the Evidence Plan. This was ahead of the 1st Evidence Plan meeting on 16 November 2021. We welcome the update of the Evidence Plan (version F02, provided 4 February 2022) which has incorporated our earlier comments.

The remit of the Benthic Ecology, Fish and Shellfish Ecology and Physical Processes EWG as set out under 4.2 of the Evidence Plan (v F02) is appropriate and in line with Natural England's previous comments, we agree the remit as set out. We welcome the outlined timetable of future meetings and their focus as presented in Table 4.2.

2. Agreement on Ways of Working document

We welcome the Evidence Plan Ways of working document (version F01, provided 4 February 2022) as a clear reference document.

Natural England agrees with the Ways of Working document which aligns with previous comments in terms of timescales for review and comment provided as part of our comments on the draft Evidence Plan (4 November 2022). As noted in the document, it may be necessary for timescales to be amended to ensure sufficient time to review and comment (e.g. large documents or multiple documents), in which case we will communicate and agree an alternative deadline.

3. **Agreement on board approach to baseline characterisation and approach to future surveys**

Natural England have set up a SharePoint Online (SPOL) site to share Natural England's advice on the environmental considerations and use of data and evidence to support offshore wind and cable projects in English waters. These should be considered when developing the baseline characterisation and designing future surveys. Advice provided on this site includes Natural England and Joint Nature Conservation Committee (JNCC)'s shared advice on 'Nature conservation considerations and environmental best practice for subsea cables in English inshore and UK offshore waters.'

The outputs of Natural England's project 'Offshore Wind Marine Environmental Assessments: Best Practice Advice for Evidence and Data Standards' are also provided. This project, produced in collaboration with DEFRA, the following reports are currently available;

- Phase I: Expectations for pre-application baseline data for designated nature conservation and landscape receptors to support offshore wind applications.
- Phase II: Expectations for pre-application engagement and best practice guidance for the evidence plan process.
- Phase III: Expectations for data analysis and presentation at examination for offshore wind applications.

You can access the new SPOL site from the following links:
[redacted]

Due to how SharePoint Online works, people outside of Defra will need to request access to the site before being able to view the advice documents, so there could be a slight delay for external stakeholders to access the site.

In addition lessons learnt from previous offshore windfarm constructions should be taken into account. For example the Natural England report (2018) Natural England Offshore wind cabling: ten years' experience and recommendations available from: [redacted] Also, the Natural England and JNCC report (2019) on key sensitivities of habitats and Marine Protected Areas in English Waters to offshore windfarm cabling within Proposed Round 4 leasing areas, available from: https://hub.jncc.gov.uk/assets/3c9f030c-5fa0-4ee4-9868-1debedb4b47f. Please note that this publication is about to be revised, Natural England will forward the updated version when available.

For clarification of any points in this letter, please contact me using the details provided below.

Yours sincerely
[redacted]
Strategic Coastal Lead Adviser
Coast and Marine Team
Cheshire, Greater Manchester, Merseyside & Lancashire Area Team
[redacted]

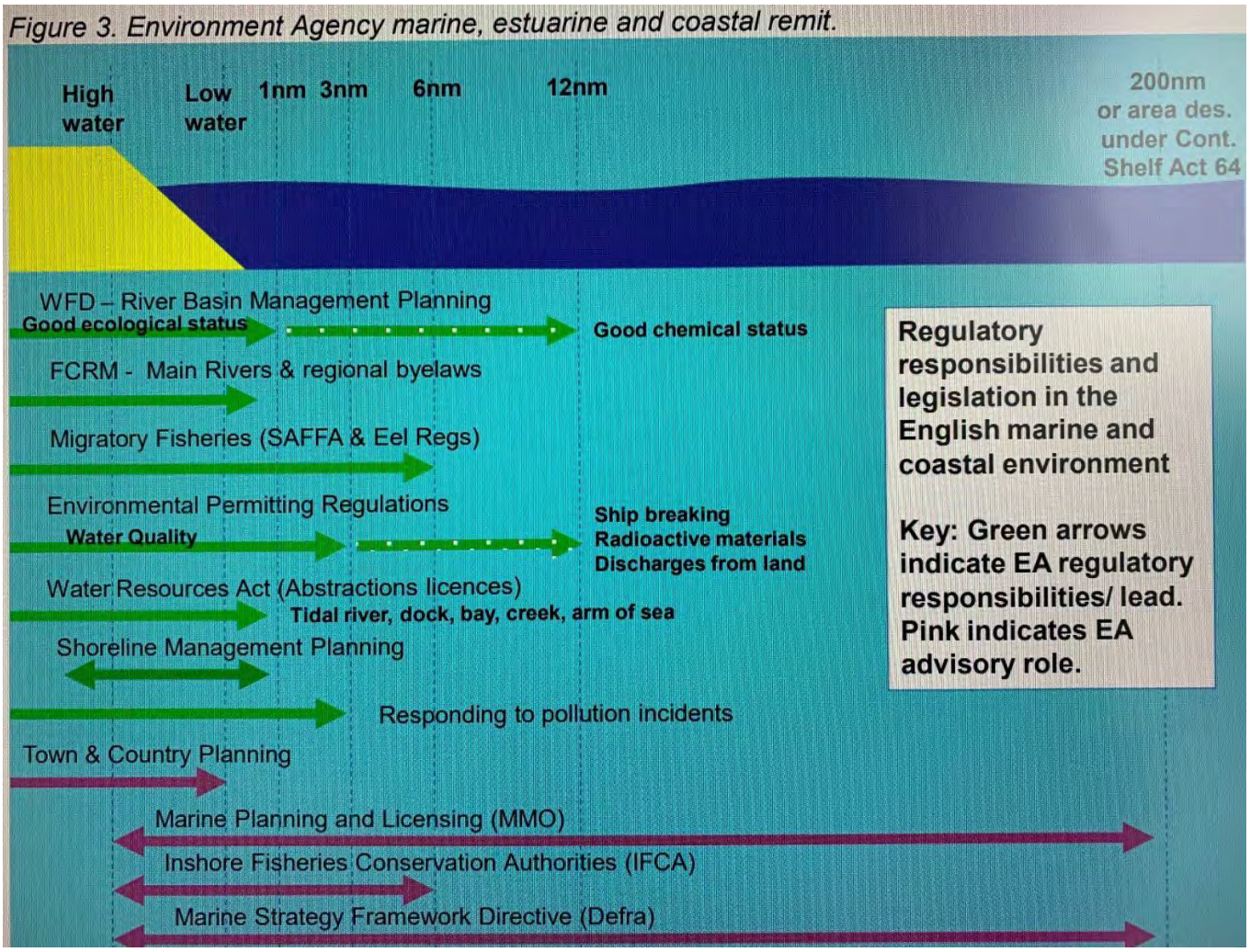
☐ The advice provided in this letter has been through Natural England's Quality Assurance process.

The advice provided within the Discretionary Advice Service is the professional advice of the Natural England adviser named below. It is the best advice that can be given based on the information provided so far. Its quality and detail is dependent upon the quality and depth of the information which has been provided. It does not constitute a statutory response or decision, which will be made by Natural England

acting corporately in its role as statutory consultee to the competent authority after an application has been submitted. The advice given is therefore not binding in any way and is provided without prejudice to the consideration of any statutory consultation response or decision which may be made by Natural England in due course. The final judgement on any proposals by Natural England is reserved until an application is made and will be made on the information then available, including any modifications to the proposal made after receipt of discretionary advice. All pre-application advice is subject to review and revision in the light of changes in relevant considerations, including changes in relation to the facts, scientific knowledge/evidence, policy, guidance or law. Natural England will not accept any liability for the accuracy, adequacy or completeness of, nor will any express or implied warranty be given for, the advice. This exclusion does not extend to any fraudulent misrepresentation made by or on behalf of Natural England.

B.2.3 Response from the Environment Agency regarding the meeting minutes

NSIP Morgan and Mona Offshore Windfarm –comments FBG team Environment Agency
Environment Agency remit and relevance to proposed expert working groups EWGs



Here are some summary bullets:

- This is a new Nationally Significant Infrastructure Project (NSIP)
- With NSIPs most of the consultation & engagement is prior to submission, in the preparation of the Environmental Impact Assessment, which should address issues within our remit
- We need to identify issues at earliest stage so they can be designed out, or mitigation can be designed in.
- It will need engagement from FBG primarily, also PSO, and likely Land & water, and potentially Groundwater and Waste depending on the constraints.
- Uncertain yet where the cabling will come ashore – a broad corridor is expected to be known later in 2022. This is awaiting the conclusion of a separate Offshore Transmission Network Review
- Our involvement will be provided as chargeable advice, managed by Liz Locke in Sustainable Places
- Expert working Groups established 2022 – will require involvement of EA technical teams, leading up to submission of the Environmental Statement.
- Most of our remit is around the onshore elements of the work, but FBG will be involved in offshore also see remit diagram above.
- The windfarms themselves are 20nm or over from the coast of Lancashire and S Cumbria, therefore the regulatory responsibilities of the Environment Agency are likely in this case to relate to the cable ways on the sea bed and any connection points to shore when these locations are decided, rather than the impacts of the wind turbines themselves. EA regulatory responsibilities extend to 12nm, however there may be an advisory capacity in relation to the MMO licence which extends 200nm.

NSIP Morgan and Mona Offshore Windfarm –comments FBG team Environment Agency Environment Agency remit and relevance to proposed expert working groups EWGs

Fisheries Biodiversity and Geomorphology Team (FBG) input to the following expert working groups:

Benthic Ecology, fish/shellfish, physical processes – [redacted] as the initial contact, considering designated sites and protected species issues, mitigation and net biodiversity gain. Likely issues to be considered also include migratory fish, SAFFA and Eel Regs, so will need to bring in fisheries technical specialist advice too. WFD and geomorphology considerations and relevant to the physical processes element of this group so geomorphology officers in the team will be asks to input as needed.

Marine Mammals – Agree do not need Environment Agency representation at this group

Offshore ornithology - Agree do not need Environment Agency representation at this group, can be covered by Natural England and RSPB.

Onshore ecology – [redacted] as the initial contact Sustainable Places team. If the cable connections and onshore activities affect the Lancashire, Cumbria or Sefton coastline FBG and other EA teams are likely to provide comments, therefore best to coordinate through Liz Locke. Again for onshore activities FBG will be considering designated sites and protected species issues, mitigation and net biodiversity gain. Particularly impacts to estuaries, river crossings, implications for fisheries issues and impacts to geomorphology. As with the benthic ecology group there may be times when biodiversity, fisheries and geomorphology specialist/officer advice is required.

B.2.4 Response from the MMO regarding the meeting minutes

Marine Management Organisation

Marine Licensing
Lancaster House
Hampshire Court
Newcastle upon Tyne
NE4 7YH

T [redacted]
F
www.gov.uk/mmo

[redacted]
Environmental Advisor
bp Alternative Energy Investments Ltd
(By email only)

Our reference:
ENQ/2021/00033

06 April 2022

Dear [redacted]

Morgan and Mona Offshore Windfarm – Expert Topic Group Meetings

The Marine Management Organisation (MMO) received the above document and accompanying comments for consideration on 04 February 2022. The MMO has reviewed the document alongside our advisors at Cefas and our comments are below:

Comments

Shellfisheries

1. Desktop data sources include the Northern Irish Sea Fish Trawl Surveys. Please note that this is unlikely to inform of shellfish abundances. At best, trawls (except for Nephrops if using an otter trawl) will provide presence/absence information at best. Shellfish (lobster, crab, whelks, cuttlefish) are typically targeted using specialised pots. The MMO would suggest interrogating MMO landings data to determine the extent of shellfish landings.

Underwater Noise

2. Timescales for Feedback (document F02 Ways of working document): Please note that although Cefas advisors can endeavour to provide comments and review minutes and contents of agreement logs within 2 weeks, the exact timeframes will ultimately depend on the deadlines specified by the MMO.

Benthic Ecology

3. The MMO requests confirmation that the benthic grab samples collected in relation to the developments will be processed to the recommend national processing guidelines (Worsfold and Hall, 2010) and that the resultant data will be made available as soon as possible.

4. The MMO note that there were several areas relevant to benthic ecology that were not discussed at the meeting (e.g., cumulative impacts, non-native invasive species, survey design and benthic analyses, electromagnetic fields, suitability of baseline

datasets, data processing and availability). The MMO is aware this is only the first group meeting but will expect these topics to be covered in the future.

Fisheries and Fish Biology

5. In the absence of confirmed export cable routes and cable landfall locations for the projects, the MMO are currently unable to comment, consider or advise on any potentially vulnerable fish receptors which may be affected by the construction activities associated with the construction and operational phases of the wind farms. The MMO will review this in more detail once landfall locations are confirmed.

6. During the expert topic meeting reference was made to the Cefas Pelagic ecosystem survey in the Western Channel and Celtic Sea (PELTIC) surveys and their potential use as a source of information/data to inform the baseline for fisheries. The MMO would advise that in the Irish sea the survey stations only go as far north as Llŷn Peninsula in North Wales, which is significantly further south of the proposed locations for Morgan and Mona. The day may be useful to provide broadscale information and data on pelagic species in the Irish Sea but may not be as useful for providing site-specific fisheries data for the windfarm study areas. See Annex1 for map of PELTIC survey stations.

Coastal Processes and Physical

7. No comments at this stage.

General- Benthic Scope of Works and the Intertidal Outline Scope Reports

8. The MMO note that Samantha Tuddenham sent an email on 01 April 2022 requesting comments on the benthic scope of works report revision 2 with a deadline of 19 April 2022. The MMO has advised previously that consultation with our advisors requires 4 weeks and there will be time either side for quality checks. Further discussions are required around the timescales the projects are proposing as the MMO do not currently find them appropriate.

Conclusion

The MMO notes there are no major concerns at this stage of the projects and has provided advice to ensure all aspects of the topics raised above are adequately covered. The MMO is still concerned however by the time the project expects the MMO to provide comments within and would encourage further discussion on this topic at the next catch-up meeting with the MMO.

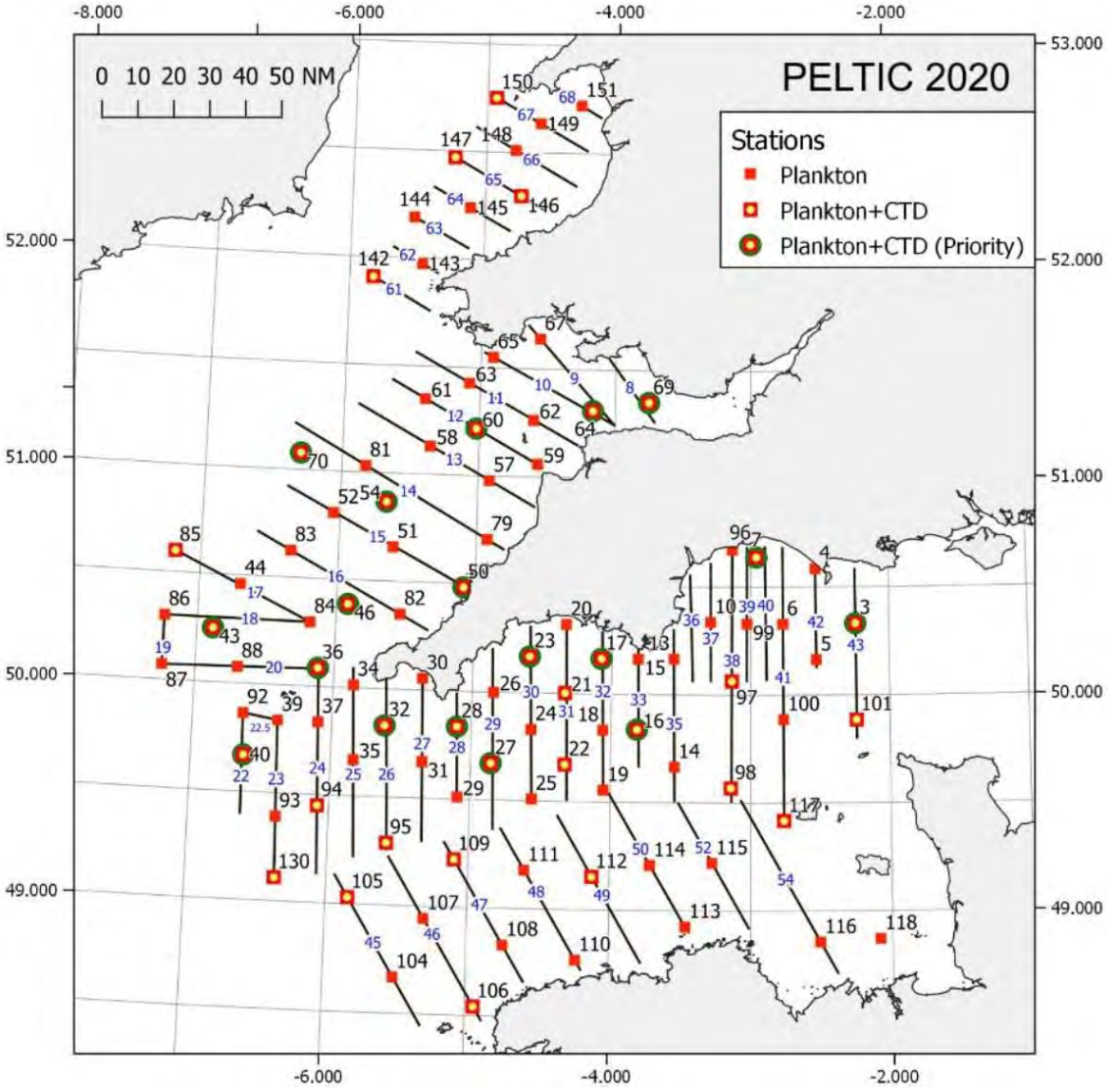
If you wish to discuss any of the points further, please don’t hesitate to contact me.

Yours sincerely,

[redacted]
Marine Licensing Case Officer

D [redacted]
E

Annex 1 – Map of Survey Stations for the PELTIC survey



B.2.5 Response from JNCC regarding the meeting minutes

Inverdee House, Baxter Street,
Aberdeen, AB11 9QA, United Kingdom

Email: [redacted]
Tel: [redacted]
Fax:

jncc.gov.uk

[redacted]
Marine Consultant
RPS | Energy
Goldvale House
27-41 Church Street West
Woking
Surrey
GU21 6DH

JNCC Reference: OIA-08535
Date: 11 March 2022

Dear [redacted]

Morgan and Mona wind farms Benthic Ecology, Fish and Shellfish and Physical Processes Expert Working Group (EWG)

Thank you for consulting JNCC on the bp / EnBW Morgan and Mona offshore wind Projects.

The documents reviewed as part of this response are;

- Morgan and Mona_BE_FSF_PP_EWG01_Presentation_F02 (received 25 Feb 2022)
- EOR0801_Morgan and Mona_Evidence Plan_F02 (received 4 Feb 2022)
- EOR0801_Morgan and Mona_Evidence Plan_Ways of Working_F01 (received 4 Feb 2022)
- EOR0801_Mona_BE, FSF, PP EWG01_Agr Log DRAFT F01 (received 25 Feb 2022)
- 20220217_Morgan and Mona_EP BE, FSF, PP EWG01 MoM DRAFT F01 (received 25 Feb 2022)

Any advice or assistance provided by JNCC via our Discretionary Advice Service is advisory only, and with reference to the General terms and conditions for DAS chargeable services, JNCC excludes any warranty that the advice provided by its officers represents JNCC's opinion or otherwise binds JNCC when acting as a Statutory Consultee.

JNCC were asked to comment on the following aspects:

Agreement on the Remit and Inputs to the EWG (as set out in Section 4.2 of the Evidence Plan Template)

JNCC are content with the remit and inputs outlined in Section 4.2 of the Evidence Plan Template, however, we would like to take this opportunity to highlight that (with regard to *Section 3.1.1.4 Joint Nature Conservation Committee*) JNCC's role in relation to offshore renewables in English waters has been delegated to Natural England. Natural England is

now authorised to exercise the JNCC's functions as a statutory consultee in respect of certain applications for offshore renewable energy installations in inshore and offshore waters (0-200nm) adjacent to England. Therefore, JNCC would not look to providecomment on the Morgan project unless we anticipate an impact on a jointly managed site (i.e a site jointly managed by ourselves and Natural England). As such JNCC have not provided feedback in relation to the Morgan project within this response. We are currently holding internal discussions regarding this issue and how this can be managed in practice. We will endeavour to provide clarity as soon as is possible.

We also note that *Section 3.1.1.3 Natural Resources Wales Advisory* states that Natural Resources Wales Advisory (NRW) will provide comment on offshore elements of the project "within and outside of 12nm from the Welsh coast". We would like to highlight that JNCC are the statutory consultee for offshore Welsh waters but will, throughout this process, look to liaise with NRW to provide joint advice where it is deemed appropriate.

Agreement on the Ways of Working document, including timescales

JNCC are satisfied with the content of the Ways of Working document and feel that the proposed timings are reasonable. Where there may be an issue in achieving the timeframe set out within the Ways of Working document, JNCC will be sure to contact bp / EnBW and RPS in a timely manner to ensure minimal disruption to the progress of the agreement(s) in question.

Agreement on the broad approach to future surveys – that previous feedback has been taken into account in future scope

JNCC are content with the surveys that have been undertaken as well as those scheduled for the array's Zone of Influence and the cable route. With regard to the upcoming surveys, we would like to refer bp / EnBW and RPS to previous advice provided by JNCC (Ref OIA-08126, 11 June 2021) regarding benthic survey scopes which may prove useful. We appreciate that the benthic survey scopes will be prepared and discussed with the EWG through the Evidence Plan process.

Agreement on the broad approach to characterisation for Benthic Ecology

JNCC note the presence and initial analysis of sea-pen and burrowing megafauna communities within the array area and welcome the opportunity to review the assessment of this feature. JNCC provide the following information as it may prove useful in further analysis.

The definition of the OSPAR T&D feature 'Seapens and burrowing megafauna communities' is the subject of on-going discussions between Contracting Parties as scientific knowledge improves, particularly for deep sea areas.

OSPAR (2008) defines the 'Seapen and burrowing megafauna communities' feature as "Plains of fine mud, at water depths ranging from 15-200m or more, which are heavily bioturbated by burrowing megafauna with burrows and mounds typically forming a prominent feature of the

sediment surface. The habitat may include conspicuous populations of seapens, typically *Virgularia mirabilis* and *Pennatula phosphorea*." The narrative then notes that - "...the tall seapen *Funiculina quadrangularis* may also be present." The OSPAR (2010) Background Document for Seapen and Burrowing megafauna communities instead notes that "... burrows and mounds may form a prominent feature of the sediment surface with conspicuous populations of seapens ..."

At a meeting of the OSPAR Contracting Parties in Bergen in November 2011[1], a key recommendation was that the **presence of burrowing megafauna is the essential defining characteristic** of the feature; the presence or absence of seapens does not in itself define the feature. Seapens may form a prominent feature of the seabed surface, but **do not have to be present** to define the OSPAR T&D habitat (SS.SMu.CFiMu.SpnMeg and/or SS.SMu.CFiMu.MegMax). This assumption is equally true of the Scottish 'burrowed mud' PMF, with the exception of the seapen *Funiculina quadrangularis*, which is designated as part of this PMF. JNCC believe that this is the most up-to-date position on the composition of this habitat.

JNCC have published the following report on the UK interpretation of the feature:

JNCC clarifications on the habitat definitions of two habitat Features of Conservation Importance: Mud habitats in deep water, and; Seapen and burrowing megafauna communities

In recent advice to Defra (concerning data from the *Nephrops* fisheries stock assessments) the threshold considered to demonstrate the presence of the OSPAR habitat Seapen and burrowing megafauna communities is a burrow density of >0.2/m^2. For further information on classifying Seapen and burrowing megafauna communities from *Nephrops* stock surveys see Section 5.1 of the JNCC's 2014 advice on possible offshore Marine Conservation Zones considered for consultation in 2015, available at:

http://data.jncc.gov.uk/data/91e7f80a-5693-4b8c-8901-11f16e663a12/2-pre-consultation-T2mcz-advice-140627-V5.0.pdf

JNCC also notes the presence of habitat which is being categorised as "low" resemblance to rocky reef habitat and would like to provide the following guidance:

When assessing potential stony reef habitat, the use of Irving (2009) guidelines is correct, however, we would like to make bp / EnBW and RPS aware that JNCC and the Statutory Nature Conservation Bodies have also produced further guidance helping to refine the characterisation of 'low resemblance' reef. JNCC Report 656[2] published in September 2020 provides some overarching principles for the application of the Annex I stony reef guidance, specifically in relation to 'low resemblance' reef and the potential for reefs to have 'medium' or 'high' resemblance classification even when one or more of the criteria are 'low'. We request that the recent surveys be reviewed against this report to ensure that there are no

[1] 20 October 2011 - 21 October 2011. OSPAR Workshop on the improvement of the definitions of habitats on the OSPAR list

[2]http://data.jncc.gov.uk/data/4b60f435-727b-4a91-aa85-9c0f99b2c596/JNCC-Report-656-FINAL-WEB.pdf

other areas of ‘medium’ or ‘high’ resemblance reef present which may require further mitigation planning.

Agreement on the broad approach to characterisation for Fish and Shellfish Ecology

We would like to take the opportunity to flag that Fish and Shellfish Ecology falls outside of JNCC’s remit and we would not therefore look to comment further.

Agreement on the broad approach to characterisation for Physical Processes

JNCC have no further comments at this stage in this process.

Further Comments

JNCC are content that the draft minutes are accurate.

Please contact me with any questions regarding the above comments.

Yours sincerely,

[redacted]

Offshore Industries Adviser

Email: [redacted]

Telephone: [redacted]

B.2.6 Provision of Intertidal Survey Scope

From:	[redacted]
To:	
Cc:	
Bcc:	Morgan Mona
Subject:	Morgan Mona 2022 Benthic Ecology Survey Scope of Works
Date:	01 April 2022 18:08:00
Attachments:	[redacted]

Dear all,

Please see attached the Survey Scope of Work for the Morgan and Mona 2022 Benthic Ecology Subtidal Survey. The outline scope for the intertidal surveys of the export cable landfalls is provided in this email below.

Please could you review the attached Benthic Scope of Works and the Intertidal Outline Scope below and provide any comments by **19th April**.

Intertidal Phase 1 Walkover Survey

A phase 1 intertidal walkover survey will be undertaken at the selected export cable landfall locations (i.e. one landfall for Mona; one for Morgan). The survey will be undertaken over a spring tide in spring/summer 2022 and will focus on intertidal biotopes from Mean High Water Springs (MHWS) to approximately Mean Low Water Springs (MLWS). The survey will be undertaken with reference to standard intertidal survey methodologies as outlined in the JNCC Marine Monitoring Handbook (Davies *et al*., 2001) within Procedural Guidance No 3-1 In situ intertidal biotope recording (Wyn and Brazier, 2001 and Wyn *et al*., 2000) and The Handbook for Marine Intertidal Phase 1 Biotope Mapping Survey (Wyn *et al*., 2006). The survey will be carried out by two suitably qualified ecologists experienced in habitat mapping in intertidal and coastal environments.

The intertidal survey will comprise both a walkover survey of the entire shore (where feasible and in line with health and safety considerations), noting changes in ecological and physical characteristics. Onsite dig over macrofauna sampling and analysis (field identification of conspicuous species) will also be undertaken in soft sediment habitats, to help characterise the biotopes. During the walkover survey, notes will be made on the shore type, wave exposure, sediments/substrates present and descriptions of species/biotopes present. The spatial relationships between these features will be observed and waypoints will be recorded by a handheld global positioning system (GPS) device, in conjunction with handwritten descriptions and photographs. All biotopes present will be identified, and their extents mapped, with the aid of aerial photography and a GPS recorder. Other features within the intertidal zone will also be noted including rock pools, man-made structures and any habitats/species of conservation importance. Where present, these features will be target noted in the intertidal biotope maps. Onsite dig over sampling stations will be undertaken in different biotopes, where possible, the locations of which will be determined in the field. This will involve the collection of four spade loads (approximately 0.02m^2) of sediment dug to a depth of 20-25cm, which will then be sieved on site through a 0.5 mm sieve. All conspicuous macrofauna species present will be identified and enumerated on site, where possible. Field notes will also be taken on the physical characteristics, including sediment type and presence of anoxic layers in the sediment. No sediment will be removed from site.

Kind Regards,

[redacted]
Marine Consultant
RPS | Energy
Goldvale House
27-41 Church Street West

B.2.7 Morgan and Mona Benthic Survey Scope of Works Report

Survey Report for
bp Alternative Energy Investments Limited

Project:
Morgan and Mona
2022 Integrated Site Survey

Description:
Benthic Survey Scope of Works Report

Expected Survey Commencement Date:
April 2022

Project Number:
11781

Report Status:
Final

REPORT AUTHORISATION AND DISTRIBUTION

Compilation	Environmental	I Carr
Authorisation	Check and approved	S Lines

Revision	Date	Title
0	17-Mar-2022	Draft
1	25-Mar-2022	Final for Approval
2	01-Apr-2022	Final

Distribution

1x electronic

BP Alternative Energy Investments Limited,
Chertsey Road,
Sunbury on Thames
TW16 7BP

For attention of

[redacted]

SERVICE WARRANTY

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GLOSSARY OF TERMS AND ABBREVIATIONS

Benthic	Relating to the seabed
Biogenic	Produced by living organisms
Cefas	Centre for environment, fisheries and aquaculture science
Clay	Sediment grains <3.9µm in diameter
CM	Central Meridian
Defra	Department for environment, foor and rural affairs
EBS	Environmental Baseline Survey
ECR	Export cable route
EnBW	Energie Baden-Wurttemberg
Fines	Sediment grains <63µm in diameter (same as Mud)
GC-FID	Gas Chromatography Flame Ionisation Detection
GC-MS	Gas Chromatography Mass Spectrometry
Gravel	Sediment grains >2mm in diameter
GRS	Geographic reference system
ICP-MS	Inductively Coupled Plasma Mass Spectrometry
IUCN	International Union for Conservation of Nature
LAT	Lowest Astronomical Tide
Macrofauna	Organisms that are normally larger than the mesh size of the sieve used. In this case 0.5mm.
MBES	Multi-beam echo sounder
MCZ	Marine conservation zone
MDAC	Methane Derived Authigenic Carbonate
Mud	Sediment grains <63µm (includes Silt and Clay)
NMBAQC	North East Atlantic Marine Biological Analytical Quality Control
OCP	Organochlorine pesticides
OSPAR	Oslo and Paris convention
OTU	Operation taxonomic unit
PAH(s)	Polycyclic aromatic hydrocarbon(s)
PCBs	Polychlorinated biphenyls
PCPT	Piezometer cone penetrometer test
PSA	Particle Size Analysis
Ramsar	The Ramsar Convention on Wetlands of International Importance Especially as Waterfowl Habitat
SAC	Special Area of Conservation
Sand	Sediment grains ≥63µm and <2mm in diameter
Silt	Sediment grains ≥3.9µm and <63µm in diameter
SOW	Scope of Work
SPA	Special Protection Areas
SSS	Side Scan Sonar
THC	Total Hydrocarbon
TOC	Total Organic Carbon
UKCS	United Kingdom Continental Shelf
USV	Unmanned survey vessels
UTM	Universal Transverse Mercator
UXO	Unexploded ordnance
ZOI	Zone of influence

1 INTRODUCTION

1.1 Scope of Work

bp Alternative Energy Investments Limited (hereafter bp) and Energie Baden-Wurttemberg (EnBW) are proposing two offshore windfarm projects in the Irish Sea, named Morgan and Mona (Figure 1.1). The offshore windfarm projects will be accompanied by an export cable route (ECR) for Morgan and an ECR for Mona to connect each of the offshore windfarms to the National Grid. The current ECR scoping areas for Morgan and Mona are shown in Figure 1.1. Within these scoping areas, more defined ECR corridors will be refined.

In order to inform the spatial planning and design of the array as well as to inform environmental impact assessments and the consenting process, a series of phased surveys are planned (bp Solutions, 2021). In 2021, initial surveys were conducted, such as a bathymetry, geophysical, geotechnical and an environmental survey in the Morgan and Mona potential array areas. A zone of influence (ZOI) was delineated, covering each array area plus a buffer of one tidal excursion, thereby representing the maximum distance suspended sediments would travel from the Morgan and Mona potential array areas in one tidal cycle prior to deposition on slack water. In 2022, surveys will cover the Morgan and Mona ZOI and ECRs and comprise:

- a third party ECR bathymetry survey (conducted by XOcean) involving multibeam echosounder (MBES) data acquisition.
- a supplementary geophysical survey conducted by Gardline offshore, Titan nearshore and involving remote-controlled small unmanned survey vessels (USV) to acquire magnetometer, SSS, MBES and SBP data as required at proposed environmental and geotechnical sampling locations to confirm clearance of obstacles and UXOs.
- an environmental survey conducted by Gardline using imagery and grab sampling to provide benthic characterisation of habitats, species and any contaminants along the ECRs and Morgan and Mona ZOI. This includes the identification of any environmentally significant habitats.
- a shallow geotechnical survey conducted by Gardline along the proposed ECRs, to establish porewater pressure using a piezometer cone penetrometer test (PCPT) and sampling with a vibrocore.

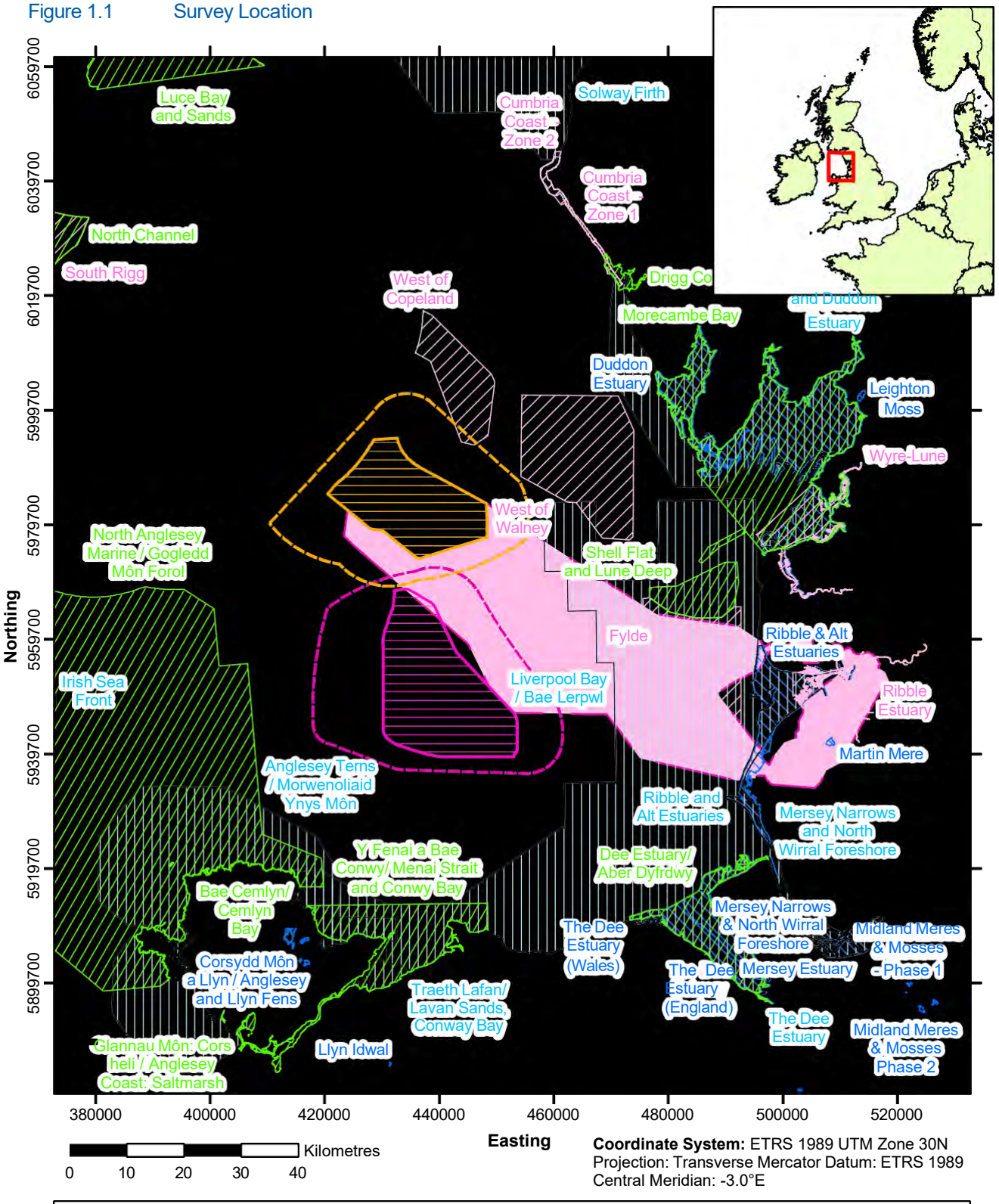
The information acquired will be used to refine the project location and help to inform selection of the final ECR for each potential array area. This survey will also supplement the 2021 survey and provide detailed survey of the ECRs.

The aim of this document is to detail the intended environmental survey plan for the benthic characterisation across both ZOI survey areas and proposed ECRs. It will look to detail the intended operations, sampling locations, sampling equipment, analysis and reporting. This document has been created in line with aspects of the monitoring guidance for marine benthic habitats which apply to initial habitat reconnaissance (Nobles-James *et al.*, 2018; Natural Resources Wales, 2021a).

In addition to this plan and as part of the project, an archaeological desk-based assessment (DBA) is being conducted by Coastal and Offshore Archaeological Research Services (COARS, issue pending) to identify potential heritage features and assign appropriate areas of exclusion through a written scope of investigation. These exclusion zones range from 50m to 100m depending upon the type of archaeological feature and will be avoided for any environmental sampling or geotechnical investigations. Further, the DBA outlines a protocol for archaeological discoveries that will be followed should any finds be encountered outside these exclusions. The results of this, as well as indications of potential archaeological features encountered in the geophysical data, once it is acquired, will be

used in any final station planning throughout the project to prevent impact to archaeological important features. In lieu of the latest DBA (COARS, issue pending), the findings of the previous DBA (COARS, 2021) have been considered in the current report.

Figure 1.1 Survey Location



1.2 Expected Sediments, Protected Species and Habitats

Following a review of the available EMODnet data (EMODnet Geology, 2021), broad scale expected sediments within the Morgan and Mona potential array and ZOI areas, and proposed ECR scoping areas are thought to comprise of coarse-grained sediments, sand, mixed sediment, and small areas of rock or other hard substrata. Inside the potential array areas, the main EUNIS classifications expected are deep circalittoral coarse sediment (A5.15) and deep circalittoral mixed sediment (A5.45) (EMODnet, 2019). Within the Morgan and Mona ZOIs there are areas identified as suitable for the EUNIS biotope complex A5.451 (Polychaete-rich deep *Venus* community in offshore mixed sediments). The previous survey conducted at the Morgan and Mona sites (Gardline, 2022b) found that EUNIS biotope A5.451 'Polychaete-rich deep Venus community in offshore mixed sediment' was dominant, although EUNIS biotope complexes A5.44 circalittoral mixed sediment and A5.14 circalittoral coarse sediment were also present, together with EUNIS biotopes A5.355 *Lagis koreni* (trumpet worm) and *Phaxas pellucidus* (transparent razor shell) in circalittoral sandy mud and an isolated occurrence of A5.445 *Ophiothrix fragilis* (common brittlestar) and/or *Ophiocomina nigra* (black brittlestar) brittlestar beds on sublittoral mixed sediment. In nearshore areas, which coincide with the proposed ECR scoping areas, the expected EUNIS classifications of sediment vary from those expected in the potential array areas. Sediments are expected to be finer with EUNIS classifications such as circalittoral mud (A5.37) and circalittoral fine sand (A5.25) (EMODnet, 2019), with some areas of rock closer to shore (A4.1), although data on sediment type within around 1km of the coastline is unavailable (EMODnet, 2019).

Available bathymetry data (EMODnet Bathymetry Consortium, 2020) indicated that water depths ranged from approximately 5m to 60m MSL including the ECR scoping areas. Generally, depths increase from north-east to south-west across the potential array areas and the seabed gradually shoals along each ECR scoping area. The previous survey within the potential array areas (Gardline, 2022b) recorded depths ranging from 27.5m to 50.0m and a general seabed slope of less than 1º. Both potential array areas were previously found to have occasional sand waves trending north-south, which could potentially extend into the ZOIs. The Morgan potential array area was characterised by a central channel that was orientated north-east to south-west and a shallower channel in the same orientation in the south-east of the potential array area. Based on available bathymetry data (EMODnet Bathymetry Consortium, 2020), this previously noted central channel extends and deepens into the north-east region of the Morgan ZOI, with water depths across the channel ranging from 30m to 55m. The Mona potential array area was previously found to exhibit broad shoal areas in the central south-east and south-east, separated by a shallow channel (Gardline, 2022b). Using broadscale bathymetry data (EMODnet Bathymetry Consortium, 2020) of the ZOIs, it is thought these channels extend outside of the potential array areas. This general seabed morphology is likely to exhibit a range of habitats given the variation in entrainment of current flow and relative relief. Until further information from the geophysical acquisition is completed, this has been used as the basis for initial station selection.

Modelled metocean data provided by bp for a previous report (Gardline, 2021) indicated that the predominant current direction in the Mona potential array area is on an east to west axis. In addition to this direction, the Morgan potential array area also shows current flow on a north-east to south-west axis, which may influence the distribution of sediments.

In terms of notable species and habitats expected to occur within the Morgan and Mona potential array areas, five species which also contribute to the formation of protected habitats were identified from data within the OBIS register (OBIS, 2021) and Gardline internal datasets; *Arctica islandica* (ocean quahog), *Ammodytes tobianus* (lesser sand eel), *Hyperoplus lanceolatus* (greater sand eel),

Sabellaria spinulosa (ross worm) and *Modiolus modiolus* (horse mussel, see Sections 1.4 and 1.5). There were no sedentary species that are listed on the IUCN (2022) red list recorded within the survey and scoping areas (OBIS, 2019).

Further, commercially important species in terms of sand eel (Ammodytidae) and herring (*Clupea harengus*) are noted to have high intensity spawning or nursery grounds across the potential array areas and ZOIs (Cefas, 2010). As such, the survey area's suitability for spawning will be directly quantified by sediment sampling for determining particle size suitability and visual inspection for these particular species (see Sections 1.3.2, 1.4.5 and 1.4.6). Further, spawning potential (Cefas, 2010) is also noted of broadcast spawners (Atlantic cod (*Gadus morhua*, Low/High), whiting (*Merlangius merlangus*, Low), common ling (*Molva molva*, Low), European plaice (*Pleuronectes platessa*, Low/High), Atlantic mackerel (*Scomber scombrus*, Low), common sole (*Solea solea*, Low/High) and Atlantic horse mackerel (*Trachurus trachurus*, Low)). In addition, nursery grounds are also predicted for these species along with Anglerfish (*Lophius piscatorius*) and several elasmobranchs (school shark (*Galeorhinus galeus*), thornback ray (*Raja clavata*), spotted ray (*Raja montagui*) and spiny dogfish (*Squalus acanthias*)). Analysis of images from the previous survey identified elasmobranch eggs present (Gardline, 2022b). Where these species or their eggs are identified they will be recorded, though the quality/suitability of spawning potential will not be assessed as they are not actively targeted by this survey's investigation methods.

Relative to the 2021 survey area (Gardline, 2022b), the larger current proposed survey area now overlaps a Marine Conservation Zone (MCZ) in the north-east corner of the Morgan ZOI. This MCZ, West of Copeland, was designated in May 2019 under the Marine and Coastal Access Act (2009) and contains three protected habitats: Subtidal coarse sediment, subtidal sand, and subtidal mixed sediments (Defra, 2019). Since West of Copeland MCZ is newly designated, conservation and management advice are not currently available (JNCC, 2021b), although the management approach from the MCZ post-consultation advice document suggested to maintain the current favourable condition (JNCC, 2018). As an indication of the likely advice, the nearby South Rigg MCZ, which was also designated in 2019 and contains the same qualifying features as the West of Copeland MCZ, has an 'Advice on Operations' document highlighting activities to which the protected habitats are evaluated to be sensitive (JNCC, 2021a). These include disturbance to the substrate on the surface of the seabed, physical sampling (removal of substratum), and smothering and siltation rate changes. Similarly, the Fylde MCZ occurs to the east of the Mona potential array area and therefore there is a potential overlap with the ECR scoping area, when fully defined. The Fylde MCZ is designated to maintain in favourable condition subtidal sand and subtidal mud, and although there is no current advice on activity within the region, Natural England has confirmed that this survey will not have a significant impact.

Threatened and/or declining habitats (OSPAR, 2008) were reviewed using EMODnet (2020) and only one small area within the Morgan ZOI encroached on an area of recognised seapen and burrowing megafauna communities habitat, which is classified as a threatened and/or declining habitat (OSPAR, 2008), and there is potential for overlap with the ECR scoping area, when fully defined. Despite this classification, the habitat is widespread throughout the central North Sea, around the south and west coasts of Norway and around the north of the British Isles (OSPAR, 2010).

The Bodelwyddan ECR scoping area overlaps with areas of intertidal blue mussel (*Mytilus edulis*) beds, which are also classified as a threatened and/or declining habitat (OSPAR, 2008). This bivalve can form dense beds in water depths up to 10m (Holt *et al.*, 1998) and occurs principally on mixed substrata; mainly cobbles and pebbles on muddy sediments (OSPAR, 2015). There are currently no definitive guidelines on what differentiates a *M. edulis* reef from a bed or a small clump of individuals,

however, the Hendrick and Foster Smith (2006) *S. spinulosa* reef scoring system can be applied to the survey data in an attempt to determine the 'reefiness' of any areas of *M. edulis* aggregations identified within the survey area.

The Bodelwyddan ECR scoping area cross habitat identified as intertidal mudflats, which are also classified as a threatened and/or declining habitat (OSPAR, 2008). This habitat is defined as intertidal mud forming mudflats, typically in calm coastal environments with fine sediment (OSPAR, 2009a). Mudflats are often bound by saltmarshes in the upper regions and the Chart Datum is often used as the lower limit (OSPAR, 2009a). The regions are important for the functioning of estuarine systems and are highly productive; however, it is under threat and/or declining in four OSPAR regions, including region III where this survey is located (OSPAR, 2009a).

Where the ECR scoping areas near the shore, all of them coincide with at least one protected area including Special Areas of Conservation (SACs), MCZs, Special Protection Areas (SPAs) and Ramsar sites.

1.3 Environmental Survey Strategy

1.3.1 Survey Plan

Geophysical data (MBES, SSS and magnetometer) will be collected to confirm the stations are clear of UXOs, specifically for equipment that will contact the seabed. A dual frequency SSS will be used to collect data that will enhance UXO detection and environmental seabed station selection. The magnetometer will be used to acquire data needed at sample locations. If appropriate, the magnetometer data may be acquired in combination with the SSS on specific lines.

The intention is to target at total of approximately 50 stations for co-located camera and sediment sampling across both the Morgan and Mona potential array areas and ZOIs to adequately characterise the benthic community and identify any potentially sensitive features. An additional camera-only target has been selected in the Mona potential array area to revisit an area previously exhibiting a low resemblance to stony reef (Gardline, 2022b). Within the ECR scoping areas, approximately 160-240 stations will be sampled, assuming routes of *c.*80km in length and sampling at 1-2km intervals. Given the phased approach to data acquisition and the operational survey window, detailed geophysical data will be reviewed during the field acquisition to determine the final sampling station locations and to determine sampling intensity. For example, where the geophysical data indicate homogenous seabed sediment over an extensive area, sampling intensity may be reduced (*e.g.,* sampling at *c.*2km interval), while in areas of heterogeneous seabed, greater sampling intensity may be required.

Consequently, based on available datasets, this plan has initially defined a series of provisional targets for approval (25 within the potential array areas, 25 within the ZOIs), along with details of how these will be adjusted. The spread of targets has been selected with consideration of the background data on the likely sediments, predicted habitats and previous survey locations that can be used for assessing trends. Bathymetry data (GEBCO Compilation Group, 2021) have been used to provide a further justification for the initial target selection due to the general observable features (*e.g.,* channels). Client supplied positions from the Inspire database (wrecks), the KIS-ORCA database (wind turbines and cables) and OGA database (wells and pipelines) were used alongside known archaeological exclusion zones (COARS, 2021) to ensure targets are away from existing or relic infrastructure (OGA, 2021; 200-250m exclusion zone as appropriate) as well as archaeological features (50-100m exclusion zones depending on the feature). Stations selected for chemical samples have been carefully chosen to target a range of sediment types, depths, and current influences.

Particular attention has been paid to areas where chemicals may accumulate, such as the bottom of channels, as well as proximity to protected sites and habitats. Although these stations have been chosen to maximise coverage and aid the interpretation of results, if the sediment type found during sampling does not provide a suitable sample for chemical analysis, field personnel may decide to move to a nearby location or microsite away from patches with unsuitable sediment. These provisional targets are detailed in Table 1.1 and Figure 1.2 for the Morgan area and in Table 1.2 Figure 1.3 for the Mona area. All positional information in this report is referenced to GRS 80 Ellipsoid, ETRS 89 Datum. All grid coordinates are projected using Universal Transverse Mercator (UTM) Projection, Grid Zone 30, Central Meridian (CM) 3° W.

This plan does not include proposed targets for sampling within the ECR scoping areas. Once more defined ECRs have been established, provisional targets will be proposed to sample along the ECRs with consideration of the background data on the likely sediments and predicted habitats. Samples are anticipated to be taken at intervals of approximately 1-2km and chemistry samples at intervals of approximately 5km (depending on the presence of suitable sediments). Final target selection will be dependent on appropriate substrate and is subject to modification in order to target every sediment type or particular features of interest.

Upon investigation of the newly acquired geophysical data, the provisional targets will be adjusted by experienced environmental scientists to target representative habitats and to provide coverage to assess the current condition of any potentially sensitive features evident. The sensitive features that will be interpreted from the geophysical data will include features associated with Annex I habitats (Directive 92/43/EEC, 1992), OSPAR threatened species or habitats (OSPAR, 2008) or UK priority species or habitats for England (Natural Environment and Rural Communities Act, 2006) and Wales (Environment (Wales) Act , 2016).

As such, targets will also be assessed from the geophysical data and adjusted to ensure no significant archaeological features are impacted or UXOs or entanglement risks targeted that would endanger sampling operations. Further, based upon the geophysical data, additional stations may be added to ensure coverage of all additional habitat types or sensitive features not already adequately sampled by the initial provisional grid of targets. Stations will also be prioritised based upon this geophysical acquisition to ensure adequate information is obtained to meet the data needs for the intended development and ensuring all habitats are sampled, for example with priority attention given to areas identified as potential Annex I reef habitats. The sample analysis for these additional stations would be reviewed subject to the reason for their addition, for example, they may be imagery only if the targeted habitat is already sampled adequately by other stations or would be detrimentally impacted by sampling.

Figure 1.2 Morgan Potential Array Area and ZOI Proposed Targets Overview

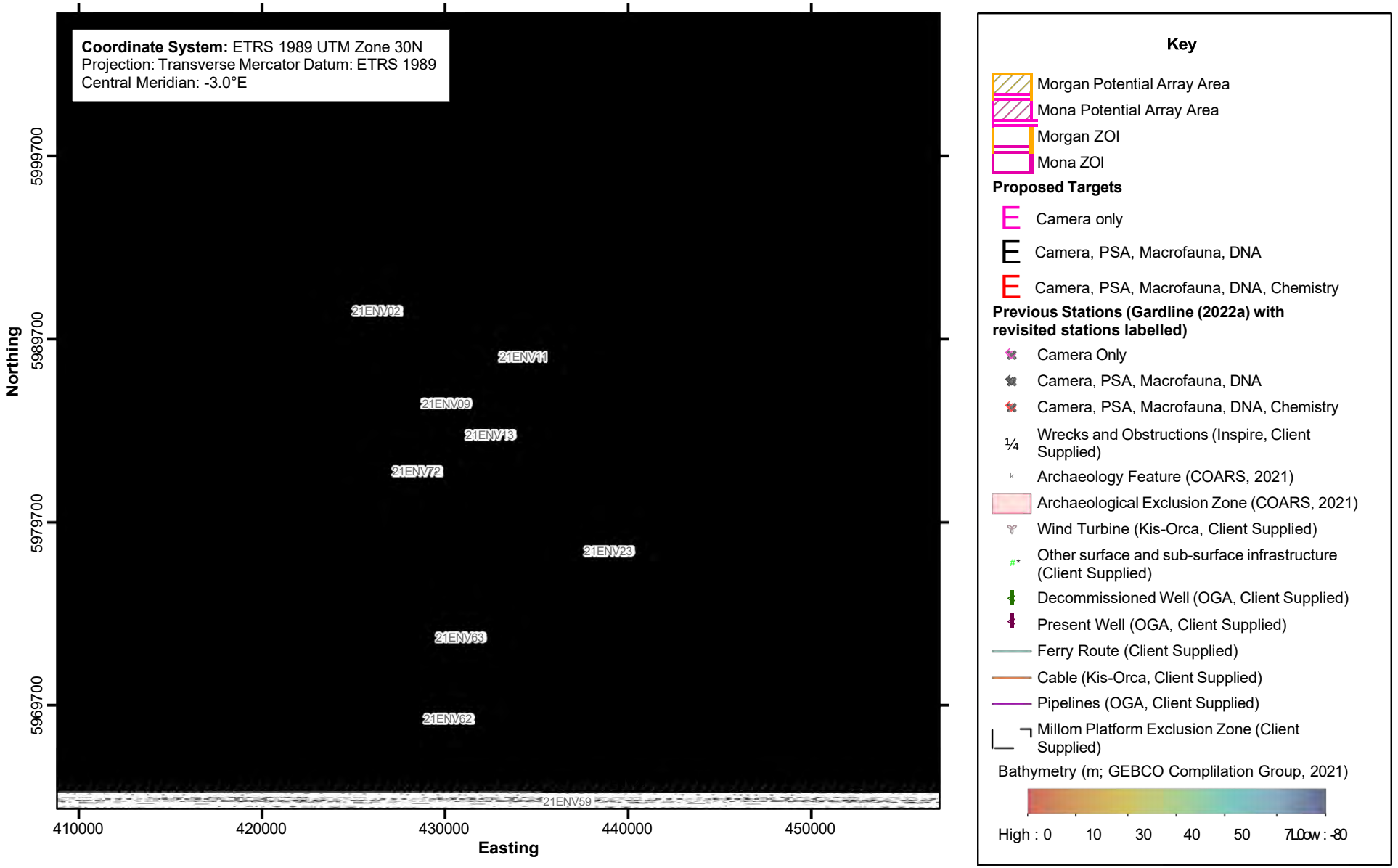


Table 1.1 Morgan Potential Array Area and ZOI Proposed Targets and Sampling Objectives

Full Station Name	Station	Easting	Northing	Broad Feature Targeted	Sample Acquisition	Area	Gardline (2022a) Station[2]
BP22MOR-ENV-GS-01	ENV1	436576	5988729	Start of central deeper channel	PSA, MF, DNA, CHEM	Array	21ENV11
BP22MOR-ENV-GS-02	ENV2	430786	5982482	End of central deeper channel	PSA, MF, DNA, CHEM	Array	21ENV72
BP22MOR-ENV-GS-03	ENV3	434800	5984480	Flank of central deeper channel	PSA, MF, DNA, CHEM	Array	21ENV13
BP22MOR-ENV-GS-04	ENV4	432396	5986200	Flank of central deeper channel (100m from archaeological feature)	PSA, MF, DNA	Array	21ENV09
BP22MOR-ENV-GS-05	ENV5	435141	5977322	Edge of mixed sediment substrate	PSA, MF, DNA	Array	-
BP22MOR-ENV-GS-06	ENV6	431274	5992764	Sand substrate and Northern Shallow Region	PSA, MF, DNA, CHEM	Array	-
BP22MOR-ENV-GS-07	ENV7	426470	5985608	Coarse-grained substrate	PSA, MF, DNA	Array	-
BP22MOR-ENV-GS-08	ENV8	441260	5978234	Mud to muddy sand substrate and spawning ground potential (moved north of previous station to 100m from archaeological feature)	PSA, MF, DNA, CHEM	Array	21ENV23
BP22MOR-ENV-GS-09	ENV9	444561	5980579	South-eastern deeper region	PSA, MF, DNA, CHEM	Array	-
BP22MOR-ENV-GS-10	ENV10	438070	5981684	Shallow region south of central deeper channel	PSA, MF, DNA	Array	-
BP22MOR-ENV-GS-11	ENV11	430574	5987585	Shallow region north of central deeper channel	PSA, MF, DNA	Array	-
BP22MOR-ENV-GS-12	ENV12	443985	5984432	Shallow region in the east of site (>200m from IOM/UK interconnector cable)	PSA, MF, DNA	Array	-
BP22MOR-ENV-GS-13	ENV13	428608	5991267	Edge of shallow region in the north and edge of substrate type[1]	PSA, MF, DNA	Array	21ENV02
BP22MOR-ENV-GS-14	ENV14	445414	5992872	Deepest region of ZOI and near MCZ (>300m from existing wind turbine)	PSA, MF, DNA, CHEM	ZOI	-
BP22MOR-ENV-GS-15	ENV15	453073	5987872	Edge of seapen and burrowing megafauna habitat	PSA, MF, DNA, CHEM	ZOI	-
BP22MOR-ENV-GS-16	ENV16	453192	5976521	Close to seapen and burrowing megafauna habitat in the south-east	PSA, MF, DNA, CHEM	ZOI	-
BP22MOR-ENV-GS-17	ENV17	433183	5973416	Mixed sediment substrate[1] (>200m of LANIS 1 cable)	PSA, MF, DNA, CHEM	ZOI	21ENV63
BP22MOR-ENV-GS-18	ENV18	418704	5984419	Coarse-grained substrate	PSA, MF, DNA	ZOI	-
BP22MOR-ENV-GS-19	ENV19	435333	5999183	Northern shallow region of ZOI and nursery area potential[1]	PSA, MF, DNA	ZOI	-
BP22MOR-ENV-GS-20	ENV20	443708	5993601	Northern flank of central deeper channel and near MCZ	PSA, MF, DNA, CHEM	ZOI	-
BP22MOR-ENV-GS-21	ENV21	416839	5978347	South-western deeper region	PSA, MF, DNA, CHEM	ZOI	-
BP22MOR-ENV-GS-22	ENV22	444501	5988189	Southern flank of central deeper channel	PSA, MF, DNA, CHEM	ZOI	-
BP22MOR-ENV-GS-23	ENV23	445035	5974393	Band of mud to muddy sand substrate[1]	PSA, MF, DNA, CHEM	ZOI	-
BP22MOR-ENV-GS-24	ENV24	427832	5995888	Intersection between coarse and sand substrate	PSA, MF, DNA	ZOI	-
BP22MOR-ENV-GS-25	ENV25	424459	5971520	Edge of ZOI at moderate depth	PSA, MF, DNA, CHEM	ZOI	-
BP22MOR-ENV-GS-26	ENV26	448470	5983030	Start of smaller deep channel in the east[1]	PSA, MF, DNA	ZOI	-

1 Target is <500m of Ferry Route.

2 For ease of comparison, the prefix 21 has been added to the stations sampled in 2021 by Gardline

Figure 1.3 Mona Potential Array Area and ZOI Proposed Targets Overview

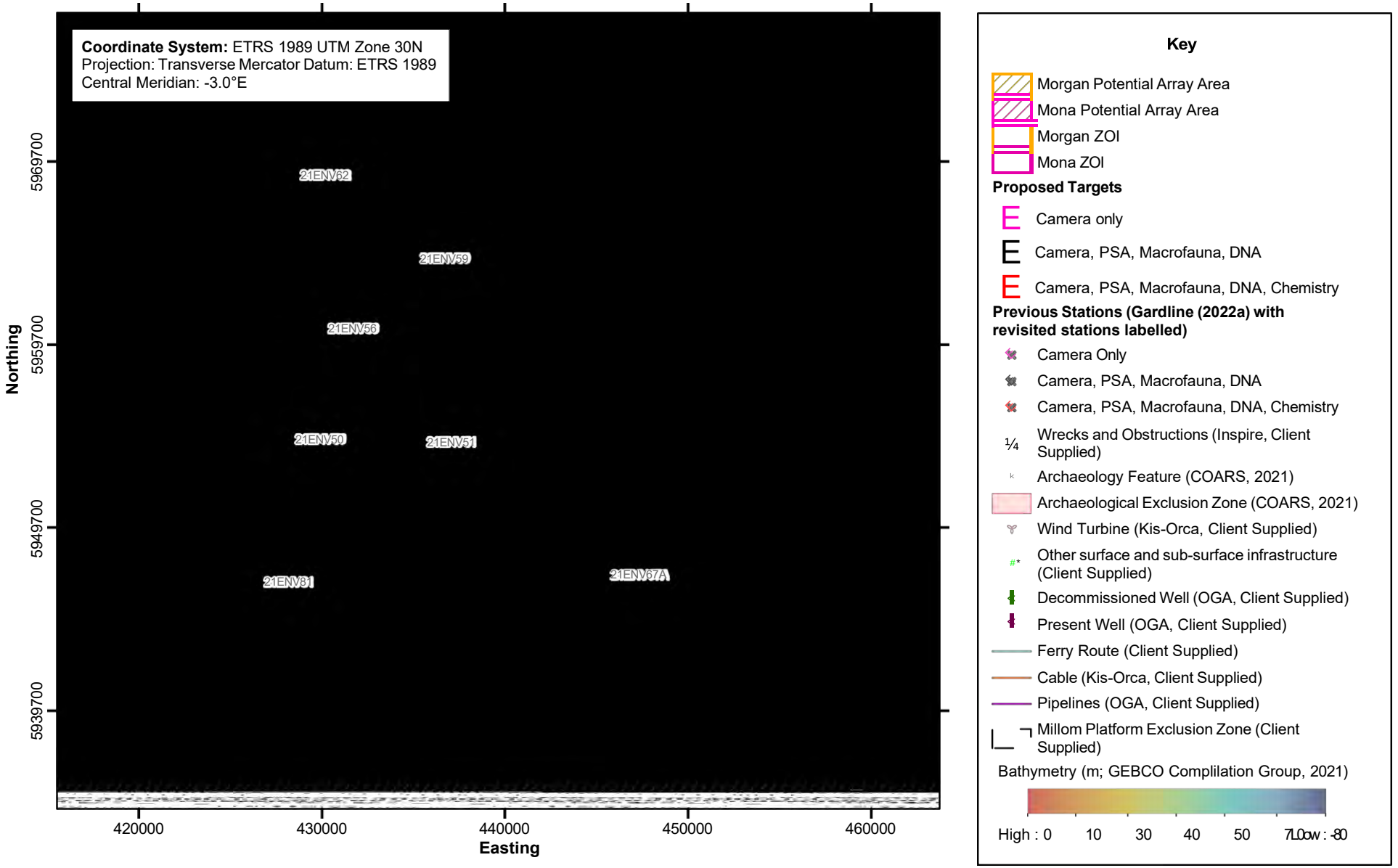


Table 1.2 Mona Potential Array Area and ZOI Proposed Targets and Sample Acquisition

Full Station Name	Station	Easting	Northing	Broad Feature Targeted	Sample Acquisition	Area	Gardline (2022a) Station[2]
BP22MON-ENV-GS-27	ENV27	449860	5947112	Slight deeper channel in south-east of site[1]	PSA, MF, DNA, CHEM	Array	21ENV67A
BP22MON-ENV-GS-28	ENV28	432215	5954552	Deeper western side of site	PSA, MF, DNA, CHEM	Array	21ENV50
BP22MON-ENV-GS-29	ENV29	439035	5964418	Shallower eastern side of site	PSA, MF, DNA, CHEM	Array	21ENV59
BP22MON-ENV-GS-30	ENV30	430332	5948303	Rocky substrate	PSA, MF, DNA	Array	-
BP22MON-ENV-GS-31	ENV31	434033	5960596	Coarse-grained substrate	PSA, MF, DNA	Array	21ENV56
BP22MON-ENV-GS-32	ENV32	439700	5957360	Mixed substrate (>200m from Hibernia Atlantic Seg.C cable)	PSA, MF, DNA	Array	-
BP22MON-ENV-GS-33	ENV33	442358	5948938	Spawning ground potential for species such as herring and cod (Cefas, 2010)	PSA, MF, DNA	Array	-
BP22MON-ENV-GS-34	ENV34	450851	5941080	Shallower region in south-east of site	PSA, MF, DNA	Array	-
BP22MON-ENV-GS-35	ENV35	439422	5954389	Shallower central region and intersection between mixed and coarse substrate	PSA, MF, DNA	Array	21ENV51
BP22MON-ENV-GS-36	ENV36	437680	5945297	Shallow region in south-west of site	PSA, MF, DNA, CHEM	Array	-
BP22MON-ENV-GS-37	ENV37	432952	5967194	Deeper north region of site	PSA, MF, DNA	Array	-
BP22MON-ENV-GS-38	ENV38	445360	5942759	Southern flank of deeper channel	PSA, MF, DNA, CHEM	Array	-
BP22MON-ENV-GS-39	ENV39	454383	5952550	Mud to muddy sand substrate[1]	PSA, MF, DNA, CHEM	ZOI	-
BP22MON-ENV-GS-40	ENV40	447940	5957440	Sand substrate (>200m of Havingsten 1.5 proposed cable route)	PSA, MF, DNA, CHEM	ZOI	-
BP22MON-ENV-GS-41	ENV41	420053	5962511	Rocky substrate and deeper western region[1]	PSA, MF, DNA	ZOI	-
BP22MON-ENV-GS-42	ENV42	454780	5945922	Shallower south-eastern region and intersection between four types of substrate[1] (>500m from Well 110/12b-5)	PSA, MF, DNA	ZOI	-
BP22MON-ENV-GS-43	ENV43	432516	5968981	Shallower northern region of Mona ZOI (also falls with Morgan ZOI)	PSA, MF, DNA, CHEM	ZOIs	21ENV62
BP22MON-ENV-GS-44	ENV44	423109	5951875	Mixed substrate	PSA, MF, DNA	ZOI	-
BP22MON-ENV-GS-45	ENV45	427673	5959733	Coarse-grained substrate[1]	PSA, MF, DNA, CHEM	ZOI	-
BP22MON-ENV-GS-46	ENV46	457320	5940881	Shallower ridge in south-east corner of ZOI (>500m from Well 110/12a-1)	PSA, MF, DNA, CHEM	ZOI	-
BP22MON-ENV-GS-47	ENV47	445017	5961797	Shallower ridge in east of ZOI	PSA, MF, DNA	ZOI	-
BP22MON-ENV-GS-48	ENV48	425610	5966083	Region of varying depth in north-west corner of ZOI	PSA, MF, DNA	ZOI	-
BP22MON-ENV-GS-49	ENV49	424578	5941874	Mixed substrate, spawning ground potential for species such as cod and whiting (Cefas, 2010) and in shallower region of south-west	PSA, MF, DNA, CHEM	ZOI	-
BP22MON-ENV-GS-50	ENV50	452597	5949533	Slight deeper channel in south-east of site	PSA, MF, DNA	ZOI	-
BP22MON-ENV-DC-51	ENV51	430533	5946737	Revisit area of low resemblance to stony reef	Camera only	Array	21ENV81

2 Target is <500m of Ferry Route.

2 For ease of comparison, the prefix 21 has been added to the Stations sampled in 2021 by Gardline

Camera investigation will comprise, as a minimum, 200m of transect in a cruciform over the intended target 0.5-1m above the seabed but will be extended to map the condition/possible extent of any encountered habitats. Should a sensitive feature such as biogenic reef be observed, then sampling will be relocated to a suitable nearby location to avoid damage of the sensitive feature and camera investigations expanded to capture the quality and extent of the feature. The expanded camera transects may be conducted as systematic additional parallel transects either side of the original where necessary for the specific sensitive feature quality assessment *i.e.,* where ross worm *(S. spinulosa*) or other biogenic reef is observed and the patchiness requires determination to establish reef resemblance (see parameters in Section 1.4.1).

The camera investigations will be broadly in line with the Epibiota monitoring operational and interpretation guidelines (Hitchin *et al.*, 2015; Turner *et al.*, 2016). Multiple photographs will be taken along each of the 200m transects using a hover and drift technique at approximately 0.5-1m above the seabed. This technique allows the frame to move progressively along the seabed as the vessel traverses the work area on its thrusters or drifts. The images should be captured remotely using a surface control unit and stored on the camera's internal memory card. Video will be actively reviewed by the environmental scientist with additional photographs of notable features acquired beyond this minimum to aid later feature assessment. Video footage will be captured throughout the transect and should be overlaid with time, position and depth, and recorded directly onto suitable media for subsequent analysis. Images will be scaled using two line-lasers fixed at a known distance (*i.e.,* 10cm) and be of sufficient quality to allow quantitative analysis.

Camera transects will be extended until a minimum of 10 quantifiable images are acquired over the targeted habitat. If the camera investigations are severely impacted by suspended sediments at a specific target (*i.e.,* after 5 mins of continuous poor visibility and/or >5 poor quality stills in a row), the investigations will be relocated to a different part of the same targeted feature of interest or a similar feature where possible.

1.3.2 Sediment Sampling Techniques and Analysis

In order to maintain consistency with previous surveys, the sampling methods will remain the same.

Due to the expectation of mixed sediments and the possible presence of ocean quahog (*A. islandica*), it is recommended that the 0.1m^2 Hamon grab is utilised for sample collection due to the ability to acquire deeper sediment penetration. The 0.1m^2 Hamon grab would allow for the sampling of *A. islandica* and greater sampling success rate in areas of mixed sediments over other grabs such as the Day grab. Furthermore, previous sampling surveys undertaken in the Morgan potential array area by Cefas (2007) in June 2007 utilised the 0.1m^2 Hamon grab and therefore would allow for more accurate comparisons to previous existing data.

In order to assess the survey areas for their potential as spawning areas and the associated habitat sensitivities, it is recommended that samples are acquired for particle size analysis (PSA) and analysed in accordance with NMBAQC methods (Mason, 2016). Additionally, the PSA results would be detailed further (*i.e.,* particle size distribution percentiles d10, d50, d90 etc.,) to allow its use, where required, in terms of ground truth for cabling and/or trenching activities associated with the development of the Morgan and Mona OWFs.

Acquisition of samples across the survey areas for physico-chemical analysis are advised in order to provide a baseline prior to site development. It is recommended that physico-chemical samples are analysed in accordance with Marine Management Organisation (MMO; Marine Management Organisation, 2020) specifications in addition to more detailed analysis of hydrocarbons via gas

chromatography to indicate potential source and degree of weathering. The parameters and methods to be followed are specified in Table 1.3 along with the appropriate limits of detection.

Table 1.3 Physico-Chemical Analysis Specifications

Analytes	Method	Limit of Detection
Organic Matter	Total Organic Carbon (TOC)	0.02%
Hydrocarbons, etc.	Total Hydrocarbons (THC) by IR	1000µg/kg
	Total Oil and Saturates by GC (FID for total, MS of FID for Saturates)	1µg/kg
	Polycyclic Aromatic Hydrocarbons (PAHs)	10µg/kg
Trace Metals	Metals – As, Cd, Cr, Cu, Hg, Ni, Pb, Zn (Dilute Nitric Acid or Aqua Regia via ICP-MS)	As (2), Cd (0.04), Cr (4), Cu (4), Hg (0.015), Ni (2), Pb (5), Zn (13) mg/kg
Polychlorinated biphenyls (PCBs)	25 Congeners Including ICES 7 Congeners (Solvent Extraction and GC Triple Quad)	0.08µg/kg
Organotins	Dibutylin and Tributyltin (Acid Digest and Solvent Extraction GC-MS)	1µg/kg
Organochlorine pesticides (OCPs)	Solvent Extraction and GC Triple Quad	0.1µg/kg

The objective of physico-chemical analysis is to provide a reconnaissance of general levels of contamination across the survey areas. The initial target stations have been selected to sample across the prevailing current directions with a rough cruciform across the Morgan and Mona potential array areas and broad coverage of the ZOIs. All known wells within the potential array areas have been decommissioned, whilst within the ZOI there are three present wells: two within the north-east region of the Morgan ZOI and one in the south-east region of the Mona ZOI (OGA, 2021). Further contamination sub-samples may be acquired where the onboard environmental scientist observes potential contamination (*i.e.,* hypoxic sediments, chemical sheens or aberrant textures/scents) during the intended PSA sample acquisition.

Furthermore, the collection of macrofauna samples will assist in determining the benthic community present across the survey areas and provide additional information on the density of protected species if present. The Cefas (2007) survey sieved the macrofaunal samples over a 1mm mesh sieve prior to analysis in the laboratory. In order to produce comparable results to those reported by Cefas and the previous Gardline (2022b) survey, it is recommended that the current survey sampling efforts also utilise the 0.1m^2 Hamon grab with the macrofaunal samples sieved over both a 0.5mm and 1mm mesh sieves to allow comparison to wider survey datasets. The intention is to acquire two samples per station with one for analysis and one retained as a spare. Following identification, the wet weight biomass of each individual taxa will be determined (where required). As per the previous survey (Gardline, 2022a), biomass will be recorded in grams to four decimal places.

In addition to traditional macrofaunal analysis conducted to NMBAQC processing guidelines (Worsfold & Hall, 2010), Gardline proposes the use of DNA metabarcoding techniques to determine accurately the species composition of the benthic macrofaunal community present across the survey areas. The benefit of utilising DNA metabarcoding techniques is that they are able to target species of interest as well as whole community assemblages therefore providing a tailored approach to the analysis. Furthermore, DNA metabarcoding techniques can identify through operational taxonomic unit (OUT) reads data to species level accuracy, which traditional taxonomy would not be able to determine due to visual identification limitations. As the volume of material required for DNA metabarcoding is small compared to the whole grab sample requirements for traditional taxonomy,

samples can be acquired from the same grab as the PSA and chemistry samples. This will allow further targeted sampling if more evidence is needed with more targeted monitoring compared to full sampling suite analysis in the future. Appropriate sterilisation of the 0.1m^2 Hamon grab in addition to the containers and sub-sampling equipment will be used to ensure no contamination of the DNA samples occurs during collection and processing. The procedures that will be established and followed are in line with advice provided by Naturemetrics to the UK Marine DNA Working Group with Naturemetrics undertaking the sample analysis. Full sequences will be reported alongside the results to enable species identity to be updated as reference libraries continue to improve in the future. However, the use of OTUs will allow community assessment at species level for the purpose of monitoring potential impacts and rates of recovery for the bacterial, microfauna and meiofaunal communities. Though DNA samples will be obtained from all stations, the number analysed may be a sub-set, however, this will reflect each habitat encountered with appropriate replication. The stations that will be selected for analysis will be optimised in line with updated development plans that reflect the outcomes of the geophysical data in terms of development suitability and any geohazards.

As previously mentioned, during the acquisition of grab samples, it is advised that sampling is not attempted in areas of biogenic reef (e.g., made by ross worm (*S. spinulosa*) or horse mussel (*M. modiolus*)) due to the damage to the sensitive habitat and increased potential of damage to the grab equipment. In such instances it is recommended that the grab target and subsequent sampling is relocated to an adjacent area of seabed that is clear of biogenic reef structures. Where camera operations are limited due to increased suspended material within the water column, a contingency sampling pattern incorporating a central target surrounded by cardinal targets at a suitable distance (relative to feature targeted) is advised in order to assess the extent and quality of the biogenic reef feature.

Where individuals of ocean quahog (*A. islandica*) are identified in the acquired grab samples, it is recommended that measurements and photographs of live and complete individuals are recorded and the specimens released back to the seabed. From the measurements it is possible to denote whether the individual is a juvenile or adult as in general, age size classes are conventionally considered to be as follows: spat (<10mm), juveniles (10-50mm) and adults (>50mm; Witbaard & Bergman, 2003).

1.3.3 Sample Volume Limitations

Under the regulations stipulated by the MMO (Marine Management Organisation, 2019) a maximum volume of 1m^3 of sediment extraction is permitted per station without the need for a marine licence. The total sediment extraction volume across all samples should not exceed 4m^3 in Welsh coastal areas and should not exceed 50 samples within any one hectare as per the guidelines stipulated by Natural Resources Wales (NRW; Natural Resources Wales, 2021b). It is not envisaged that the maximum sample volumes stipulated by the MMO or NRW (Marine Management Organisation, 2019; Natural Resources Wales, 2021b) would be exceeded during the planned sampling efforts across the survey areas.

A maximum of three Hamon grab samples per station will be acquired.

- One will be sub-sampled to obtain samples for PSA and for metabarcoding of bacterial and infaunal communities. Where chemical contaminant sampling is required at a station it will also be sub-sampled for chemical analyses.
- Two samples will be acquired for macrofaunal processing, with one analysed and the other kept as a spare.

A 0.1m^2 Hamon grab is reported to obtain between 10-12l of sediment per sample. Consequently, each station where full sampling is undertaken is projected to acquire 0.036m^3. Currently, there are approximately 50 stations planned within Welsh territorial waters, representing a total volume of 1.8m^3 without any additional stations for additional features being targeted. Outside of Welsh waters, 50 stations will be sampled within the Morgan and Mona survey areas and ZOIs with an additional 160-240 potential stations within the ECR scoping areas, totalling a maximum of 290 stations. Overall this gives a potential total of 340 stations, which is within the total allowing for contingency applied for in the Crown Estate Seabed Survey Licence. The use of a 0.1m^2 Hamon grab is likely to have minimal partial sample recoveries so extracted sediment volumes are not likely to significantly vary from these estimates.

1.4 Habitat Data Analysis

1.4.1 Biogenic Reefs - *Sabellaria spinulosa*

The distinction between what is or is not a *Sabellaria* sp. 'reef' is imprecise. To try to make the process of 'reef definition' more transparent and reproducible, Hendrick and Foster-Smith (2006) produced a scoring system based on a series of physical, biological and temporal characteristics of reef features:

- physical characteristics: elevation, sediment consolidation, spatial extent, patchiness
- biological characteristics: *S. spinulosa* density, biodiversity, biotope and community structure
- temporal characteristics: longevity and stability

Upon acquisition of seabed imagery, and should *S. spinulosa* be identified, the Hendrick and Foster-Smith (2006) scoring system will be applied in an attempt to define the 'reefiness' of the areas or colonies identified within the surveyed area. The scoring criteria used are:

- spatial Extent – Area (from the geophysical data) of interpreted extent of colonies
- patchiness – Percentage cover (from video/stills footage)
- elevation – Average height of tubes within colony(ies) (from video/stills footage) as well as elevation of overall reef-like features relative to surrounding seabed (from MBES data)

Other scoring criteria; *e.g.*, consolidation, biodiversity and longevity scores, may not be applicable as they are reliant upon time series of data, sampling observations and detailed benthic community data being available. Whilst mainly subjective, the results can allow a basic understanding of the *Sabellaria* sp. colony composition of each area to be made and a measure of its 'reefiness' to be arrived at.

The 'reefiness' scale has been based largely on results of an inter-agency workshop run by JNCC to help define and manage *S. spinulosa* reefs and reported in Gubbay (2007). During the workshop participants were asked, based on their experience, to indicate what they believed would be suitable cut off points for grading an area on a scale of low-medium-high for 'reefiness'. The best, but not unanimous, agreement which could be reached on the day is given in Table 1.4. It should be emphasized that the figures presented are considered as a starting point for wider discussion rather than accepted and fully agreed thresholds for *S. spinulosa* reef identification.

Table 1.4 Range of figures which could be used together as a measure of 'reefiness'

Measure of 'reefiness'	Not a Reef	Low	Medium	High
Elevation (cm) (average tube height)	<2	2-5	5-10	>10
Area (m^2)	<25	25-10,000	10,000-1,000,000	>1,000,000
Patchiness (% cover)	<10%	10-20%	20-30%	>30%

Where adequate seabed imagery is acquired, each photograph and frame grabs, taken at intervals from the video between photos, will be reviewed for *Sabellaria* sp. at all acquired stations. This review will determine the presence, percentage cover and approximate elevation of *Sabellaria* sp. tubes. In the aim of assessing the 'reefiness' of *Sabellaria* sp. when present, a scoring system will be created as detailed in Table 1.5 and applied to each image. This score aids where angle of incidence of specific images may make exact measurement of reef height difficult though will use observer expert judgement to approximate in these cases.

Table 1.5 *Sabellaria* Scoring System used in Image Analysis

Resemblance	Score	Criteria
No Resemblance to Reef	1	Possible scattered *Sabellaria* sp. tubes with no height
	2	Single scattered tubes of *Sabellaria* sp. present, no elevation from the seabed
Low Resemblance	3	Aggregations of *Sabellaria* sp. tubes, minimal elevation from the seabed
Medium Resemblance	4	Aggregations of *Sabellaria* sp. tubes partially elevated from the seabed
High Resemblance	5	Aggregations of *Sabellaria* sp. tubes notably elevated from the seabed

The relative proportion of these images (photographs and frame grabs) along with segmentation of the camera track into 5m intervals will be used to then determine the relative reef structure scoring in line with Jenkins, *et al.* (2018) as per Table 1.6. In addition, the patchiness coefficient for the overall transect, defined in Jenkins, *et al.* (2018), will be calculated and presented for monitoring where required.

Table 1.6 *Sabellaria* Reef Structure Matrix Assessment

Reef Structure Matrix % Segment Cover	Elevation (cm)			
	<2	2 to 5	>5 to 10	>10
	Scores			
	≤2	3	4	5
<10	No Resemblance	No Resemblance	No Resemblance	No Resemblance
10 to 20	No Resemblance	Low Resemblance	Low Resemblance	Low Resemblance
>20 to 30	No Resemblance	Low Resemblance	Medium Resemblance	Medium Resemblance
>30%	No Resemblance	Low Resemblance	Medium Resemblance	High Resemblance

1.4.2 Biogenic Reefs – *Modiolus modiolus* (Horse Mussel)

For mussel beds Gardline will use assessment criteria established from an inter-agency workshop relating to *M. modiolus* reef (Morris, 2015). Firstly, Morris (2015) identified three primary (Stage 1) factors, all of which must be met before assessing the confidence for Annex I designation (Stage 2, see Table 1.7);

- Live adult *M. modiolus* individuals are present;
- The biota/communities are distinct from the surrounding habitat; and,

- The distinct region containing *M. modiolus* is greater than 25m^2 in extent.

According to Morris (2015), *M. modiolus* is the foundation species in biogenic reefs that are characterised by clumped mussels and shell covering more than 30% of the substrate, which may be infaunal or embedded reefs, semi-infaunal (with densities of greater than five live individuals per m^2) or form epifaunal mounds (standing clear of the substrate with more than 10 live individuals per clump), all of which support communities with high species richness (or diversity) compared to sediments of the surrounding area.

Table 1.7 Brief Guidance for Positive Identification of Annex I biogenic *M. modiolus* reef habitat

Location	Open Coast			Sheltered/Semi-enclosed		
Likelihood of Annex I reef habitat	Unlikely	Likely		Unlikely	Likely	
Confidence in being reef habitat	Uncertain	Medium	High	Uncertain	Medium	High
Score	1	2	3	1	2	3
Percent cover of suspected biogenic reef (over an area of 25m^2)	<30%	30% to 70%	70% to 100%	<5% (as clumps)	5% to 40%	>40%
No. of individuals	<5 per m^2	5 to 9 per m^2	>9 per m^2	>3 per clump	>10 per clump	>10 per clump
Distinct acoustic signature	No	Yes	Yes	No	Yes	Yes
Elevation	No	Low (some protrusion)	High (distinct wave form/noticeably elevated)	Elevated (usually from mud)	Elevated (usually from mud)	Elevated (usually from mud)

Based on Morris (2015).
At least two 'likely' categories must be met to be considered Annex I biogenic reef or the total score for the location should add up to 6 in order to be potential Annex I biogenic reef, which would require further evidence/work.

1.4.3 Stony Reef

A multi-criteria scoring system (Table 1.8), will be used to assess the characteristics of any potential stony or bedrock reefs. Each characteristic will be scored as low, medium or high; with spatial extent (m^2), substratum composition (% cover) and elevation (m) as the primary characteristics, as defined by Irving (2009). Although Irving's (2009) criteria are widely applied within the industry, further refinement of the criteria for defining areas with a low resemblance to stony reef have been published (Golding *et al.*, 2020) and these will be taken into consideration in the analysis.

Table 1.8 Stony Reef Criteria

Characteristic	Resemblance to 'Stony Reef'			
	NOT a 'Stony Reef'	Low	Medium	High
Composition	<10% cobbles/boulders	10 - <40% cobbles/boulders	40 - <95% cobbles/boulders	≥95% cobbles/boulders
		Matrix supported: dominated by sediment	Clast supported: dominated by cobbles/boulders	Clast supported: dominated by cobbles/boulders
Elevation	Flat seabed	<0.064m	0.064 - <5m	≥5m
Extent	≤25m^2	>25m^2	>25m^2	>25m^2
Biota	Dominated by infaunal species			>80% of species present composed of epifaunal species

Stony reef assessment criteria adapted from Irving (2009)

1.4.4 Sea Pen and Burrowing Megafauna Communities

Clarifications on the identification of OSPAR description of the habitat were summarised in a report by the JNCC (2014b) to improve the definition and correct identification of this habitat. These clarifications suggest that burrowed areas of mud should be deemed to be a 'sea pen and burrowing megafauna communities' habitat regardless of the presence of sea pens, if multiple sightings of burrows and/or mounds attributable to the relevant species are observed. Furthermore, although the habitat occurs predominantly in fine mud sediments, examples of the habitat have been identified in areas of sandy muds where there is clear evidence of the relevant biological assemblages (burrowing megafauna and in some examples, sea pens). Consequently, habitats can be classed as 'sea pen and burrowing megafauna communities' regardless of the grain size composition of the sediment (JNCC, 2014b). The report (JNCC, 2014b) also recommends that the definition should extend further than the habitat classification biotope 'sea-pens and burrowing megafauna in circalittoral fine mud' (Connor *et al.*, 2004) since additional biotopes are also considered to be associated with the habitat.

The clarifications (JNCC, 2014b) advocate utilising seabed video imagery and/or photographs to confirm the presence of burrows and/or mounds and sea pens, where present. Whilst from seabed grab samples, identification would confirm associated fauna and particle size analysis (PSA) data a fine mud/sandy mud habitat. The density classifications as laid out by the Marine Nature Conservation Review (MNCR) SACFOR scale (JNCC, 2013) were used to quantify these defining features (see Table 1.9). The JNCC (2014b) clarification report specifies that multiple sightings of burrows and/or mounds attributable to relevant species together with sea pens, if present, should be classified as at least 'frequent' for their size on the SACFOR scale in order to be considered a 'sea pen and burrowing megafauna communities' habitat. However, it acknowledges the inherent difficulties of identifying species from burrow type alone using ever evolving guides, such as those cited by the ICES (2011) guide. Subsequently, the overall density of burrows themselves will be assessed instead, in order to consider whether their density was a 'prominent' feature of the sediment surface and potentially indicative of a sub-surface complex gallery burrow system. JNCC have previously regarded all stations recording a mean burrow density ≥0.2 m^{-2} as demonstrating the presence of 'sea pen and burrowing megafauna communities' habitat (JNCC, 2014).

Table 1.9 SACFOR Abundance Scale

Density	Size of Individuals			
	<1cm	1-3cm	3-15cm	>15cm
≥10000 m^{-2}	S	S	S	S
≥1000 m^{-2} to <10000 m^{-2}	A	S	S	S
≥100 m^{-2} to <1000 m^{-2}	C	A	S	S
≥10 m^{-2} to <100 m^{-2}	F	C	A	S
≥1 m^{-2} to <10 m^{-2}	O	F	C	A
≥0.1 m^{-2} to <1 m^{-2}	R	O	F	C
≥0.01 m^{-2} to <0.1 m^{-2}	R	R	O	F
≥0.001 m^{-2} to <0.01 m^{-2}	R	R	R	O
<0.001 m^{-2}	R	R	R	R

S= Superabundant, A = Abundant, C = Common, F = Frequent, O = Occasional and R = Rare. Table amended from: JNCC (2013).
For sedentary species attached to the substratum, percentage cover should be used in preference to the density scale whenever possible.

1.4.5 Herring Spawning

Determination of spawning potential for a specific area of seabed is based on guidelines provided by Cefas (2001) and Reach *et al.* (2013 in; MarineSpace Ltd; ABPmer Ltd; ERM Ltd; Fugro EMU Ltd; Marine Ecological Surveys Ltd, 2013), summarised in Table 1.10, and a variety of measures and inferred sedimentological and hydrodynamic characteristics.

In order to be classified as 'Prime' or 'Sub-Prime' under the habitat sediment preference criteria for herring spawning (Reach *et al.*, 2013 in; MarineSpace Ltd; ABPmer Ltd; ERM Ltd; Fugro EMU Ltd; Marine Ecological Surveys Ltd, 2013), the sediment must be composed of >50% or >25% gravel (>2mm), respectively, with little (<5%) mud (<63µm, silt and clay). In general terms, the area must fall into one of three sediment types based on the modified Folk (1954) classification: gravel, sandy gravel or gravelly sand, in order to be considered suitable. As acknowledged by Reach *et al.* (2013 in; MarineSpace Ltd; ABPmer Ltd; ERM Ltd; Fugro EMU Ltd; Marine Ecological Surveys Ltd, 2013) and as previously defined by Cefas (2001), use of the modified Folk classification alone may over-estimate the suitability of an area in terms of its herring spawning potential as further consideration should be given to other environmental (physical, chemical and abiotic) parameters such as oxygenation, siltation, micro-scale morphological features (*e.g.,* ripples and ridges). Furthermore, the area must be exposed to the main flow of water and the sediments well sorted to ensure maximum oxygenation of the sediment and hence the lower layers of herring eggs; the area should be elevated with respect to the surrounding seabed.

Based on these criteria, the herring spawning potential of each station/transect, once acquired, will be graded from 'Unsuitable' to 'Prime' based on habitat sediment preference and 'Unsuitable' to 'Preferred' based on habitat sediment classification, as presented in Table 1.10.

Table 1.10 Herring Spawning Ground Potential Criteria

Criteria From	Habitat Sediment Preference[1]	Prime	Sub-Prime	Suitable	Unsuitable
Sediment Classes (Reach *et al.*, 2013 in; MarineSpace Ltd; ABPmer Ltd; ERM Ltd; Fugro EMU Ltd; Marine Ecological Surveys Ltd, 2013)	% Particle Contribution Preference	<5% muds, >50% gravel	<5% muds, >25% gravel	<5% muds, >10% gravel	>5% muds, <10% gravel
	Modified Folk classification (based on sand, mud, gravel fractions above)	Gravel and part sand gravel	Part sandy gravel and part gravelly sand	Part gravelly sand	Everything excluding gravel, sandy gravel and part gravelly sand
Further sediment Description Parameters (including those from Cefas (2001))	% coarse sand to gravel	≥60%	40% to <60%	20% to <40%	≤20%
	Sorting coefficient and description (Folk & Ward, 1957)	≤0.5, Well	0.5 to <0.71, Moderately well	0.71 to <1.00, Moderate	≥1.00, poor to extremely poor
	Wentworth (1922) Classification of mode grain size	Granule to pebble	Coarse to very coarse sand	Very fine to medium sand	Silts and clays
	Exposure	Elevated (such as raised gravel banks) relative to surrounding seabed			Flat seabed
Criteria From	Habitat Sediment Classification[2]	Preferred		Marginal	Unsuitable
Sediment Classes (Reach *et al.*, 2013 in; MarineSpace Ltd; ABPmer Ltd; ERM Ltd; Fugro EMU Ltd; Marine Ecological Surveys Ltd, 2013)	Generalised Folk Classification Preference	Gravel and sandy gravel		Gravelly sand	All others

1 Colours indicate where Prime Sub-Prime Suitable or Unsuitable spawning potential criteria are met
2 Colours indicate where Preferred Marginal or Unsuitable spawning potential criteria are met

1.4.6 Sand Eel Spawning

Determination of spawning potential for a specific area of seabed has been based on guidelines laid out in Latto *et al.* (2013), as summarised in Table 1.11. To be classified as 'Prime' or 'Sub-Prime' for sand eel spawning, the sediment must be composed of >85% or >70% sand (≥63µm, <2mm), respectively, with little mud (<1% or 4%; <63µm). Although these criteria do not easily blend with the modified Folk (1954) classification; in general terms the area must fall into one of three sediment types: sand, slightly gravelly sand or gravelly sand. Beyond this, 'Suitable' conditions are those where the sediment is composed of >50% sand and <10% mud and while this covers parts of several modified Folk (1954) classifications, sandy gravel is generally considered the marginal seabed type.

Based on these criteria, the sand eel spawning potential of each station/transect will be graded, once acquired, from 'Unsuitable' to 'Prime' based on habitat sediment preference and habitat sediment classification, as presented in Table 1.11.

Table 1.11 Sand Eel Spawning Potential

Habitat Sediment Preference	Prime	Sub-prime	Suitable	Unsuitable
% Particle contribution preference	<1% muds, >85% sand	<4% muds, >70% sand	<10% muds, >50% sand	>10% muds, <50% sand
Folk classification based on % particle contribution preferences above	Part S, part (g)S, and part gS	Part S, part (g)S, and part gS	Part S, part (g)S, part gS, part sG, part mS, part (g)mS, part gmS and part msG.	All others (including part mS, part (g)mS, part gmS, part msG and part sG)
Habitat Sediment Classification	**Preferred**		**Marginal**	**Unsuitable**
Folk classification generalised	Sand, slightly gravelly sand and gravelly sand		Sandy gravel	All others

Adapted from Latto *et al.* (2013)

S	Sand		mS	Muddy sand		msG	Muddy sandy gravel
(g)mS	Slightly gravelly muddy sand		gS	Gravelly sand		gmS	Gravelly muddy sand
(g)S	Slightly gravelly sand		sG	Sandy gravel			

1.5 Other Species of Conservation Interest

The ocean quahog; *A. islandica*, is a species of conservation importance and is a long-lived species with a slow growth rate. *Arctica islandica* is on the OSPAR (2008) list of threatened and/or declining species and habitats and is listed as a low or limited mobility species under Scotland's priority marine features (JNCC, 2012). However, *A. islandica* is commonly found within this area of the Irish Sea (Oil and Gas U.K., 2010) where populations of 40-80 years old specimens have been observed, with a substantial proportion over 100 years old (OSPAR, 2009c). A review of each photograph from all stations where adequate seabed imagery is acquired will be undertaken, to determine the presence, size and density of any *A. islandica* shells or siphons observed.

Two species of lesser sand eels belonging to the genus *Ammodytes* occur in UK waters, members of the *Ammodytes* genus (specifically *A. marinus*) are listed as priority species under UK Post 2010 Biodiversity Framework (JNCC and Defra, 2012) and as a feature of conservation importance defined in relation to the MCZ network (Natural England and Joint Nature Conservation Committee, 2010). Additionally, the greater sand eel (*H. lanceolatus*) and the smooth sand eel (*Gymnammodytes semisquamatus*) also occur in UK waters as an important commercial fisheries stock, however, are listed as least concern according to the International Union for Conservation of Nature (IUCN) Red List of species (IUCN, 2022). In addition, there is also another Ammodytidae species, Corbin's sand eel (*Hyperoplus immaculatus)*, that has been noted in the wider east Irish sea region (OBIS, 2021).

The angel shark (*Squatina squatina*) is listed as critically endangered on the IUCN Red List and is included in the OSPAR List of Threatened and Declining Species (OSPAR, 2017). As determined from the 2021 Status Assessment (OSPAR, 2022), *S. squatina* is a very sensitive species and has declined in abundance within OSPAR III region in which Morgan and Mona are located. Although the identified key areas for this species are not within the ZOI (Barker *et al.*, 2020; Shephard *et al.*, 2019), the Irish Sea is considered to contain a resident population (OSPAR, 2022) which is under threat and/or in decline (OSPAR, 2017). The angel shark is also protected from intentional disturbance, targeting, injuring or killing within 12 nautical miles of the Welsh and English Coast (Wildlife and Countryside Act 1981, 1981).

Four species of skate and ray, which are listed on the OSPAR List of Threatened and Declining Species (OSPAR, 2017), occur within OSPAR III region: the common skate (*Dipturus batis*), spotted ray (*Raja montagui*), white skate (*Rostroraja alba*) and thornback ray (*Raja clavata*), although *R. clavata* is not considered to be declining within the Irish Sea. The previous survey conducted in 2021 (Gardline, 2022b) only identified *R. clavata* within the survey area out of the four species listed. However, with the ZOI encompassing a larger area than previously surveyed as well as the ECR scoping areas, the potential presence of the other three species should not be discounted. A review of each photograph from all stations where adequate seabed imagery is acquired will be undertaken, to determine the presence of any skates or rays observed.

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B.2.8 Response from JNCC regarding the Benthic Survey Scope of Works Report and Provision of Intertidal Scope

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[redacted]
RPS | Energy
Goldvale House
27-41 Church Street West
Woking
Surrey
GU21 6DH

JNCC Reference: OIA-08660

Date: 22 April 2022

Dear [redacted]

Projects Mona and Morgan: Benthic Survey Scope of Works Report

Thank you for consulting JNCC on the bp Alternatives Energy Investments Limited and Energie Baden-Wurttemberg, Projects Mona and Morgan Benthic Survey Scope of Works Report (Revision 1, dated 1 April 2022) which we received on 1 April 2022.

The JNCC advice contained within this minute is provided (under a Discretionary Advice Service agreement). JNCC has a statutory advisory role to the UK Government and devolved administrations on issues relating to nature conservation in UK offshore waters (beyond the territorial limit). We have subsequently concentrated our comments on aspects of the document that we believe relate to offshore Welsh waters and defer to comments provided by Natural Resources Wales (NRW) for aspects relating to inshore Welsh waters and to Natural England for aspects relating to inshore and offshore English waters.

1.1 Scope of Work

Figure 1.1 Survey Location

This figure is difficult to read given the amount of information presented and the colours used. JNCC would recommend considering different colour palettes to represent the arrays, ZOIs and associated export cable routes against the marine protected areas. JNCC would also, always, request that the boundary between English and Welsh waters is represented along with the 12nm limit to allow SNCBs to clearly identify areas within their remit.

1.2 Expected Sediments, Protected Species and Habitats

JNCC acknowledge that the West of Copeland Marine Conservation Zone (MCZ) does not currently have conservation advice associated with it, we anticipate that this will be available within the next few months and will highlight when the advice becomes available. We note that Gardline has used South Riggs MCZ conservation advice as a proxy, JNCC are currently

developing a proxy process for Marine Protected Areas and should be in a position to provide an update in the coming weeks.

1.3.1 Survey Plan

It is unclear from the text whether the 50 stations for co-located camera and sediment sampling across the Morgan and Mona array areas and Zones of Influence (ZOIs) is the combined total for both projects or 50 stations per project. We would recommend that the number of sample sites not be capped at 50 and that the decision on appropriate number of sample sites be based primarily on geophysical evidence.

JNCC would appreciate if the outcome of the camera only targets in the Mona array, which are being revisited having previously exhibited low resemblance of reef could be shared.

JNCC note that until further information from geophysical acquisition is complete the information gathered to date will be used as the basis for initial station selection. JNCC assumes and recommends that any necessary changes be made on receipt of new geophysical data.

1.3.2 Sediment Sampling Techniques and Analysis

We commend bp, EnBW and Gardline on their intention to return individual *A.islandica* to the sea and recommend that individuals be returned carefully to the seabed, in a *suitable* habitat.

Please contact me with any questions regarding the above comments.

Yours sincerely,

[redacted]

Offshore Industries Adviser

Email: [redacted]

Telephone: [redacted]

B.2.9 Response from Natural England regarding the Benthic Survey Scope of Works Report and Provision of Intertidal Scope

Date: 22 April 2022
Our ref: DAS/UDS A000566 / 387987
Your ref: Benthic and Intertidal Scope of Works

Hornbeam House
Crewe Business Park
Electra Way
Crewe
Cheshire CW1 6GJ

T 0300 060 3900

[redacted]
BP Alternative Energy Investments Limited

BY EMAIL ONLY

Dear [redacted]

Discretionary Advice Service (Charged Advice) - UDS A000566
Development proposal: BP EnBW Morgan and Mona Offshore Wind Farm
Consultation: Benthic Ecology Survey Scope of Works and Intertidal Phase I Walkover Survey

This advice is being provided as part of Natural England's Discretionary Advice Service in accordance with the Quotation and Agreement dated 17 May 2021 to BP Alternative Energy Investments Limited.

Thank you for your consultation on the above dated and received on 01 April 2022.

The following advice is based upon the information within;

- Email from [redacted] RPS, received by [redacted] setting out the Intertidal Ph y (dated 1 April 2022);
- Morgan and Mona – 2022 Integrated Site Survey Benthic Survey Scope of Works Report, Gardline Report Ref 11781.E00 (dated 1 April 2022).

Overarching comments

Natural England's advice in this letter is based on the document received as listed above. Natural England welcomes the Benthic Survey Scope of Works report which sets out the planned works for 2022, and builds on the advice we provided on the 2021 Benthic Survey Strategy (dated 10 June 2021). We have provided more detailed comments and advice below.

Detailed comments

Intertidal Phase 1 Walkover Survey

Natural England advises that the Intertidal Phase I Walkover Survey be set out in a report, reflecting full details once determined (i.e. location), reflecting any desk-based studies and fully referenced.

We broadly agree with the survey methodology as set out in the email from Samantha Tuddenham, RPS (dated 1 April 2022) in so far as it is detailed.

Natural England advise that the intertidal area is heavily designated and that there should be consideration of designated sites and their features, and that where necessary permissions for works with designated sites should be acquired.

2022 Integrated Site Survey Benthic Survey Scope of Works Report

1.1 Scope of Work

We acknowledge that the Export Cable Route (ECR) presented in *Figure 1.1 Survey Location*, includes a wide scope and that the report sets out that these scoping areas will be more defined and refined

ECR corridors will be produced. This has resulted in limited information being provided within the report on the characterisation of the ECR, as a result Natural England cannot provide advice on the adequacy of the survey scope in detail for the ECR.

Natural England welcomes the wider scope of the survey areas included in the 2022 methodology from that surveyed in 2021, primarily the Zone of Interest (ZoI) for the array areas, which has been defined as the array area plus a buffer of one tidal excursion. The ZoI should ensure that all potential direct and indirect affects form the development can be established. Additional survey sites of similar seabed type and habitat outside of the license area boundaries will also provide a control that will be important when considering any changes within the license area that result from the project.

Natural England advise that the presentation of the designated sites and ECR Scoping Areas displayed in *Figure 1.1 Survey Location* needs improvement, as in the current form Fylde Marine Conservation Zone (MCZ) is not visible against the Penwortham ECR Scoping Area. We advise that the map is reviewed and amended.

1.2 Expected Sediments, Protected Species and Habitats

The ZoI for Morgan array overlaps with West of Copeland MCZ designated for three protected features. Please note that the General Management Approach set out for each of the three protected features post-designation is;

- Subtidal sand – maintain in favourable condition;
- Subtidal coarse sediment – recover to favourable condition;
- Subtidal mixed sediments – recover to favourable condition[1].

Natural England are content for the use of South Rigg MCZ conservation advice to be used in consideration of West of Copeland MCZ in the absence of a site specific conservation advice package. The distribution and composition of the habitats will differ between the sites, so site specific advice in the Supplementary Advice on Conservation Objectives is unlikely to apply to West of Copeland MCZ and the General Management Approach for the same features may differ between the two sites.

1.3.1 Survey Plan

Natural England cannot make further comment on whether the proposed survey scope is appropriate, as there is no clarity on the survey sampling stations within the ECR scoping areas within the report.

While there is information set out in T*able 1.1 Morgan Potential Array Area and ZoI Proposed Targets and Sampling Objectives* and *Table 1.2 Mona Potential Array Area and ZOI Proposed Targets Overview* on the feature targets for the proposed sampling stations locations, there is no information showing the location of the indicative habitats within the area, from desk-based review or the 2021 survey outputs. Without further detail showing the indicative habitats within the array areas, which would assist in advising if the sampling stations are of suitable resolution for characterisation, we are limited on the advice we can provide on if the survey stations as proposed in the report will provide sufficient robust evidence.

We welcome the assurance that the survey scope remains flexible to be adjusted based on data acquisition and adjustments made to ensure additional sample stations can be supported to ensure that there is appropriate coverage of all habitats types and sensitive features beyond those in the initial provisional grid of targets.

The sampling stations should be suitably located and representative to allow ground truthing of the indicative habitats and enable the development of a robust habitat map. Should habitats encountered differ from those expected based on the geophysical data acquired then we would expect to see an increase in sample stations to ensure that all potential habitats are sampled and mapped in order to enable a full assessment of potential impacts resulting from development. The stations should ensure sampling of all habitats and particularly transitions between habitats is evidenced to provide a true understanding of what is present in the area.

[1] West of Copeland Marine Conservation Zone (31 May 2019)

We welcome that camera survey consist of both stills and video are undertaken and extended to map condition, and advise it should also cover the boundary extents, of habitats and biogenic reefs. This will ensure that impacts on these features can then be robustly assessed against potential impacts of the development.

1.3.2 Sediment Sampling Techniques and Analysis
We support that the survey sampling methods remain the same as with those set out and agreed by Natural England for the previous surveys in 2021, allowing for data comparison with the previous surveys and existing Cafas data, where available.

We welcome the additional information on the analysis of the physio-chemical samples in accordance with Marine Management Organisation specifications and hydrocarbons analysis as set out in the report and *Table 1.3 Physico-Chemical Analysis Specifications.*

We welcome that eDNA procedures will be in line with those set out to the UK Marine DNA Working Group and that full sequences will be submitted to support updates to reference libraries.

Natural England welcomes the avoidance of sensitive habitats (i.e. *Sabellaria* sp.) with the grab in order to avoid damage to the sensitive conservation interest features. We further welcome the detail for recording *Arctica islandica* and support the return to the seabed of live individuals acquired in grab samples.

1.4.1 Biogenic Reefs – *Sabellaria spinulosa*
Natural England acknowledges that our previous advice provided on the 2021 Benthic Survey Strategy has been followed and that the relative reef structure scoring will be in line with the approach set out in Jenkins *et al.* (2018)[2].

1.4.3 Stony Reef
We welcome that Golding *et al.* (2020)[3] refinement of the criteria for defining areas with low resemblance to stony reef will be taken into consideration in the analysis.

1.5 Other Species of Conservation Interest
Natural England welcomes the consideration of species of conservation interest as set out, and supports that as the survey area has been extended from the 2021 surveys to incorporate the ZoI and the ECR that no species should be ruled out if not present in 2021 surveys.

For clarification of any points in this letter, please contact me using the details provided below.

Yours sincerely

[redacted]

Strategic Coastal Lead Adviser
Coast and Marine Team
Cheshire, Greater Manchester, Merseyside & Lancashire Area Team
[redacted]

☒ The advice provided in this letter has been through Natural England's Quality Assurance process.

[2] Jenkins, C., Eggleton, J.,Barry, J., O'Connor, J., Advances in assessing Sabellaria spinulosa reefs for Ongoing monitoring. Ecology and Evolution, 2018; 8:7673–7687
[3] Golding, N., Albrecht, J., and McBreen, F., Refining the criteria for defining areas with a 'low resemblance' to Annext I stoney reef, 2020; ISSN 0963-8091

The advice provided within the Discretionary Advice Service is the professional advice of the Natural England adviser named below. It is the best advice that can be given based on the information provided so far. Its quality and detail is dependent upon the quality and depth of the information which has been provided. It does not constitute a statutory response or decision, which will be made by Natural England acting corporately in its role as statutory consultee to the competent authority after an application has been submitted. The advice given is therefore not binding in any way and is provided without prejudice to the consideration of any statutory consultation response or decision which may be made by Natural England in due course. The final judgement on any proposals by Natural England is reserved until an application is made and will be made on the information then available, including any modifications to the proposal made after receipt of discretionary advice. All pre-application advice is subject to review and revision in the light of changes in relevant considerations, including changes in relation to the facts, scientific knowledge/evidence, policy, guidance or law. Natural England will not accept any liability for the accuracy, adequacy or completeness of, nor will any express or implied warranty be given for, the advice. This exclusion does not extend to any fraudulent misrepresentation made by or on behalf of Natural England.

Cc commercialservices@naturalengland.org.uk

B.2.10 Response from NRW regarding the Benthic Survey Scope of Works Report and Provision of Intertidal Scope

Morgan and Mona 2022 Integrated Site Survey: Benthic Survey Scope of Works

[redacted]
Senior Marine Advisor

21st April 2022

Introduction

This advice is provided in response to the **Morgan and Mona 2022 Integrated Site Survey: Benthic Survey Scope of Works Report, dated 1st April 2022 (Final) Strategy.**

NRW advice in this document is provided (under a Discretionary Advice Service agreement) in respect of a proposal which will require an application for which Natural Resources Wales is a Statutory Consultee.

The customer acknowledges that the content of any advice or assistance provided by NRW is advisory only and that it shall not be deemed to bind or in any other way restrict NRW in performing its statutory functions.

The recipient acknowledges that:

- any advice given or materials or documentation provided by NRW do not constrain or bind NRW in respect of its statutory functions or its role as a statutory consultee or any decision NRW may make in relation to any application for a licence or permit;
- any advice given by NRW does not bind NRW in respect of any future representations it may make as statutory consultee or any decision NRW may make in relation to any application for a licence or permit;
- any views or opinions expressed by NRW are without prejudice to the consideration NRW may be required to give to any application or any future representations as statutory consultee or any decision NRW may make in relation to any application for a licence or permit;
- the final decision as to any representations made by NRW as statutory consultee will be based on all the relevant information available to NRW at the time it makes such representations;
- NRW cannot and does not give any guarantee as to the representations it may make as statutory consultee; and,
- any advice given by NRW may be overtaken by changes in available information, law, policy and guidance relevant to the subject matter of the advice.

Specialists Consulted:
Benthic Ecology
Physical Processes
Marine Water Quality
Marine WFD
Marine Fish

Advice

Benthic Ecology:

Key Issues:

None

Detailed Comments:

- NRW Advisory (A) agree in general with the sampling strategy that has been proposed.

- NRW (A) agree that areas where the geophysical data indicates homogenous seabed sediment over an extensive area, sampling intensity may be reduced, while in areas of heterogenous seabed, greater sampling intensity may be required.

- In general, NRW (A) advise a minimum of one sample station per broadscale habitat (EUNIS L3/L4), and where the indicative habitat areas are extensive, the minimum number of sample stations per habitat type should be increased accordingly to provide sufficient coverage of that habitat type.

- NRW (A) note that the plan does not include proposed targets for sampling within the Export Cable Route (ECR) scoping areas as the final ECR has not yet been defined. NRW (A) broadly agree with the sampling at 1–2km spacing, but advise that in nearshore / intertidal areas, the sampling frequency may need to be greater than this.

- NRW (A) welcome the intention of the applicant to sample the Zone of Influence (ZOI) and agree with the buffer that has been applied, based on the maximum tidal excursion. However, NRW (A) seek clarification on the following:
    - NRW (A) note that no sampling stations are proposed on the southern ZOI buffer side of the array. Clarification is sought as to why no samples are being proposed here – will this section be covered by the ECR surveys?

    - The spacing between the proposed sample stations in the ZOI seems to be large (up to 10km between some stations). As noted above, NRW (A) advise a minimum of one sample station per broadscale habitat (EUNIS L3/L4), and where the indicative habitat areas are extensive, the minimum number of sample stations per habitat type should be increased accordingly to provide sufficient coverage of that habitat type.

- NRW (A) welcome the avoidance of sensitive features such as biogenic reef. If sensitive habitats (i.e. *Sabellaria spinulosa* reef, *Sabellaria alveolata* reef, *Modiolus* etc.) are encountered during grab sampling, NRW (A) advise that any replicate grab samples should be moved a sensible distance from the sensitive habitat e.g. 50m, or at the

discretion of the monitoring officer, based on survey specificity and sensitivity of the habitat.

- If a grab fails due to the presence of *Sabellaria spinulosa* reef, NRW (A) recommend that the following data is collected to help determine the distribution of the habitat:
  - Photographs should be taken of the grab upon retrieval:
    - Photograph the grab contents within the bucket (it may be necessary to find a more appropriate vessel to take the photo e.g. if the bucket is too deep, or use the sieve – it is unlikely that there will be a large amount of material). These photos should be taken from numerous angles to enable assessment of occupancy/live tubes
  - Photograph the sample once it has been sieved, to include:
    - A general sieved sample photograph, as usual
    - Photographs taken from numerous angles to enable assessment of occupancy/live tubes
    - Where there are numerous aggregations – photographs of the individual aggregations.
    - A photographic scale
  - The following data collection measurements are also recommended:
    - Estimate of average tube height, by measuring tubes in a few places and putting them into the following categories:
      <2cm, 2–5cm, 5–10cm, >10cm
    - Estimate of tube consolidation following the Limpenny *et al*. (2010) "reefiness" criteria
    - Measure of how deep the *S. spinulosa* is within the sediment, if relevant (this will need to be done prior to sieving.)
    - Name any obvious epifauna/infauna or provide a general description

- NRW (A) welcome the use of DNA metabarcoding techniques alongside traditional macrofauna analysis – it will be interesting to compare the results of both techniques. NRW (A) also welcome the proposal to submit the full sequences as this will help to fill data gaps in reference libraries.

- NRW (A) are content with the approach for the Intertidal Phase 1 Walkover Survey outlined separately in the Morgan Mona 2022 Benthic Ecology Survey Scope of Works advice request email received 01/04/22 at 18:09.

Physical Processes:

Key Issues:

None

Detailed Comments:

- NRW (A) welcome the recommendation that sediment samples for PSA are analysed in accordance with NMBAQC methods (Mason, 2016) and that the PSA results would be detailed further (i.e. particle size distribution percentiles d10, d50, d90 etc.).

- NRW (A) advise that the sediment samples are also analysed to determine the percentage of fines <63 microns (silt and clay) if the sediment sample and drop-down camera photos indicate the presence of fines.

Water Quality:

Key Issues:

None

Detailed Comments:

- The report defines a set of survey locations and identifies a subset which will be analysed for chemicals (Fig 1.3). Given the offshore location NRW (A) agree with the spread of sites for chemicals. The report also discusses giving consideration to sediment type, which is appropriate as coarser grained sediments do not typically harbour contaminants. NRW (A) also agree with the physico-chemical analysis specifications given in Table 1.3 and further advise that the results of these should be compared to CEFAS action levels.

- The survey does not discuss sampling along the ECR in detail as the route is not sufficiently defined at present. However, it is anticipated that samples will be taken at intervals of approximately 1–2 km, with chemical subsamples taken every 5 km. Whilst NRW (A) agree with the sampling for the offshore section, we would advise a higher frequency of chemical sampling nearshore (i.e. every 2 km) where the chance of sediment contamination is greater.

- Furthermore, in relation to the ECR, NRW (A) advise sediment sampling of the beach where landfall will be made (if within 2 km of a designated bathing water). This sampling would provide analysis of the bacterial content of the sediment to assess the risk to the Bathing Water quality.

Marine WFD:

Key Issues:

None

Detailed Comments:

- It should be noted that it is highly likely that it is only the ECR component of the scheme which will have potential interactions with WFD water bodies.

- The report presents the proposed benthic characterisation for the array areas and the zone of influence of the project, which are sufficiently offshore that they are outside of, and have no interactions with, any WFD water bodies. No information relating to the characterisation of the ECR scoping area is provided within the report, as it is stated that the ECR is not sufficiently defined at present. Sampling at 1–2 km spacing has been suggested – NRW (A) advise that further inshore, the frequency of sampling is likely to need to be greater than this, depending on the ECR when further defined. This is of particular relevance to nearshore/intertidal areas.

- Assuming that the methodology for characterisation of the ECR will remain unchanged, NRW (A) welcome acquisition of samples for PSA to support the grab sampling. NRW (A) welcome the methodology as set out in Section 1.3.3, that the PSA sample is a replicate at each macrofauna sample, as opposed to a sub-sample from the macrofauna sample, to ensure the sampling is WFD compliant.

- Avoidance of high sensitivity habitats including biogenic reef is welcomed.

Marine Fish:

Key Issues:

None

Detailed Comments:

- NRW (A) welcome the intention to use the sediment sampling to quantify areas suitable for herring spawning and sandeel habitat and would advise that the results are used in conjunction with BGS Folk Classifications to model suitable habitats, as per the GIS-based methodology developed for the marine aggregate sector by MarineSpace Ltd. *et al*., (2013).

- NRW (A) further advise that any sandeel, or other fish, encountered in the analysis of the grab samples are also recorded and used in the assessment.

References:

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B.2.11 Response from NRW - Rhiannon Modiolus survey North Anglesey (2015)

Cyfoeth Naturiol Cymru
Natural Resources Wales

NRW Rhiannon *Modiolus* survey 2015: video and still image analysis

Moore, J.[1], Jones, J[1]. and Robinson K[2].

[1]Coastal Assessment, Liaison & Monitoring Ltd.
[2]Natural Resources Wales

Report No: 215

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Natural Resources Wales is the organisation responsible for the work carried out by the three former organisations, the Countryside Council for Wales, Environment Agency Wales and Forestry Commission Wales. It is also responsible for some functions previously undertaken by Welsh Government.

Our purpose is to ensure that the natural resources of Wales are sustainably maintained, used and enhanced, now and in the future.

We work for the communities of Wales to protect people and their homes as much as possible from environmental incidents like flooding and pollution. We provide opportunities for people to learn, use and benefit from Wales' natural resources.

We work to support Wales' economy by enabling the sustainable use of natural resources to support jobs and enterprise. We help businesses and developers to understand and consider environmental limits when they make important decisions.

We work to maintain and improve the quality of the environment for everyone and we work towards making the environment and our natural resources more resilient to climate change and other pressures.

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- Maintaining and developing the technical specialist skills of our staff;
- Securing our data and information;
- Having a well resourced proactive programme of evidence work;
- Continuing to review and add to our evidence to ensure it is fit for the challenges facing us; and
- Communicating our evidence in an open and transparent way.

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Contract Manager:	Karen Robinson
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Author(s):	**Jon Moore, Jen Jones & Karen Robinson**
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- Yn 2008 cynhaliwyd arolwg gan Brosiect Rhyng-gysylltydd Dwyrain-Gorllewin EIR Grid tua 10nm i'r Gogledd o Ynys Môn a chlustnodwyd ardal o wely'r môr â llofnod acwstig oedd yn arwydd o rîff *Modiolus modiolus* biogenig. Yn ddiweddarach cadarnhawyd presenoldeb y rîff gan arolwg fideo tanddwr. Yn 2012 clustnododd arolygon ar gyfer fferm wynt alltraeth arfaethedig Rhiannon yn yr un safle hefyd nifer o safleoedd â signal acwstig oedd yn arwydd o rîff *Modiolus*.
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2. Executive Summary

- *Modiolus modiolus* (Horse Mussel) reef is an OSPAR threatened and declining habitat and a component of Annex I Reef. In Wales two *Modiolus* reefs have been well described to date off the North Lleyn Peninsula.
- In 2008 the EIR Grid East West Interconnector Project conducted a survey approximately 10nm North of Anglesey and identified an area of seabed with an acoustic signature indicative of biogenic *Modiolus modiolus* reef. The presence of reef was later confirmed by drop down video survey. In 2012 surveys for the proposed Rhiannon Offshore Windfarm in the same location also identified several areas with an acoustic signal indicative of *Modiolus* reef.
- NRW undertook some survey work in October 2015 to collect video and still images from areas identified as potential *Modiolus* reef by the two previous commercial projects in welsh waters. This report provides a detailed description of the method, a summary of the results, and some initial conclusions from the study.
- A total of 5074 still images and 7.5 hours of video were collected from 32 drop-camera tows, within an area measuring approximately 10 km by 5km. The stills and video were analysed to identify fauna, estimate abundances and characterise the habitat. The data were then entered into the Marine Recorder database. Verification and validation procedures were undertaken to ensure the quality of the data. A total of 136 taxa were recorded from 39 tow sections; six biotopes were assigned to the tow sections.
- The majority of the surveyed seabed was composed of tide-swept mixed and / or coarse sediment with pebbles, gravel, whole and broken bivalve shells, coarse sand and cobbles, with occasional small boulders. The epifauna present on those habitats were typical of tide-swept coarse sediments.
- Live *Modiolus modiolus* were observed in some tows and in five tows they were in sufficient abundance to be characterised as *Modiolus* reef. Some areas of *Sabellaria* reef and bedrock reef were also described.
- The areas of live *Modiolus* reef correlated well in terms of their location with live reef areas identified during the 2008 EIR Grid Cable Corridor Survey. Other biotopes identified during the study were typical of those previously recorded off the coast of Anglesey in similar circalittoral, tideswept environments.

3. Introduction

Our knowledge of the distribution and extent of seabed habitats in Welsh waters is extremely patchy and in some areas we have very little knowledge of which habitats may be present. In order to increase our knowledge and improve our evidence base NRW's marine evidence staff have been using collaborative opportunities where possible to collect survey data in areas where we believe habitats or species of conservation importance may be present. This current piece of work was undertaken in collaboration with the Environment Agency as part of a Service Level Agreement with Natural Resources Wales.

Modiolus modiolus (Horse Mussel) reef is an OSPAR threatened and declining habitat and a component of Annex I Reef; in addition, it is a Section 42 (Natural Environment and Rural Communities Act 2006) habitat of principal importance. *Modiolus* beds appear to be extremely sensitive to physical disturbance and are thought to have declined in extent and quality. In Wales we have good knowledge of two *Modiolus* reefs off the North Lleyn Peninsula within the Pen Llŷn a'r Sarnau Special Area of Conservation (Lindenbaum et al., 2008). *Modiolus modiolus* beds are also thought to occur on the seabed off the North and West coasts of the Isle of Anglesey. In the past, several surveys have recorded aggregations of *Modiolus* in these areas but in general the density and extent of any beds has not been accurately mapped. A survey conducted by the Countryside Council for Wales (CCW), in conjunction with the Joint Nature Conservation Committee (JNCC) also recorded aggregations of *Modiolus* to the North West of Anglesey (Ramsay *et al.*, in prep).

In 2008, the EIR Grid East West Cable Interconnector Project undertook an acoustic survey of the proposed cable corridor which ran to the North of Anglesey. The data collected from this survey identified an area with an acoustic signature indicative of biogenic *Modiolus modiolus* reef. Further investigations using drop-down video confirmed the presence of live *Modiolus* reef along with extensive areas of dead shell (Fugro, 2009). In 2012 multibeam and sidescan sonar surveys were undertaken as part of a characterisation survey for the proposed Rhiannon Offshore Windfarm approximately 10nm North of Anglesey. These again identified several areas with an acoustic signal indicative of *Modiolus* reef. Unfortunately, the windfarm proposal was terminated before ground-truthing surveys could be carried out. NRW therefore undertook some survey work in October 2015 to collect video and still images from the areas identified as potential *Modiolus* reef (shown in Figure 1) to assess the presence and likely extent of the reef in a number of locations, and to identify other seabed habitats that are also present in the area.

The aims of the study were to i) verify the presence of *Modiolus modiolus* reef in the areas identified as possible reef from commercial sidescan sonar data; ii) define the quality and extent of any *Modiolus* reef present and iii) collect data on other seabed habitats in the area to improve our benthic knowledge for this location.

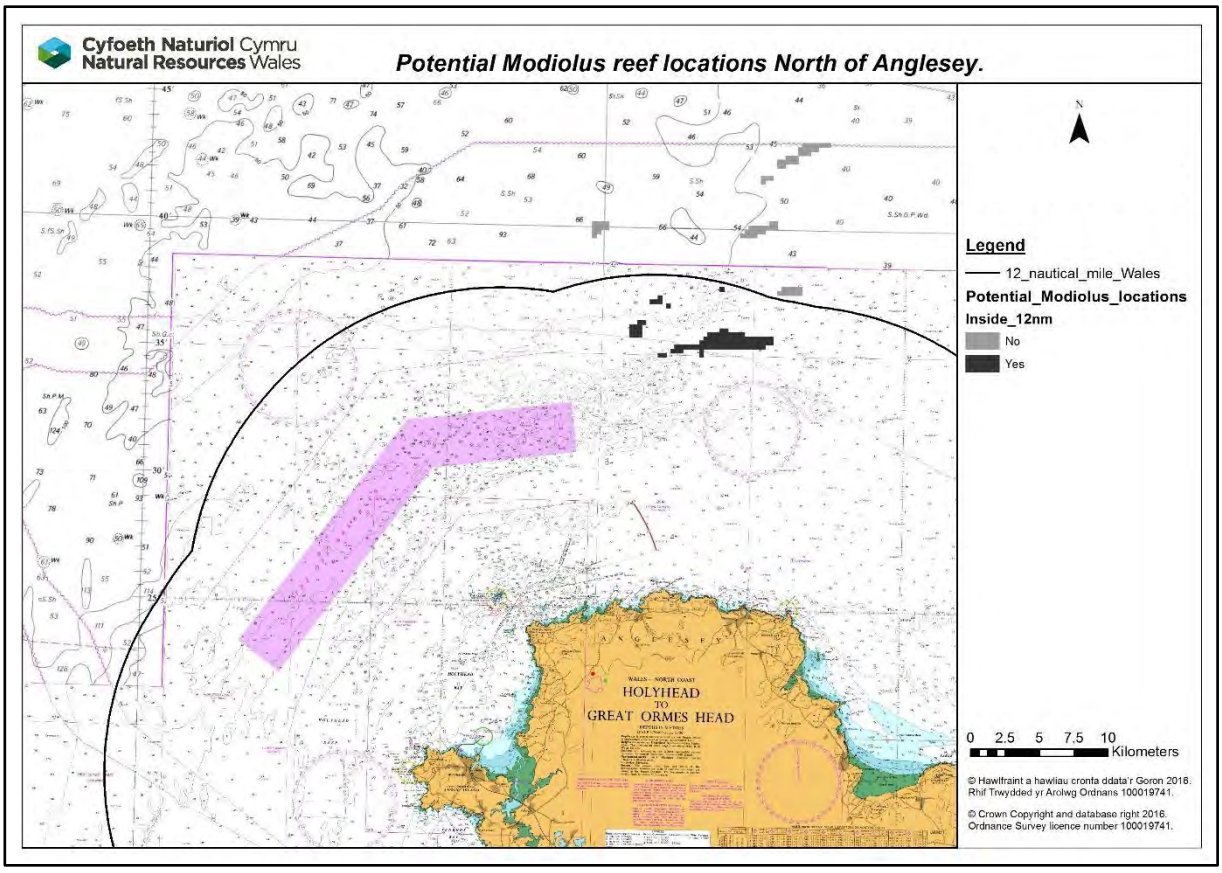


Figure 1 Potential *Modiolus* reef locations identified from commercial surveys North of Anglesey. © British Crown and OceanWise Ltd, 2016. All rights reserved. License No. EK001-20120402.

4. Methods

4.1. Survey sites and drop-down image collection

Natural Resources Wales worked in collaboration with the Environment Agency under the organisation's joint Service Level Agreement to undertake a 3-day survey on board the RV Mersey Guardian from 14th to 16th October 2015. The survey locations were chosen based on evidence of the presence of the horse mussel *Modiolus modiolus* from previous sidescan sonar data that had been collected during benthic characterisation work for both the EIR Grid Interconnector project and the proposed Rhiannon windfarm. The full extent of the area of interest was approximately 10 km in an east west direction by 5 km north south. Sample stations were allocated on a grid basis throughout the potential reef areas and split into high and low priority sites to achieve highest level of coverage in the boat time available (Figure 2).

The camera equipment used for the survey was a sledge mounted a C-Tecnics High definition CT3009 camera providing full 1080i HD recording (1920 x 1080). This was obliquely mounted on a sledge accompanied by two x C-Tecnics CT4004 LED Lamps each of approximately 1100 Lumens, accompanied by two C-Tecnics Laser lights (CT4005 – subsea Laser Modules) and two lasers set at a width of 10cm apart to

provide a visual scale on the resulting video footage. The video unit had its own integrated depth sensor. The video feed was relayed to the surface unit via a 200m umbilical where real-time GPS positional and other information were over-laid on the video footage and recorded on the surface units' computer hard drive.

The drop down sledge was also equipped with a RovTech Seacam 18megapixel auto stills camera with an 18 mm lens, twin strobes and battery pack. This was a self-contained system that was set to take pictures at predefined intervals (for this study the stills camera interval varied from 6 to 10 seconds). The camera was set to start recording before the sledge was placed in the water and continued to take images at the predefined interval until it was brought back on board. Images were then downloaded between each camera tow and saved to a computer hard drive.

The drop down video survey method followed the MESH (Mapping European Seabed Habitats) standard protocols (Coggan *et al.*, 2007) as closely as possible. Drops were carried out during a neap tide and where possible during the period either side of slack water. Even on a neap tide, given the depth of some of the survey locations and the fast running currents in the area, it was difficult to position the video tow so that it passed exactly through the survey location, although every effort was made to get as close as possible.

During the survey, the vessels' position was logged every five seconds and plotted onto a trackline in the Manifold GIS (Geographical Information System) software package. After the survey, the points relating to each individual video tow line were extracted from this position log using the recorded times and locations for the start of line and end of line.

For each survey station visited, a hand-written station log was completed to record essential information relating to the location, video quality, water depth, locations of the start and end of line and also any notes taken by the surveyor watching the video on the vessel. This was used to help inform post-survey data analyses and data entry.

Unfortunately, a software error on 14th October (day 1) meant that no video footage was collected on that day; only still images were collected from the 10 sites visited that day. Because of this, we decided to standardise our approach to data analysis by focussing on the still images from all survey sites as the primary source of information for species identification, enumeration and biotope classification. Where video footage was available this was used to aid species identification, enumeration and biotope analysis, as well as providing supplementary information such as records of additional large species not seen in the still images, position (Lat / Long coordinates) of features, water depth etc.

A total of 5074 still images were collected from 32 camera tows on 14th, 15th and 16th October. The video dataset comprised 24 tows of approximately 100m length each (Fig 2) (total video footage of approximately 7.5 hours; longest single tow was 32 minutes) collected on 15th and 16th October. In some cases, drop down camera sites

were combined in to a single long tow (e.g. at sites 6, 7 and 8) to reduce time wasted on deploying and retrieving the sledge in deeper water.

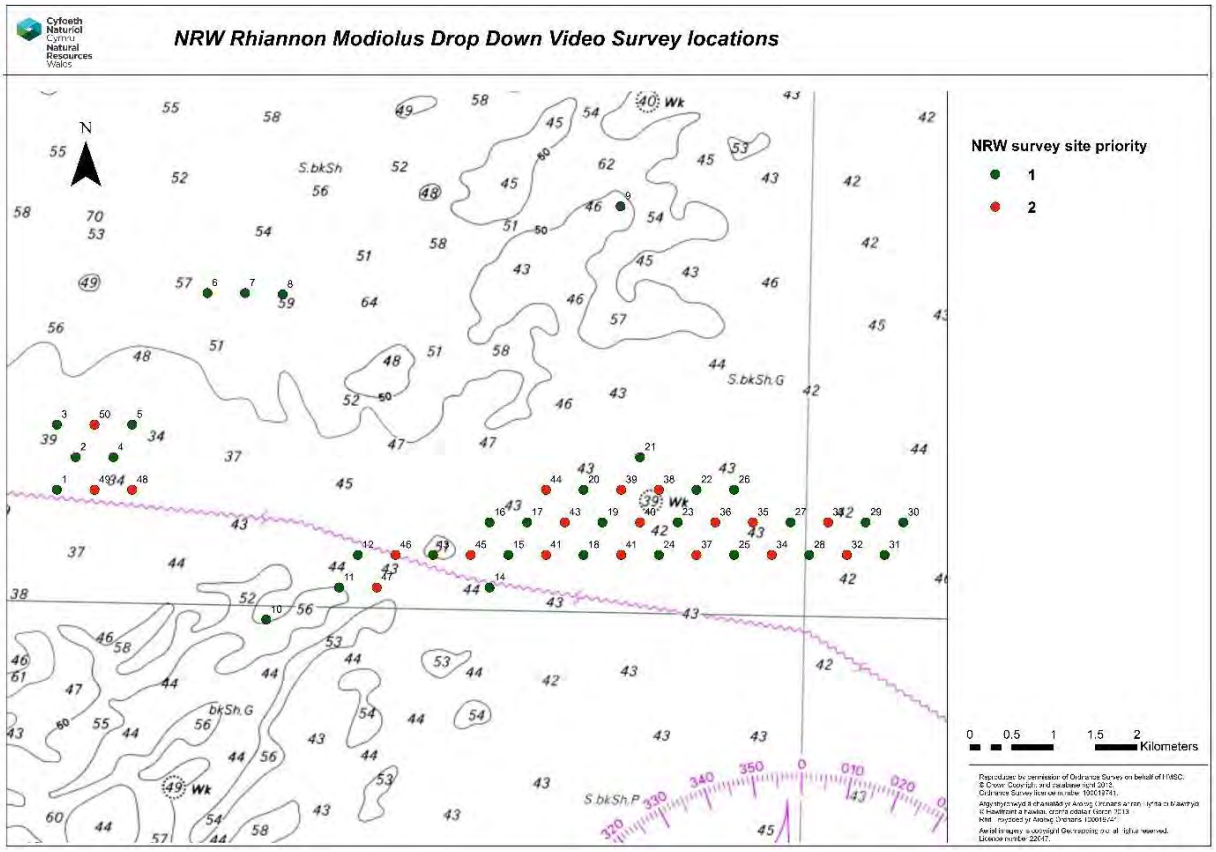


Figure 2 *Modiolus modiolus* sample stations split in to priority 1 and 2 locations (not all stations were surveyed).

Figure 3 Start (green) and end (red) locations of each survey tow, with vessel track (white) and depth contours (dark blue deeper than 50m, light blue shallower than 50m).

4.2. Data collation and preparation for analysis

All relevant data from the metadata, field logs (site numbers, positions, dates and times, survey staff, equipment details, vessel details, etc.) and image files (Exif data) was collated. These data were then sense-checked (coordinates for tows and stills in expected locations, correct dates and times, etc.) and formats were standardised as appropriate for further analysis. Cross-reference was made to metadata standards to check that all necessary data was present. A data entry spreadsheet for video and stills analysis was prepared.

4.3. Video and stills analysis, including verification

The procedures used for analysing the video are described below:

The videos were played through VLC media player software on a computer with a high definition LCD monitor. The software allowed considerable control over the playback, including variable speed advance and reverse, freeze frame and view frame-by-frame, so that the analyst could study the substrata and fauna and record appropriate information to support the more detailed information available from the stills. The stills were viewed in a standard Windows photo viewer.

Analysis began with a rapid overview of the full collection of videos and stills to identify any problems with viewing the files, checking image quality, becoming familiar with the range of biotopes, and splitting the tows into sections. Where biotope boundaries were identified, the tow was divided into two or more separate sections, and the coordinates for start and end positions taken from the positions of the video. Where video was unavailable (and therefore also the overlaid positional information) the start and end positions of mid-tow sections was calculated from the number of stills in each section and the proportional difference between the Lat Long positions from the start and end of the whole tow. A column in the data entry spreadsheet (= 1 sample) was made for each section and a one sentence description written for each.

The sections were then analysed one at a time. The stills associated with a section were analysed first, using the zoom and pan functions where necessary, to identify fauna, estimate abundances and characterise the habitat (substratum types etc.). The video was then analysed to provide any additional or complimentary details on habitat or species that were not picked up in the stills analysis.

A single sample comprised the data derived from a single section of video and the group of stills taken along that section. Sample data included start and end coordinates and times, image file information, substratum characteristics, water depth, names and estimated abundances (SACFOR scale) of taxa, other details listed in the contract specification and any other relevant metadata. Biotope codes were assigned for each sample and then reviewed on completion of all the image analysis.

Verification

10% of the video tows (4 tows, 8 tow sections) were randomly selected by another analyst for verification (complete re-analysis, without reference to the original

analysis). The verification data and original data were pasted into a single spreadsheet and directly compared. Inevitably there were some differences, particularly in recorded abundances and a few differences in identification (usually due to one analyst assigning a higher or lower taxon than the other). Most of the differences were small (one abundance category different, higher or lower with no bias), but for certain species one analyst had recorded higher abundances (one or two abundance categories, usually higher) than the other. This difference was discussed and found to be a difference in the application of the abundance scales (one analyst using the % cover scales and the other using the density scales, for certain species). The appropriate scales for each species were discussed and agreed and some changes were made to the final data.

4.4. Marine Recorder data, including validation

Data were entered into the Marine Recorder database (http://jncc.defra.gov.uk/page-1599), using the standard guidance and protocols provided by NRW. Data were then exported from Marine Recorder using the Snapshot Tool and the following data validation procedures were carried out on the Snapshot file. Any errors were fixed in the Marine Recorder database.

In Access Snapshot

- Export Survey, Location, SurveyEvent, PhysicalData, Sample and SampleBiotope tables to Excel.
- Check in Sample table that all UserSampleRefs are unique
- Create matrix of species v UserSampleRef from SampleSpecies data (Access Crosstab Query) and export to Excel.

In Excel

Species matrix

- Check through list of species, using knowledge of species, to see if any do not seem right for locality (i.e. geographic range and habitat). Carry out search in WoRMS and Google for any unknown taxa, to check that names are valid and that they seem right for locality.
- Species abundances - compare with original data. Start by calculating and comparing total count of records for each species in original data and in MR extract.

Survey data and Location data

- Browse through to check entries are suitable and consistent
- Positions - Import into GIS and plot Lat/LongWGS84 positions - place on appropriate map or chart backdrop to check that positions look right. Import Lat/LongWGS84 positions from original data spreadsheet and compare with positions from the Snapshot. Check that all positions match-up.

SurveyEvent data

- Positions - do same as for Survey data. Plot start and end positions from drop down video tows as well as the centre positions. Check that none are outside the survey box defined by the SW and NE positions in the Survey data.
- Other data - browse through to check entries are suitable and consistent, compare with original data (at least 5%, more if errors are found) - particularly depths and dates.

Sample data

- Positions - do same as for SurveyEvent.
- Habitat descriptions – check against original data, check spelling and check that species mentioned in the description are also recorded in the Species data.
- Other data - browse through to check entries are suitable and consistent, compare with original data (at least 5%, more if errors are found)

Biotope data

- Other data - browse through to check entries are suitable and consistent, compare with original data (at least 5%, more if errors are found)

Physical data

- Check that data has been entered for all samples
- Calculate sum of substrata % for each sample to check that they add up to 100%
- Check that biological zones are suitable and consistent
- Compare depths with original data (at least 5%, more if errors are found)

5. Results

The total of 39 sections were described from the 32 tows (8 tows were split into 2 or 3 sections). Six biotopes were assigned, either partially or wholly, to the tow sections.

5.1. Summary characteristics of the seabed habitats and communities

Figure 4 shows the distribution of the seabed biotopes that are described in the following text. Tables 1 to 3 summarise the habitat characteristics and taxa present in each biotope.

The surveyed seabed lies in water depths of approximately 40m to 70m, which therefore has insufficient light penetration for algal populations (i.e. characterised as circalittoral). The majority of the surveyed seabed was tide-swept mixed or coarse sediment of pebbles, gravel, whole and broken bivalve shells, coarse sand and cobbles, with occasional small boulders. The epifauna present on those habitats were typical of tide-swept coarse sediments, including a variety of scour resistant hydroids,

bryozoa, ascidians, the soft coral *Alcyonium digitatum* and the serpulid worm *Spirobranchus*. The majority of those tow sections were assigned to the level 3 biotope complex SS.SMx.CMx, but two tow sections were wholly or partly characterised by faunal communities that could be assigned to higher level biotopes (SS.SMx.CMx.FluHyd and SS.SMx.CMx.OphMx).

A large proportion of the dead bivalve shells observed on the tow images were *Modiolus modiolus* (horse mussel), typically forming an unconsolidated layer of mobile shells on the surface of the sediment. Live *M. modiolus* were observed in some tows and in five tows they were in sufficient abundance to be characterised as *Modiolus* reef (SS.SBR.SMus.ModMx). Live *Sabellaria spinulosa* (ross worm) was present in many tows and in one tow section it was sufficiently abundant and elevated enough to be characterised as *Sabellaria* reef (SS.SBR.PoR.SspiMx). Areas of low lying bedrock were present in some tows and in six tow sections it was of sufficient cover to be characterised as a rocky reef biotope (CR.HCR.XFa). The bedrock and *Modiolus* reef habitats were characterised by a greater variety and abundance of fauna.

A total of 136 taxa were recorded from the still images and video. 1394 individual species abundances were recorded. The maximum number of taxa recorded from a tow section was 58, the minimum was 5. The total and average number of taxa for each biotope are given at the end of Table 3.

Figure 4 Distribution of biotopes along video track.

Table 1 Frequency of biotopes assigned to video tow sections

BiotopeCode	Biotope description	Sections
CR.HCR.XFa	Mixed faunal turf communities	6
SS.SBR.PoR.SspiMx	*Sabellaria spinulosa* on stable circalittoral mixed sediment	1
SS.SBR.SMus.ModMx	*Modiolus modiolus* beds on open coast circalittoral mixed sediment	5
SS.SMx.CMx	Circalittoral mixed sediment	30
SS.SMx.CMx.FluHyd	*Flustra foliacea* and *Hydrallmania falcata* on tide-swept circalittoral mixed sediment	1
SS.SMx.CMx.OphMx	*Ophiothrix fragilis* and/or *Ophiocomina nigra* brittlestar beds on sublittoral mixed sediment	1

Table 2 Average substrata (% cover) recorded in tow sections for each biotope. (Only includes data for biotopes that were wholly assigned to a tow section (i.e. not SS.SMx.CMx.OphMx)).

Biotope	Bedrock	Small boulders	Cobbles	Pebbles	Dead shells	Modiolus	Gravel	Sand	Mud
XFa	27.5	5	12.8	16.8	14.2	0	13.8	10	0
SspiMx	0	0	65	10	10	0	10	5	0
ModMx	0	0.2	3.6	16	24.8	38	12	3	2.4
CMx	0.1	0.3	7	19.6	38.4	0.1	18.6	15	0.8
FluHyd	0	0	1	20	35	0	25	19	0

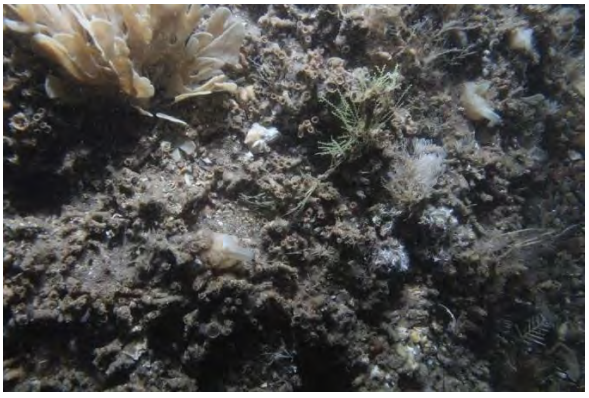
Table 3 Maximum abundance (SACFOR scale) and number of records (tow sections) of the most frequently occurring taxa (all tows) for each biotope (number of brackets denotes the total number of tow sections where the biotope was recorded). Only includes data for biotopes that were wholly assigned to a tow section (i.e. not SS.SMx.CMx.OphMx).

Taxa	Maximum abundance	XFa (6)	SspiMx (1)	ModMx (5)	CMx (30)	FluHyd (1)
Porifera (enc)	F	4	1	4	17	
Porifera	O	2		5	10	
Hymedesmia paupertas	R	2	1	5	5	
Dysidea fragilis	F	2	1	5	3	
Hydrozoa	C	3	1	2	12	
Nemertesia antennina	F	4	1	4	11	
Abietinaria abietina	C	4	1	3	19	1
Hydrallmania falcata	C	3	1	5	23	1
Sertularella gayi	C	4	1	1	16	
Sertularia argentea	C	1	1	5	18	1
Alcyonium digitatum	A	3	1	5	15	1
Actiniaria	F	2		3	10	
Urticina felina	F	2	1	5	18	1
Capnea sanguinea	O	1	1	4	16	1
Sagartia elegans	O	2	1	3	9	
Hormathia coronata	F	4	1	5	9	

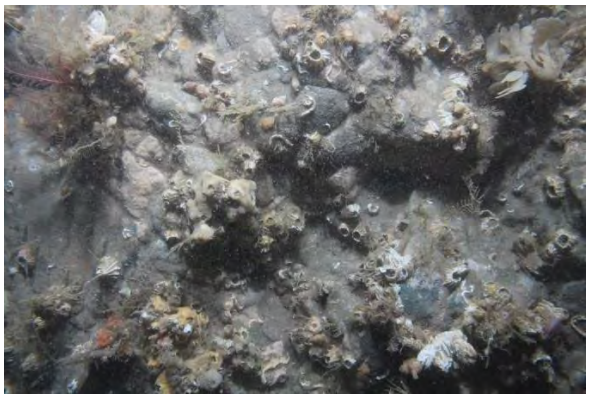
Taxa	Maximum abundance	XFa (6)	SspiMx (1)	ModMx (5)	CMx (30)	FluHyd (1)
Sabellaria spinulosa	A	3	1		15	1
Sabella pavonina	C	3	1	2	8	1
Serpulidae	F	3		3	12	1
Spirobranchus	C	4	1	5	24	1
Balanus balanus	F	4	1	5	20	1
Balanus crenatus	O	4	1	2	14	
Pandalus	F	4	1	5	18	1
Paguridae	F	2	1	1	15	1
Ebalia	F	3		4	12	
Inachus	C	3	1	5	8	
Polyplacophora	O	1	1	1	9	
Gibbula magus (/tumida)	O	2			9	
Gibbula cineraria	O	1			10	1
Calliostoma zizyphinum	F	4	1	5	16	1
Buccinum undatum	F	2		4	13	1
Modiolus modiolus	A			5	5	
Chlamys	O	3	1		9	
Aequipecten opercularis	O			1	6	1
Anomiidae	R			1	9	
Bryozoa (enc)	C	4	1	4	23	
Crisia	C	4	1		9	
Pentapora foliacea	R		1		1	
Eucratea loricata	F	3	1	1	12	1
Electra pilosa	F	3	1	1	24	1
Flustra foliacea	C	4	1	4	18	1
Cellaria	C	4	1		5	
Crossaster papposus	C	1		2	9	1
Henricia	F	3		5	7	
Asterias rubens	C	2	1	5	12	
Psammechinus miliaris	C	2		5	9	
Echinus esculentus	C	3		1	5	
Ascidiacea	C	3	1	5	15	1
Ascidia conchilega	C	2		5	8	
Polycarpa pomaria	C	4	1	5	16	1
Dendrodoa grossularia	F	2	1	2	16	1
Total number of taxa recorded		**55**	**52**	**82**	**108**	**27**
Average number of taxa per section		**37**	**52**	**48**	**31**	**27**

5.2. Representative images of the habitats and characterising species

Tow 19 *Modiolus* reef, with *Alcyonium*, sponges, ascidians, hydroids and snails

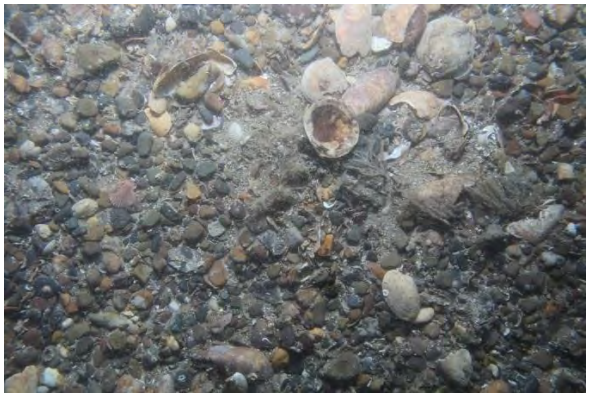


Tow 4 *Sabellaria* reef, with *Flustra, Sertularella gayi* and *Polycarpa pomaria*



Tow 5 Bedrock, with barnacles, sponges, hydroids and bryozoa

Tow 26 Mixed sediment with *Spirobranchus*, encrusting bryozoa and hydroids



Tow 8 Mixed sediment with sparse hydroids

Tow 13 Mixed sediment with *Capnea sanguinea*

Tow 10 Mixed sediment with hydroid and bryozoan turf

Tow 17 Mixed sediment with *Flustra* and *Hydrallmania*

Tow 17 Mixed sediment with *Urticina*, *Eucratea* and barnacles

Tow 3 Mixed sediment with *Ophiothrix fragilis*

6. Conclusions

The habitats recorded during this survey were broadly similar to those recorded in other surveys nearby, notably the Countryside Council for Wales / JNCC survey carried out to the North West of Anglesey in 2009 (Ramsay et al., in prep.), the JNCC 2008 North Anglesey survey (Blyth-Skyrme et al. 2008), the 2008 EIR Grid Cable Corridor Survey (Fugro, 2009) and the 2004 SEA6 survey (Rees 2005). All of these studies recorded seabed habitats that were often a mixture of coarse sediments, gravel, pebbles, cobbles and boulders with both live and empty *Modiolus* shell aggregations. Areas of *Sabellaria spinulosa* crusts and / or reef were also recorded in this and other surveys off the coast of Anglesey, with more extensive areas of reef being recorded more recently in Church Bay to the north of Holyhead by NRW in 2016 (Gouge et al in prep).

Records of *Modiolus modiolus* in this particular location were first noted during a survey conducted by the EIR Grid East West Interconnector Project in 2008, when a number of video transects were conducted following multibeam and sidescan sonar survey that had originally identified an area of potential biogenic reef extending to approximately 185,006 m^2. The EIR Grid surveys identified large areas of dead shell, with smaller extents of live mussel bed (approximately 15% of the area surveyed contained live mussel reef) in the same or similar locations to those identified during the current NRW survey. The large areas of shell around smaller patches of live *Modiolus* suggest that this bed was once extensive and healthy, though

the absence of previous data from this area makes it difficult to determine when and why the area of live mussels declined.

In terms of biotopes identified in the present study, the *Modiolus* reef was assessed as SS.SBR.SMus.ModMx (*Modiolus modiolus* beds on open coast circalittoral mixed sediment), compared with SS.SBR.SMus.ModCvar (*Modiolus modiolus* beds with *Chlamys varia*, sponges, hydroids and bryozoans on slightly tide-swept circalittoral mixed substrata) during the EIR Grid survey. The differences in assigned biotopes were due to differences in epifauna associated with the areas of live *Modiolus* reef; *Chlamys varia* was found to be present amongst live *Modiolus* during the EIR Grid surveys, but this species was not recorded on any areas of live mussel bed in the NRW survey (though was recorded as occasionally present at other mixed sediment sites). The 'ModMx' biotope is usually associated with open coast mussel beds, occurring in environments with greater wave exposure or higher tidal velocities than other *Modiolus* biotopes. 'ModCvar' is often associated with more sheltered environments found in e.g. sea lochs or embayments, though has also previously been assigned to some areas of the *Modiolus* bed off the Lleyn peninsula in Wales. Given the high tidal flows experienced in the survey area off North Anglesey, and the fauna observed during the NRW survey, the 'ModMx' classification was deemed the most appropriate designation for this site. 'ModMx' was also recorded in similar conditions during the 2009 CCW / JNCC survey off North West Anglesey. Other biotopes identified during the survey fitted well with those found elsewhere off the coast of Anglesey, and are typical of the high tidal flows, water depths and sediment types found in the area.

7. References

Blyth-Skyrme, V., Lindenbaum, C., Verling, E., Van Landeghem, K., Robinson, K., Mackie, A., Darbyshire, T. 2008. Broad-scale biotope mapping of potential reefs in the Irish Sea (north-west of Anglesey). JNCC Report No 423

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Fugro Ltd. (2009). EIR Grid East West Interconnector project: Habitat Investigation Results. Volume 1 of 5. Report Number: 9617V1.1

Lindenbaum C., Bennell J.D., Rees E.I.S., McClean D., Cook W., Wheeler A.J. and Sanderson W.G. (2008) Small-scale variation within a *Modiolus modiolus* (Mollusca: Bivalvia) reef in the Irish Sea. I. Seabed mapping and reef morphology. Journal of the Marine Biological Association of the United Kingdom 88, 133–141.

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8. Appendix 1

8.1. Video and still analysis summary Table.

The following table contains a summary of the video and still image data collected during each video tow section.

Sample Reference	V.RM_3-S1	V.RM_3-S2	V.RM_2_S1	V.RM_4_S1
Tow Number (Field log)	3	3	2	4
Tow segment No.	3.1	3.2	2.1	4.1
Habitat name	Mixed sediment with dense empty Modiolus shell and sparse fauna	Cobbles and occasional boulders with abundant faunal turf	Mixed sediment with small areas of very low lying bedrock with diverse faunal turf	Mixed sediment with hydroids and bryozoans
Depth (m)	47 - 47.6	47 - 47.6	42.8 - 45.8	43.7 - 45.9
Habitat description	Mixed sediment with dense empty Modiolus shell, small numbers of Ophiothrix fragilis. Occasional cobbles.	Cobbles with occasional boulders and bedrock with abundant faunal turf dominated by hydroids and Alcyonium digitatum. Areas of mixed sediment between.	Mixed sediment with small areas of very low lying bedrock, some scoured, but mostly with diverse faunal turf dominated by hydroids. Sediment comprising pebbles, gravel, sand and empty Modiolus shell.	Level seabed of tideswept gravel, pebbles and empty shells (particularly Modiolus), with sparse fauna
Lat_start (Field log)	53.6028	53.6025	53.5989	53.5989
Long_start (Field log)	-4.4669	-4.4677	-4.4637	-4.4570
Lat_end (Field log)	53.6025	53.6023	53.5991	53.5991
Long_end (Field log)	-4.4677	-4.4683	-4.4667	-4.4595
Biotope 1	SS.SMx.CMx	CR.HCR.XFa	SS.SMx.CMx	SS.SMx.CMx
Certain / Uncertain 1:	Certain	Certain	Certain	Certain
Applicable to Part / Whole of habitat 1:	Whole	Part	Part	Whole
Biotope 2		SS.SMx.CMx	CR.HCR.XFa	
Certain / Uncertain 2:		Certain	Uncertain	
Applicable to Part / Whole of habitat 2:		Part	Part	
Annex 1 reef present? (Y/N/uncertain)	No	Yes	Uncertain	No

Sample Reference	V.RM_4_S2	V.RM_48_S1	V.RM_5_S1	V.RM_6&7_S1
Tow Number (Field log)	4	48	5	678
Tow segment No.	4.2	48.1	5.1	6&7.1
Habitat name	Sabellaria spinulosa reef on mixed sediment	Mixed sediment with areas of dense empty Modiolus shell	Very low lying bedrock with diverse faunal turf	Mixed sediment with patches of dense empty Modiolus shell
Depth (m)	43.7 - 45.9	43.6 - 46.1	44.1 - 46	68.2 - 70.6
Habitat description	Sabellaria spinulosa reef on mixed sediment (underlying subtrata not visible) with diverse fauna dominated by hydroids and bryozoans.	Mixed sediment with areas of dense empty Modiolus shell. Larger cobbles with hydroid and bryozoan turf and other fauna.	Very low lying bedrock with diverse faunal turf with patches of mixed sediment between.	Mixed sediment with patches of dense empty Modiolus shell. Occasional cobbles with diverse faunal turf dominated by hydroids and ascidians. Very silty in places, making analysis difficult.
Lat_start (Field log)	53.5991	53.5955	53.6024	53.6167
Long_start (Field log)	-4.4595	-4.4551	-4.4569	-4.4437
Lat_end (Field log)	53.5992	53.5959	53.6024	53.6164
Long_end (Field log)	-4.4609	-4.4515	-4.4542	-4.4337
Biotope 1	SS.SBR.PoR.SspiMx	SS.SMx.CMx	CR.HCR.XFa	SS.SMx.CMx
Certain / Uncertain 1:	Certain	Certain	Certain	Certain
Applicable to Part / Whole of habitat 1:	Whole	Whole	Whole	Whole
Biotope 2				
Certain / Uncertain 2:				
Applicable to Part / Whole of habitat 2:				
Annex 1 reef present? (Y/N/uncertain)	Yes	No	Yes	No

Sample Reference	V.RM_8_S1	V.RM_10_S1	V.RM_11_S1	V.RM_13_S1
Tow Number (Field log)	678	10	11	13
Tow segment No.	8.1	10.1	11.1	13.1
Habitat name	Mixed sediment with hydroids and other faunal turf	Mixed sediment with hydroids and mixed faunal turf	Mixed sediment seabed with boulders and cobbles with diverse faunal turf	Mixed sediment with empty Modiolus shell
Depth (m)	63.1 - 66.3	54.1 - 57.2	52.5 - 55.1	55 - 55.3
Habitat description	Mixed sediment with occasional very low lying bedrock and cobbles. Faunal turf dominated by hydroids.	Mixed sediment with hydroids and mixed faunal turf on larger cobbles. Empty Modiolus shell throughout, with some dense patches. Small numbers of Sabellaria spinulosa present in one area.	Mixed sediment seabed with boulders and cobbles. Abundant faunal turf dominated by hydroid/bryozoan turf and sponges.	Tideswept level seabed of sandy pebbles, gravel and whole shells, with sparse fauna of hydroids and erect and encrusting bryozoa. More cobbles near end of tow, and small patches of Sabellaria reef.
Lat_start (Field log)	53.6165	53.5816	53.5855	53.5888
Long_start (Field log)	-4.4309	-4.4317	-4.4162	-4.3994
Lat_end (Field log)	53.6154	53.5820	53.5855	53.5883
Long_end (Field log)	-4.4275	-4.4294	-4.4187	-4.4021
Biotope 1	SS.SMx.CMx	SS.SMx.CMx	SS.SMx.CMx	SS.SMx.CMx
Certain / Uncertain 1:	Certain	Certain	Certain	Certain
Applicable to Part / Whole of habitat 1:	Part	Whole	Part	Whole
Biotope 2	CR.HCR.XFa		CR.HCR.XFa	
Certain / Uncertain 2:	Uncertain		Certain	
Applicable to Part / Whole of habitat 2:	Part		Part	
Annex 1 reef present? (Y/N/uncertain)	Uncertain	No	Yes	No

Sample Reference	V.RM_13_S2	V.RM_15_S1	V.RM_17_S1	V.RM_18_S1
Tow Number (Field log)	13	15	17	18
Tow segment No.	13b	15.1	17.1	18.1
Habitat name	Mixed sediment with empty Modiolus shell	Mixed sediment with empty bivalve shell with sparse fauna	Mixed sediment with Hydrallmania falcata and Flustra foliacea	Mixed sediment with Alcyonium digitatum
Depth (m)	55.2-55.9	50 - 51.7	52 - 53	50.9 - 51.6
Habitat description	Tideswept level seabed of sandy pebbles, gravel and whole empty shells, including Modiolus, with sparse fauna.	Mixed sediment with empty bivalve shell with hydroids. Larger cobbles and isolated small boulders covered with Alcyonium digitatum.	Mixed sediment with Hydrallmania falcata and Flustra foliacea, and frequent Alcyonium digitatum. Empty Modiolus shell dense in patches.	Mixed sediment with Alcyonium digitatum and hydroids on larger cobbles and isolated boulders. Small patches of bare rock showing in places.
Lat_start (Field log)		53.5893	53.5925	53.5893
Long_start (Field log)		-4.3866	-4.3828	-4.3718
Lat_end (Field log)		53.5885	53.5923	53.5890
Long_end (Field log)		-4.3885	-4.3863	-4.3765
Biotope 1	SS.SMx.CMx	SS.SMx.CMx	SS.SMx.CMx.FluHyd	SS.SMx.CMx
Certain / Uncertain 1:	Certain	Certain	Uncertain	Certain
Applicable to Part / Whole of habitat 1:	Whole	Whole	Whole	Whole
Biotope 2				
Certain / Uncertain 2:				
Applicable to Part / Whole of habitat 2:				
Annex 1 reef present? (Y/N/uncertain)	No	No	No	No

Sample Reference	V.RM_19_S1	V.RM_24_S1	V.RM_23_S1	V.RM_27_S1
Tow Number (Field log)	19	24	23	27
Tow segment No.	19.1	24.1	23.1	27.1
Habitat name	Modiolus modiolus on mixed sediment with Chalmys varia, Alcyonium digitatum and sponges	Mixed sediment with empty Modiolus shell	Modiolus modiolus on mixed sediment	Modiolus modiolus and empty shell on mixed sediment with Alcyonium digitatum, Chlamys varia and sponges
Depth (m)	51.6 - 52.7	50.3 - 50.7	50 - 50.6	48.5 - 49.1
Habitat description	Modiolus modiolus on mixed sediment with Chalmys varia, Alcyonium digitatum and sponges being the dominant faunal turf. Psammechinus miliaris frequent.	Mixed sediment with empty Modiolus shell, and very rare single live Modiolus. Isolated large cobbles and small boulders with faunal turf.	Modiolus modiolus on mixed sediment with Alcyonium digitatum and sponges.	Modiolus modiolus and empty shell on mixed sediment with Alcyonium digitatum, Chlamys varia and sponges.
Lat_start (Field log)	53.5926	53.5894	53.5930	53.5932
Long_start (Field log)	-4.3709	-4.3615	-4.3583	-4.3376
Lat_end (Field log)	53.5926	53.5899	53.5933	53.5934
Long_end (Field log)	-4.3667	-4.3593	-4.3558	-4.3364
Biotope 1	SS.SBR.SMus.ModMx	SS.SMx.CMx	SS.SBR.SMus.ModMx	SS.SBR.SMus.ModMx
Certain / Uncertain 1:	Certain	Certain	Certain	Uncertain
Applicable to Part / Whole of habitat 1:	Whole	Whole	Whole	Whole
Biotope 2				
Certain / Uncertain 2:				
Applicable to Part / Whole of habitat 2:				
Annex 1 reef present? (Y/N/uncertain)	Yes	No	Yes	Uncertain

Sample Reference	V.RM_27_S2	V.RM_29_S1	V.RM_39_S1	V.RM_9_S1
Tow Number (Field log)	27	29	39	9
Tow segment No.	27.2	29.1	39.1	9.1
Habitat name	Mixed sediment with little fauna	Mixed sediment with areas of dense empty Modiolus modiolus shell	Mixed sediment with scattered Ophiothrix fragilis and faunal turf	Mixed sediment with very rare small patches of Sabellaria spinulosa
Depth (m)	49.30-49.89	47.8 - 48.6	49.2 - 49.3	52.7 - 52.9
Habitat description	Tideswept mixed sediment with little fauna. Many empty Modiolus modiolus shell.	Tideswept and fairly mobile mixed sediment with areas of dense empty Modiolus modiolus shell. Occasional large cobbles and small boulders with Alcyonium digitatum and other faunal turf.	Mixed sediment with scattered Ophiothrix fragilis in the first half of the tow. Alcyonium digitatum, hydroids and sponges the dominant fauna on the pebbles and cobbles. Live Modiolus at the very end of the tow signifying the possible start of a bed.	Mixed sediment with very rare small patches of Sabellaria spinulosa and occasional empty Modiolus shell.
Lat_start (Field log)		53.5935	53.5964	53.6269
Long_start (Field log)		-4.3242	-4.3681	-4.3666
Lat_end (Field log)		53.5948	53.5977	53.6272
Long_end (Field log)		-4.3226	-4.3663	-4.3696
Biotope 1	SS.SMx.CMx	SS.SMx.CMx	SS.SMx.CMx	SS.SMx.CMx
Certain / Uncertain 1:	Certain	Certain	Certain	Certain
Applicable to Part / Whole of habitat 1:	Whole	Whole	Whole	Whole
Biotope 2				
Certain / Uncertain 2:				
Applicable to Part / Whole of habitat 2:				
Annex 1 reef present? (Y/N/uncertain)	No	No	No	No

Sample Reference	V.RM_9_S2	V.RM_9_S3	V.RM_20_S1	V.RM_44_S1
Tow Number (Field log)	9	9	20	44
Tow segment No.	9.2	9.3	20.1	44.1
Habitat name	Large cobbles and small boulders with hydroid and bryozoan turf	Ophiothrix fragilis on mixed sediment	Patchy clumps of Modiolus modiolus on mixed sediment	Modiolus modiolus reef with Alcyonium digitatum and mixed faunal turf
Depth (m)	52.7 - 52.9	52.7 - 52.9	50.1 - 50.1	50.4 - 51.1
Habitat description	Large cobbles and small boulders with hydroid and bryozoan turf. Area not thought to be large enough to be labelled Annex 1 Reef.	Areas of dense Ophiothrix fragilis on mixed sediment.	Patchy clumps of Modiolus modiolus on mixed sediment with Alcyonium digitatum	Modiolus modiolus reef with Alcyonium digitatum and mixed faunal turf, mainly solitary ascidians and sponges.
Lat_start (Field log)			53.5961	53.5958
Long_start (Field log)			-4.3738	-4.3782
Lat_end (Field log)				53.5967
Long_end (Field log)				-4.3815
Biotope 1	CR.HCR.XFa	SS.SMx.CMx.OphMx	SS.SBR.SMus.ModMx	SS.SBR.SMus.ModMx
Certain / Uncertain 1:	Certain	Certain	Certain	Certain
Applicable to Part / Whole of habitat 1:	Whole	Part	Whole	Whole
Biotope 2		SS.SMx.CMx		
Certain / Uncertain 2:		Certain		
Applicable to Part / Whole of habitat 2:		Part		
Annex 1 reef present? (Y/N/uncertain)	No	No	Yes	Yes

Sample Reference	V.RM_44_S2	V.RM_26_S1	V.RM_22_S1	V.RM_22_S2
Tow Number (Field log)	44	26	22	22
Tow segment No.	44.2	26.1	22.1	22.2
Habitat name	Mixed sediment with some live Modiolus modiolus and areas of dense empty Modiolus shell	Circalittoral mixed sediment with Spirobranchus and encrusting bryozoa on larger pebbles and cobbles	Mixed sediment with dense empty Modiolus shell	Mixed sediment with dense empty Modiolus shell
Depth (m)	50.4 - 51.1	49.5 - 49.5	50.02	50.02-50.33
Habitat description	Mixed sediment with some live Modiolus modiolus and areas of dense empty Modiolus shell.	Tideswept and fairly mobile circalittoral mixed sediment with Spirobranchus and encrusting bryozoa on larger pebbles and cobbles.	Tideswept, unconsolidated (fairly mobile) whole dead shells (particularly Modiolus), pebbles and coarse sand, with sparse fauna of encrusting bryozoa (mostly dead), Spirobranchus (mostly dead), and occasional gastropods	Tideswept and unconsolidated (fairly mobile) whole dead shells (particularly Modiolus), pebbles and coarse sand, with sparse fauna.
Lat_start (Field log)		53.5966	53.5963	
Long_start (Field log)		-4.3459	-4.3502	
Lat_end (Field log)			53.5959	
Long_end (Field log)			-4.3559	
Biotope 1	SS.SMx.CMx	SS.SMx.CMx	SS.SMx.CMx	SS.SMx.CMx
Certain / Uncertain 1:	Certain	Certain	Certain	Certain
Applicable to Part / Whole of habitat 1:	Whole	Whole	Whole	Whole
Biotope 2				
Certain / Uncertain 2:				
Applicable to Part / Whole of habitat 2:				
Annex 1 reef present? (Y/N/uncertain)	No	No	No	No

Sample Reference	V.RM_22_S3	V.RM_21_S1	V.RM_25_S1	V.RM_25_S2
Tow Number (Field log)	22	21	25	25
Tow segment No.	22.3	21.1	25.1	25.2
Habitat name	Mixed sediment with empty Modiolus shell	Mixed sediment with dense empty Modiolus shell, hydroids and Flustra foliacea	Silty mixed sediment with dense empty Modiolus shell	Silty cobbles and pebbles with Alcyonium digitatum and hydroids
Depth (m)	49.92-50.94	52.1 - 54.7	51.1 - 51.7	51.1 - 51.7
Habitat description	Tideswept and fairly mobile mixed sediment with empty Modiolus shell with sparse fauna and very rare isolated live Modiolus	Mixed sediment with dense empty Modiolus shell, with fauna of hydroids and Flustra foliacea. Small cluster of larger cobbles with faunal turf. Video footage fast at times.	Silty mixed sediment with dense empty Modiolus shell	Silty cobbles and pebbles with Alcyonium digitatum and hydroids. Split from previous section due to different substrata, but still classed as a sediment habitat due to size not being enough for a reef. Empty Modiolus shell dominate end of tow.
Lat_start (Field log)		53.5998	53.5892	
Long_start (Field log)		-4.3650	-4.3483	
Lat_end (Field log)		53.5979	53.5900	
Long_end (Field log)		-4.3590	-4.3434	
Biotope 1	SS.SMx.CMx	SS.SMx.CMx	SS.SMx.CMx	SS.SMx.CMx
Certain / Uncertain 1:	Certain	Certain	Certain	Certain
Applicable to Part / Whole of habitat 1:	Whole	Whole	Whole	Whole
Biotope 2				
Certain / Uncertain 2:				
Applicable to Part / Whole of habitat 2:				
Annex 1 reef present? (Y/N/uncertain)	No	No	No	No

Sample Reference	V.RM_28_S1	V.RM_30_S1	V.RM_30_S2
Tow Number (Field log)	28	30	30
Tow segment No.	28.1	30.1	30.2
Habitat name	Mixed sediment with abundant empty Modiolus shell	Mixed sediment with little fauna	Mixed sediment with dense areas of empty Modiolus shell
Depth (m)	50.4 - 50.8	50.5 - 51.5	51.35-51.46
Habitat description	Tideswept and fairly mobile mixed sediment with abundant empty Modiolus shell on sand and gravel. Very little fauna.	Tideswept and fairly mobile mixed sediment with little fauna, abundant bivalve shell.	Tideswept and fairly mobile mixed sediment with dense areas of empty Modiolus shell. Occasional Hydrallmania falcata.
Lat_start (Field log)	53.5893	53.5935	
Long_start (Field log)	-4.3349	-4.3177	
Lat_end (Field log)	53.5896	53.5939	
Long_end (Field log)	-4.3317	-4.3165	
Biotope 1	SS.SMx.CMx	SS.SMx.CMx	SS.SMx.CMx
Certain / Uncertain 1:	Certain	Certain	Certain
Applicable to Part / Whole of habitat 1:	Whole	Whole	Whole
Biotope 2			
Certain / Uncertain 2:			
Applicable to Part / Whole of habitat 2:			
Annex 1 reef present? (Y/N/uncertain)	No	No	No

Data Archive Appendix

Data outputs associated with this project are archived in project 476, media 1553 (metadata number 118981) on server–based storage at Natural Resources Wales.

The data archive contains:

[A] The final report in Microsoft Word and Adobe PDF formats.

[B] Excel spreadsheets of data recorded during the analysis of the drop-down videos and stills, including verification data (repeated analysis of 10% of the tows) and metadata.

[C] A NBN data file containing the relevant survey details.

[D] A Marine Recorder snapshot of the survey for NRW validation purposes.

[E] An Excel spreadsheet containing the metadata for the survey and its products.

[F] A full set of images from the drop down camera, in jpg format.

[G] A full set of videos from the drop down video camera, in asf format.

Metadata for this project is publicly accessible through Natural Resources Wales' Library Catalogue http://libcat.naturalresources.wales/webview/ (English Version) and http://libcat.naturalresources.wales/cnc/ (Welsh Version) by searching 'Dataset Titles'. The metadata is held as record no [NRW to insert this number]

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B.3. Benthic ecology, Fish and shellfish and Physical processes EWG meeting 2

B.3.1 Meeting minutes

MINUTES OF MEETING

Security Classification:
Project Internal

Partners in UK offshore wind

MOM Number	:	20221129_Morgan and Mona EP_BE, FSF, PP EWG02	**REV. No.** :	F03
MOM Subject	:	Morgan generation and Mona Evidence Plan Benthic, fish and shellfish and physical processes expert working group meeting 2.		

MINUTES OF MEETING

MEETING DATE	:	29/11/2022
MEETING LOCATION	:	Microsoft Teams
RECORDED BY	:	[redacted] (RPS)
ISSUED BY	:	[redacted] (RPS)

PERSONS PRESENT:

- [redacted] – bp (MP)
- [redacted] – bp (IG)
- [redacted] – RPS (KL)
- [redacted] – RPS (ST)
- [redacted] – RPS (KR)
- [redacted] – RPS (LS)
- [redacted] – RPS (AP)
- [redacted] – RPS (TH)
- [redacted] – RPS (NS)
- [redacted] – MMO (APrice)
- [redacted] – MMO (RG)
- [redacted] – Natural England (AuB)
- [redacted] – Natural England (LB)
- [redacted] – Natural England (EW)
- [redacted] – JNCC (JW)
- [redacted] – NRW (LR)
- [redacted] – NRW (RN)
- [redacted] – NRW (JI)
- [redacted] – NRW (LN)
- [redacted] – NRW (IN)
- [redacted] – Cefas (GE)
- [redacted] – Cefas (PM)
- [redacted] – Cefas (PW)
- [redacted] – Cefas (JW)
- [redacted] – TWT (BC)
- [redacted] – IoM (PD)

APOLOGIES

- [redacted] – bp (GV)

ITEM NO:	DISCUSSION ITEM:	Responsible party	Date
1.	**Project update (presented by IG)** bp are working with EnBW in a 50/50 partnership (the Applicants) to develop the Morgan Offshore Wind Project Generation Assets ('Morgan (Generation Assets)')and the Mona Offshore Wind Projects ('Mona'), which are being progressed as two separate projects. Morgan (Generation Assets) is the northern project located in English waters, and Mona is the southern project located mostly in Welsh waters. Together, they will have a combined capacity of 3GW. The Morgan Offshore Wind Project and the Morecambe Offshore Windfarm (developed by Cobra Instalaciones Servicios, S.A. and Flotation Energy plc) have been scoped into the Pathways to 2030 workstream under the Offshore Transmission Network Review (OTNR). Under the OTNR, the National Grid Electricity System Operator is responsible for conducting a Holistic Network Design Review to assess options to improve the coordination of offshore wind generation connections and transmission networks. The output of this process concluded that the Morgan Offshore Wind Project and the Morecambe Offshore Windfarm should share a transmission assets route corridor to a shared grid connection location at Penwortham in Lancashire. Both projects support the Holistic Network Design Review conclusions and intend to collaborate on a shared route corridor. The Morgan and Morecambe Transmission Assets project will be subject to a separate DCO. This consenting approach will provide a formal structure for the projects to collaborate, allows for integrated consideration of cumulative effects and streamlining the process with a single consent which should be simpler for stakeholders. The Applicants therefore intend to set up a separate Evidence Plan Process (EPP) to cover the Morgan and Morecambe Transmission Assets. The Mona and Morgan (Generation Assets) EPP will progress as planned and be separate from the Morgan and Morecambe Transmission Assets EPP. Mona is being taken forward as a separate DCO including both the generation and transmission assets. The individual Morgan (Generation Assets) and Mona PEIR submissions will be at the end of Q1 2023. The two PEIR submissions have been aligned to allow the Applicant to properly consider the cumulative effects between the projects. The Morgan and Morecambe Transmission Assets PEIR is likely to be submitted in Q3 2023.		

2.	**Project updates: cable corridor (Presented by KL)** The slides present a reminder of the overview of the constraints in the Mona Offshore Cable Corridor as presented to the Steering Group in July 2022. The project engineers have not yet been able to fully consider the site specific and geophysical and geotechnical surveys along the Mona cable route. The intention is that the project design updates will be discussed with the wider EWG next year. Does the whole EWG want to be involved in that discussion or should this be a meeting with NRW? It is not feasible to avoid the Y Fenai a Bae Conwy/ Menai Strait and Conwy Bay SAC. The Mona Offshore Cable Corridor goes through the edge of Constable Bank and the northeast corner of the SAC (with no overlap with the known Annex I features within the SAC – though this will be confirmed through site specific surveys). KL noted (via slides presented from the Steering Group meeting in July 2022) the constraints in the nearshore area which has led to the routing of the cable within Constable Bank and the SAC. KL noted that all assessments etc in the presentation are initial outputs and may be tweaked slightly between the EWG and PEIR. It should also be noted that for the Constable Bank and the SAC the assessment outputs are based on the worst case scenario and we would be looking to refine the project envelope based on the sites specific geophysical and geotechnical data (currently being analysed).	**EWG members to feedback on if they would like to be involved in a discussion on the Mona Offshore Cable Corridor and engineering discussions re Constable Bank and the SAC (given this is primarily in NRW (A)'s remit).**	Complete
3.	**Mona and Morgan generation Physical processes (Presented by NS)** We have undertaken a very similar process between the Morgan generation assets and the Mona Offshore Wind Project therefore this section on physical processes will cover both projects. The project that best demonstrates the methodology being outlined will be presented. The modelling that has been undertaken is proportionate to the assessment to determine likely significant effects. It has been split into physical processes receptors and physical processes as a pathway to other impacts that are considered in other topic assessments e.g. increases in suspended sediments which is assessed in benthic ecology. The study area has been extended from that presented in the scoping report to one spring tidal excursion from the Mona or Morgan Array Areas. The model domain covered a much greater area to ensure that if any impacts did go beyond one spring tidal excursion, then they would be captured. A technical report will be included as an annex in the Preliminary Environmental Information Report (PEIR) for each of the two projects which will show the full detail of the model development and outputs. The models were calibrated to ensure they were fit for purpose, and this is presented in a number of sections in the technical report of the PEIR. Impacts on the wave climate were assessed for long term and short-term return period events. The sediment transport is governed by the		

	residual current and modelling quantified this over the spring tidal cycle. We have used EMODnet data and site-specific data to identify the sediment types and they were classified using the British Geological Society database. <u>Modelling approach for the operations phase</u> The slides present the indicative layout that was used to undertake the modelling. We have applied changes to the bathymetry where the scour and cable protection would be included. JI- What is the resolution of the model. NS- It varies across the sites within the array areas. It goes down to 5m so it will pick up the cable protection, but the infrastructure features will be represented by 'sub-cell structures'. KL- This resolution is for the array areas. For the PEIR, we don't have the site-specific data for the offshore cable corridors. For the Mona offshore cable corridor we have used 2m resolution data which is 3 years old. The influence on wave climates depends on the direction of the waves and alignment of the wind turbines. We have also modelled the impact on the combined waves and tides. Currents increased in front of the structures and decreased in the lee of the structure. JI- What is the water depth and the Morgan and Mona Array Areas? KL- 45-50m across the Morgan and Mona Array Areas. To model suspended sediment plumes we have modelled seabed preparation activities, drilling for piled foundations and cable trenching. Under calm conditions the suspended sediment concentrations in the Irish Sea are 5mg/l. In storm conditions this goes up to 30mg/l. We have chosen a selection of modelled pile-locations based on the alignment with each other and the tides in order to assess the maximum design scenario (MDS) and the full range of potential conditions. It has been assumed that the sediment is the finest representative material as this will create the largest plumes. This all adds up to several layers of precaution in the assessment. The conclusions of the modelling were that sediments will remain within the sediment cell. JI-does the model include for scour protection? NS- The scour protection is included in the model. The need for scour protection is part of the design of the projects so we haven't modelled with and without scour protection. <u>Constable Bank</u> We have used the 2019-2020 UKHO data for the model for the Mona Offshore Cable Corridor. The site-specific data will be available to verify the data used in the modelling for the purposes of the Environmental Statement. The site-specific data for the section of the Mona Offshore Cable Corridor that runs through the Constable Bank		

	has been reviewed early and it looks almost identical to the 2019 UKHO data which is what has been used for modelling in the PEIR. When you look at the older data, the net movement of the bank is almost nothing. This gives us confidence on how deep the cables need to be buried to avoid the mobile sediments of the bank. JI-What are the heights of the sandwaves? NS- The largest ones are about 5m. From the analysis of the previous surveys, the sandbank itself is stable, it's just the sandwaves that are mobile. KL- This is one of the data sets that the cable engineers are reviewing to understand which of the sandwaves would need clearance works and how to install the cable below the mobile seabed layer. The cable routing has been undertaken specifically to reduce the overlap with the main bank feature for environmental considerations and practical engineering considerations. Modelling has been undertaken assuming dredging along the whole Mona Offshore Cable Corridor at an average depth of 5.1m, at 100m/h along a 104 wide route to take off all the mobile sediment features. This a conservative worst case scenario. We have also modelled cable trenching along the Mona Offshore Cable Corridor. Suspended sediment concentrations increase as trenching comes closer to shore as water depth decreases. We have modelled a 3m wide, 3m deep v-shaped trench at an installation rate of 450m/h. JI- Do you have any indication of the cable protection measures that might be needed along the Mona Offshore Cable Corridor? Would cable protection been required on the Constable Bank? KL-The MDS that has been considered in the PEIR does not include the engineer's consideration of the site-specific data. There are provisions for cable protection in the Mona Offshore Cable Corridor particularly with regards to Benthic Ecology. JI- Need to be mindful of the change to the seabed and change to sediment transport even if the cable protection is buried. Would it cause a change to the sandwaves on the bank? NS- As it's a sandbank, you would likely be able to achieve the burial depth required. However material is mobile, the protection (if required) may initially present a barrier to sediment movement, but the sediment will find its way over the barrier as there is high bed load movement. JI- NRW would be interested in how far away the cable protection would need to be from Constable Bank before there is no impact to the sediments on the bank. The cumulative assessment study area has considered in excess of two spring tidal excursions. Within the cumulative assessment, we undertake a "two stage" screening to identify cumulative projects and		

	impacts. Where impacts of the project alone are considered as being negligible then that impact will be screened out of the assessment.		
4.	**<u>Mona Benthic ecology</u>** <u>Mona Benthic baseline (presented by TH)</u> The 2021 environmental survey covered the Mona Array Area. The 2022 environmental survey covered the Mona Array Area zone of influence and the Mona Offshore Cable Corridor. The surveys have consisted of grab sampling, drop down video, particle size analysis, sediment chemistry analysis and eDNA. For the PEIR, the Mona Array Area has been characterised by the site-specific data. The Mona Offshore Cable Corridor has been characterised by desk top data. The site-specific survey data for the Mona Array Area zone of influence and the Mona Offshore Cable Corridor will be consulted on with the EWG in summer 2023 and incorporated into the final Environmental Statement. The site-specific surveys showed that the benthic communities in the Mona Array Area were dominated by the polychaete-rich deep Venus community in offshore mixed sediments (PoVen) biotope. A habitats assessment also showed low resemblance stony reef at five stations in the Mona Array Area. An assessment for presence of the seapens and burrowing megafauna communities habitat concluded that it is highly unlikely that any habitat across the Mona array area constitutes anything other than a negligible resemblance to this habitat. An intertidal phase 1 survey was undertaken in 2022 at the Mona landfall location. The intertidal survey recorded a variety of communities. The majority were a mosaic of biotopes dominated by infaunal polychaetes and bivalves. In the west there is an extensive *Sabellaria alveolata* reef. The reef was estimated to be 47,473m^2. However, not all that area falls within the Mona Offshore Cable Corridor. In addition, small pockets of *Sabellaria alveolata* that were not part of the main reef and were not classified as reef, were recorded in the east of the survey area on groynes. Piddocks with sparse fauna were noted close to low water. A small patch of blue mussel beds were recorded close to low water in the west of the survey area, adjacent to the *Sabellaria alveolata* reef. The landfall overlaps with the Pensarn Site of Special Scientific Interest (SSSI) however the features of the SSSI are all above mean high water springs (MHWS), so this site has been considered under the terrestrial ecology EIA. Constable Bank and the Y Fenai a Bae Conwy/ Menai Strait and Conwy Bay SAC overlap with the Mona Offshore Cable Corridor. The Little Ormes Head SSSI and the Great Ormes Head SSSI fall within the boundary of the SAC, which is a higher designation classification, therefore the features of the SSSI have been considered in the assessment of impacts on the SAC. The features of the SAC which have been taken forward into the assessment in the PEIR		

	chapter are Annex I subtidal and intertidal reefs and Annex I sandbanks which are covered by water at low tide. LN- For the other features of the Y Fenai a Bae Conwy/ Menai Strait and Conwy Bay SAC that haven't been taken forward to the assessment, has the physical process modelling shown that the impacts on physical process doesn't reach those features. AP- Yes, the increase in suspended sediment concentrations doesn't reach the other features of the SAC as mapped by NRW. This will be re reviewed once we have the site-specific data for the Mona Offshore Cable Corridor. The assessment for PEIR adopts a precautionary approach that assumes that Annex I reefs and Annex I sandbank features could be affected, although the NRW mapping indicates no direct overlap with these features. <u>Mona Benthic impact assessment (presented by AP)</u> We have updated the list of impact included in the EIA from those that were presented in the scoping report. We have included those that were requested in the scoping opinion (e.g. EMF, heat from cables and remobilisation of sediment bound contaminants). LN- Is secondary scour and impacts on adjacent habitats being considered. AP- Modelling has been undertaken with the scour protection in place so the impact assessment of changes in physical processes includes the impact of scour protection. LN – Noted. Please ensure any potential impacts from habitat alteration are assessed in the benthic chapter by drawing from the information presented in the physical processes chapter. PD- How do you assess the connection between the potential habitat alterations and shellfish ecology e.g. if a different habitat has presented, how will this affect shellfish populations? KL- We align the different receptor groups. The fish and shellfish assessment does draw on the benthic ecology assessment and the marine mammal and birds assessments draw on the fish and shellfish assessment. The fish and shellfish assessment does consider the habitat alterations and what that means for the populations. For some species or groups of species, there will be benefits, while others (e.g. those associated with soft, sandy sediments) there will be negative implications. Accidental pollution has been scoped out. It was agreed to be scoped out in the scoping opinion. Accidental pollution will be controlled via standard management plans. The impact assessment methodology has been undertaken in line with the CIEEM 2022 guidance[1].		

[1] CIEEM (2022) Guidelines for Ecological Impact Assessment in the UK and Ireland, Terrestrial, Freshwater, Coastal and Marine. September 2018 version 1.2 updated April 2022.

	Mona Preliminary assessment outputs for subtidal important ecological features (IEFs) The preliminary outputs of the impact assessments for temporary habitat disturbance, long term habitat loss and increased SSC/sediment deposition on subtidal important ecological features IEFs were presented. All of the Isle of Man Marine Nature Reserves and Marine Conservation Zones (MCZ) are outside of the zone of influence from SSCs so while they are considered in the benthic ecology technical report they have not been taken forward to assessment. We presented a preliminary MCZ screening in in the scoping report which concluded that no MCZs would be affected. We have considered the updated physical processes modelling and underwater sound modelling for mobile features of MCZs and still conclude that no MCZs required a full MCZ assessment. PD- Will those clarifications be included in the assessment. That would make it clear that the process has been followed. AP- yes, we have a section of the chapter on designated sites which explains the reasoning for why sites have not been taken forward to the assessment. Mona Preliminary assessment outputs for Y Fenai a Bae Conwy/ Menai Strait and Conwy Bay SAC and Constable Bank The Mona Offshore Cable Corridor doesn't overlap with any of the features of the SAC, as mapped by NRW. We will revisit this when we have the site-specific data. This will be included in the assessment for the Environmental Statement and HRA. LN- When the assessments are carried out, indirect impacts from changes in physical processes impact on SAC features need to be considered. AP-We have been precautionary and have assumed in the assessment that there is overlap with the two SAC features taken forward to the assessment. The assessment on the features of the SAC and Constable Bank is precautionary as not all cables within these areas will required sandwave clearance. LN- Work has been done by NRW to update the guidance on how low resemblance rocky reef should be considered as Annex I features. GE- Will any of the infrastructure remain *in situ* after decommissioning? AP- The assumption is the foundations and cables will be removed but cable and scour protection will be left *in situ*. This has been considered in the assessment as a permanent habitat change. We can't be certain about the decommissioning plan at this time, but the worst case has been assessed.	**NRW to provide updated guidance on how low resemblance rock reef features should be considered as annex I features.**	Completed

	Mona Preliminary assessment outputs for intertidal IEFs The preliminary outputs of the impact assessments for temporary disturbance resulting from the installation of cables via open cut trenching at the landfall were presented. Effects associated with cable installation through the piddock habitat have been assessed as long term habitat loss. Bp/EnBW are investigating measures to reduce the impact on the sensitive features at the landfall e.g. micro siting around the *S. alveolata* reef. LN- The peat and clay exposures with piddocks and the blue mussel beds are protected under the Environments (Wales) Act (Section 7 habitat) and should be considered alongside the reef for micrositing around.	**The applicant to consider micrositing around the blue mussel beds and peat and clay exposures with piddocks.**	In progress
5.	**Mona Fish and shellfish (presented by KL)** The fish and shellfish study area has been updated to include the whole Isle of Man waters as per the scoping opinion. The additional data sources provided in the scoping response have been incorporated into the baseline characterisation. The site-specific data shows that the sediments are mixed, gravelly, and muddy. The Mona Array Area is not suitable for sandeel however there is lots of suitable habitat within the wider study area. There is important herring spawning grounds to the north of the Mona Array Area. Sediments are unsuitable for herring within the Mona Array Area. Additional data collected on herring larvae and spawning evidence from Northern Irish Herring Larvae Survey. These indicate that the extent of spawning grounds align well with the Coull *et al*. (1998) mapping. PD- Have the angel shark areas off north Wales been considered? KL- They have not been specifically included. They weren't included as the Mona Array Area and the Mona Offshore Cable Corridor are not in areas considered important for that species. IN- NRW have some records for angel shark but they are further inshore and around the Llyn Peninsula. Accidental pollution, underwater sound from operational wind turbines and underwater sound from vessels have been scoped out. Modelling of the proposed large wind turbines has been undertaken and the modelling shows similar results to previous studies which show little effects on fish and shellfish. Injury impacts will only occur if fish remain in close proximity to the wind turbines for long periods of time; behavioural effects not predicted to be significant based on evidence of a wide range of fish using wind farms from post construction monitoring. We have not taken this forward to the assessment as it is not going to cause a significant effect.	**NRW to provide records of angel shark in the Irish Sea**	Completed

	IN- Did they model direct drive or geared turbines. Newer turbines are direct drive which have a lower noise impact so this could be added to the justification for scoping out. KL- RPS to take this away. *Post meeting note: Underwater sound modelling for the operational wind turbine generators has been based on the methodology presented in Tougaard et al. (2020)[2]. The model is based on data acquired from wind farms using gear box technology.* <u>Mona Underwater sound</u> We consider SELpk and SELcum. The assessment criteria for injury and behavioural effects have been taken from Popper *et al* 2014[3]. The modelling includes a ramp up procedure, initial strikes through the soft start process to allow fish and marine mammals to move away from the area. The SELcum considered both fleeing fish and stationary fish as requested by the EWG. When undertaking the impact assessment, we consider more information than the qualitative fields defined by Popper *et al* 2014, including published literature on the effects of impulsive noise on fish and shellfish. IN- Are spawning areas for cod considered. KL- We do specifically consider cod, we discuss the general habitats for cod and other species that don't have the same close link to sediment types as herring and sandeels. GE- Will simultaneous and concurrent piling be modelled if that is a potential construction plan. KL- We have modelled simultaneous and concurrent piling and we will be presenting the injury ranges for both in the PEIR. We are considering both the temporal and spatial implications for piling impacts. We have noticed that for the Awel y Mor documents, they have presented impacts as a factor of area and time. They have used km^2h. Has this approach been agreed with stakeholders, it is likely to be something that is recommended for the Morgan Generation Assets and Mona Offshore Wind Projects? GE- We generally expect to see spatial and temporal maximum design scenarios presented, however we don't provide specific advice on how to do this.		

[2] Jakob Tougaard, Line Hermannsen, and Peter T. Madsenb (2020) How loud is the underwater noise from operating offshore wind turbines? The Journal of the Acoustical Society of America 148, 2885 (2020); doi: 10.1121/10.0002453

[3] Popper, A. N., Hawkins, A. D., Fay, R. R., Mann, D., Bartol, S., Carlson, Th., Coombs, S., Ellison, W. T., Gentry, R., Hal vorsen, M. B., Lokkeborg, S., Rogers, P., Southall, B. L., Zeddies, D. G. and Tavolga, W. N. (2014) ASA S3/SC1.4 TR-2014 Sound Exposure Guidelines for Fishes and Sea Turtles: A Technical Report prepared by ANSI-Accredited Standards Committee S3/SC1 and registered with ANSI. Springer and ASA Press, Cham, Switzerland.

	IN – The slides presented that the sensitivity of herring to underwater sound is medium. We would assume that herring have the highest sensitivity to underwater sound. KL- When we assign sensitivity, we look at vulnerability and recoverability which is in line with the MarESA approach. Herring is vulnerable to underwater noise, but it has high recoverability, so they are considered to have medium sensitivity. We also look at the importance of receptors in this sensitivity classification, but the medium sensitivity is largely due to the recoverability of populations following piling. MMO have advised in the Morgan Scoping Opinion that we should be considering the 135dB SELss from Hawkins, A. D. and Popper, A. N. (2016)[4]. We consider this to be highly precautionary, especially considering that the impulsive nature of the sound will dissipate and become continuous with distance from the source, the fact that response to sound does not necessarily mean avoidance and that the paper noted that experiments were undertaken in very quiet environments (in contrast to the Irish Sea). Also the authors of the paper noted that this noise level should not be used to define sound exposure criteria. Taking a risk based approach, considering both the spatial extent of the noise contours (assuming the maximum hammer energy) and the duration of piling (i.e. approx. 70 days), we are not predicting this impact to be significant. *Post meeting note from Cefas: In respect of the comment by Kevin Linnane; 'When we assign sensitivity, we look at vulnerability and recoverability which is in line with the MarESA approach. Herring is vulnerable to underwater noise, but it has high recoverability, so they are considered to have medium sensitivity. We also look at the importance of receptors in this sensitivity classification, but the medium sensitivity is largely due to recoverability of populations following piling'. In reference to the 'high recoverability' of herring, we assume that Mr Linnane means recoverability of herring populations. If this is the case, the Applicant must provide appropriate peer-reviewed literature to support this statement. Herring are considered to be highly sensitive to noise and vibration in terms of physiological and behavioural effects. It should be noted that physiological effects caused by changes in pressure from explosions and impulsive sounds such as piling include death and potential mortal injuries such as barotrauma, blood gases coming out of solution, rapid expansion and contraction of swim bladders, damage to tissue and organs, and potential rupture of the swim bladder (Popper et al., 2014). Barotrauma can result in lethal injury through either immediate, or delayed mortality (McKinstry et al. 2007). Whilst some physical injuries such as fin hematomas, capillary dilation, and loss of sensory hair cells are potentially recoverable, they can still lead to death either through a decreased level of fitness or through predation and disease*		

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Hawkins, A. D. and Popper, A. N. (2016) A sound approach to assessing the impact of underwater noise on marine fishes and invertebrates. ICES Journal of Marine Science, 74 (3): 635-651.

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	(Halvorsen, 2011 & 2012). For these reasons, herring, as a receptor, are considered to have low recoverability to underwater noise from pile driving, explosions and other impulsive sounds. *Post meeting note from Cefas: In respect of the comment by Kevin Linnane; 'MMO have advised in the Morgan Scoping Opinion that we should be considering the 145dp SELss from Hawkins, A. D. and Popper, A. N. (2016). We consider this to be highly precautionary especially considering that the impulsive nature of the sound will dissipate and become continuous with distance from the source, the fact that response to sound does not necessarily mean avoidance and that the paper noted that experiments were undertaken in very quiet environments (in contrast to the Irish Sea). Also the authors of the paper noted that this noise level should not be used to define sound exposure criteria.' The recommendation was for modelling to be carried out based on a 135dB threshold (rather than 145dB) as this is recommended by Cefas fisheries advisors as a conservative indicator for determining the impact range in which clupeid species (including herring) are likely to exhibit behavioural responses. The 135dB threshold is based on research by Hawkins et al. (2014), who exposed wild schooling sprat to short sequences of repeated impulsive playback sounds at different sound pressure levels, to resemble that of a percussive pile driver. Observed behavioural responses included the break-up of fish schools. The sound pressure levels to which the fish schools responded on 50% of the presentations were 163.2 and 163 dB re 1 µPa (peak-to-peak), and as a result the concluded single strike sound exposure level was 135 dB re 1 µPa2 ·s. 11. Cefas Fisheries and Noise and Bioacoustics advisors recognise that this is a conservative threshold as the Hawkins study was carried out in an enclosed, quiet coastal sea loch, where fish were not accustomed to heavy disturbance from shipping and other sounds (Hawkins et al., 2014). However, sprat is a clupeid species, closely related and anatomically similar to herring, and similarly sensitive to underwater sound (sprats also possess a swim bladder involved in hearing). Given an absence of other peer-reviewed empirical evidence of behavioural responses in clupeid fishes to support an alternative threshold for impulsive noise, Hawkins et al., (2014) is currently considered the best available scientific evidence by Cefas Fisheries and Underwater Noise specialists, and as such a 135dB threshold is deemed appropriate.* *Post meeting correction: The MMO Scoping response states "For the purpose of modelling behavioural responses in herring at their spawning ground, the MMO recommend the inclusion of a 135dB threshold based on startle responses observed in sprat by Hawkins et al. (2014)." The statement that the MMO have recommended a 145db threshold was a typing error in the meeting minutes that has now been corrected. A 135db threshold was what was presented in the EWG meeting and PEIR chapter, noting the caveats discussed above.*		

6.	<u>Next steps (presented by KL)</u> • Meeting minutes to be circulated 2 weeks following the EWG. • Agreement logs to be circulated following EWG. • Meeting to discuss Constable Bank and Menai Strait SAC. • Meeting to discuss Morgan Generation assessment outputs – Q1 2023. The applicant is seeking agreement on: • Agreement on approach to baseline characterisation for physical processes, benthic ecology and fish and shellfish ecology. • Agreement on impacts scoped out for benthic ecology and fish and shellfish. • Agreement on approach to noise modelling and assessment for fish and shellfish following clarifications provided in EWG.		
7.	*Post Meeting note: PD Provided additional data sources from Isle of Man Government via email to ST and KL on 29/11/2022. RPS to look to include in PEIR where possible and if not, in the final application.*		

B.3.2 Response from Natural England regarding the meeting minutes

Date: 11 January 2023
Our ref: DAS/UDS A000566 412777
Your ref: Benthic ecology, fish and shellfish, and physical processes EWG02

[redacted] and [redacted]
BP Alternative Energy Investments Limited

c/c [redacted] and [redacted]
RPS/ Energy

Hornbeam House
Crewe Business Park
Electra Way
Crewe
Cheshire
CW1 6GJ

0300 060 3900

BY EMAIL ONLY

Dear [redacted]

Discretionary Advice Service (Charged Advice) – UDS A000566
Development proposal: BP EnBW Morgan and Mona Offshore Wind Farm
Consultation: Benthic ecology, fish and shellfish, and physical processes EWG02

This advice is being provided as part of Natural England's Discretionary Advice Service in accordance with the Quotation and Agreement dated 17 May 2021 to BP Alternative Energy Investments Limited.

The following advice is based upon the information within Benthic Ecology, Fish and Shellfish Ecology and Physical Processes Expert Working Group (EWG) Meeting 2 (attended on 29th November 2022) and subsequent meeting notes provided 14th December 2022 by Samantha Tuddenham.

Natural England was asked to provide advice upon:

- Agreement on broad approach to characterisation for Benthic Ecology
- Agreement to the scoping of impacts for the EIA and HRA for Benthic Subtidal and Intertidal Ecology
- Agreement to the scoping of impacts for the EIA and HRA for Fish and Shellfish Ecology
- Agreement on approach to noise modelling and approach to assessment following clarifications provided in EWG

Detailed comments

Offshore Wind Marine Environmental Assessments: Best Practice Advice for Evidence and Data Standards

Natural England has been leading the 'Offshore Wind Marine Environmental Assessments: Best Practice Advice for Evidence and Data Standards' project, funded by Defra's Offshore Wind Enabling Actions Programme (OWEAP).

The project is providing up-front best practice advice on the way data and evidence is used to support offshore wind farm development and consenting in English waters, focussing on the key ecological receptors which pose a consenting risk for projects, namely seabirds, marine mammals, seafloor habitats and species and fish.

The project aims to facilitate the sustainable development of low impact offshore wind by increasing clarity for industry, regulators and other stakeholders over data and evidence requirements at each stage of offshore wind development, from pre-application through to post-consent.

The advice documents are currently stored on a SharePoint Online site, access to the SharePoint site needs to be requested from neoffshorewindstrategicsolutions@naturalengland.org.uk. Please allow up to three working days for requests to access the site to be granted. Natural England is currently reviewing ways of making the advice more accessible and open access.

1. **Agreement on broad approach to characterisation for Benthic Ecology.**

Natural England broadly agree with the approach to characterisation for benthic ecology as presented at the expert working group meeting on 29th November 2022.

2. **Agreement to the scoping of impacts for the EIA and HRA for Benthic Subtidal and Intertidal Ecology**

Natural England broadly agree with the scoping of impacts for the EIA and HRA for Benthic Subtidal and Intertidal Ecology, as presented at the expert working group meeting on 29th November 2022.

3. **Agreement to the scoping of impacts for the EIA and HRA for Fish and Shellfish Ecology**

Natural England broadly agree with the scoping of impacts for the EIA and HRA for Fish and Shellfish Ecology, as presented at the expert working group meeting on 29th November 2022.

4. **Agreement on approach to noise modelling and approach to assessment following clarifications provided in EWG**

Natural England agree to the approach to noise modelling and approach to assessment as presented at the expert working group meeting on 29th November 2022.

For clarification of any points in this letter, please contact me using the details provided below.

Yours sincerely,

[redacted]
Marine and Coastal Lead Adviser
Coast and Marine Team
Cheshire to Lancashire Area Team
[redacted]

☒ The advice provided in this letter has been through Natural England's Quality Assurance process

The advice provided within the Discretionary Advice Service is the professional advice of the Natural England adviser named below. It is the best advice that can be given based on the information provided so far. Its quality and detail is dependent upon the quality and depth of the information which has been provided. It does not constitute a statutory response or decision, which will be made by Natural England acting corporately in its role as statutory consultee to the competent authority after an application has been submitted. The advice given is therefore not binding in any way and is provided without prejudice to the consideration of any statutory consultation response or decision which may be made by Natural England in due course. The final judgement on any proposals by Natural England is reserved until an application is made and will be made on the information then available, including any modifications to the proposal made after receipt of discretionary advice. All pre-application advice is subject to review and revision in the light of changes in relevant considerations, including changes in relation to the facts, scientific knowledge/evidence, policy, guidance or law. Natural England will not accept any liability for the accuracy, adequacy or completeness of, nor will any express or implied warranty be given for, the advice. This exclusion does not extend to any fraudulent misrepresentation made by or on behalf of Natural England.

Cc commercialservices@naturalengland.org.uk

Annex 1
European Protected Species

A licence is required in order to carry out any works that involve certain activities such as capturing the animals, disturbance, or damaging or destroying their resting or breeding places. Note that damage or destruction of a breeding site or resting place is an absolute offence and unless the offences can be avoided (e.g. by timing the works appropriately), it should be licensed. In the first instance it is for the developer to decide whether a species licence will be needed. The developer may need to engage specialist advice in making this decision. A licence may be needed to carry out mitigation work as well as for impacts directly connected with a development. Further information can be found in Natural England's 'How to get a licence' publication.

If the application requires planning permission, it is for the local planning authority to consider whether the permission would offend against Article 12(1) of the Habitats Directive, and if so, whether the application would be likely to receive a licence. This should be based on the advice Natural England provides at formal consultation on the likely impacts on favourable conservation status and Natural England's guidance on how the three tests (no alternative solutions, imperative reasons of overriding public interest and maintenance of favourable conservation status) are applied when considering licence applications.

Natural England's pre-submission Screening Service can screen application drafts prior to formal submission, whether or not the relevant planning permission is already in place. Screening will help applicants by making an assessment of whether the draft application is likely to meet licensing requirements, and, if necessary, provide specific guidance on how to address any shortfalls. The advice should help developers and ecological consultants to better manage the risks or costs they may face in having to wait until the formal submission stage after planning permission is secured, or in responding to requests for further information following an initial formal application.

The service will be available for new applications, resubmissions or modifications – depending on customer requirements. More information can be found on Natural England's website.

B.3.3 Response from Cefas regarding the meeting minutes

From: [redacted]
To:
Cc: [redacted]
Subject: RE: Morgan Mona BE, FSF, PP EWG02 meeting
Date: 10 January 2023 14:01:45
Attachments: [redacted]

CAUTION: This email originated from outside of RPS.

Dear [redacted]

We sought input from Cefas regarding the draft meeting minutes you provided and have provided comments on the draft minutes below based on the advice we have received from Cefas. Apologies that this is being provided after 6 January – Cefas provided their comments to my colleague Adam Price and not to myself, and he was on leave when their comments were provided.

1. In respect of the comment by Kevin Linnane; '*When we assign sensitivity, we look at vulnerability and recoverability which is in line with the MarESA approach. Herring is vulnerable to underwater noise, but it has high recoverability, so they are considered to have medium sensitivity. We also look at the importance of receptors in this sensitivity classification, but the medium sensitivity is largely due to recoverability of populations following piling'.* In reference to the 'high recoverability' of herring, we assume that Mr Linnane means recoverability of herring populations. If this is the case, the Applicant must provide appropriate peer-reviewed literature to support this statement. Herring are considered to be highly sensitive to noise and vibration in terms of physiological and behavioural effects. It should be noted that physiological effects caused by changes in pressure from explosions and impulsive sounds such as piling include death and potential mortal injuries such as barotrauma, blood gases coming out of solution, rapid expansion and contraction of swim bladders, damage to tissue and organs, and potential rupture of the swim bladder (Popper *et al*., 2014). Barotrauma can result in lethal injury through either immediate, or delayed mortality (McKinstry *et al*. 2007). Whilst some physical injuries such as fin hematomas, capillary dilation, and loss of sensory hair cells are potentially recoverable, they can still lead to death either through a decreased level of fitness or through predation and disease (Halvorsen, 2011 & 2012). For these reasons, herring, as a receptor, are considered to have <u>low</u> recoverability to underwater noise from pile driving, explosions and other impulsive sounds.

2. In respect of the comment by Kevin Linnane; '*MMO have advised in the Morgan Scoping Opinion that we should be considering the 145dp SELss from Hawkins, A. D. and Popper, A. N. (2016). We consider this to be highly precautionary especially considering that the impulsive nature of the sound will dissipate and become continuous with distance from the source, the fact that response to sound does not necessarily mean avoidance and that the paper noted that experiments were undertaken in very quiet environments (in contrast to the Irish Sea). Also the authors of the paper noted that this noise level should not be used to define sound exposure criteria.'* The recommendation was for modelling to be carried out based on a 135dB threshold (rather than 145dB) as this is recommended by Cefas fisheries advisors as a conservative indicator for determining the impact range in which clupeid species (including herring) are likely to exhibit behavioural responses. The 135dB threshold is based on research by Hawkins *et al.* (2014), who exposed wild schooling sprat to short sequences of repeated impulsive playback sounds at different sound pressure levels, to resemble that of a percussive pile driver. Observed behavioural responses included the break-up of fish schools. The sound pressure

levels to which the fish schools responded on 50% of the presentations were 163.2 and 163 dB re 1 µPa (peak-to-peak), and as a result the concluded single strike sound exposure level was 135 dB re 1 µPa2 ·s. 11. Cefas Fisheries and Noise and Bioacoustics advisors recognise that this is a conservative threshold as the Hawkins study was carried out in an enclosed, quiet coastal sea loch, where fish were not accustomed to heavy disturbance from shipping and other sounds (Hawkins *et al*., 2014). However, sprat is a clupeid species, closely related and anatomically similar to herring, and similarly sensitive to underwater sound (sprats also possess a swim bladder involved in hearing). Given an absence of other peer-reviewed empirical evidence of behavioural responses in clupeid fishes to support an alternative threshold for impulsive noise, Hawkins *et al*., (2014) is currently considered the best available scientific evidence by Cefas Fisheries and Underwater Noise specialists, and as such a 135dB threshold is deemed appropriate.

References

Halvorsen M.B., Casper B.M., Woodley C.M., Carlson T.J., Popper A.N. (2011) Predicting and mitigating hydroacoustic impacts on fish from pile installations. NCHRP Res Results Digest 363, References 66 Project 25–28, National Cooperative Highway Research Program, Transportation Research Board, National Academy of Sciences, Washington, D.C.

Halvorsen M.B., Casper B.M., Woodley C.M., Carlson T.J., Popper A.N. (2012) Threshold for onset of injury in Chinook salmon from exposure to impulsive pile driving sounds. PLoS ONE 7(6):e38968.

Hawkins, A., Roberts, L., & Cheesman, S., 2014. Responses of free-living coastal pelagic fish to impulsive sounds. The Journal of the Acoustical Society of America, 135, 3101–3116. https://doi.org/10.1121/1.4870697.

McKinstry C., Carlson T., Brown R. (2007) Derivation of a mortal injury metric for studies of rapid decompression of depth-acclimated physostomous fish. PNNL-17080, Pacific Northwest National Laboratory, Richland, WA.

Popper, A.N., Hawkins, A.D., Fay, R.R., Mann, D.A., Bartol, S., Carlson, T.J., Coombs, S., Ellison, W.T., Gentry, R.L., Halvorsen, M.B., Løkkeborg, S., Rogers, P.H., Southall, B., Zeddies, D.G. & Tavolga, W.N., 2014. Asa S3/Sc1.4 Tr-2014 Sound Exposure Guidelines for World Class Science for the Marine and Freshwater Environment Pakefield Road, Lowestoft, Suffolk, NR33 0HT | www.cefas.co.uk | +44 (0) 1502 562244 V8 JL_15/03/2022 Fishes and Sea Turtles: A Technical Report Prepared by ANSI-Accredited Standards Committee S3/Sc1 a (Springerbriefs in Oceanography).

Kind regards

[redacted]se Officer | Marine Management Organisation
@ Lancaster House | Hampshire Court | Newcastle upon Tyne | NE4 7YH
8 [redacted]

B.3.4 Response from JNCC regarding the meeting minutes

From: [redacted]
To:
Cc:
Subject: RE: Morgan Mona BE, FSF, PP EWG02 meeting
Date: 04 January 2023 12:31:36
Attachments: [redacted]

CAUTION: This email originated from outside of RPS.

Hi [redacted]

Please see JNCC's response to the EWG actions below. I have also attached the updated agreement log.

EWG members to feedback on if they would like to be involved in a discussion on the Mona Offshore Cable Corridor and engineering discussions re Constable Bank and the SAC (given this is primarily in NRW (A)'s remit) (06/01/23)
Given our offshore remit, JNCC does not feel it necessary that we be involved in conversations regarding Constable Bank and Menai Strait and Conwy Bay SAC.

We are content with the minutes and have no comments to make.

Kind regards,

[redacted] (sent on behalf of [redacted]

[redacted] BSc(Hons)
Offshore Industries Adviser
Marine Management Team
JNCC, Inverdee House, Baxter Street, Aberdeen, AB11 9QA
Tel: [redacted]
Email: [redacted]

JNCC have been monitoring the outbreak of COVID-19 closely and developed a response plan. As a result, the vast majority of our staff are working from home and adhering to the government's advice on social distancing and travel restrictions. Whilst we are taking these actions we are available for business as usual. We will respond to enquiries as promptly as possible. However, there may be some delays due to the current constraints and we ask for your understanding and patience.

jncc.gov.uk

B.3.5 Response from NRW regarding Low Resemblance Stony Reef

From: [redacted]
ject: Low Resemblance Stony Reef
Date: 29 November 2022 17:18:56

CAUTION: This email originated from outside of RPS.

[redacted]

Many thanks for the presentation of information at today's BE FSF PP EWG – we recognise and appreciate the substantial amount of work that has been undertaken across the receptors discussed today.

As per one of our actions, please find below NRW's updated paragraph re. Low resemblance stony reef:

Stony reef can be categorised according to Irving (2009) with additional clarification provided by Golding et al. (2020). The criteria state that low resemblance stony reef can be included as an Annex 1 feature where there is "strong justification". NRW currently advise that any justification for inclusion of low resemblance stony reef should be based on the following:
1. the associated biological community is composed of a diverse mix of epibiota, including erect and / or branching forms, and / or
2. the substrate is relatively stable and allows longer lived or slow growing epibiota to persist.

We will respond with regards provision of data on Angelshark in due course.

Kind regards,
Leonie

[redacted]

Cyfoeth Naturiol Cymru / Natural Resources Wales
Ffôn/ Phone: *Please contact me initially via email or Teams*
[redacted]

without it leading to a delay.

B.4. Benthic ecology, Fish and shellfish and Physical processes EWG meeting 3

B.4.1 Meeting minutes

MOM Number	:	20230314_Morgan and Mona EP_BE, FSF, PP EWG03	**REV. No.** : F02
MOM Subject	:	Morgan Generation and Mona Offshore Windfarms Evidence Plan: Benthic, fish and shellfish and physical processes Expert Working Group meeting 3.	

MINUTES OF MEETING

MEETING DATE	:	14/03/2023
MEETING LOCATION	:	Microsoft Teams
RECORDED BY	:	[redacted] (RPS)
ISSUED BY	:	[redacted]

PERSONS PRESENT:

- [redacted] – RPS (KL)
- [redacted] RPS (LS)
- [redacted] – RPS (AP)
- [redacted] RPS (KR)
- [redacted] – RPS (TH)
- [redacted] – bp (GV)
- [redacted] – bp (MP)
- [redacted] – bp (SR)
- [redacted] – Natural England (KB)
- [redacted] – Natur and)
- [redacted] – Natural England (LB)
- [redacted] – NRW (LN)
- [redacted] – NRW (LR)
- [redacted] – NRW (JI)
- [redacted] NRW (IN)
- [redacted] – MMO (APrice)
- [redacted] – MMO (MS)
- [redacted] – Cefas (SB)
- [redacted] – Cefas (PM)
- [redacted] – Cefas E)
- [redacted] – Cefas (JW)
- [redacted] – Cefas (PW)
- [redacted] – JNCC (JWhyte)
- [redacted] – Cefas (CR)
- [redacted] The Wildlife Trust (BC)
- [redacted] – IoM (PD)

ITEM NO:	DISCUSSION ITEM:	Responsible party	Date

1.	The agenda will focus on Morgan Generation Assets and will not cover physical processes, as this was covered in detail in the EWG02. <u>Project update (presented by GV)</u> PEIR finalisation is currently underway for Morgan Gen and Mona, and we are on target to submit the PEIR applications mid-April. S42 will commence from mid-April through May and there is a 47-day consultation period, ending early June. In addition to addressing consultation responses, a key point for activities post PEIR will be providing feedback on the benthic ecology data from the Zone of Influence (ZoI) for Mona and Morgan Generation, and cable corridor for Mona. This 2022 data will not be included in the PEIR, so we will consult post PEIR on this additional data, in a post PEIR EWG. We will confirm how this may or may not affect the conclusion of the impact assessment and this will be presented in the next EWG, rather than in any PEIR documentation. Key milestones: We have completed the Scoping stages and are about to submit PEIR applications for both Morgan Generation and Mona. DCO applications for both projects are anticipated Q1 2024. Morgan/Morecambe Transmission Assets PEIR application is planned for Q3 2023 and the DCO application is anticipated to be submitted in Q3 2024.	-	-
2.	<u>Feedback and Actions from EWG02 (presented by KL and AP)</u> Cefas feedback – KL noted that there was a query on recoverability regarding the underwater noise assessment on fish and shellfish populations; KL agreed that for a lot of injury effects, recovery would not be expected, however, mitigation measures such as soft starts will minimise the risk of injury/mortality such that these will not result in significant effects on populations. The recovery discussed was referring to behavioural effects and we will cover this in more detail later on in the EWG. KL raised the use of 135dB SEL_{SS} (SEL single strike) metric – there was an error in the draft meeting minutes for EWG02, it should have read 135dB, not 145dB, and this has now been corrected. We have presented SEL_{SS} noise levels in the PEIR, but the use of the 135 dB noise level is heavily caveated. The study this noise level has come from was undertaken in a very quiet environment and the authors of the report also note that this level should not be used as a threshold for deciding what is/is not significant disturbance. We believe that our preferred approach in the PEIR is adequately precautionary and the presentation of the SEL_{SS} noise contours and specifically application of the 135 dB SEL_{SS} noise level is heavily caveated in the PEIR. This will be discussed later in presentation. AP discussed NRW guidance provided following the last EWG on when low resemblance stony reef can be considered as an Annex 1 feature. During the last EWG RPS presented low resemblance stony reef in Mona Array Area. RPS will consider the guidance on low resemblance stony reef and this will be incorporated in the Environmental Statement (not PEIR); to be discussed at next EWG.	-	-

3.	Benthic Ecology Baseline (presented by TH) Two site-specific surveys (grab, drop down video and eDNA) have been undertaken for the Morgan Generation project so far; a 2021 survey of the Morgan Array Area, and a 2022 survey of the Zone of Influence (ZoI). The PEIR includes the results of the 2021 array survey, and incorporates desktop data to characterise the ZoI. The final Environmental Statement will incorporate the 2022 Morgan Generation ZoI data. Subtidal biotopes maps in the Mona Array Area have been used in wider context. The Morgan Array Area is dominated by polychaete rich biotopes, with some areas of coarse sediment. There is circalittoral sandy mud biotope to the east of the Morgan Array Area. The habitat assessment identified two stations in the Morgan Array Area ZoI which showed low resemblance stony reef. All stations within the Morgan Array Area were assessed to see if they were representative of the seapens and burrowing megafauna communities habitat. Video and image analysis of burrow density found there was no evidence of any species associated with 'sea pen and burrowing megafauna communities' habitat supporting the conclusions the determination that it is highly unlikely that any habitat across the Morgan survey area constitutes anything other than a negligible resemblance to this habitat. The 2022 survey data will be reported in the next EWG, later in the summer, and reported in the final application. There are 25 designated sites within the Morgan Generation benthic subtidal and intertidal ecology study area. Only 2 have the potential to be affected by impacts from the Morgan Generation Assets, and only indirectly and are not expected to be significant. IEFs have been assigned for subtidal habitats, and for the features of the West of Walney MCZ and West of Copeland MCZ. Representative biotopes have been used in the assessment to help define the sensitivities using the MarESA.	-	-
4.	Benthic Ecology Assessment (presented by AP) Impacts have been scoped into the assessment based on the Scoping Report, but have also been updated to take on board the scoping opinion comments received from the Planning Inspectorate and the SNCBs. Three further impacts have been scoped in based on feedback received; disturbance/remobilisation of sediment-bound contaminants; electromagnetic Fields (EMF) from subsea electrical cabling; and heat from subsea electrical cables. The remainder of the presentation is focused on just a few of what we perceive to be the key impacts: temporary habitat disturbance during conduction, long term habitat loss during construction/operations and maintenance (O&M) and increased SSC and deposition during construction. Only one impact has been scoped out - accidental pollution. The risk is managed by standard post consent plans. This was agreed in the Scoping Opinion for Benthic ecology. Impact assessment approach – this is the same as presented previously for Mona and follows CIEEM 2019 guidance. Firstly, identify IEFs (which are identified in the Technical Report); secondly define the magnitude of each impact based on the MDS and PDE from engineering (defined in the chapter); next, define the sensitivity of the receptor; and lastly conclude the significance of the impact in EIA terms based on the assessment matrix shown in the slide pack.	-	-

	Temporal subtidal habitat disturbance is likely to be highest during construction and therefore this is the focus of the presentation. This may result from sandwave clearance, jack up events, pre-lay preparation, anchor placement and cable installation. Low resemblance reef IEF does not occur within the Morgan Array Area and the West of Walney MCZ and West of Copeland MCZ do not overlap with the Array Area, therefore these are not assessed for this impact. The MDS for this impact is for up to 87.36km^2 of temporary habitat disturbance. Effects will be localised, temporary and intermittent during the 4 year construction period. In our assessments we've drawn on OWF monitoring and best available data which suggests that sediments will recover which will support the recovery of associate benthic communities over time. As a result, the magnitude of this impact is therefore low and sensitivity of IEFs are low to medium. Long-term subtidal habitat loss will occur during the construction, and O&M phases of the project, but will reach peak during O&M. The assessment has been combined and assessed for both phases. The MDS for long-term habitat loss is 1.52km^2. The magnitude for long-term habitat loss is low due to the spatial extent of the impact, and the sensitivity is high because the sedimentary habitats are fully replaced with hard substrate as a result of the installation of structures. Habitat alteration may occur and this is assessed in the benthic chapter as a separate impact which considers the effects of colonisation. Increased SSC and sediment deposition will be at its highest during the construction phase. The assessment for benthic ecology is fully informed by physical processes modelling and the Technical Report which supports that. During sandwave clearance, increased SSC will be greatest during the deposition phase of this activity, with the plume predicted to extend for a tidal excursion (~20km in extent) with average increases of <500mg/l. Sedimentation will be low and may reach up to 0.5mm in the immediate vicinity, and one day following the cessation of the clearance operation levels of typically <0.01mm, are present at circa 100m distance from the release. During drilling for foundation installation, the maximum extent of a plume was predicted to extend 22km, but increases in SSC are considerably lower than for sandwave clearance. Based on modelling, the magnitude of the impact is low and sensitivity of subtidal habitat IEFs within the Morgan Array Area is negligible to low. There is potential, during flood tide and wind from the southwest, that plumes generated during construction in the east of the Morgan Array Area could extend to the western edge of the West of Walney and West of Copland MCZs. Significant dispersion is however predicted to occur prior to reaching the MCZs, with concentrations predicted to be well below 1mg/l. The magnitude of the impact on the IEFs of the MCZs is deemed to be negligible. The output of the modelling also demonstrated that the IoM Marine Nature Reserves (MNRs) are outside the ZoI so are not considered further in the assessment. The Cumulative Effects Assessment (CEA) takes into account the Morgan Generation Assets and other projects within the CEA study area (up to 50km buffer around the Morgan Array Area). The study area for interactive/synergistic cumulative impacts (i.e. increase in suspended sediment concentration (SSC) and changes in physical processes) was defined by the physical processes CEA study area which is defined as two tidal excursions. Projects which are fully constructed and operational are considered part of the baseline and are not included in the CEA (unless they have ongoing impacts such as maintenance). A number of impacts assessed as being of negligible significance for the Morgan Generation Assets alone have not been considered within the CEA.		

	A MCZ Screening report will be submitted along with PEIR which refines the preliminary screening submitted with scoping. This takes into account physical processes modelling and underwater sound modelling and considers all potential features of MCZs. Ten MCZs were identified through receptor specific screening criteria based on the ZoI. West of Copeland and West of Walney MCZ are located just over 7km from the Morgan Array Area. Physical processes modelling looked at implications on MCZs and has shown that increases in SSC in the vicinity of the West of Walney MCZ and the West of Copeland MCZ are predicted to very low and in the region of <1mg/l. Sedimentation will also be de minimis at this distance. The conclusion of the screening is that the Morgan Generation Assets is not capable of affecting (other than insignificantly) the protected features of any MCZ, therefore no sites are proposed to be taken forward to Stage 2 assessment. <u>Questions/Comments</u> PM – Noted that this all sounds positive. Cefas may have queries later in terms of where the grab imagery data and eDNA will be shown. KL – All grab sample analysis is presented in PEIR TR; for the final application the technical report will be updated with ZoI and export cable data. Raw data can be provided on request. AP- An overview of the eDNA analysis is included for reference in an appendix to the PEIR TR but is not used to inform the assessment for PEIR. The main characterisation comes from grab and drop down video.		
5.	<u>Fish and Shellfish Baseline (presented by KL)</u> The baseline and assessment presented is for Morgan Generation only; please note there is a lot of repeated information for the baseline from the previous EWG, as it is similar to Mona. The study area is the same as Mona and extended to the west to include the Isle of Man, based on Scoping responses. Morgan and Morecambe Transmission Assets are being considered separately in their own Evidence Plan. Spawning and nursery habitats in the study area are drawn from Cefas habitat mapping and recent NRW references (as provided following Scoping). Sandeel baseline – There is a mix of suitable and unsuitable sediments for sandeel spawning across the Morgan Array Area, and a reasonable amount of mud and therefore mixed sediments – not ideal for sandeel. However, there is extensive suitable habitats in the wider Fish andShellfish Ecology study area. Herring baseline – Site specific survey data shows that the Morgan Array Area is mostly unsuitable for herring, as there is not enough gravel and too much mud for spawning. Adjacent to the Morgan Array Area there is suitable spawning habitat (Coull *et al*., 1998). The PEIR Technical Report will be updated with cable corridor data and we will give the EWG early sight of that ahead of DCO application. Scallop baseline – Identified as important/key species in the Scoping report/opinion, and by stakeholders. Queen scallops fishing grounds have been identified across the Morgan Array Area (noting there are expected to be similar habitats in the wider area). Suitable habitats for both king and queen scallop species occur across the Fish and Shellfish study area. Designated sites with fish and shellfish features are incorporated into the MCZ and LSE Screenings. Slides show the key species being considered.	-	-

	IEFs baseline has been broadly split out into marine fish, shellfish and diadromous species presented on slides.		
6.	<u>Fish and Shellfish Assessment (presented by KL)</u> Seven impacts are scoped into the assessment for fish and shellfish, as presented at the last EWG and in the Scoping Report. Accidental pollution has been scoped out as a potential impact on fish and shellfish ecology, for the same reasoning as benthic ecology. The potential impact of underwater sound has been scoped out from wind turbines during O&M and from vessels during all phases. We maintain the point of view that this is scoped out due to site specific modelling which show noise levels are generally low level and evidence that fish do continue to populate wind farm areas, which suggests no significant effects on populations. The impact assessment methodology is the same as discussed under the benthic ecology slides, with the assessment based on magnitude and sensitivity. For the assessments we use a wide range of sources to ensure the best available data supports the assessments, including data from other OWFs (Beatrice cod and sandeel monitoring is a good example). Impact Assessment – Underwater sound assessment approach and modelling. Modelling has been undertaken by Seiche to understand the construction monopile and pin piling noise emissions. Injury ranges are based on Acoustical Society of America (ASA) criteria, and are broken down to mortality, recoverable injury, TTS and behaviour. We have looked at both fleeing and static fish (as relevant) based on stakeholder feedback. Behavioural impacts – based on qualitative behavioural responses to noise and thresholds (Popper *et al*. 2014) using 'near field' (tens of metres), 'intermediate field' (hundreds of metres) and 'far field' (kilometres) and the relative risk levels indicated by Popper *et al*. 2014). However, alongside these qualitative risks, we have also tried to quantify these using best available data on fish behavioural responses to noise and particularly impulsive noise. KL noted that TTS is often used as a proxy for behavioural disturbance (threshold of 186 dB SEL), and we have presented TTS ranges for the various fish grouping within the impact assessment but with regard to behavioural responses we've looked at other metrics too, noting their limitations. KL presented a breakdown of the MDS for Underwater Sound. In short summary, monopiles are the highest hammer energy, and pin piles are the longest duration – all details will be included in the PEIR. Initial assessment outputs – Cod and Sandeel (max monopile hammer energy at North piling location). Modelling showed injury out to 634m, and mortality out to 297m for Cod. For Sandeel, modelling showed an injury range out to 386m, and mortality out to maximum 120m. It should be noted these are the maximum hammer energies; for initial strikes the ranges are much smaller. For behavioural effects, the assessment looked at the degree of overlap with spawning grounds. We focussed largely on the SPLpk metric for assessing behavioural effects and particularly when looking at mapping of noise contours. A wide range of literature was reviewed and presented in the PEIR on behavioural effects of noise on fish and based on this, we consider the 160 dB SPLpk contour as a good starting point for making risk based decisions on significant behavioural effects, noting there is no agreed threshold. For some species, this threshold is likely to be highly conservative (e.g. salmon and flatfish), but for the more sensitive species, we consider this to be a reasonable, but conservative starting point. The maps shown present the SPLpk contours for the maximum hammer	**Visual representation of the cumulative piling scenario, and noise mitigation measures to be presented at the next EWG**	**Q2 2023**

	energy for monopile – all other scenarios, the noise contours will be smaller. When assessing impacts on cod and sandeel, we looked at the overlap of spawning habitats, the duration of piling and monitoring data from other wind farms (e.g. recent monitoring from Beatrice wind farm). Initial assessment outputs – Herring (max hammer energy for monopile and pin piling). Figures show the western most location, for which the noise contours overlap most with herring spawning grounds – so the "worst case" for herring spawning. Locations further east and with lesser hammer energies would result in less overlap with herring spawning ground. Piling will be short term and intermittent over 2 year period, and the PEIR concludes that in the long term herring are expected to recover. However, we acknowledge there is a risk of significant effects on herring spawning if piling occurs during spawning period, particularly in the most westerly part of the Morgan Generation Array Area. In the PEIR, we have noted that the project is currently undertaking work on minimising effects on herring spawning (also relevant for marine mammals). This could include for example spatial restrictions or noise abatement, but this is a work in progress for the project and will be reported to the EWG following S42 consultation. MMO advised on Morgan that we also consider this 135 dB SEL_{SS} threshold (Hawkins *et al* 2014). As per Feedback and Actions on EWG02 above, KL noted that this is not appropriate as a threshold. The author of the report which reported behavioural changes at this level, states this should not be used as standard threshold for determining behavioural effects. We are of the opinion that the approach taken to the assessment (i.e. using SPL_{pk} and using 160 dB SPL_{pk} as a guide for making risk based decisions) is a more scientifically robust and defensible position based on best available scientific data for where behavioural effects may occur. The 135 SEL_{SS} is highly precautionary, we think this overestimates the risk of behavioural responses. We have presented these contours in the PEIR at the request of the MMO, but they come with a heavy caveat that they are over-conservative. GE - Has a worst case scenario of two vessels piling at the same time been modelled? From an advice point of view, we would want to see a visual representation of the cumulative scenario as cumulative piling may lead to larger contours than just two contours together. If this is included in the UWS part of the PEIR, that will be fine. KL – yes, ranges for injury for cumulative scenario are modelled; includes TTS ranges. We have presented one piling event in this EWG, as this extends over the largest area of herring spawning ground. We haven't presented cumulative piling scenarios in the PEIR figures, but we can present that at the next EWG along with what we're working on with regards to noise mitigation too; recommend for GE to review FSF and UWN TR side by side. Initial assessment - Diadromous fish – KL noted that the focus of the impact assessment is looking at the potential barrier effects and disruption to migration. Magnitude and sensitivity are predicted to be low due to the distance from the Morgan Array Area. Noise contours demonstrate that barrier effects are unlikely to occur. If using 160 dB re 1µPa SPL_{pk} as a guide, the contours show that even at the highest hammer energies there is negligible risk of barrier effects for diadromous fish. It should be noted these noise levels are likely to be highly conservative for salmon and lamprey, which are less sensitive to underwater noise. IN – when you have timing of upstream migration it's often taken from coastal migration and you're quite far offshore so those periods can shift out but it's not clear how long by. KL agreed; there is some uncertainty with regard to how diadromous fish use the marine environment,		

	however, key impact is on fish migration as this is a critical part of their life cycle. Initial assessment - Scallops. Scoping opinions have been incorporated into PEIR. Scallops have been included as an IEF and in the shellfish assessment for each impact. There is limited information available regarding the effects of underwater sound on invertebrates, but we have included a detailed review of available information, including one study which found that giant scallop behaviour was affected, but activity returned to baseline levels after cessation. However, KL noted that any effects on shellfish would be much less extensive than those on fish receptors..		
7.	<u>Cumulative Effects Assessment – Method and Impacts (presented by KL)</u> Projects within a 50km buffer of the Morgan Generation Assets have been scoped in for direct physical impacts, and 100km for underwater noise. <u>Questions and comments</u> CR – There is nothing to stand out as an issue at this stage and no concerns. KL – Acknowledged, that's good to know. GE – Is modelling based on 160 dB SPL_{pk} for Diadromous fish? KL – For injury effects, we're using the Popper *et al.* (2014) thresholds for Group 1-4 fish species, and this is set out in the Underwater Sound Technical Report, and the Fish and Shellfish PEIR. For behavioural effects, we have referred to a range of studies, but we have used the 160 dB SPL_{pk} as a guide for considering whether there is potential for disruption of migration/ barrier effects on diadromous fish. GE – We will review once we receive the PEIR. LB – Shads have been considered as Diadromous with 160 dB SPL_{pk} for behavioural effects, whilst Herring have been considered with 135 dB SEL_{SS}? Have you considered lining Shad up with Herring given they're the same group? KL – 135dB SEL_{SS} has been presented for Herring, but as previous, this is heavily caveated that we don't agree with that approach. We think that 160 dB SPL_{pk} as a guide to assessing risk is much more realistic, adequately precautionary and scientifically robust and as such our approach is largely based on that (noting that you get similar ranges for TTS, which has been used in other applications as a proxy for behavioural effects). LB – We will review once we receive the PEIR. KB – Regarding the CEA: licence area 457 are submitting a renewal of marine licence for marine aggregate dredging. They have submitted a scoping report but are not submitting an EIA until Q3 of 2024. KL – Thank you. We will review ahead of final DCO Application, if available at that time. IN - How is cumulative piling with Morgan Gen and Mona likely to occur, across the spawning seasons? KL – In terms of CEA this is quantitative in the PEIR between Morgan Generation and Mona and looks at total piling days. We should be able to include quantitative assessment with Morecambe in final assessment too	**Stakeholders to review Underwater sound technical report alongside the Fish and shellfish technical report when reviewing the PEIR**	**Q2 2023**

	once their PEIR becomes public- this would be included in the final DCO application.		
8.	<u>Approach to Agreement (presented by KL)</u> Revisited Evidence Plan template and remits, as presented on slide #47. The focus now is on the approach to agreement as part of the EPP remit and building towards the statement of common ground that will be submitted with or soon after the application for consent. When you read the PEIR we would appreciate it if you could think about agreement on the baseline and assessments, keeping in mind the agreements we are aiming for, for the application. If you do not agree with what is in the PEIR, please focus on what the Applicant can provide to get agreement. It is important to note that the HRA and EIA process are a step in the process to agree how the Applicant can build these projects with minimal impact to the environment. The Applicant is looking to get as much agreement as possible before the application submission and examination.	**Stakeholders to consider, when reviewing the PEIR, agreement process for baseline and assessments, keeping in mind the agreements we are aiming for, for the final application.**	
9.	<u>Next steps</u> Agreement log and minutes within 2 weeks. Review of PEIR by the EWG in April and May. Next EWGs in June/July.		

B.5. Benthic ecology, Fish and shellfish and Physical processes EWG meeting 4

B.5.1 Meeting minutes

MINUTES OF MEETING

Security Classification: Project Internal

Partners in UK offshore wind

MOM Number	:	20230711_Morgan and Mona BE, FSF, PP	**REV. No.**	: F02
MOM Subject	:	Morgan and Mona Evidence Plan BE, FSF, PP EWG meeting 4		

MINUTES OF MEETING

MEETING DATE	:	11/07/2023
MEETING LOCATION	:	Microsoft Teams
RECORDED BY	:	[redacted] (RPS)
ISSUED BY	:	[redacted] (RPS)

PERSONS PRESENT:

- [redacted] – bp (GV)
- [redacted] – bp (SR)
- [redacted] – bp (MP)
- [redacted] – bp (DH)
- [redacted] – RPS (KL)
- [redacted] RPS (ST)
- [redacted] – RPS (AP)
- [redacted] – RPS (NS)
- [redacted] – RPS (LS)
- [redacted] – JNCC (JW)
- [redacted] – NE (KB)
- [redacted] NE (EW)
- [redacted] – NRW (LR)
- [redacted] – NRW (JI)
- [redacted] NRW (LVN)
- [redacted] – IoM (PD)
- [redacted] – TWT (GJC)
- [redacted] – TWT (BS)
- [redacted] – MMO (AP)
- [redacted] – Cefas (SB)
- [redacted] – Cefas (GE)

ITEM NO:	DISCUSSION ITEM:	Responsible party	Date
	Project updates (presented by GV) Statutory consultation on the Mona and Morgan Generation PEIRs ended on 4th June. The Applicant appreciates all the feedback; we are currently reviewing all the responses and how they can be addressed. From the statutory consultation feedback and parallel activities, the Applicant has been considering a number of project updates. There are several updates to the project description envelope that are expected to be included in the application. The Applicant is looking to reduce the Mona Array Area and the Morgan Generation Array Area. They are expected to be reduced from what was		

	presented in PEIR and lie wholly within the array areas presented in the PEIR. The Mona Array Area is anticipated to be reduced by approximately 33% and lie wholly within Welsh offshore waters. The Morgan Array Area is anticipated to be reduced by approximately 10%. The primary driver for these reductions is shipping and navigation, specifically ensure safety of navigation. The need for changes for the project design envelope has been highlighted through engagement with a number of the ferry companies in the Irish Sea. The reductions have also been driven through consultation with aviation and other sea users receptors. The layout principles for both Mona and Morgan Generation are expected to be updated to increase the spacing requirements between offshore structures, the specific updates will be communicated in due course. These updates are to address concerns from commercial fisheries. The Applicant is anticipating that monopile foundations will be removed from the project design envelope. The foundation options remaining will be gravity base or jackets (which may be pin piled or suction bucket foundations). This is being driven by the ground conditions. The Applicant expect there to be a mixed foundation solution taken forward to the application, likely to be a mix of jacket and gravity base foundations. The smallest wind turbine option is being removed from the project design envelope due to feedback from the supply chain that this turbine option will not be available at the time of construction. The maximum rotor diameter will also increase from 280m to 320m and this is also based on feedback from the supply chain on the parameters for the wind turbines that will be available at the time of construction. The Applicant is also reviewing the parameters for the design envelope following the statutory consultation responses. Any updated parameters will be fully explained and justified within the application. The Applicant is also reviewing the cable protection and sandwave clearance parameters. We do not have final confirmation but we are expecting that neither cable protection nor sandwave clearance will be required within the Menai Strait and Conwy Bay SAC and Constable Bank. This will be reviewed and confirmed in time to be included in the application.		
	<u>Section 42 responses- overarching (presented by KL)</u> The Applicant and RPS have been working through all the S42 responses, looking to the project design envelope and the environmental assessment. There were a couple of key responses that we wanted to raise to the EWG. There were several requests for the project to undertake assessments for historic projects where quantitative information required to include them in the cumulative and in-combination assessments is not available. The cumulative and in-combination assessment can only be undertaken on publicly available data and it may not be appropriate to undertake analysis for other projects. There is also no precedent for that type of analysis – this was discussed at the Offshore Ornithology EWG last week. The IoM offshore windfarm is in the early stage of the planning process and we expect the scoping report to be published in the autumn. We will incorporate the information in the public domain into the cumulative and in-combination assessment for Mona and Morgan Generation, in line with the Tiered approach.		

	PD- Are the projects only considering projects in the public domain in the cumulative assessment? KL- We have based the assessment on publicly available information within the PEIR and we will do the same for the application. For example, for the IoM wind farm, we are expecting the scoping report to be published in the Autumn and we would therefore include it in the assessment. We will only be able to include the information included in the scoping report, we cannot make an assumption on what that project design may be. This is in line with the tiered approach which is set out in the Planning Inspectorate guidance. GV-The Applicant is consulting with Orsted on the IoM wind farm. Orsted are looking into whether they can provide the Applicant with early sight of information that will be in the scoping report. PD- Noted it is good to hear there are discussions ongoing with Orsted. KL noted there were a few comments on the site specific data available to be included in the PEIR. The benthic data for the Mona Offshore Cable Corridor and the zone of influence for the Mona and Morgan Array Areas will be presented in this EWG. For marine mammals and offshore ornithology, the 24months of survey data for Morgan Generation will be presented and discussed in the October EWG meetings for those topics. Natural England provided comments on the Morgan Generation and the Morgan and Morecambe Offshore Wind Farms: Transmission Assets (Transmission Assets) applications to ensure that a whole project assessment is undertaken. Are there specific topics or receptors that are of particular concern for the cumulative assessment for Morgan Generation and the Transmission Assets together? The Applicant is considering how human topic cumulative impacts are addressed and we have strategies for those impacts. For Morgan Generation, we will be undertaking a whole project assessment within the cumulative effects assessment (CEA). The Transmission Assets will be included within the CEA as a separate section so it clearly defines the impact of the Morgan Offshore Wind Project as a whole project. We can only base the CEA on information in the public domain. These projects are subject to separate consent applications so there will always be difficulty regarding what information is available at the time of application. However, that is why the tiered approach to CEA was developed and adopted and we feel the approach set out in the slides adequately addresses the concerns raised. We will circulate the slides after the meeting so you can review the approach to CEA in full. Please can the stakeholders provide their feedback in writing with the meeting minutes.	**Stakeholders to provide their feedback on the approach to the CEA for Morgan Generation and whether there are specific topics or receptors that are of particular concern**	Complete
	<u>Benthic ecology Section 42 responses (presented by AP)</u> Thank you for providing your responses to the PEIR. A number of comments were applicable to both Mona and Morgan Generation Assets. One comment was regarding difficulty to comment on the conclusions of		

	the PEIR without the 2022 survey data on the Mona Offshore Cable Corridor and zone of influence (ZOI) survey data. This data has now been analysed and is being included in the benthic technical report and chapter. We will send the EWG the updated benthic technical report for your review ahead of the final application. S42 Response: The MMO identified inconsistencies in the reporting of the sediment contamination data. This will be corrected in the updated benthic technical report and chapter but, broadly, levels of contamination are low. S42 Response: The MMO commented that the Particle size analysis (PSA) was not undertaken by an accredited laboratory. We have investigated this and the PSA was undertaken by Ocean Ecology who are an MMO accredited laboratory. S42 Response: The MMO suggested a separate sediment and water quality chapter. We have reviewed this and think that we can address this through improving the sign posting of where information is included across the chapters already included so a separate sediment and water quality chapter will not be included with the applications. S42 Response: The JNCC requested that the removal of scour and cable protection was assessed. The project position is that best practice for decommissioning will be followed and scour and cable protection may not be removed however the benthic ecology chapter will be updated to assess the decommissioning of cable and scour protection. S42 Response: There were several comments regarding the requirements for monitoring. The assessment is being updated to take into account the updated project description. The requirement for monitoring will then be re-assessed. S42 Response: NRW had concern over impacts to the peat and clay habitat with piddocks. We are looking at the project design with the engineers to reduce the impact on these habitats. However the Mona landfall is heavily constrained with the *Sabellaria* reef to the west and the Traeth Pensarn SSSI to the east. Further consideration is being given to horizontal directional drilling (HDD). S42 Response: NRW commented that the Dee Estuary SAC was screened into the ISAA but was not included in the EIA assessment. For the application, we are proposing to screen out the Dee Estuary SAC from the ISAA on the basis of the physical processes modelling and that there is no pathway to impact for this SAC. LVN- It would be good to see more information on the methodology for the open cut trenching option. It was not clear in the PEIR how the trench was going to be infilled. It would be good if more detail could be added to clarify the worst case. AP- Noted, this can be included in the project description and relevant detail added to the benthic chapter. **<u>Fish and shellfish S42 responses (presented by LS)</u>** S42 Response: There were several responses to the PEIR to request more up to date data sources for baseline characterisation. This will be considered for the application and we will include more detail on the Irish		

	Sea Ground fish data. The 2022 Mona offshore cable corridor and zone of influence site specific data will also be included. S42 Response: There was a request from the MMO to present herring and sandeel substrate suitability assessment to include heat maps following the MarineSpace methodology (Reach *et al.,* 2013[1]; Latto *et al*., 2013[2]). RPS's key concern with this approach is that it may downplay the importance of the Isle of Man herring spawning ground due to the low larval counts compared to those seen in the North Sea for which the MarineSpace tool was developed. We will present the sediment data as 'preferred' and 'marginal' habitat alongside the folk classification. S42 Response: The MMO highlighted that quantifying impacts to spawning grounds based upon percentage overlap is not recommended. We agree with that recommendation based upon spawning ground boundaries not being defined "limits" of spawning activity. This comment will be carried forwards into the application. (see Post-meeting note on page 8) S42 Response: The Applicant also received some general comments on the definition of Important Ecological Features, magnitude and sensitivity. These will all be reconsidered for the application to ensure we are using an appropriate approach. S42 Response: There were other comments requesting further information on the effect ranges for concurrent piling. We propose to present noise contours for concurrent piling to support the assessment. KL- This was particularly in relation to the cumulative SEL TTS thresholds and ranges associated with these. GE- All the comments and discussion from the meeting with the MMO and Cefas on their initial PEIR feedback regarding feedback on the MarineSpace approach to heatmapping should be considered. It was noted that the MarineSpace approach is not ideal for numbers in the Irish Sea, where abundances were much lower. The Applicant should look at adapting this approach where possible. It would be useful to look at the NIHLS larval data as a 10-year dataset and to provide contour mapping based on this, which may highlight some particular "hot spots". In addition, using additional sources to support the substrate classification such as Cefas' OneBenthic tool to extract more PSA data from the region (where available) to provide characterisation beyond the surveyed areas. LS – this is something we can look into for inclusion within the Environmental Statement where appropriate. KL-There were also comments on how the grab sample data is presented. We have been asked to presented it as an appendix of the herring and sandeel sediment suitability classification alongside the folk classification. LS – This is something we can include. Benthic ecology will also be including the PSA data, but perhaps we can present the relevant data with the substrate classification for sandeel and herring to allow easy interrogation by stakeholders.	**EWG to confirm approach to assessment of underwater sound for fish and shellfish**	**Complete**

[1] Reach, I. S., Latto, P., Alexander, D., Armstrong, S., Backstrom, J., Beagley, E., Murphy, K., Piper, R. and Seiderer, L. J., 2013. Screening Spatial Interactions between Marine Aggregate Application Areas and Atlantic Herring Potential Spawning Areas. A Method Statement produced for BMAPA. 40pp.

[2] Latto, P. L., Reach, I.S., Alexander, D., Armstrong, S., Backstrom, J., Beagley, E., Murphy, K., Piper, R. and Seiderer, L. J., 2013. Screening Spatial Interactions between Marine Aggregate Application Areas and Sandeel Habitat. A Method Statement produced for BMAPA. 40pp.

	LS- The MMO and NRW have provided differing advice on the preferred approach to underwater sound thresholds for the fish and shellfish assessment. The MMO have recommended the 135dB SELss threshold as per Hawkins *et al.,* (2014) for herring. NRW preference is to present SELcum/TTS. As mentioned in previous EWG meetings, SELss is not considered an appropriate metric on its own, given the lack of comparable data available, meaning reliance on a single source, and for herring, the Hawkins *et al.,* (2014) study itself not being considered applicable outside of acoustically quiet environments. Hawkins and Popper's 2014 review of the Hawkins *et al.*, (2014) study also highlighted that 135dB SELss is not considered appropriate for use as a behavioural response threshold. We propose to present the information re. the 135dB SELss (with heavy caveats as per the author's own recommendation), alongside the larger pool of evidence using SELcum (TTS) and SPLpk to ensure consideration of a range of sources. Other projects, such as Awel y Mor, used a combination of TTS (SELcum) and SPLpk to undertake a robust assessment of UWN impacts to herring. We have also considered SELss, and given the uncertainties with regards to general UWN modelling and thresholds, consider that reference to multiple sources is the best approach, with the actual effects being somewhere in-between these modelled values. Please can the EWG confirm this approach is acceptable. KL- We have taken a precautionary approach for the underwater sound modelling, in reality the worst case scenario modelled (i.e. maximum hammer energy) will not occur throughout the full duration of the construction period. A combination of thresholds and metrics for static and mobile receptors will be looked at including SPLpk, TTS (SELcum) and SELss. But need to acknowledge that the noise contours (with conservatism built into them) are only part of the assessment; consideration should also be based on the duration of piling operations, the temporary nature of the impact and the monitoring data available for key fish species (e.g. monitoring for cod spawning undertaken at Beatrice wind farm[3]). SB- Cefas do not have an underwater advisor present at this meeting, but we will take this away and feedback. LR- NRW do not have a fish specialist on the call but we will also take this away and feedback. Following initial feedback from our fish specialist, NRW (A) recognise that there is a lack of good evidence for behavioural impacts on noise and there are no threshold values for different groups of fish. We welcome the intention to include the 135 SELss in addition to presenting the SELcum/TTS. NRW (A) will base our advice on the use of TTS SELCum, but recognise that this is a threshold for physiological effects, so it should be acknowledged that the behavioural effects are likely to be larger. GE: Cefas recognise the limitations of the Hawkins *et al.*, (2014) study, and presenting the SELcum information for behavioural responses with the caveats mentioned is reasonable. It needs to be recognised that TTS is a physiological response not a behavioural response to noise. Also, even if monopiles are being removed from the project description for the Mona	EWG to confirm if the use of a combination of TTS (SELcum) and SPLpk to undertake a robust assessment of UWN impacts to herring	Complete

[3] BOWL (2021b) Beatrice Offshore Wind Farm Post-Construction Cod Spawning Survey – Technical Report. Available at: https://marine.gov.scot/sites/default/files/bowl_-_post-construction_cod_spawning_survey_-_technical_report_redacted.pdf.

	and Morgan Generation, the pin piles remaining in the project description need to be assessed cumulatively with monopiles from other projects. RF: It is recognised that this is a conservative approach. S42 Response: Feedback was received to indicate that based on the underwater noise modelling outputs, cumulative effects of underwater noise through piling are expected to be significant for herring and cod. Considering the design changes previously discussed (particularly removal of the monopile option), we do not anticipate a significant cumulative effect, however the noise modelling is being re-run based upon the new design parameters, and the data will be fully assessed to determine any potential significant effects. Measures will be considered where necessary to mitigate, and there will be further consideration of requirements as part of the final application in line with Defra workstreams. S42 Response: The Applicant also received feedback requesting that noise abatement is considered for the application. Further consideration of requirements as part of the final application will be in line with Defra workstreams. KL noted that although these are being developed largely for marine mammals, fish would also benefit from noise abatement technologies which reduce noise levels at source. S42 Response: NRW suggested that the assessment for underwater sound should not be based on soft starts or ramp ups. Regardless of the benefits of soft start and ramp ups, these measures will be part of the construction schedule therefore assessing impacts without these measures is not a realistic scenario. With implementation of these measures the noise level entering the marine environment from the baseline will be considerably lower than going straight into "full-power" piling and a gradual build-up of sound is likely to prevent sudden trauma. For some fish and shellfish species these measures will be of benefit (and individuals may "flee"), whereas others may not move away; the reality is likely somewhere in the middle of the information presented regarding the two extremes for static and fleeing receptors. Fish and shellfish is such a broad group of organisms that it is impossible to assign a one-size-fits-all approach to mitigation and responses, and as such we consider it appropriate to present data for both static and fleeing receptors. GE: Cefas agree that modelling including soft starts and ramp ups is fairly standard and agree that this approach is acceptable. LR: NRW will take this offline and feedback. S42 Response: There was a response recommending piling restrictions for Mona and Morgan Generation for herring and cod spawning. Given the changes in the project design, the underwater sound modelling will be updated for the Environmental Statement. Given the increased distance of the Mona Array Area from Isle of Man herring spawning area, we predict that the impact from pile driving at the Mona Array Area will be minor. Initially we are looking for agreement from the MMO and NRW on sensitivity classification for cod to underwater sound. The MMO suggested that cod should be high sensitivity but NRW agreed with the current classification of medium sensitivity. Given the demonstrated recoverability of cod (i.e. from Beatrice[3]), and the extensive scale of the mapped spawning grounds, despite the increased sensitivity to UWN of cod when compared to other species (except group 4 fish), the sensitivity is	NRW to feedback regarding justification for basing assessment on soft starts and ramp up procedures	Complete

	considered medium.GE – Cefas maintain that cod should be classed as high sensitivity to underwater sound. Further, recommendations for piling restrictions will be made if considered necessary based upon the information presented within the Environmental Statement. LR- NRW (A) agree with the MMO that cod should be considered as having high sensitivity to noise. We base this on the extensive cod spawning grounds in Liverpool Bay, the use of cod vocalisation in courtship display and cod stocks being low in the Irish Sea. KL- Sensitivity to noise for behavioural responses has been considered as medium as there is sufficient evidence from monitoring data, such as Beatrice offshore wind farm[3], that following piling, cod spawning does still occur. Recoverability is a key element to sensitivity. **Post-meeting note:** <u>Heat mapping</u> The Applicant proposes the following approach to the characterisation of herring spawning potential, based on a modification of the heat-mapping approach outlined by Reach *et al.* (2013)[1]: • Presentation of 10 years of annual herring larval data as "bubble" plots, with one map per year, displayed with Coull *et al.* (1998)[4] high and low intensity herring spawning ground polygons. • Presentation of aggregated 10-year herring larval data as a contour plot, displayed with Coull *et al.* (1998)[4] high and low intensity herring spawning ground polygons. • Presentation of site-specific survey PSA data; each sampling point will be classified as preferred/marginal/unsuitable based upon the proportions of fines, sands and gravels. Data points will be displayed with EMODnet[5] Folk Classification[6] polygons for preferred and marginal substrates for herring spawning and Coull *et al.* (1998)[4] high and low intensity herring spawning ground polygons. • Presentation of site-specific survey PSA data alongside regional PSA data extracted from the Cefas OneBenthic tool[7]; each sampling point will be classified as preferred/marginal/unsuitable based upon the proportions of fines, sands and gravels. Data points will be displayed with EMODnet[5] Folk Classification[6] polygons for preferred and marginal substrates for herring spawning and Coull *et al.* (1998)[4] high and low intensity herring spawning ground polygons. The Applicant proposes the following approach to the characterisation of sandeel, based on a modification of the heat-mapping approach outlined by Latto *et al.* (2013)[2]:	EWG to confirm acceptance of this proposed approach for characterisation of herring spawning potential EWG to confirm acceptance of this proposed approach	Complete

[4] Coull, K.A., Johnstone, R, and Rogers, S.I. (1998) Fisheries Sensitivity Maps in British Waters. UKOOA Ltd: Aberdeen.
[5] European Marine Observation and Data Network (EMODnet) (2023) Seabed habitats. Available: http://www.emodnet-seabedhabitats.eu/.
[6] Folk, R.L. (1954) The distinction between grain size and mineral composition in sedimentary rock nomenclature, Jour. Geology, 62, 344–359.
[7] https://openscience.cefas.co.uk/obdash/

	• Presentation of site-specific survey PSA data; each sampling point will be classified as preferred/marginal/unsuitable based upon the proportions of fines, sands and gravels. Data points will be displayed with EMODnet[5] Folk Classification[6] polygons for preferred and marginal substrates for sandeel spawning and mapped high and low intensity sandeel spawning and nursery grounds from Ellis *et al.* (2012)[8]. • Presentation of site-specific survey PSA data alongside regional PSA data extracted from the Cefas OneBenthic tool[7]; each sampling point will be classified as preferred/marginal/unsuitable based upon the proportions of fines, sands and gravels. Data points will be displayed with EMODnet[5] Folk Classification[6] polygons for preferred and marginal substrates for sandeel spawning and mapped high and low intensity sandeel spawning and nursery grounds from Ellis *et al.* (2012)[8].	for characterisation of potential sandeel habitation and spawning	Complete
	<u>Physical processes-Section 42 comments (presented by NS)</u> We will be taking on board general comments regarding the presentation of results to make it easier to interpret the results e.g. adding scale bars to the figures and overlaying receptors. More work is being undertaken to refine the project design. The modelling and assessment for the PEIR used a realistic pragmatic approach. We will be revisiting all the assessments and assumptions being made for the final application in view of a more comprehensive project description and refined PDE. S42 Response: One of the comments received was regarding cable exposure in the intertidal area. The assessment is based on the project design so this will be updated as the project design is refined. Similarly, for cable exposure with regards to sandwave migration, engineers are reviewing parameters with respect to cable routes and geophysical survey data. The Applicant has a commitment to minimise cable protection. Cable protection will only be placed on the seabed where trenching depths cannot be achieved. The modelling was undertaken for a realistic worst case scenario of a continuous length of cable protection in a location that was perpendicular to the prevailing current and where less favourable ground conditions were indicated (moraine deposits). We will check the modelling against the updated project design to ensure the modelling assumptions are still valid. S42 Response: There were several comments regarding sandwave clearance. By way of clarification, the project is not proposing to infill the troughs between sandwaves but side-cast material which ensures sediment supply is available for sandwave reformation and sufficient burial depth is achieved within the troughs and cables are not readily exposed on reformation. Within the context of the suspended sediment modelling, the maximum parameters in terms of width, depth and length have been used assuming that whole volume would be mobilised rather than a typical sandwave clearance volume. Engineering design currently underway will determine more detail in which areas and volumes clearance may be		

[8] Ellis, J.R., Milligan, S.P., Readdy, L., Taylor, N. and Brown, M.J. (2012) Spawning and nursery grounds of selected fish species in UK waters. Scientific Series Technical Report. Cefas Lowestoft, 147: 56 pp.

	required based on engineering constraints, ground conditions and seabed morphology. It is anticipated that current scoping principles will endure. However, it is noted that if this is not the case further assessment may be required; a sandwave migration/reformation study may only be undertaken when the location is identified as these characteristics are site specific and event driven. Stakeholders also kindly provided advice on approaches to assessment and potential mitigation should this be required following more detailed design assessment. KL- We are working with the Rochdale envelope approach as there needs to be some flexibility. The modelling is still very conservative however it needs to represent a realistic scenario. LR- NRW will take this away and provide comments. The project has a commitment to provide scour protection. There is a recognition that this may lead to secondary scour however the detailed, site specific, provision of these measures will be, by definition, designed to minimise this. Assessment of secondary scour was, by agreement, scoped out however we have received comments to the contrary. This is likely to relate to the lack of detail in placement of material and there was no commitment to not place cable protection in sensitive areas such as on Constable Bank in PEIR. If the project can commit to no cable protection on Constable Bank and in the SAC then we consider that this can still be scoped out and dealt with in the context of detailed design. S42 Response: Other issues included provision of information on the fate of HDD drilling muds for benthic assessments. It was noted that intertidal trenching modelling has been included in the PEIR and, as these areas comprise silt fractions, model data can therefore be used to indicate the dispersion of drilling mud. Provisional assessment of the PSA data has indicated that the modelling assumptions with regards to sediment grading remain valid. This was anticipated as data was available from a range of sources to support the modelling, such as BGS. Within the application further information will be provided to demonstrate the rationale for modelled scenarios, such as the selection of meteorological conditions, tide only simulations and concurrent drilling of piles.	**NRW to provide feedback on approach to the physical processes for the application**	Comple te
	<u>Benthic ecology updated baseline (presented by AP)</u> We should be able to provide an updated benthic ecology technical report which contains the data analysis of the Mona offshore cable corridor and the Mona array area zone of influence in advance of the application. We will be in touch on how and when we will be providing this. Further offshore environmental surveys were undertaken in summer 2022. They covered the Mona and Morgan Array Area ZOI and the Mona offshore cable corridor. Grab sample and drop down video were used and the sample strategy was agreed with the SNCBs ahead of the survey. The 2022 subtidal surveys also resurveyed 5 sample stations in the Mona Array Area and 6 sample stations in the Morgan Array Area. Of the 2022 sample stations, 43 were analysed for sediment chemistry. The 2022 survey data will analysed with the 2021 survey data for the array area ZOIs. The Mona offshore cable corridor has been analysed as a separate data set but will be		

	presented in the same technical report. The analysis has been undertaken in PRIMER as per PEIR. An additional survey at the Mona landfall was also undertaken in 2023 to cover the gap in coverage from the 2022 intertidal survey due to the change in shape of the landfall and also to revisit the extent of the *Sabellaria* reef. The results presented below are preliminary outputs. We are fairly confident in these results but they may change through the review process. <u>Mona Array Area ZOI</u> The sediments in the Mona array area ranged from muddy sandy gravel to muddy sand. The results of the biotope classification were overlaid on the EMODnet 2019 data map to provide further context for the biotopes. In the north west of the Mona ZOI the mixed sediments are characterised by a variety of polychaetes such as *Syllis armillaris*, *Pholoe inornate* and *Lysidice unicornis* which has led to the SS.SMx.OMx.PoVen (hereafter PoVen) biotope being assigned. Where the community is a bit broader the circalittoral mixed sediment biotope has been assigned. All metals were below the Cefas Action Level 1 (AL1) and Action Level 2 (AL2) except cadmium which exceeded AL1 at a single station (but was below AL2). Arsenic exceeded the Canadian Threshold Effect Level (TEL) at all stations but was below the PEL and Cefas ALs. Concentrations of PCBs and PAHs were below all relevant thresholds. Organotins were below the limit of detection at all stations. In the south west the sediment continues to be mixed but contains a larger echinoderm component, specifically the communities were dominated by *Ophiothrix fragilis*, with each sample station assigned the OphMx biotope. This biotope also occurred in the south east of the Mona ZOI. The east of the Mona ZOI had a greater variety of sediments. The sediments in the east of the Mona array area are predominantly coarse with broad communities. The PoVen biotope is also present in the east at the boundary between sediment types. One station in the south east of the ZOI was characterised by an abundance of sand and fine sediment and was subsequently assigned the circalittoral fine sand biotope. <u>Mona Offshore Cable Corridor</u> In the Mona offshore cable corridor the majority of sediment samples are classified as gravelly muddy sand and sand (both 26%). Sediments in the section of the Mona Offshore Cable Corridor closest to the Mona Array Area were predominantly gravelly muddy sand. Sample stations in the centre of the Mona Offshore Cable Corridor were typically coarser including stations which were classified as gravel as well as sandy gravel. The stations closest to the landfall location were mostly sand with the shallowest station being slightly gravelly sand. All metals were below the AL1 and AL2 except arsenic which was above the AL1 and Canadian TEL at three stations (but below the AL2 and PEL). Concentrations of PCBs and PAHs were below all relevant thresholds. Organotins were below the limit of detection at all stations. A variety of biotopes have been preliminarily assigned in the Mona Offshore Cable Corridor.		

	In the north, adjoining the Mona Array Area and ZOI the community was dominated by polychaetes and bivalves leading to the assignment of the PoVen biotope which extended across a significant portion of the north of the Offshore Cable Corridor. The sediment becomes dominated by sand as the cable moves further south towards the coast, although still mixed in places. Broad sand, coarse and mixed sediment based biotopes have been identified at different locations along the Mona Offshore Cable Corridor however in the southern half of the cable corridor the communities become more distinct and are influenced more by bedforms. Three distinct communities can be identified, in turquoise is the SS.SSa.IFiSa.NcirBat characterised as a mix of sand, muddy sand and coarse sediment and taxa were dominated by polychaetes as well as some key crustacea such as *Bathyporeia guilliamsoniana*. The biotope SS.SMx.CMx.KurThyMx was assigned due to the presence of the characterising species such as *Kurtiella bidentata*. Closest to the coast the communities were characterised by sand and mud as well as the characteristic fauna *Fabulina fabula* and *Magelona johnstoni* which has led to the assigning of the SS.SSa.IMuSa.FfabMag biotope. Habitat assessments were conducted where potentially fragile or protected habitats were identified. All stations within the Mona Offshore Cable Corridor were classified overall as having no resemblance to stony reef. All stations within the Mona Offshore Cable Corridor were classified overall as having no resemblance to Fragile Sponge and Anthozoan Communities on Subtidal Rocky Habitats. On the basis of the desktop data included in the PEIR, Annex I sandbanks and reefs were the only Annex I habitats that had the potential to occur within the section of the Mona Offshore Cable Corridor that overlaps with the Menai Strait and Conwy Bay SAC. However, the surveys have shown that no Annex I habitats were recorded within the section of the Mona Offshore Cable Corridor that overlaps with the Menai Strait and Conwy Bay SAC. We are confident that there will be no direct impact on any feature of the SAC and that indirect impacts (e.g. increases in SSC) will not result in a significant effect on any feature. Therefore there will be no adverse effect on the integrity of the site. KL- We are hopeful we can avoid cable protection within the SAC, although if the project is not able to completely rule out cable protection in the SAC, we consider that there will be no adverse effect on the integrity of the site as there are no direct impacts on the SAC features. We would like to confirm if the stakeholders agree to confirm that we do not need to develop a without prejudice compensation case. LVN- That is good news that there will be no direct impacts to the SAC features. We agree that if no Annex I habitats are directly or indirectly affected then there would be no adverse effect on integrity. We would however like to review the latest data before the application submission. KL- The updated benthic technical report will come out to the EWG to review ahead of the application. Comment is noted regarding indirect effects on designated features; the final application will have further justification, where required, on indirect effects. <u>Mona 2023 intertidal survey</u>	**SNCBs to feedback on whether they agree there will be no adverse effect on the integrity of the Menai Straights and Conwy Bay SAC and therefore a without prejudice compensation case is not required.**	Complete

	The Mona 2023 intertidal survey comprised a Phase 1 walk over of the area within the site which had not been surveyed in 2022 as well as revisiting some of the other key habitats. The survey identified no new biotopes at the Mona landfall, instead this section connected biotopes which had already been identified. The survey area contained barren littoral shingle (LS.LCS.Sh.BarSh) in the upper shore. The mid-shore contained the *Macoma balthica* and *Arenicola marina* in littoral muddy sand biotope (LS.LSa.MuSa.MacAre) which became a mosaic of the LS.LSa.MuSa.MacAre and the *Lanice conchilega* in littoral sand biotope (LS.LSa.MuSa.Lan) in the lower shore. In the survey area two pipes were also identified on the upper shore. The intertidal survey re-mapped the extent of the *Sabellaria alveolata* reef to see if the extent has changed following the survey the previous year. The extent of the reef has not changed significantly between years although some degradation to the eastern edge was noted. Bacterial sampling for *E.coli* was also conducted, as requested by NRW, in the west of the site at nine stations over two transects (each sampling the upper, middle and lower shore) with a focus on any fine sediments which are more likely to hold on to contamination. Levels of E.coli were below the limit of detection (LOD) of the analyses used (i.e. <10 cfu/g) in all samples. <u>Morgan Array Area ZOI</u> Across the Morgan ZOI sediments ranged from muddy sandy gravel to gravelly muddy sand. Sand was the main component of 86% of samples in the Morgan ZOI. The sediment composition illustrates a similar trend to what was observed in the array area with samples in the south west of the ZOI being much more mixed with a higher proportion of gravel whereas sediments in the north east contained a higher proportion of fine sediment but did not contain any gravel. All metals were below the AL1 and AL2 except arsenic which was above the AL1 at two stations and exceeded TEL at 8 stations (but was below AL2 and PEL). Concentrations of PCBs and PAHs were below all relevant thresholds. Organotins were below the limit of detection at all stations. The Morgan subtidal survey in the ZOI identified a variety of biotopes may of which connect with what was previously identified in the Array Area. In the south and west of the ZOI the PoVen biotope was dominant due to the variety of polychaetes identified in the samples in this area such as *Scoloplos armiger*, *Scalibregma inflatum* and *Pholoe inornate* as well as bivalves like *Kurtiella bidentata* and *Mediomastus fragilis*. Also in the south east of the Morgan ZOI was a site with high abundance of *Ophiothrix fragilis*, therefore this sample station was assigned the SS.SMx.CMx.OphMx biotope. In the north of the Morgan ZOI the sediments were dominated by sand and faunally characterised by a greater number of echinoderms such as *Echinocyamus pusillus* as well as the bivalve *Abra* leading the assigning of the SS.SSa.CFiSa.EpusOborApri biotope.		

	In the east of the ZOI the seabed has a greater proportion of fine sediment. Some of the samples in this area exhibited a broad community which couldn't be defined beyond the SS.SMu.CSaMu biotope. Others however could be characterised by the species *Kurtiella bidentata* and *Amphiura filiformis* which has led these samples to be allocated the biotope SS.SMu.CSaMu.AfilKurAnit. Two habitat assessments were undertaken for the Morgan array area ZOI. No sample stations were found to resemble the Sea Pen and Burrowing Megafauna Communities. No sample stations were found to resemble the Fragile Sponge and Anthozoan Communities on Subtidal Rocky Habitats. There was also no evidence of any potential stony reef.		
	<u>Fish and shellfish updated baseline (presented by LS)</u> Some of the comments within the S42 responses reflected some omissions or some areas which needed a bit more baseline context, therefore further information sources will be used to update the current baseline characterisation within the Environmental Statement. These include PSA and visual observations (where applicable) from the 2022 survey and more detailed review of the Northern Irish/Irish Sea Groundfish Survey data to provide more present-day context for the historic fish and shellfish surveys referred to demonstrate continued applicability in supporting baseline characterisation. More information will also be drawn from the Bangor University/AFBI scallop stock assessment, and some recent publications by Bangor University regarding shellfish maturity and stocks. Heat Mapping: The substrate classification criteria from the MarineSpace methods is applied to all PSA data collected from site-specific benthic surveys, and is interpreted alongside other data sources, e.g. mapped spawning grounds, herring larval data, and broadscale EMODnet substrates. Using heat maps, the importance of the IoM herring spawning ground may be reduced, due to very low larval counts. Therefore, this data is not considered conducive to heat mapping (see discussed earlier in the EWG meeting). No site-specific information is available overlapping the area of mapped IoM herring spawning grounds, therefore we would be reliant on the information presented already, based upon broadscale datasets/NINEL herring larval data and are unlikely to be able to increase the resolution of potential spawning grounds through this process. Site specific data collected within the array and along the export cable reflects the presence of patchy sediments, in line with expectations for the area. Discrete variances are unlikely to be represented well with heat mapping. For sandeel and herring, we present the EMODnet broadscale seabed substrates with both the mapped spawning grounds from Ellis *et al*., 2012 and Coull *et al*, respectively, and the site specific data (now shown as preferred, marginal, unsuitable to support collective interpretation (latest charts are shown on the next couple of slides (slides 38 and 39))). The inclusion of multi-year larval data on the herring spawning suitability chart will not particularly add to the interpretation, as the points are generally consistent with the mapped spawning grounds, and will complicate the image, given the number of sampling points presented from the site specific survey.		

	We consider that the information, whilst not presented as a heat map, is adequately interpreted to provide a robust characterisation of the suitability for herring spawning and sandeel habitation/spawning. As discussed previously, we will look at using aggregated 10-year herring larval data and contour mapping to seek to highlight potential herring spawning "hot-spots" within the Isle of Man herring spawning ground, and will also integrate PSA data from the OneBenthic tool into our substrate suitability assessment where applicable. LR- NRW agree that the spawning heat maps are not required. The updated sandeel and herring substrate suitability maps are presented, including the 2022 survey data for the Array Zone of Influences (ZoIs) and the Mona Export Cable Corridor. The Array and ZoI data was variable for sandeel with areas of preferred, marginal and unsuitable substrates. The Mona Export Cable Corridor showed largely preferred substrates for sandeel with unsuitable substrates encountered at the northern and southern limits of the route. For herring, the Array areas, ZoI and export cable corridor were largely unsuitable, with occasional occurrences of marginal and preferred substrate. For both herring and sandeel this highlighted the variable nature of the *in-situ* sediments, when compared to the broadscale substrate classifications. With areas considered marginal or preferred in the broadscale substrate classifications, revealed to be unsuitable at a finer scale.		
	<u>Agreement logs (presented by KL)</u> The latest agreement logs were circulated in May and it would be useful if stakeholders could review their positions within those agreement logs and update them now the PEIR has been reviewed. Parallel to that the Applicant and RPS is working through the statutory consultation responses and looking at where we consider agreement has been reached. If stakeholders can provide feedback on agreement logs to date and then following the EWGs, we will circulate the meeting minutes two weeks after the meeting but the agreement logs may be a week or so behind that to incorporate the statutory consultation feedback.	**Stakeholders to provide updated EWG agreement logs to reflect the information provided in the PEIR.**	Complete
	<u>Next Steps (presented by KL)</u> KL noted that meeting minutes are to be circulated 2 weeks following the meeting, with agreement logs circulated after the meeting minutes. Next EWG meeting planned for October 2023.		

B.5.2 Response from Natural England regarding the meeting minutes

Date: 11 August 2023
Our ref: DAS/UDS A009203 444374
Your ref: Morgan and Mona BE, FSF, PP EWG04 11th July 2023

[redacted]
RPS/ Energy
Goldvale House
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cc [redacted]
RPS

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0300 060 3900

BY EMAIL ONLY

Dear [redacted]

Discretionary Advice Service (Charged Advice): UDS A009203
Development proposal: Morgan Generation and Mona Offshore Windfarm
Consultation: Morgan and Mona BE, FSF, PP EWG04

This advice is being provided as part of Natural England's Discretionary Advice Service (DAS) in accordance with the Quotation and Agreement dated 23rd May 2023 to Morgan Offshore Wind Limited & Mona Offshore Wind Limited.

The following advice forms Natural England's response to the meeting minutes provided for the Morgan and Mona BE, FSF, PP EWG04 attended by Natural England on 11th July 2023.

Natural England were asked to provide feedback on the following points:

- EWG to confirm approach to assessment of underwater sound for fish and shellfish
- EWG to confirm if the use of a combination of TTS (SELcum) and SPLpk to undertake a robust assessment of UWN impacts to herring
- EWG to confirm acceptance of this proposed approach for characterisation of herring spawning potential
- EWG to confirm acceptance of this proposed approach for characterisation of potential sandeel habitation and spawning

Detailed comments

Approach to assessment of underwater sound for fish and shellfish

Natural England broadly agrees with the approach for the assessment of underwater sound for fish and shellfish.

Assessment of underwater noise impacts to herring

Natural England acknowledges that the applicant intends to present 135dB SELss alongside the

SELcum (TTS) and SPLpk to undertake a robust assessment of UWN impacts to herring. NE encourages this approach as it ensures consideration of a range of sources.

Characterisation of herring spawning potential

Natural England broadly agrees with the approach for characterisation of herring spawning potential.

Characterisation of potential sandeel habitation and spawning

Natural England broadly agrees with the approach for characterisation of potential sandeel habitation and spawning.

For clarification of any points in this letter, please contact me using the details provided below.

Yours sincerely,

[redacted]
Marine and Coastal Lead Adviser
Coast and Marine Team
Cheshire to Lancashire Area Team
[redacted]

☒ The advice provided in this letter has been through Natural England's Quality Assurance process

The advice provided within the Discretionary Advice Service is the professional advice of the Natural England adviser named below. It is the best advice that can be given based on the information provided so far. Its quality and detail is dependent upon the quality and depth of the information which has been provided. It does not constitute a statutory response or decision, which will be made by Natural England acting corporately in its role as statutory consultee to the competent authority after an application has been submitted. The advice given is therefore not binding in any way and is provided without prejudice to the consideration of any statutory consultation response or decision which may be made by Natural England in due course. The final judgement on any proposals by Natural England is reserved until an application is made and will be made on the information then available, including any modifications to the proposal made after receipt of discretionary advice. All pre-application advice is subject to review and revision in the light of changes in relevant considerations, including changes in relation to the facts, scientific knowledge/evidence, policy, guidance or law. Natural England will not accept any liability for the accuracy, adequacy or completeness of, nor will any express or implied warranty be given for, the advice. This exclusion does not extend to any fraudulent misrepresentation made by or on behalf of Natural England.

Cc commercialservices@naturalengland.org.uk

Annex 1
European Protected Species

A licence is required in order to carry out any works that involve certain activities such as capturing the animals, disturbance, or damaging or destroying their resting or breeding places. Note that damage or destruction of a breeding site or resting place is an absolute offence and unless the offences can be avoided (e.g. by timing the works appropriately), it should be licensed. In the first instance it is for the developer to decide whether a species licence will be needed. The developer may need to engage specialist advice in making this decision. A licence may be needed to carry out mitigation work as well as for impacts directly connected with a development. Further information can be found in Natural England's 'How to get a licence' publication.

If the application requires planning permission, it is for the local planning authority to consider whether the permission would offend against Article 12(1) of the Habitats Directive, and if so, whether the application would be likely to receive a licence. This should be based on the advice Natural England provides at formal consultation on the likely impacts on favourable conservation status and Natural England's guidance on how the three tests (no alternative solutions, imperative reasons of overriding public interest and maintenance of favourable conservation status) are applied when considering licence applications.

Natural England's pre-submission Screening Service can screen application drafts prior to formal submission, whether or not the relevant planning permission is already in place. Screening will help applicants by making an assessment of whether the draft application is likely to meet licensing requirements, and, if necessary, provide specific guidance on how to address any shortfalls. The advice should help developers and ecological consultants to better manage the risks or costs they may face in having to wait until the formal submission stage after planning permission is secured, or in responding to requests for further information following an initial formal application.

The service will be available for new applications, resubmissions or modifications – depending on customer requirements. More information can be found on Natural England's website.

B.5.3 Mona and Morgan Generation Offshore Wind Projects Physical Processes Environmental Statement Modelling Strategy

Partners in UK offshore wind

MONA AND MORGAN GENERATION OFFSHORE WIND PROJECT

Physical Processes Environmental Statement Modelling Strategy

August 2023

F01

Image of an offshore wind farm

www.morganandmona.com/en

Document status

Version	Purpose of document	Authored by	Reviewed by	Approved by	Review date
F01	Version for EWG	RPS	bpEnBW	bpEnBW	14/08/23

Prepared by:

RPS

Prepared for:

Morgan/Mona Offshore Wind Ltd.

1 PHYSICAL PROCESSES ENVIRONMENTAL STATEMENT MODELLING STRATEGY

1.1.1.1 The physical processes modelling studies for the Mona and Morgan Generation offshore wind projects that have been undertaken to date were based on the project description and maximum design scenarios associated with the Preliminary Environmental Information Report (PEIR) for each of the respective developments. It is proposed that further modelling to update the modelling presented in the PEIR is not required because of the very limited changes anticipated to occur as a result of the reduction in envelope following design changes, which are not anticipated to change PEIR assessment conclusions.

1.1.1.2 As the projects progress, updates to the project design will be made in response to stakeholder feedback, preliminary findings and project refinement, such as those outlined below.

Area of Change	Nature of change
Array Area	Reduction in array area from red line boundary presented in PEIR. Reduced array area will sit wholly within the array area assessed in PEIR. Anticipated that Mona array area will lie entirely in Welsh waters.
Layout Principles	Relating to spacing arrangements, orientation of wind turbine rows, search area and rescue requirements, commercial fisheries activity.
Foundations	Anticipate removal of monopile foundation for wind turbines. Gravity base and jackets (pin piles and suction buckets) retained.
Wind Turbines	Removal of smallest wind turbine from envelope. Increase in rotor diameter for largest wind turbine against supply chain feedback from 280m to 320m.

1.1.1.3 For both projects, the array area has been reduced from the previous (PEIR) boundary with the same proposed types of wind turbine infrastructure. The Mona Array Area is anticipated to be reduced by approximately 33% and lies wholly within Welsh offshore waters. The Morgan Array Area is anticipated to be reduced by approximately 10%. The changes in array area will be associated with revised indicative layouts, however, given that the reductions in area are modest, lie wholly within the PEIR boundaries and the Mona and Morgan Generation PEIRs concluded that all physical processes impacts would be negligible (not significant in EIA terms) the representative/indicative layout applied within the modelling studies undertaken for the PEIR is deemed to provide appropriate information to support the physical processes assessment of the updated project for the Environmental Statement.

1.1.1.4 In some cases, the modelling of construction activities extends beyond the revised Environmental Statement boundary. These areas do however have bathymetry, tidal currents and sediment classifications consistent with those within the PEIR boundary due to the close proximity. It is considered that, given these similarities, and that the revised layout represents a modest change in terms of the physical processes assessment, the modelling undertaken for the PEIR boundary and layout remains valid and will therefore be used to inform the physical processes assessment presented for the Environmental Statement. In addition, the physical processes study area will be retained for the Environmental Statement (and not decreased in line with the array area reduction) to provide additional context to the physical processes assessment.

1.1.1.5 In line with the environmental impact assessment methodology, the updated project design envelope for each of the applications will be examined to determine the

maximum design scenario for assessments. As noted within the PEIR, physical processes are comprised of tides, waves and sediment transport. These aspects are integrated, with different design parameters have varying levels of influence on each aspect. A holistic approach will therefore, be applied to assess the maximum design scenario. However, it is proposed that single unit sensitivity testing is undertaken where applicable. For example, suction bucket foundations may provide the greatest impediment at both the surface (influencing waves) and at the seabed (influencing sediment transport pathways), but a gravity base foundation may present a greater water column blockage (influencing tides). The influence of a single gravity base foundation on tidal flow would therefore not be modelled separately but will be examined by way of a sensitivity test and compared with a single suction bucket foundation.

1.1.1.6 As previously noted, the preparation of a PEIR and subsequent application is a live process with refinements being made to the project description throughout this period. For this reason, the modelled scenarios will, inevitably, vary by degrees from those ultimately assessed. However, due to the limited nature of these refinements, the modelling study remains a legitimate resource for supporting information for the Environmental Statement. Where variations occur between the modelled parameters and those assessed they will be cited within the relevant sections with reference to the applicability of the modelled data to the specific assessment. It is therefore proposed that further modelling to update the modelling presented in the PEIR is not required because of the very limited changes anticipated to occur as a result of the reduction in envelope following design changes, which are not anticipated to change PEIR assessment conclusions.

B.5.4 Response from JNCC regarding the Physical Processes Modelling Strategy

From: [redacted]
Sent: 24 August 2023 16:53
To: [redacted]
Cc:
Subject: RE: Mona Morgan Gen physical processes modelling strategy

CAUTION: This email originated from outside of RPS.

Hi [redacted]

Thank you for the opportunity to comment on the Mona and Morgan Generation Offshore Wind Project – Physical Processes Environmental Statement Modelling Strategy (F01, dated August 2023). JNCC would not look to feedback on the Modelling Strategy and defer the NRW for comment.

Kind regards,

[redacted] **| Offshore Industries Adviser | JNCC**
Pronouns: she/her
Inverdee House, Baxter Street, Aberdeen, AB11 9QA | Tel: [redacted]
Working pattern: Monday to Friday

Website Twitter Facebook LinkedIn

B.5.5 Responses and advice note from NRW regarding the Physical Processes Modelling Strategy

From: [redacted]
Sent: 21 August 2023 18:03
To: [redacted]
Cc:

Subject: RE: Morgan Generation & Mona fourth BE, FSF, PP EWG meeting

Hi [redacted],

Thank you for your email. Regarding your points:

EWG to confirm acceptance of this proposed approach for characterisation of potential sandeel habitation and spawning (11/08/23)

I can confirm that NRW Advisory (A) agree with the proposed approach for the characterisation of potential sandeel habitation and spawning.

SNCBs to feedback on whether they agree there will be no adverse effect on the integrity of the Menai Straights and Conwy Bay SAC and therefore a without prejudice compensation case is not required (11/08/23)

NRW (A)'s benthic specialist [redacted] had already provided a response to this query in the meeting (as below), hence not addressing it in the action points – from the minutes:

LVN- That is good news that there will be no direct impacts to the SAC features. We agree that if no Annex I habitats are directly or indirectly affected then there would be no adverse effect on integrity. We would however like to review the latest data before the application submission.

Of relevance here, I recently provided a response to a similar, separate query that arose through my monthly catch-up meetings with Miriam, Gero and Paul – copied below for completeness:

Query 1: Regarding the potential need for IROPI / Compensation with respect to sandwave clearance and cable protection within the Menai Strait and Conwy Bay SAC

Provided there is no direct and/or indirect impact to Annex 1 features of the Menai Strait and Conwy Bay SAC from the placement of cable protection, NRW (A) agree that there is no requirement for compensation. Given the information presented by the applicant to date, it seems unlikely that cable protection will be placed on Annex 1 features and it is therefore unlikely that there will be any direct impact to Annex 1 features. However, NRW (A) would like to review the evidence to support the characterisation of the habitats present in the cable route and potential areas where cable protection is being proposed within the SAC, as this information was not available at the time of the PEIR submission and has not been presented since. Please also note that cable protection placed outside of Annex 1 features could also indirectly impact features within the SAC and we therefore advise that this is assessed appropriately within the Environmental Statement. At present, NRW (A) are unable to comment on this aspect as the potential locations of cable protection inside and outside the SAC have not been provided. We advise that this information is shared with NRW (A) for review, as soon as possible.

From a Physical Processes perspective and linked to our PEIR response, NRW (A) would also like further information on the height, length and width of the proposed cable protection.

From: [redacted]
Sent: 16 August 2023 15:27
To: [redacted]
Cc: [redacted]
Subject: RE: Morgan Generation & Mona fourth BE, FSF, PP EWG meeting

CAUTION: This email originated from outside of RPS.

Hi [redacted]

Please find attached our amendments to the fourth Benthic, Fish and Shellfish, Physical Processes EWG meeting minutes. Please also see our response to the Meeting Actions below:

- *EWG to confirm approach to assessment of underwater sound for fish and shellfish.* NRW Advisory (A) welcomes the intention to incorporate additional data into the baseline characterisation, and clarifying definitions for various Important Ecological Features. NRW (A) note the response to the MMO, but advise that quantifying impacts to spawning grounds for species of primary concern (such as herring and cod) as percentage overlap are included for contextualisation. We recognise the limitations in the available data and that spawning is not necessarily limited to mapped spawning grounds. Nevertheless, presenting the quantification is useful, provided the spatial scale against which the percentage of affected spawning or nursery area is calculated, is appropriate and the limitations acknowledged.
- *EWG to confirm if the use of a combination of TTS (SELcum) and SPLpk to undertake a robust assessment of UWN impacts to herring.* NRW (A) agrees with the proposed approach and welcomes the inclusion of the 135 dB SELss for information.
- *NRW to feedback regarding justification for basing assessment on soft starts and ramp up procedures.* NRW (A) recognises that soft -start and ramp up procedures are standard work practises in piling. However, as advised pre, robust evidence for fleeing behaviour is lacking, and all fish receptors should be considered to be stationary. On this basis it is NRW (A)'s view that it is not possible to verify or quantify the mitigating effect of soft start and ramp up.
- *EWG to confirm acceptance of this proposed approach for characterisation of herring spawning potential.* NRW (A) agrees with the proposed approach of using heat maps as outlined in the post meeting note.
- *EWG to confirm acceptance of this proposed approach for characterisation of potential sandeel habitation and spawning.* NRW (A) agrees with the proposed approach of using heat maps as outlined in the post meeting note.

We will provide our feedback on the approach to Physical Processes following the additional documentation / our upcoming meeting and in line with the later deadline provided.

Kind regards,

[redacted]

Enw / [redacted]
Teitl swydd / Uwch Gynghorydd Morol - Rhaglen Ynni Adnewyddadwy ar y Môr / Senior Marine Advisor - Offshore Renewable Energy Programme

Adran / Tîm Cyngor a Rheoli Ardal Morol / Marine Area Advice & Management Team

Projects Mona & Morgan Generation Physical Processes Modelling Strategy

[redacted]
Senior Marine Advisor

21st August 2023

Introduction

This advice is provided in response to the **Physical Processes Modelling Strategy sent by email to NRW Advisory on 14th August 2003**.

NRW advice in this document is provided (under a Discretionary Advice Service agreement) in respect of a proposal which will require an application for which Natural Resources Wales is a Statutory Consultee.

The customer acknowledges that the content of any advice or assistance provided by NRW is advisory only and that it shall not be deemed to bind or in any other way restrict NRW in performing its statutory functions.

The recipient acknowledges that:

- any advice given or materials or documentation provided by NRW do not constrain or bind NRW in respect of its statutory functions or its role as a statutory consultee or any decision NRW may make in relation to any application for a licence or permit;
- any advice given by NRW does not bind NRW in respect of any future representations it may make as statutory consultee or any decision NRW may make in relation to any application for a licence or permit;
- any views or opinions expressed by NRW are without prejudice to the consideration NRW may be required to give to any application or any future representations as statutory consultee or any decision NRW may make in relation to any application for a licence or permit;
- the final decision as to any representations made by NRW as statutory consultee will be based on all the relevant information available to NRW at the time it makes such representations;
- NRW cannot and does not give any guarantee as to the representations it may make as statutory consultee; and,
- any advice given by NRW may be overtaken by changes in available information, law, policy and guidance relevant to the subject matter of the advice.

Advisors Consulted:
Marine and Coastal Physical Processes

Advice

The intention of the Physical Processes Modelling Strategy provided on 14th August 2023, is not to conduct any further modelling relating to physical processes impact assessment. **NRW Advisory (A) cannot rule out further modelling at this stage as there were a number of concerns raised during the PEIR phase that may potentially require more focused modelling.**

Please note the previous relevant comments made by NRW (A) in response to the Preliminary Environmental Information Report (PEIR), and copied below:

- With reference to *Section 1.7 Potential Environmental Changes* (Numerical Modelling), NRW (A) confirm that the model presented to describe the physical processes (tides, waves and sediment transport) has been adequately calibrated and validated and provides a good prediction of the baseline physical processes into the nearshore zone.

- With reference to *Figure 1.65 Modelled Array and Trenching Route Indicative Layout,* the positioning of the turbine legs, inter array, interconnector cables and predicted cable protection and scour protection has been included in the physical processes modelling impact assessment for the Mona Array Area. The export cable corridor, however, has not been presented in the same way as the Array and nothing has been presented in the PEIR or supporting technical reports to show where the cable protection will be located along the export cable corridor. It is therefore not clear that the hydrodynamic simulations with the addition of the infrastructure, and the difference plots (proposed minus the baseline condition for currents, waves, littoral currents and residual currents) accurately predicts the total change that could arise along the cable corridor particularly if the cable protection is located in shallow water of the nearshore zone where wave impacts will be greater.

- With reference to *Section 1.7.2.4 Wave Climate* (Post Construction), there is a degree of uncertainty where the cable protection will be placed along the cable corridor and it cannot be assumed at this stage that there will be no cable protection located in the nearshore zone, on the Constable sand bank system, in the Menai Strait and Conwy Bay SAC or across the intertidal, particularly if HDD is the chosen option for cable landfall which could potentially require exit pits cable protection if located between MHWS and MLWS. As such, until the cable locations are known for certain NRW (A) cannot agree that the changes to wave climate would be indiscernible from the baseline wave climate and would not have an impact on the shoreline or nearshore banks.

- With reference to *Figures 1.165 – 1.168 Modelling of SSC plumes caused by trenching across intertidal,* the model assumes that the suspended sediment plumes generated during trenching are transported by tide only currents. NRW (A) request confirmation whether the currents generated by the model include wave induced currents (alongshore currents which are generated by wave breaking at an angle to the shore) as well as tide driven currents? The transport of SSC during intertidal trenching and the sediment

deposition will be strongly dependent on the wave conditions at the time of trenching in addition to the tidal state (spring or neap, flood or ebb). Please justify why tide only currents are chosen to simulate suspended sediment transport across the intertidal if this is the case.

- Regarding *Section 1.8.4.11 Offshore export cables* (SSC Plumes during Cable Installation), NRW (A) advise that suspended sediment transport will be driven by the prevailing wind direction and wave activity as well as the flood and ebb tidal excursion. If, for example, the trenching occurred during a northerly wind then the SSC would also be driven towards the coast in the surface waters affected by the wind driven circulation. The modelling is conducted for tide only conditions and does not include the effect of wind driven circulation, which will be important closer to the coast as the water depth shallows and the waves play a more prominent role. NRW (A) recommend revisiting the modelling and including wave effects, particularly from the North-west and North.

- With reference to *Section 6.8.4 Impacts to the wave regime due to presence of infrastructure and the associated potential impacts along adjacent shorelines*, NRW (A) do not know where along the cable corridor cable protection will be placed and the modelling does not include cable protection or protection at the cable crossings outside the Mona Array. If in the event cable protection is located in the nearshore area or across the intertidal or on Constable Bank or in the Menai Strait and Conwy Bay SAC, then the potential impact to tides, waves, sediment transport processes, seabed/beach morphology and associated potential impacts along adjacent shorelines should be assessed.

- With reference to *Sections 6.8.5.11 and 6.8.5.12 Sensitivity of receptor*, it is not known if cable protection will be placed on Constable Bank or how much sand wave clearance will be conducted. Both activities will interrupt sediment transport processes with the potential to affect the structure and function of the sand bank system. The current modelling assessment only considers the turbine foundations and scour protection at the array. A more detailed assessment is required for Constable Bank if it is deemed necessary to install cable protection.

B.5.6 Email from RPS regarding the herring larval approach and the herring larval heatmap

[redacted]

Cc: [redacted]

Subject: Mona and Morgan Generation herring larval heat/contour mapping

Dear All,

Following the recent EWG for the Mona and Morgan Generation Assets in July 2023, as part of the Evidence Plan Process, we took an action to investigate the potential for heat/contour mapping for the aggregated 10-year NINEL herring larval data to see if we were able to identify any potential hot-spots/trends in the year on year data.

Prior to including this within the two respective Fish and Shellfish Ecology ES chapters, we wanted to run the draft chart by you, which is based on a kernel density heat plot. We investigated a number of options and believe this is the best fit for and most reflective of the data available, but wanted to confirm that this is what you had in mind/were expecting to see before going ahead and incorporating this into our baseline characterisation. The details and context of the action and investigation are as follows:

Cefas S42 feedback

The Cefas/MMO S42 response suggested that heat mapping be undertaken following MarineSpace (2013) guidance, combining particle size data and herring larval data. However we discussed with the EWG that this would not be appropriate due to the larval densities being too low, compared with densities typically encountered in the North Sea, on which the MarineSpace guidance was developed. As such, we proposed we undertake heat mapping using larval densities only and present particle size data along side this (as we did in the PEIR).

Heat Mapping

In the Morgan Generation Assets PEIR, we presented herring larval data over a 10 year period from the NINEL dataset, but did not combined these into one single heat map.

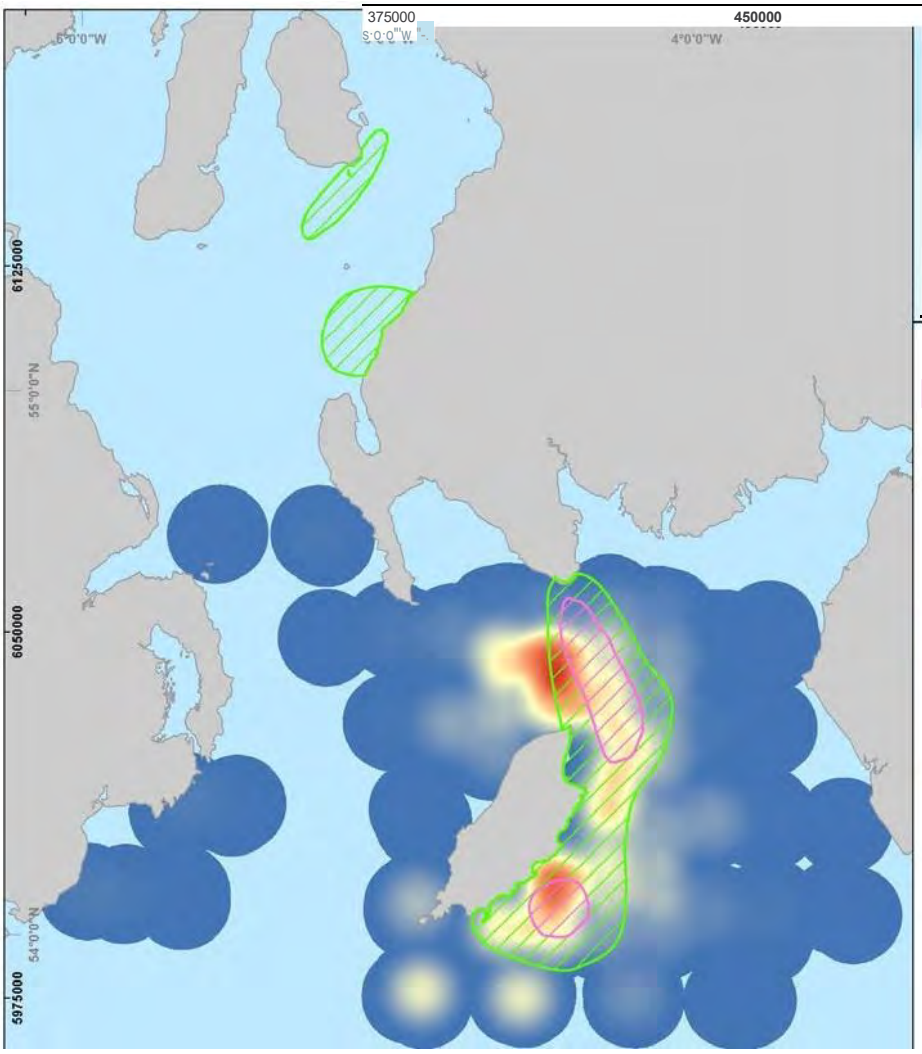
The Figure attached shows the full aggregated 10-year NINEL dataset, but with heat mapping of these as a kernel density map. This was produced by checking a 10 km radius around each station and considering point spatial density and herring larval density at each station. So the resulting heatmap combines the density/abundance of points as well as the value of each point. This was used to indicate levels of spawning on a qualitative high-low scale, with colour smoothing between points used to indicate wider interpolated spatial patterns in spawning.

The link below provides some information on the specific tool we used.
Heatmap (kernel density estimation): 27.1.5. Interpolation — QGIS Documentation documentation

Please could you provide your feedback on the above, and attached figure, by **Wednesday 20th September 2023**.

Kind Regards, [redacted]

[redacted]
Senior Marine Consultant
RPS | Energy
Goldvale House
27-41 Church Street West
Woking, Surrey GU21 6DH, United Kingdom
T [redacted] F [redacted]
D [redacted] M [redacted]
E [redacted]
Digital Business Card



Cc1 l.:o LondNb,
ENGLAND

LEGEND

EZ.I Spawning Ground - High Intensity (Coull et al., 1998)

(:22 Spawning Ground - Low Intensity (Coull et al., 1998)

Heatmap (Kernel Density) of Herring Larvae Density, 2012-2021

High

Low

N

A

Data Sources: Cli@nl,NINEL

Project Name:
MONA OFFSHORE WIND PROJECT AND MORGAN OFFSHORE WIND PROJECT: GENERATION ASSETS

0 5 10 20 nm
0 10 20 40 km

Drawing Number:
RPSE-MN-ES-FAS-036-01

Drawing Title:
HEATMAP (KERNEL DENSITY) FOR NINEL HERRING LARVAE DISTRIBUTION 2012-2021

Geodetic Information:
Datum: ETRS 1989
Projection: ETRS 1989 UTM Zone 30N
Scale 160mmx220mm: 1:1600000

VER	DATE	DETAILS	BY	CHECK
00	09/08/23	First issue	NA	HM
00	04/09/23	Revision	NG	KR

B.5.7 Response from NRW regarding the herring larval heat/contour mapping

From: [redacted] <[redacted]>
Sent: 12 September 2023 17:36
To: [redacted]
Cc:

Subject: RE: Mona and Morgan Generation herring larval heat/contour mapping

CAUTION: This email originated from outside of RPS.

Dear [redacted]

With reference to your email below (sent 06/09/23) regarding the Herring Larval heat / contour mapping:

Thank you for providing the draft kernel density heat plot and the additional detail / context on the tool and process followed. NRW Advisory confirm that we are content with the information provided and its inclusion in the Fish and Shellfish Ecology Chapter(s) of the Environmental Statement.

Kind regards,

[redacted]

Enw / [redacted]
Teitl swydd / Uwch Gynghorydd Morol - Rhaglen Ynni Adnewyddadwy ar y Môr / Senior Marine Advisor - Offshore Renewable Energy Programme

Adran / Tîm Cyngor a Rheoli Ardal Morol / Marine Area Advice & Management Team

Croesewir gohebiaeth yn Gymraeg a byddwn yn ymateb yn Gymraeg, heb i hynny arwain at oedi.
Correspondence in Welsh is welcomed, and we will respond in Welsh without it leading to a delay.

From: [redacted]
Sent: 06 September 2023 14:52
To: [redacted]

B.6. Benthic ecology, Fish and shellfish and Physical processes EWG meeting 5

B.6.1 Meeting minutes

MINUTES OF MEETING

Security Classification: Project External

Partners in UK offshore wind

MOM Number	:	20231012_Morgan and Mona BE, FSF, PP	**REV. No.**	: F02
MOM Subject	:	Morgan and Mona Evidence Plan BE, FSF, PP EWG meeting 5		

MINUTES OF MEETING

MEETING DATE	:	12/10/2023
MEETING LOCATION	:	Microsoft Teams
RECORDED BY	:	[redacted] (RPS)
ISSUED BY	:	[redacted] (RPS)

PERSONS PRESENT:

- [redacted] – bp (SR)
- [redacted] – bp (MP)
- [redacted] – RPS (KL)
- [redacted] - RPS (ST)
- [redacted] - RPS (AP)
- [redacted] - RPS (KH)
- [redacted] – JNCC (JW)
- [redacted] – Natural England (KB)
- [redacted] – Natural England (KC)
- [redacted] – Natural England (EW)
- [redacted] – NRW (LR)
- [redacted] – NRW (LVN)
- [redacted] – NRW (EL)
- [redacted] – NRW (NP)
- [redacted] – IoM (PD)
- [redacted] – MMO (AP)
- [redacted] – MMO (MS)
- [redacted] – Cefas (PM)

ITEM NO:	DISCUSSION ITEM:	Responsible party	Date
	Project updates (Presented by MP) Following responses to the Mona and Morgan Generation Preliminary Environmental Information Reports (PEIRs), the project design envelope has been reviewed and updated. The Mona and Morgan array areas have been reduced in size, mainly in response to shipping and navigation and commercial fisheries consultation and assessments. The slide (slide 5) provides links to the offshore newsletters for Mona and Morgan Generation that were published in September 2023 and presents key offshore updates. The maximum number of wind turbines has been reduced from 107 to 96 for both Mona and Morgan Generation projects. The rotor diameter of the largest wind turbine has increased from 280 m to 320		

	m for both Mona and Morgan Generation. Monopiles have been removed from the list of foundation options included in the project design envelopes. Gravity base foundations and jackets on suction buckets or pin piles (drilled or driven) are retained. No cable protection higher than 70 cm will be installed within in the Menai Strait and Conwy Bay SAC. The percentage of export cable requiring cable protection has been reduced to not exceed 10% of the total length within the SAC. Additionally, no more than a 5% reduction in water depth will occur at any point along the export cables without prior written approval from the Licensing Authority in consultation with the MCA. The Mona export cables will be installed under the intertidal area from below MLWS to above MHWS onshore via trenchless techniques. Open-cut trenching within the intertidal area has been removed for the project design envelope. The Mona sandwave clearance volume for the inter-array cables has been reduced from 9,542,806 m^3 to 4,188,876 m^3 through a reduction in clearance width from 104 m to 80 m. The Mona sandwave clearance volume for the offshore export cables has been reduced from 12,051,955 m^3 to 1,504,000 m^3 through a reduction in clearance width from 104 m to 40 m and a reduction in the percentage of offshore export cable requiring clearance from 70% to 20%. The Morgan Generation sandwave clearance volume for the inter-array cables has been reduced from 11,843,641 m^3 to 5,026,651 m^3 through a reduction in clearance width from 104 m to 80 m and a reduction in the percentage of inter-array cable requiring clearance from 50% to 40%.		
	<u>Benthic ecology assessment (Presented by AP)</u> We wanted to run through the impacts included in the Mona benthic subtidal and intertidal ecology chapter. • Temporary habitat loss/disturbance • Increased suspended sediment concentrations and associated deposition (including an assessment of the release of bentonite during trenchless technique activities) • Disturbance/remobilisation of sediment-bound contaminants • Long term habitat loss (including habitat alteration) • Introduction of artificial structures • Increased risk of introduction and spread of invasive non-native species (INNS) • Removal of hard substrates • Changes in physical processes • EMF from subsea electrical cabling • Heat from subsea electrical cables The benthic chapter has been updated with the project design changes that have been discussed. The following project design changes are of particular importance to the benthic chapter:		

	• Commitment to use trenchless techniques to install the Mona export cables underneath the landfall area therefore all direct impacts to intertidal important ecological features in the intertidal area will be avoided. • Reduction of sandwave clearance volumes for the project alone and in the Menai Strait and Conwy Bay SAC. • Reduction of cable protection in the Menai Strait and Conwy Bay SAC. • Comittment to no sandwave clearance outside the footprint of the cable installation tool within the Constable Bank The assessment concluded the effects would be of negligible or minor adverse significance in EIA terms. Since PEIR was published, a number of updates have been made to the benthic subtidal and intertidal ecology technical report. Minor inconsistencies regarding reporting of the sediment chemistry data in the PEIR have been reviewed and corrected. Levels of contamination across the Mona Offshore Wind Project are low. The Mona benthic technical report now includes full analysis of the site specific grab sample and DDV data for the Mona Zone of Influence as well as the Mona Offshore Cable Corridor, collected in 2022, in combination with the Morgan and Mona 2021 site specific data. Based on this new analysis we are able to confirm that none of the Annex I habitat features of the Menai Strait and Conwy Bay SAC occur within the Mona Offshore Cable Corridor (i.e. there will be no direct impacts on these features). The Mona benthic technical report also includes reporting of the 2023 infill intertidal survey for sections of the landfall not captured in the 2022 survey (including sediment bacterial analysis and remapping of the extent of the *S. alveolata* reef). The project has updated the project boundary in the intertidal area so it now excludes the *S. alveolata* reef. There was a previous commitment to avoid the reef with a buffer of 50 m. This boundary change confirms that there will be no direct impacts to the reef. The Habitat Assessment has been revisited for seapens and burrowing megafauna (with the full image analysis provided by Gardline) which has led to the inclusion of a new seapens and burrowing megafauna IEF. This will be taken forward to the chapter. The Habitat Assessment has been revisited for the Fragile sponge and anthozoan communities on subtidal rocky habitats (with the full image analysis provided by Gardline) and we are able to confirm that this habitat is not present. Following further consultation with Gardline, low resemblance stony reef has been classified as an Annex I stony reef IEF (outside designated site) in line with the guidance in Golding et al. (2020). AP: Are there any comments or questions on the benthic ecology technical report or updates to the assessment? (no comments from the EWG)		

	<u>Y Fenai a Bae Conwy/ Menai Strait and Conwy Bay SAC HRA (presented by AP)</u> The maximum length of Mona export cable that may be within the Menai Strait and Conwy Bay SAC has been reduced from 14 km to 8.1km. The PEIR assumed 20% of this cable may require cable protection, this has further been reduced to 10%. Therefore, this has reduced the maximum length of cables potentially requiring cable protection within the SAC from 2.8 km to 800 m. In addition, the Applicant has made the commitment that no cable protection higher than 70 cm will be installed within the SAC. The Applicant is looking for agreement that there will be no LSE from long term habitat loss and temporary habitat disturbance and so these impact pathways can be screened out of the ISAA for the Menai Strait and Conwy Bay SAC (i.e. due to no overlap with any designated features and so no direct impacts). LN- NRW has reviewed the Mona benthic subtidal and intertidal TR and agrees that there are no designated features of the SAC within the Mona Offshore Cable Corridor so there will be no LSE from long term habitat loss and temporary habitat disturbance for the Menai Strait and Conwy Bay SAC and these impacts can be screened out of the ISAA for this SAC. NRW are pleased that indirect impacts are being considered in the ISAA. Does the Applicant have further details on the specific locations of cable protection within or outside the SAC? KL- Aside from cable crossings (of which there are none in the SAC), cable protection will be remedial (e.g. where cables become exposed due to mobile seabed). The project will not use cable protection where burial can be successful as burial is the most effective means of protecting the cable. It is very difficult to predict where cable burial may not be successful so at the moment we do not know where cable protection may be required. The engineers have looked at the SAC in detail to refine the parameters, but we don't know exact locations. LN- It is very positive to see the reduction in parameters from the PEIR. As cable installation at the landfall will use trenchless techniques, will cable protection been needed at the exit pits? KL- We can take this away and check what is in the project descriptions and how it is included in the assessment. MP- We would also highlight that there is a commitment for no sandwave clearance within the Menai Strait and Conwy Bay SAC. *Post meeting note: The export cable exit point in the nearshore area may have cable protection in the form of mattressing or rock bags (although as with other remedial cable protection, ideally cable protection would be avoided and cables will be buried by sediments). The width and height of the cable protection are subject to the same commitments as for the whole export cable corridor. Cable protection will be up to 10 m wide and will cause no more than a 5% reduction in water depth at any point along the export cables without prior written approval from the Licensing Authority in consultation with the MCA.*	EWG to confirm that long term habitat loss and temporary habitat disturbance can be screened out of the ISAA for the Menai Strait and Conwy Bay SAC	Complete

	The following impacts have been assessed in the HRA for the Y Fenai a Bae Conwy/ Menai Strait and Conwy Bay SAC HRA. Construction phase • Increases in SSC and sediment deposition • Increased risk of introduction and spread of invasive non-native species (INNS) • Accidental pollution Operations and maintenance phase • Increases in SSC and sediment deposition • Changes in physical processes • Increased risk of introduction and spread of INNS • Accidental pollution Decommissioning phase • Increases in SSC and sediment deposition • Increased risk of introduction and spread of INNS • Removal of hard structures • Accidental pollution We have concluded no LSE from direct impacts from heat and EMF from cables and no LSE from introduction of hard structures as there is no overlap with features of the SAC therefore no direct impacts. On the basis of the sediment chemistry results from the Mona Offshore Cable Corridor, disturbance of contaminated sediments has been screened out of the ISAA due to the conclusion of no LSE. LN- This sounds good, NRW agree with the screening out of EMF, heat and introduction of artificial structures from the ISAA. NRW will respond after the meeting on the screening of disturbance of contaminated sediments once our water quality specialist has been consulted. KC- If the size of the rotor diameters has been increased, is there any change to the substructure of the foundations i.e. has the foundation footprint increased. MP- There is no change to the size of the foundations themselves, just the option of monopiles has been removed. KL- There are other changes to the project design envelope that will change the overall footprint of the projects through e.g. reduction in the maximum number of wind turbines. *Post meeting note: The licensing of the dredge and disposal activities within the Mona and Morgan Generation project boundaries are being included in the DCO and Marine Licence therefore the results of the sediment chemistry analysis are included in the benthic subtidal and intertidal technical report. Please can NRW confirm that the results do not also need to be provided in the NRW PS analysis results template.*	EWG to confirm that resuspension of contaminated sediments can be screened out of the ISAA for the Menai Strait and Conwy Bay SAC NRW to confirm that the sediment chemistry results do not need to be provided in the NRW PS analysis results template	Complete Complete

	<u>Agreement logs (presented by KL)</u> The agreement logs will be re-circulated with the meeting minutes for your review and update. They have been updated to take into account the discussions that have taken place since PEIR. They will outline and formalise the discussions over the last few months. To date, they have set out agreement on methodology and baseline characterisation and we have agreed a lot of these items. They will set out what the Applicant is looking for agreement on from now to the application. The agreement logs will look to lead the discussions over the next few months to feed into the statement of common grounds. There will be items in the agreement logs where we are asking for formal agreement as the Applicant considers them to have been agreed in discussions over the last few months and there are items which the Applicant considers still under discission, however your comments are welcome.	**EWG to review and update the agreement logs**	Complete
	<u>Next steps (presented by KL)</u> The meeting minutes and agreement logs will be circulated two weeks following this meeting. The next EWG meeting will be held on 07 December 2023 and will run through the updated Mona assessments for fish and shellfish ecology and physical processes, updated assessment for Morgan Generation as well as looking to the statement of common grounds.		

B.6.2 Response from NRW regarding the meeting minutes

From: [redacted]
To:
Cc:

Subject: RE: Morgan Mona benthic, fish and shellfish and physical processes EWG meeting 5
Date: 09 November 2023 17:32:41
Attachments: [redacted]

[redacted]

Thank you for circulating the minutes and agreement log following the fifth benthic, physical processes, fish and shellfish EWG on 12th October. Please note the following:

- Please find attached NRW Advisory comments on the Mona Offshore Wind Project Environmental Statement Volume 6, Annex 2.1: Benthic subtidal and intertidal ecology technical report.
- NRW Advisory have no comments to make on the minutes of the meeting.
- Please find attached NRW Advisory's updated Agreement Log.
- Having reviewed the Benthic Ecology Technical Report, NRW Advisory agree that there are no Annex I features of the Menai Strait and Conwy Bay SAC present in the overlap with the Mona Offshore Cable Corridor. NRW Advisory therefore agree there will be no LSE from long term habitat loss and temporary habitat disturbance so these impacts can be screened out of the ISAA. However NRW Advisory advise that indirect impacts to benthic habitats from changes in physical processes should be screened into the ISAA as these changes can also lead to potential indirect impacts on Annex I features. We understand from discussions at the EWG that this impact has been scoped in for the operation phase.
- NRW Advisory agree that resuspension of contaminated sediments can be screened out of the ISAA for the Menai Strait and Conwy Bay SAC.
- NRW Advisory confirm that the sediment chemistry results do not need to be provided in the NRW PS analysis results template.
- NRW Advisory understand that an updated HRA methodology note / long-list of projects screened into the CEA / in-combination assessment will be provided for review shortly. Following the list presented at PEIR, NRW Advisory recommended inclusion of e.g. Offshore elements of the HyNet project, so it would be useful to review the final list prior to final agreement.
- NRW Advisory are keen to include some discussion around primary and secondary scour from a Physical Processes perspective at the next EWG in December.

Please let me know if you have any queries.

Kind regards,

[redacted]

B.6.3 Provision of Benthic subtidal and intertidal ecology technical report

From: [redacted]

ect: Mona benthic subtidal and intertidal ecology technical report
Date: 02 October 2023 15:10:00
Attachments: [redacted]

Dear all,

Please see attached the updated Mona benthic subtidal and intertidal ecology technical report for the Environmental Statement. The Applicant has also made the following project refinements relevant to benthic ecology.

The Applicant is looking for agreement that there will be no LSE from long term habitat loss and temporary habitat disturbance and so these impact pathways can be screened out of the ISAA for the Menai Strait and Conwy Bay SAC (i.e. due to no overlap with any designated features and so no direct impacts). Please can the EWG review the technical report, project refinements and come to the EWG on 12th October prepared to discuss this topic.

Project	Area of change	Nature of change
Both	Number of turbines	We have reduced the maximum number of turbines for each project from 107 to 96
Both	Size of turbines	The rotor diameter of the largest wind turbine has increased from 280 m to 320 m
Both	Foundations	Monopiles have been removed. Gravity base foundations and jackets on suction buckets or pin piles (drilled or driven) are retained.
Mona only	Cable protection	No cable protection higher than 70 cm will be installed within in the Conwy Bay and Menai Strait SAC. The percentage of export cable requiring cable protection has been reduced to not exceed 10% of the total length. Additionally, no more than a 5% reduction in water depth will occur at any point along the export cables without prior written approval from the Licensing Authority in consultation with the MCA
Mona only	Intertidal installation	Mona export cables will be installed under the intertidal area from below MLWS to onshore via HDD or other trenchless technique. Trenching within the intertidal area has been removed.
Mona only	Sandwave clearance- inter-array cables	Sandwave clearance volume for the inter-array cables has been reduced from 9,542,806 m^3 to 4,188,876 m^3 through a reduction in clearance width from 104 m to 80 m and a reduction in inter-array cable length.
Mona only	Sandwave clearance- export cables	Sandwave clearance volume for the offshore export cables has been reduced from 12,051,955 m^3 to 1,504,000 m^3 through a reduction in clearance width from 104 m to 40 m and a reduction in the percentage of offshore export cable requiring clearance from 70% to 20%.
Morgan Generation only	Sandwave clearance- inter-array cables	Sandwave clearance volume for the inter-array cables has been reduced from 11,843,641 m^3 to 5,026,651 m^3 through a reduction in clearance width from 104m to 80 m and a reduction in the percentage of inter-array cable requiring clearance from 50% to 40%.

[redacted]

B.6.4 NRW comments on Benthic subtidal and intertidal ecology technical report

Mona Offshore Wind Project Environmental Statement Volume 6, Annex 2.1: Benthic subtidal and intertidal ecology technical report

[redacted]

8th November 2023

Introduction

These comments are provided in response to the **Mona Offshore Wind Environmental Statement, Volume 6, Annex 2.1: Benthic subtidal and intertidal ecology technical report** received via email on 2nd October 2023.

NRW advice in this document is provided (under a Discretionary Advice Service agreement) in respect of a proposal which will require an application for which Natural Resources Wales is a Statutory Consultee.

The customer acknowledges that the content of any advice or assistance provided by NRW is advisory only and that it shall not be deemed to bind or in any other way restrict NRW in performing its statutory functions.

The recipient acknowledges that:

- any advice given or materials or documentation provided by NRW do not constrain or bind NRW in respect of its statutory functions or its role as a statutory consultee or any decision NRW may make in relation to any application for a licence or permit;
- any advice given by NRW does not bind NRW in respect of any future representations it may make as statutory consultee or any decision NRW may make in relation to any application for a licence or permit;
- any views or opinions expressed by NRW are without prejudice to the consideration NRW may be required to give to any application or any future representations as statutory consultee or any decision NRW may make in relation to any application for a licence or permit;
- the final decision as to any representations made by NRW as statutory consultee will be based on all the relevant information available to NRW at the time it makes such representations;
- NRW cannot and does not give any guarantee as to the representations it may make as statutory consultee; and,
- any advice given by NRW may be overtaken by changes in available information, law, policy and guidance relevant to the subject matter of the advice.

Advisors Consulted:
Benthic Ecology
Marine and Coastal Physical Processes

Comments

Please note that the comments below refer to the section of the export cable route that interacts with the array, the export cable route and landfall. JNCC will be advising on the array area.

- Overall NRW Advisory (A) are satisfied with the Benthic Subtidal and Intertidal Ecology Technical Report. The report is very detailed and clearly outlines the baseline characterisation survey, the results and assessments that were carried out.

- The habitats present within the offshore cable corridor section that intersects with the Menai Strait and Conwy Bay SAC have been appropriately identified. NRW (A) agree with the applicant that no Annex I features have been identified within this section of the export cable corridor.

- The Annex I *Sabellaria alveolata* reef has been re-mapped in 2023 and has not changed significantly since the 2022 survey.

- The habitat assessments carried out for the Seapens and burrowing megafauna, Annex I stony reef assessment and hard substrate Porifera have been presented in Appendix B. The presentation of these has helped NRW (A) review the assessments that were carried out.

- NRW (A) are satisfied that the habitats present within the export cable corridor and the landfall have been appropriately identified and that sufficient site-specific and desktop data has been collated to appropriately characterise the baseline benthic subtidal and intertidal ecology environment to inform the EIA.

B.7. Benthic ecology, Fish and shellfish and Physical processes EWG meeting 6

B.7.1 Meeting minutes

MINUTES OF MEETING

Security Classification: Project External

Partners in UK offshore wind

MOM Number	:	20231207_Morgan and Mona BE, FSF, PP	**REV. No.**	:	F02
MOM Subject	:	Morgan and Mona Evidence Plan BE, FSF, PP EWG Meeting 6			

MINUTES OF MEETING

MEETING DATE	:	07/12/2023
MEETING LOCATION	:	Microsoft Teams
RECORDED BY	:	[redacted](RPS)
ISSUED BY	:	[redacted](RPS)

PERSONS PRESENT:

- [redacted] – MMO (APrice)
- [redacted] – RPS (APrior)
- [redacted] – Wildlife Trust (BS)
- [redacted] – NW Wildlife Trust (BC)
- [redacted] – RPS (BP)
- [redacted] – Cefas (CR)
- [redacted] – NRW (EL)
- [redacted] - Cefas (GE)
- [redacted] bp (GV)
- [redacted] – NRW (IN)
- [redacted] – Cefas (JW)
- [redacted] – JNCC (JW)
- [redacted] – NRW (JI)
- [redacted] – Natural England (KB)
- [redacted] – RPS (KH)
- [redacted] – RPS (KL)
- [redacted] – Natural England (KC)
- [redacted] – NRW (LN)
- [redacted] - RPS (LS)
- [redacted] – MMO (MS)
- [redacted] – bp (MP)
- [redacted] – RPS (NS)
- [redacted] – NRW (PMin)
- [redacted] – Cefas (PMc)
- [redacted] – Isle of Man (PD)
- [redacted] - RPS (ST)
- [redacted] – bp (SR)
- [redacted] – RPS (TT)

ITEM NO:	DISCUSSION ITEM:	Responsible party	Date
1.	**Project Updates - presented by MP** Assessments are being finalised right now, the Applicant is aiming to submit the Mona DCO application towards end of February 2024 and the Morgan Gen DCO application after Easter 2024. Any further comments and completion of the agreement logs before the Christmas break would be appreciated as we are now at a critical time and are unable to include anything new at this stage. All previous stakeholder comments have been considered. EL: will need to look at NRW internal capacity regarding the agreement logs and will keep RPS updated.		
2.	**Physical Processes Assessment - presented by NS** NS provided some updates on the physical processes assessment: • Reduction in Mona Array Area from that presented in the Preliminary Environmental Information Report (PEIR) The Mona Array Area sits entirely in Welsh waters now • Updated layout of turbine rows and spacing with a minimum of 1,400m between and within wind turbine rows • Removed monopiles from the Project Design Envelope (PDE) • Removal of the smallest wind turbine, with associated increase in rotor diameter for the largest one from 280 to 320 m. The Applicant has received agreement on the approach to the modelling in the PEIR. No further modelling or revised assessment is required, as the PEIR modelling assumptions are reflected in the project description. NS stated that there were two sets of concerns raised by NRW, one due to the location/extent/height of cable protection (particularly in shallow areas). The second was related to the trenching activities in nearshore/intertidal zone. Refinements and commitments of the Mona OWF project include: <u>Cable installation</u> • Development and adherence to a Cable Specification and Installation Plan (CSIP) which includes cable burial where possible and cable protection. • Offshore export cables will be installed under the intertidal area from below MLWS to onshore via trenchless techniques. No open-cut trenching or cable protection will be required in the intertidal zone. <u>Seabed preparation</u> • Sandwave clearance at Constable Bank will be minimised (within the swept path of the cable burial tool which has been further reduced from 40m to 20m swept path width) and there will be no sandwave clearance in the Menai Strait and Conwy Bay SAC		

	• Sandwaves will not be flattened, they will be reduced in height to allow passage of the burial tool • Material arising from drilling and sandwave clearance will be deposited back in close proximity. JI: Have you done an assessment on sandwave recoverability (particularly in the array offshore)? NS: We've looked at other studies (one on seabed mobility) during the EIA modelling. There was a specific seabed mobility study done as part of the engineering studies. These will be referenced, and material drawn from them will be included in the assessment in the physical processes chapter. We can certainly include a technical annex for the EWG. JI: Stated that you need to be mindful of regional sediment transport budgets being affected cumulatively with other projects. NS: Noted NS continued refinements and commitments: <u>Cable protection</u> • No cable protection required in Constable Bank. Within the Menai Strait and Conwy Bay SAC, cable protection will reduce water depth no more than 5% without approval from the Licensing Authority and the Marine Coastguard Agency and restricted to 10% of the cabling within the SAC. • The foundation scour protection measures will be subject to engineering design to ensure they are fit for purpose and to minimise the occurrence of primary and secondary scour. Secondary scour will become negligible through detailed site specific design. • Therefore there will be minimal changes to wave climate, tide, and sediment transport regimes in areas where cable protection is required. Occurrence of scour and secondary scour will be minimised. JI: Tend to disagree with scoping out secondary scour. What are the implications of scour (particularly along the corridor) on benthic habitats and have these been cross-linked in the document. You can't scope out secondary scour without the evidence at this stage. Would there be mitigation measures in place if secondary scour became an issue during the monitoring? NS: Secondary scour is discussed and looked at in the context of the assessment. There are commitments specifically looking into it (including the CSIP). At this stage, it is difficult to quantify the magnitude and extent of any secondary scour that may occur at this stage (due to engineering uncertainties). From an engineering process, reducing/avoiding secondary scour is advantageous. JI: Reiterated that secondary scour has to be considered. Otherwise happy to see that the cable protection has been reduced and the approach presented to this. MP: We'll take an action to revisit our draft assessments and ensure we have included all the studies and modelling used.	**Applicant to revisit the draft assessments to review how secondary scour has been considered.**	For the Environmental Statement

	NS moved on to refinements and commitments for Morgan Generation and stated that the comments from above on Mona will also be applied to Morgan Generation. The commitments and refinements above will be carried forward to Morgan Generation too. <u>Modelling assessment and strategy</u> Trenchless technology will reduce event driven sediment dispersion. With the changes, updates, and commitments, it is not as necessary to undertake specific modelling for event driven sediment dispersion although it is still considered within the assessment. The physical processes team has done additional sensitivity testing in terms of the different foundation types that could potentially be used. <u>Material harvesting for gravity based foundations</u> It is proposed that up to 7,000 m^3 of seabed preparation material may be harvested from each gravity base. Due to the fact there is a large proportion of coarse sand across the array, this will not cause changes to the seabed sediment characteristics and associated sediment transport rates. The volume of the gravel base placed under the slab is greater than the potential sediment to be used as a ballast, hence there will not be a void to interrupt sediment transport pathways. Any sediment used in the ballast from offsite would be clean material which had passed any relevant quality and contaminants checks and all ballast would be decommissioned by offsite disposal. JI: Will gravel be left behind at decommissioning? NS: No, the material that will be used to fill the ballast will be taken off site. The gravel underneath the structure will remain *in situ*. JI: We need to know size and quantity of gravel remaining *in situ*. Have you assessed material removal in combination with Morgan Generation as it could be significant. Will go back and discuss this further with JNCC and refrain from making any more comments until we have discussed. KC: Will gravity bases be used for all turbines across the array? NS: Assessment has been undertaken for up to 70 locations within each of Mona and Morgan as the maximum design scenario. KC: Are you looking at the different biotopes at these locations, as some will be more receptive to material removal than others? APrior: We don't have a layout on where these 70 locations modelled will be, so cannot provide the level of granularity that you're asking for at this stage of the project. The biotopes are widespread across the array and wider Irish Sea. MP: The assessment is at a worst case, so we have assessed all the habitats and species within the array. ST: Please do feedback to us if you have any more queries.	**Applicant to include gravel remaining in situ in the physical processes assessment**	With the Environmental Statement
3.	**<u>Benthic Ecology assessments – presented by Aprior</u>**		

	P presented the sampling in 2022 of the Morgan Array Area and Zone of Influence (ZoI). APrior stated that we are combining the 2021 and 2022 survey data for the final application for consent. <u>Morgan Generation</u> Particle Size Analysis (PSA) shows that sediments ranged from muddy sandy gravel to gravelly muddy sand with most as gravelly sand and gravelly muddy sand. Typically coarser in the west and with a higher composition of sands and muds in the east of the array. Detailed the results of the sediment chemistry analysis, which showed that contamination was low overall and, with the exception of arsenic, below the relevant Cefas Action Levels (ALs) and Canadian Threshold Effects Level (TEL). Biotopes are dominated by the Polychaete-rich deep Venus community in offshore mixed sediments (SS.SMx.Omx.PoVen) biotope with the *Lagis koreni* and *Phaxas pellucidus* in circalittoral sandy mud (SS.Smu.CsaMu.LkorPpel) biotope in the east. Brittlestar bed recorded at one station in the west of the ZoI. Annex I low resemblance stony reefs was identified at two stations in the south of the Morgan Array Areas ZoI (as per the 2021 survey), but this habitat was not found to be present within the array. No evidence of stony reef was recorded in the Morgan Gen ZoI in 2022 survey. An assessment of the 'sea pen and burrowing megafauna communities' habitat was undertaken at two stations in the ZoI but burrows at both stations had a SACFOR result of rare meaning they were not considered to resemble this habitat. No 'Fragile Sponge and Anthozoan Communities on Subtidal Rocky Habitats' was recorded. APrior gave a quick recap of the list of impacts in the Morgan Generation assessment, which have not changed from those presented in the PEIR. Presented updates that have been made to the benthic subtidal ecology technical report in response to S42 comments: • Minor inconsistencies regarding sediment chemistry have been reviewed and corrected which confirms the original conclusion that levels of contamination, on the whole, are low across the Morgan Array Area • Includes biotope analysis of site specific survey data for the Morgan ZoI in combination with the Morgan and Mona 2021 data • Includes description of bedform features from the site-specific geophysical surveys • Habitat Assessment (for both the 2021 and 2022 surveys) has been revisited (with the full image analysis provided by Gardline). This has led to a decision to include, on a precautionary basis, a new seapens and burrowing megafauna IEF. This has been taken forward for full assessment in the benthic ES chapter • Fragile sponge and anthozoan communities on subtidal rocky habitats assessed has been revisited which has confirmed that this habitat is not present The low resemblance stony reef recorded in the ZoI has been classified as an Annex I stony reef IEF (albeit outside an SAC) in line with the		

	guidance in Golding et al. (2020) and is assessed accordingly in the chapter. Changes to the chapter: • Morgan Array Area has reduced in size • Reductions in the maximum design scenario (MDS) due to the changes to project parameters (e.g. reductions in sandwave clearance parameters) • The Mooir Vannin offshore wind farm has been included as Tier 2 in the CEA • Queries registered with Isle of Man Government regarding whether some cumulative projects are active and will update accordingly • Chapter includes seapens and burrowing megafauna IEF (as a precaution). No comments from the EWG on the benthic ecology section presented by Aprior.		
4.	**<u>Fish and Shellfish Ecology – presented by LS</u>** Provided a summary of key feedback received and proposed actions surrounding underwater sound assessment for herring and cod. Provided updates on the revised underwater sound assessment for Mona and Morgan Generation. These involved removal of monopiles of the design envelope, reduced maximum hammer energy, and reduced hammer energies associated with concurrent piling scenarios. The sensitivities of herring and cod have been updated to 'high' at the suggestion of the EWG through the response to the PEIR. LS provided an overview of the outputs from updated underwater sound modelling for Mona and Morgan Generation, showing contour plots for SPL_{pk} and SEL_{ss} alongside herring spawning grounds, and SPL_{pk} alongside cod spawning grounds. Contour plots were shown for both the 4,400 kJ and 3,300 kJ hammer energy scenarios, along with plots for concurrent piling (SEL_{cum}). IN: Why are you modelling single strike instead of cumulative SEL? LS: The ranges for SEL_{cum} will also be presented in the chapter, but in terms of the threshold proposed for herring single strike has been presented here (135 dB SEL_{ss}; use of this metric was requested by Cefas). All thresholds and metrics will be fully discussed in the chapter. JW: It's confusing for the 5 dB increments to be provided on the figure, could you confirm why this was done? LS: These were included in the figures to illustrate the 135 dB but we will plot the relevant TTS thresholds from Popper *et al.* (2014) up without the increments within the Fish and Shellfish Ecology Chapter of the Environmental Statement. KL: Note that these will need to be two different figures given the different units in the Popper *et al* (2014) thresholds in comparison to the 135 dB (SEL_{ss}). LS: Noted LS continued presenting the sound contours for herring at Mona highlighting that whilst the 135 dB SEL_{ss} sound contour shows some overlap with the mapped herring spawning ground at Douglas Bank,	**Applicant to plot the relevant TTS thresholds in the Environmental Statement**	With the Environmental Statement

	this threshold is highly precautionary (based on the author's own statement that it should not be applied as a threshold). Piling will also be intermittent, and it is unlikely for continuous piling to occur for the full 3-4 weeks of the spawning period. Further, the hammer energies modelled are the maximums, and in practice, it is unlikely that the maximum energy level will be reached all foundation locations. These results should only be considered in the context of the spawning periods for herring and cod, and outside of these timeframes the spatial concerns are limited, as herring are not constrained to specific substrates outside of spawning, and impacts to cod communications are not anticipated to affect spawning success outside of their spawning period. The concurrent piling modelling shows minimal difference between that modelled for single piling (noting that there is a slight difference in metric between SEL_{ss} and SEL_{cum}). This is due to sound levels not being mathematically additive, with only a small increase (c. 3 dB) when combining two sound sources of the same level. The maximum concurrent scenario will also be presented within the Fish and Shellfish Ecology Chapter of the Environmental Statement. GE: You mentioned a 160 dB SPL_{pk}, we have made a few comments regarding how sound levels were converted before on the Morgan and Morecambe Offshore Windfarms: Transmission Assets. Have you checked your equations on this for Mona? LS: We will come back to you on this after looking at the equations again (as I haven't seen the comments regarding this). KL: The reason we have used the 160 dB SPL_{pk} as a basis for assessing impacts of behavioural effects is that it is based on various reports on piling and seismic (such as McCauley *et al*., 2000, Mueller-Blenkle *et al*., 2010) and in the absence of any agreed, published thresholds for behavioural effects. We've used higher sound level references on other projects (such as 168 dB to 173 dB SPL_{pk} used on Atlantic Array and Hornsea One), however we wanted to be precautionary on this project. *Post meeting note: many projects use the less precautionary Popper et al. (2014) thresholds for TTS as a proxy for behavioural responses; while more profound behavioural effects are likely to occur within this TTS range, we feel that using 160 dB SPL_{pk} is a better guide for assessing risk of behavioural effects on fish, and it is appropriately precautionary, whilst not being too conservative.* GE: Was the Atlantic Array example for herring? KL: It was for herring and shad. For some species (such as lamprey and flatfish) the 160 dB SPL_{pk} behavioural effects range will be massive over estimations of the impact, but it's appropriate to capture sensitivities of all fish species. We note that 135 dB SEL_{ss} discussed earlier is highly conservative but are still presenting it as requested by Cefas. GE: Appreciate that you have presented these. No further comments. LS continued to present Mona sound contours for cod, based on 160 dB SPL_{pk} at the northernmost location. There is a wide extent of high and low spawning grounds in the entire Irish Sea, and as previously discussed for herring, piling will be of short duration and intermittent. It is not expected to span throughout the entire cod spawning season (not least due to the likely weather conditions in winter) and the		

	maximum hammer energies modelled are not likely to occur in practice at all foundation locations. LS continued to present very similar findings for cod and herring at Morgan. Overlaps between sound contours (both 135 dB SEL_{ss} and 160 dB SPL_{pk}) and the mapped Douglas Bank herring spawning ground are increased, due to the closer proximity of Morgan Generation to this ground. The same justifications provided previously for Mona apply for Morgan Generation, in terms of the short-term nature of the piling phase, and the high degree of intermittency, along with the modelling being undertaken based upon the maximum potential hammer energies, which is not likely to be required in practice. The recoverability of cod and herring should also be considered, and the application of these spatial concerns during the spawning periods for these species. PD: Have you had additional advice on the larval phases of herring post spawning and how these will be impacted by sound? LS: Our assessment includes fish eggs and larvae (static) mortality ranges, which are outlined both in a table and fully in text in the chapter. They don't specifically relate to herring eggs and larvae, but are considered applicable. KL: Generally, adults are more sensitive so you wouldn't expect an effect on eggs and larvae at the distances shown on these contour maps. LS: We have used larval kernel density on the maps to show where peak aggregations of larvae are likely to be immediately post-hatching. PD: The spawning grounds are not necessarily as close to the Isle of Man, more so that currents transfer the larvae up to these hotspots. I can send you the most recent larval survey maps? LS: For the larval data, the approach broadly taken is to present data on larvae of a particular size (<10mm; i.e. those which have recently hatched and have not been subject to extensive transport by currents within the water column). This is then a good indication of where they have hatched from, and therefore where the eggs were deposited and spawning occurred. The larvae presented here is of this particular size range, as these will not likely have been carried away by the current yet. KL: The larvae heatmap is based on ten years of data, so is comprehensive. The data presented in the maps was provided by the Agri-food and Bioscience Institute (AFBI). PD: Have the AFBI looked at the assumptions in the modelling and accepted them? KL: Agreed to take this query away and requested that PD sends over the most recent maps and data that he mentioned. GE: Potentially aggregate or PSA data around the Isle of Man could help combining the larval density hotspots as herring spawning grounds. Is there a potential scenario for concurrent piling at Mona and Morgan Generation at the same time?	**IoM Gov to send over the most recent PSA data**	Complete

	LS: Outside of the Irish Sea Offshore wind round 4 cluster there will be potential differences in the way that modelling has been done for other projects (such as at Awel y Mor, and this information is not available for the Mooir Vannin Offshore Windfarm). This makes it difficult to create a concurrent piling scenario for all these projects. KL: For a quick answer, yes, it is possible that Morgan Generation and Mona could pile at the same time, which will be included in the CEA. GE: Yes, I appreciate this, and there is a low likelihood that two piles are hit at the exact same time (and how this will make modelling difficult). MP: There should be no overlap in piling with the Mooir Vannin wind farm, based on its scoping documents. GV: We plan to complete construction by 2030, and Mooir Vannin shouldn't be piling until after then. IN: Even if the ensonified areas aren't larger as a result of cumulative piling, you will still have multiple patches of ensonified areas. LS: This has been considered qualitatively in the CEA in terms of increased coverage by ensonified areas from multiple projects.		
5.	**<u>Underwater Sound Management Strategy (UWSMS) – presented by ST</u>** Site Integrity Plans have historically been applied to projects in the Southern North Sea (SNS), in particular those within or close to the Southern North Sea SAC, which is designated for Harbour Porpoise. In these SIP's there are defined thresholds for cumulative effects of piling – 10% in a particular season, or 20% on a particular day. Mona and Morgan Generation are not predicted to reach the 10% area threshold for the nearest harbour porpoise SAC (i.e. North of Anglesey Marine SAC), either alone or in-combination with other projects. As such, a SIP, similar to those used in the Southern North Sea SAC, is not considered appropriate to manage underwater sound impacts. At PEIR, outstanding concerns were raised with respect to: • Bottlenose dolphin populations, including those associated with Welsh SACs; • Cumulative concerns about impacts of piling on cod spawning; • Concerns about piling impacts on herring spawning. The Applicant is looking to agree a mechanism (similar to SIPs) that allow us to agree an approach to managing of underwater sound impacts post consent, when more details of the project construction for the individual projects, and more detail on cumulative projects in the region is known. We are producing an Underwater Sound Management Strategy (UWSMS) to do this. The UWSMS would allow the projects to focus on underwater sound for multiple receptors (fish and marine mammals). The project will submit an outline of the UWSMS with the applications so the stakeholders and Secretary of State can have confidence that this will be effective and agreed post consent.	**Stakeholders to confirm whether the UWSMS is an acceptable approach to manage underwater sound impacts**	Complete

	The UWSMS would set out the detailed project design pre-construction (e.g. the number of foundations that will need piling may be reduced, hammer energies may be revised etc.) as the application collects more information on the ground conditions. The version developed post-consent will contain any further environmental information e.g. cod and herring stock or spawning grounds if necessary. These have previously been used post-consent in discussion on underwater sound impacts. The impact assessments within offshore wind applications assume all the piling is occurring at the same time and therefore you end up with a large, conservative assessment. In reality, all cumulative projects may not be piling at the same time therefore the cumulative impacts will likely be reduced from what has been assumed in the final applications. This has been the experience for SIPs where impacts have been reduced due to phasing of projects. The UWSMS will set out potential mitigation options which could be employed if there are residual concerns about the cumulative impacts of underwater noise following refined project design. These are often agreed in principle at the application stage with final agreement achieved post consent with the final project design. Presented a working table of content for the UWSMS. This is may still subject to change. An outline of the UWSMS will be submitted with the application for consent along side the MMMP. The main advice the applicant is looking for is whether this approach would be acceptable. This approach was presented at the steering group and the project general received positive feedback. We are trying to put forward a process where the projects can continue towards consent and the detail can be discussed post-consent when further information is available. IN: Will timing restrictions be included in mitigation? KL: The spatial restrictions presented will be relevant to timing. The Applicant will want to have the option to undertake piling operations throughout the year, although there may be the need for spatial restrictions at certain times of year, depending on project design refinements that happen between now and construction; this will be part of the focus of the UWSMS. IN: Great. There were no further comments on the UWSMS presented by ST.		
6.	**<u>HRA Updates for Mona – presented by APrior</u>** APrior discussed some key updates for the Mona Offshore Wind Project. Regarding the Menai Strait and Conwy Bay SAC, up to 8.1 km of export cable will be installed within it. Up to 10% of this cable may require protection (this is a reduction in values presented in the PEIR: 800 m reduced from 2.8 km). No cable protection higher than 70 cm. No Annex I habitat features occur within the Mona Offshore Cable Corridor (nearest is 2.4 km away).		

	Reiterated that NRW were happy to screen out temporary and long term habitat loss and contaminated sediments based on no LSE for this SAC. The following impact pathways have been screened in for LSE and are assessed in the ISAA for Annex I reefs and Annex I sandbanks: • Increases in SSC and associated deposition • Changes in physical processes • Increased risk of introduction and spread of INNS • Accidental pollution. APrior summarised the assessment of increases in SSC and associated deposition. Modelling of export cable installation was undertaken with tidal forcing. Average SSC of <300 mg/l are predicted along the cable path, with the level dropping to background levels on the slack tide. Sedimentation level is small typically <0.5 mm and the greatest levels of deposition occur along the trenching route as coarser material settles. In nearshore regions the tidal flows are oriented parallel to the coastline and the plume is not predicted to encroach on the shoreline and the Menai Strait and Conwy Bay SAC features. JI: Have you considered including wind generated sediment transport, particularly in the nearshore area? For example, if you had a northerly wind blowing towards the coast and normal wave condition in shallow waters, this could result in potential transport of the sediment plume towards the coast? NS: There are only certain conditions that you could undertake these cable installation activities. The wind would need to be coming from the north or north east, and, in terms of the SAC, the tide would also need to be an ebb tide. There are a lot of factors at play. However, as the majority of work is at the seabed, most of the sediment falls back into the trench (due to the nature of the works undertaken and the coarse nature of the sediment). Softer sediments, yes, could get dispersed further albeit at lower suspended sediment concentrations. If you have wind influencing the seafloor, you also have normal sediment transport as a result. JI: So the tidal ellipse moves in line with the trench? NS: Yes, correct. Within the technical report we have the ebb and flood tidal currents and vectors. We could generate some figures showing the ellipses at multiple places along the export cable corridor. APrior continued to summarise that there would be no risk of an adverse effect on the integrity of the Menai Strait and Conwy Bay SAC due to increased SSCs and deposition, based on the physical processes modelling outputs presented on the slide. APrior summarised the assessment of changes in physical processes. Any cable protection within the SAC will be minimised and will not exceed 0.7 m. Peak tidal flows may be redirected, however this will not be detectable beyond the immediate vicinity. JI: Can I confirm that the cable protection will be removed? GV: We aren't able to fully state what will happen on this in 35 years. Where removal is the worst case this has been assessed. Where cable	**Applicant to add figure of tidal ellipsis into the Environmental Assessment**	With the Environmental Statement

	protection remaining in situ is the worst case scenario is the worst case, this has been assessed. APrior: We will ensure this is worded correctly in the HRA with regards to the MDS for this impact (removal or leaving cable protection *in situ*). It can be concluded that there is no risk effect on the integrity of the Menai Strait and Conwy Bay SAC due to changes in physical processes.		
7.	**<u>Agreement Logs – presented by ST</u>** Progress is being made towards submission (Q1 and Q2 2024). As discussed in previous EWG meetings we have made good progress on methodologies, and these have been logged in the agreement logs. The next aim is to map out progress towards conclusions and mitigation agreements as we move to application submission. The projects are looking to agree topics now based on the PEIR and project update and information provided in this presentation, and other EWG discussions. The projects are aware that there will be some items under discussion and so agreements will be made once these discussions take place and as the projects progress the advice received from the PEIR and EWGs. The agreement log includes a requestion for agreement that for the project alone there will not be any adverse effects on integrity of designated sites. This is based on the PEIR and updates shown today that there is no greater magnitude of impact than was presented at PEIR. The applicant understands the EWG will wish to see the full cumulative assessment ahead of providing agreements on impact levels, but we wanted to highlight that we are not in a position of significant/adverse effects or impacts for Mona or Mogan Gen. Some additional items in the agreement log and others have been flagged as under discussion, and some have been flagged as agreed. We would like to map a pathway to agreement and where we want to progress to, up to application. These logs will form framework for statements of common ground. Minutes will be circulated within two weeks of today.	**Stakeholders to review and update the agreement log**	Ongoing

B.7.2 Response from Cefas regarding the meeting minutes

From: [redacted]
[redacted]
Subject: RE: Morgan Mona BE, FSF, PP EWG meeting 6
Date: 08 January 2024 16:21:20
Attachments: [redacted]

[redacted]

Please see below comments from the underwater noise team:

Please note that no one from our noise team attended this meeting on the 7th December. Therefore, I defer to Cefas fisheries advisors who were present to confirm whether they are content with the meeting minutes.

I have provided thoughts on the Underwater Sound Management Strategy (UWSMS) which was also discussed during the marine mammal ETG held on the 5th December 2023.
We (Cefas) would be interested to hear Natural England's views on this, specifically the applicant's view that a Site Integrity Plan (SIP) is not considered appropriate to manage noise impacts. If an Underwater Sound Management Strategy (UWSMS) is agreed as the preferred approach, then it would be helpful to set out in advance the conditions under which noise abatement, for example, will be required, so that there is a clear set of boundaries within which the developer will be working. This approach would still allow for the construction planning to evolve, but it would also give confidence that appropriate safeguards are in place at the stage of giving consent to the project, rather than leaving it to time-pressured discussions (which is too often the case) after consent has been granted.

Many thanks

[redacted]

B.8. Benthic ecology, Fish and shellfish and Physical processes EWG agreement log

Item	Meeting Date	Issue on which agreement is sought	Topic	Consultee	Progress of agreement in the EWG	Agreement?	Notes
1	17/02/2022	Agreement on the Remit and Inputs to the EWG (as set out in Section 4.2 of the Evidence Plan Template).	Benthic ecology, fish and shellfish ecology and physical processes	NRW	NRW Advisory (A) agree in principle to the remit and inputs to the EWG, although, as stated previously, NRW (A) needs to be able to carefully consider, plan and manage our resources at all times and as such we can only commit to the Evidence Plan Process on a 'best-endeavours' basis. It should also be noted, that the Evidence Plan process falls under our Discretionary Advice Service – whilst we aim to meet demand for the service, there may be times when our capacity to do so is limited. In those instances, we reserve the right to not offer the service. NRW (A) would like to clarify in Section 3.1.1.3 Natural Resources Wales Advisory within the Evidence Plan Template that JNCC remain the statutory consultee for Welsh waters beyond 12 nm, but we will endeavour to align our advice where possible.	Agreed	NRW (A) will endeavour to 'agree' the points outlined in Section 4.2 where possible, but as acknowledged within the Evidence Plan process, it may not always be possible to reach full agreement between all parties. Where agreement is not reached, NRW (A) will advise according to our remit and clearly outline our reasoning. Similarly, in the second to last bullet point in Section 4.2.1, it may not be possible to 'ensure' the effects are reduced to an acceptable level. It should be noted that any advice that we provide is advisory only and will not be binding, or in any way restrict NRW in performing its statutory functions. All advice provided by NRW will be based on the information that has been made available to us, and policies that are in place at that time. In response to the sector topics covered within this EWG, whilst NRW (A) acknowledge that input from additional receptor specialists can be overseen by the NRW Advisory Case Manager, we reiterate the need to include discussions on Water Quality and WFD where appropriate.
			Benthic ecology, fish and shellfish ecology and physical processes	JNCC	JNCC are content with the remit and inputs outlined in Section 4.2 of the Evidence Plan Template, however, we would like to take this opportunity to highlight that (with regard to Section 3.1.1.4 Joint Nature Conservation Committee) JNCC's role in relation to offshore renewables in English waters has been delegated to Natural England. Natural England is now authorised to exercise the JNCC's functions as a statutory consultee in respect of certain applications for offshore renewable energy installations in inshore and offshore waters (0-200nm) adjacent to England. Therefore, JNCC would not look to provide comment on the Morgan project unless we anticipate an impact on a jointly managed site (i.e. a site jointly managed by ourselves and Natural England). As such JNCC have not provided feedback in relation to the Morgan project within this response. We are currently holding	Agreed	04/08/2023: For Information Only, JNCC will not look to provide comment on the Morgan Project. As previously stated, JNCC's role in relation to offshore renewables in English waters has been delegated to Natural England (NE). We defer to NE regarding the Morgan Project.
			Benthic ecology, fish and shellfish ecology and physical processes	TWT	TWT are happy to accept the minutes and agree to the log to date.	Agreed	None
			Benthic ecology, fish and shellfish ecology and physical processes	Natural England	Natural England provided comment on the draft Evidence Plan, via a comments log, on 4 November 2021. It was our view that the Evidence Plan set out the basic framework of the Evidence Plan. This was ahead of the 1st Evidence Plan meeting on 16 November 2021. We welcome the update of the Evidence Plan (version F02, provided 4 February 2022) which has incorporated our earlier comments. The remit of the Benthic Ecology, Fish and Shellfish Ecology and Physical Processes EWG as set out	Agreed	None
2	17/02/2022	Agreement on Ways of Working document, including timescales.	Benthic ecology, fish and shellfish ecology and physical processes	NRW	NRW (A) agree in principle to the Ways of Working document and the timescales for responding, although we reiterate that more time may be required for a response if there are large / multiple documents or due to unforeseen circumstances. Where deadlines cannot be reached, NRW (A) will notify RPS / bp / EnBW as soon as possible. As above, NRW (A) can only commit to the Ways of Working on a 'best endeavours' basis and reserve the right to not offer our Discretionary Advice Service at times when our capacity to do so is limited.	Agreed	None
			Benthic ecology, fish and shellfish ecology and physical processes	JNCC	JNCC are satisfied with the content of the Ways of Working document and feel that the proposed timings are reasonable. Where there may be an issue in achieving the timeframe set out within the Ways of Working document, JNCC will be sure to contact bp / EnBW and RPS in a timely manner to ensure minimal disruption to the progress of the agreement(s) in question.	Agreed	Any advice or assistance provided by JNCC via our Discretionary Advice Service is advisory only, and with reference to the General terms and conditions for DAS chargeable services, JNCC excludes any warranty that the advice provided by its officers represents JNCC's opinion or otherwise binds JNCC when acting as a Statutory Consultee.
			Benthic ecology, fish and shellfish ecology and physical processes	TWT	TWT are happy to accept the minutes and agree to the log to date.	Agreed	None
			Benthic ecology, fish and shellfish ecology and physical processes	Natural England	We welcome the Evidence Plan Ways of working document (version F01, provided 4 February 2022) as a clear reference document. Natural England agrees with the Ways of Working document which aligns with previous comments in terms of timescales for review and comment provided as part of our comments on the draft Evidence Plan (4 November 2022). As noted in the document, it may be necessary for timescales to be amended to ensure sufficient time to review and comment (e.g. large documents or multiple	Agreed	None
3	17/02/2022	Agreement on broad approach to future surveys – that previous feedback has been taken into account in future scope. Detailed scope of survey to follow spring 2022.	Benthic ecology	NRW	NRW Advisory agree with the broad approach taken for future surveys and that previous feedback to date has been taken into account in future scope.	Agreed	None
			Benthic ecology	JNCC	JNCC are content with the surveys that have been undertaken as well as those scheduled for the array's Zone of Influence and the cable route. With regard to the upcoming surveys, we would like to refer bp / EnBW and RPS to previous advice provided by JNCC (Ref OIA-08126, 11 June 2021) regarding benthic survey scopes which may prove useful. We appreciate that the benthic survey	Agreed	None
			Benthic ecology	TWT	TWT are happy to accept the minutes and agree to the log to date.	Agreed	None
			Benthic ecology	Natural England	n/a	Agreed	Natural England have set up a SharePoint Online (SPOL) site to share Natural England's advice on the environmental considerations and use of data and evidence to support offshore wind and cable projects in English waters. These should be considered when developing the baseline characterisation and designing future surveys. Advice provided on this site includes Natural England and Joint Nature Conservation Committee (JNCC)'s shared advice on 'Nature conservation considerations and environmental best practice for subsea cables in English inshore and UK offshore waters.'
4		Agreement on broad approach to baseline characterisation for Benthic Ecology.	Benthic ecology	NRW	NRW Advisory agree on the broad approach to characterisation for Benthic Ecology in particular now that the Zone of Influence will be sampled.	Agreed	NRW (A) would welcome the opportunity to review the assessment / data associated with the Sea-pen and Burrowing Megafauna Communities in due course.
			Benthic ecology	TWT		Agreed	

Item	Meeting Date	Issue on which agreement is sought	Topic	Consultee	Progress of agreement in the EWG	Agreement?	Notes
	17/02/2022		Benthic ecology	JNCC	JNCC note the presence and initial analysis of sea-pen and burrowing megafauna communities within the array area and welcome the opportunity to review the assessment of this feature. JNCC provide the following information as it may prove useful in further analysis. The definition of the OSPAR T&D feature 'Seapens and burrowing megafauna communities' is the subject of on-going discussions between Contracting Parties as scientific knowledge improves, particularly for deep sea areas. OSPAR (2008) defines the 'Seapen and burrowing megafauna communities' feature as "Plains of fine mud, at water depths ranging from 15-200m or more, which are heavily bioturbated by burrowing megafauna with burrows and mounds typically forming a prominent feature of the sediment surface. The habitat may include conspicuous populations of seapens, typically Virgularia mirabilis and Pennatula phosphorea." The narrative then notes that - "...the tall seapen Funiculina quadrangularis may also be present." The OSPAR (2010) Background Document for Seapen and Burrowing megafauna communities instead notes that "... burrows and mounds may form a prominent feature of the sediment surface with conspicuous populations of seapens ..." At a meeting of the OSPAR Contracting Parties in Bergen in November 2011 , a key recommendation was that the presence of burrowing megafauna is the essential defining characteristic of the feature; the presence or absence of seapens does not in itself define the feature. Seapens may form a prominent feature of the seabed surface, but do not have to be present to define the OSPAR T&D habitat (SS.SMu.CFiMu.SpnMeg and/or SS.SMu.CFiMu.MegMax). This assumption is equally true of the Scottish 'burrowed mud' PMF, with the exception of the seapen Funiculina quadrangularis, which is designated as part of this PMF. JNCC believe that this is the most up-to-date position on the composition of this habitat. JNCC have published the following report on the UK interpretation of the feature:	Under discussion	Comments reiterated in JNCC's PEIR response.
5	17/02/2022	Agreement on broad approach to characterisation for Fish and Shellfish Ecology.	Fish and shellfish ecology	NRW	NRW Advisory agree on the broad approach to characterisation for Fish and Shellfish Ecology.	Agreed	None
			Fish and shellfish ecology	TWT		Agreed	
			Fish and shellfish ecology	JNCC	We would like to take the opportunity to flag that Fish and Shellfish Ecology falls outside of JNCC's remit and we would not therefore look to comment further.	n/a	None
6	17/02/2022	Agreement on broad approach to characterisation for Physical Processes.	Physical processes	NRW	NRW Advisory agree on the broad approach to characterisation for Physical Processes.	Agreed	None
			Physical processes	TWT		Agreed	
			Physical processes	JNCC	JNCC have no further comments at this stage in this process.	n/a	None
7	29/11/2022	Agreement on broad approach to characterisation for Benthic Ecology.	Benthic ecology	Natural England	Natural England broadly agree with the approach characterisation for benthic ecology as presented at the expert working group meeting on 29th November 2022.	Agreed	None
			Benthic ecology	NRW	NRW Advisory agree on the broad approach to characterisation for Benthic Ecology.	Agreed	None
			Benthic ecology	TWT		Agreed	
			Benthic ecology	JNCC	JNCC agree on the broad approach to characterisation for Benthic Ecology	Agreed	None
8	29/11/2022	Agreement to the scoping of impacts for the EIA and HRA for Benthic Subtidal and Intertidal Ecology	Benthic ecology	Natural England	Natural England broadly agree with the scoping of impacts for the EIA and HRA for Benthic Subtidal and Intertidal Ecology, as presented at the expert working group meeting on 29th November 2022.	Agreed	None
			Benthic ecology	NRW	NRW Advisory agree with the scoping of impacts for the EIA and HRA for Benthic Subtidal and Intertidal Ecology.	Agreed	None
			Benthic ecology	TWT		Agreed	
			Benthic ecology	JNCC	With regard to the impacts presented in this EWG, JNCC agree with the scoping of impacts for the EIA and HRA for Benthic Subtidal Ecology. We would, however, like to refer RPS, EnBW and bp back to our Scoping response dated 1 June 2022 (Ref OIA-08713) where we provided the following advice; "we would ask that Habitat Alteration be scoped in. JNCC acknowledge that 'colonisation of hard structures' has been scoped in however, JNCC consider 'physical change to another sediment type' to be a pressure for the offshore wind operation phase and the introduction of hard substrate into	Agree with caveats	Further comments reiterating these points have been included in JNCC's PEIR response.
9	29/11/2022	Agreement to the scoping of impacts for the EIA and HRA for Fish and Shellfish Ecology	Fish and shellfish ecology	Natural England	Natural England broadly agree with the scoping of impacts for the EIA and HRA for Fish and Shellfish Ecology, as presented at the expert working group meeting on 29th November 2022.	Agreed	None
			Fish and shellfish ecology	NRW	NRW Advisory agree with the scoping of impacts for the EIA and HRA for Fish and Shellfish Ecology	Agreed	None
			Fish and shellfish ecology	JNCC	Outside of our remit.	n/a	None
10		Agreement to the scoping of impacts for the EIA and HRA for physical processes	Physical processes	NRW	No objections raised with regards to scope of physical processes.	Agreed	
			Physical processes	JNCC	No objections raised with regards to scope of physical processes.	Agreed	None
			Physical processes	Cefas	No objections raised with regards to scope of physical processes.	Agreed	
			Physical processes	TWT		Agreed	

Item	Meeting Date	Issue on which agreement is sought	Topic	Consultee	Progress of agreement in the EWG	Agreement?	Notes
			Physical processes	Natural England	No objections raised with regards to scope of physical processes.	Agreed	
11	29/11/2022	Agreement on approach to noise modelling and approach to assessment following clarifications provided in EWG.	Fish and shellfish ecology	Natural England	Natural England agree to the approach to noise modelling and approach to assessment as presented at the expert working group meeting on 29th November 2022.	Agreed	None
			Fish and shellfish ecology	NRW	NRW Advisory largely agree with the approach to modelling and approach to assessment following clarifications provided in the EWG, but await further clarification on e.g. sandeel habitat / herring spawning as per comments provided within our scoping response.	Agreed	
			Fish and shellfish ecology	JNCC	Outside of our remit.	n/a	None
12	11/07/2023	Agreement on physical processes modelling strategy	Physical processes	NRW	Modelling stategy with regard to PEIR to ES project changes: Advice note issued 14/08/2023 and follow up meeting 18/08/2023	Agreed	No issue with using existing PEIR study as supporting evidence for ES PDE
				NRW	Overaching strategy: "NRW Advisory (A) cannot rule out further modelling at this stage as there were a number of concerns raised during the PEIR phase that may potentially require more focused modelling."	Agreed with Caveat	Concerns relate largely to location, extent and height of cable protection (particularly in shallow/near shore areas). No further modelling or revised assessment required provided the PEIR modelling assumptions are reflected in the PDE. ES adopted measures now include this (in concert with compliance with MCA navigation restricitions).
				JNCC	JNCC would not look to feedback on the Modelling Strategy and defer the NRW for comment.	n/a	None
				TWT		Agreed	
				MMO/ Cefas	No comments from physical processes advisor. Agreement on approach from Fisheries, Fish & Shellfish and Benthic Ecology Advisors.	Agreed	
13	11/07/2023	There will be no significant effects on physical processes in EIA terms for the project alone or cumulatively with other plans and projects.	Physical processes	NRW		Under discussion	NRW (A) are unable to agree that there will be no significant effects on physical processes in EIA terms without sight of the assessments.
				Natural England	For Mona, NE defer for NRW for this issue.	n/a	
				JNCC	It is outwith JNCC's area of expertise to address this comment, we defer to NRW on matters relating directly to physical processes.	n/a	
				TWT		No comments in agreement log	
				Cefas		No comments in agreement log	
14	11/07/2023	The approach used for determining LSE on European sites with Annex I habitats as features is appropriate and that all sites within the zone of influence of indirect effect from SSC and changes in physical processes have been identified (noting that the Dee Estuary SAC falls outside the ZoI and will be screened out of the LSE screening for the final application).	Benthic ecology (HRA)	NRW	NRW Advisory agree with the approach used for determining LSE and all sites within the ZOI have been screened in. Clarifications were provided in the EWG as to why the Dee Estuary SAC was screened into the ISAA and not the PEIR. It was noted the ISAA was produced prior to the outputs of	Agreed	
				Natural England	For Mona, NE defer for NRW for this issue.	n/a	
				JNCC	No sites designated for Annex I habitats occur in the offshore area of the Mona project. JNCC therefore have no further comments to make.	n/a	
				TWT		Agreed	
				Cefas		No comments in agreement log	
15	11/07/2023	The approach used for determining LSE on European sites with Annex I I diadromous fish as features is appropriate and that all the relevant sites have been identified .	Fish and shellfish ecology (HRA)	NRW		Agreed	Agreement updated 09/01/2024
				Natural England	Natural England defer to NRW regarding fish and shellfish ecology for the Mona project.	n/a	
				JNCC	Fish and Shellfish Ecology falls outside of JNCC's remit and we would not therefore look to comment further.	n/a	
				TWT		Agreed	
				Cefas		No comments in agreement log	
16	11/07/2023	Agreement that the fish and shellfish ecology study area that was defined in the PEIR is appropriate for the baseline characterisation	Fish and shellfish ecology	NRW	No objections raised regarding the fish and shellfish ecology study area	Agreed	
				Natural England	No objections raised regarding the fish and shellfish ecology study area	Agreed	
				JNCC	No objections raised regarding the fish and shellfish ecology study area. Fish and Shellfish Ecology falls outside of JNCC's remit and we would not therefore look to comment further.	n/a	
				TWT		Agreed	
				Cefas	No objections raised regarding the fish and shellfish ecology study area	Agreed	

Item	Meeting Date	Issue on which agreement is sought	Topic	Consultee	Progress of agreement in the EWG	Agreement?	Notes
17	11/07/2023	The characterisation of herring spawning potential is sufficient to inform the EIA, with the caveat that additional heat mapping of herring larval data is presented for the Environmental Statement, that PSA data is presented for the Environmenal Statement to allow for data cross-checking by stakeholders and that additional PSA sample data is extracted from the Cefas OneBenthic tool for the project region to provide a wider context regarding substrate suitability.	Fish and shellfish ecology	NRW		Agreed	Agreement updated 09/01/2024
				Natural England	For Mona, NE defer to Cefas on this issue.	n/a	
				JNCC	Fish and Shellfish Ecology falls outside of JNCC's remit and we would not therefore look to comment further.	n/a	
				TWT		No comments in agreement log	
				Cefas	Cefas: *All the comments and discussion from the meeting with the MMO and Cefas on their initial PEIR feedback regarding feedback on the MarineSpace approach to heatmapping should be considered. It was noted that the MarineSpace approach is not ideal for numbers in the Irish Sea, where abundances were much lower. The Applicant should look at adapting this approach where possible. It would be useful to look at the NIHLS larval data as a 10-year dataset and to provide contour mapping based on this, which may highlight some particular "hot spots". In addition, using additional sources to support the substrate classification such as Cefas' OneBenthic tool to extract more PSA data from the region (where available) to provide characterisation beyond the surveyed areas*	Under discussion	
18	11/07/2023	The characterisation of sandeel potential is sufficient to inform the EIA with the caveat that PSA data is presented for the Environmental Statement to allow for data cross-checking by stakeholders and that additional PSA sample data is extracted from the Cefas OneBenthic tool for the project region to provide a wider context regarding substrate suitability.	Fish and shellfish ecology	NRW		Agreed	Agreement updated 09/01/2024
				Natural England	Natural England defer to NRW regarding fish and shellfish ecology for the Mona project.	n/a	
				JNCC	Fish and Shellfish Ecology falls outside of JNCC's remit and we would not therefore look to comment further.	n/a	
				TWT		No comments in agreement log	
				Cefas	Applied to both herring and sandeel substrate suitability: *using additional sources to support the substrate classification such as Cefas' OneBenthic tool to extract more PSA data from the region (where available) to provide characterisation beyond the surveyed areas*	Under discussion	
19	11/07/2023	The correct designated sites and appropriate fish and shellfish ecology features have been identified within the baseline characterisation and considered where appropriate in the EIA and HRA.	Fish and shellfish ecology	NRW	No objections raised regarding the designated sites presented with relevant fish features within the PEIR and prior/subsequent Expert Working Group meetings.	Agreed	
				Natural England	No objections raised regarding the designated sites presented with relevant fish features within the PEIR and prior/subsequent Expert Working Group meetings.	Agreed	
				JNCC	No objections raised regarding the designated sites presented with relevant fish features within the PEIR and prior/subsequent Expert Working Group meetings. Fish and Shellfish Ecology falls outside	n/a	
				TWT	No objections raised regarding the designated sites presented with relevant fish features within the PEIR and prior/subsequent Expert Working Group meetings.	Agreed	
				Cefas	No objections raised regarding the designated sites presented with relevant fish features within the PEIR and prior/subsequent Expert Working Group meetings.	Agreed	
20	11/07/2023	There will be no adverse effects on integrity for SACs designated for fish features for any impacts for the project alone or in combination.	Fish and shellfish ecology	NRW	In Section 42 Consultation responses: NRW (A) agree with the conclusions of no adverse effects on siteintegrity for qualifying Annex II diadromous fish features on the Dee Estuary and River Dee and Bala Lake SACs	Agreed	
				NE	Natural England defer to NRW regarding fish and shellfish ecology for the Mona project.	n/a	
				JNCC	Fish and Shellfish Ecology falls outside of JNCC's remit and we would not therefore look to comment further.	n/a	
				TWT		Agreed	
				Cefas		No comments in agreement log	
22	11/07/2023	On the basis that there is no direct overlap with fish features of MCZs of sound contours with the potential to cause injury or behavioural responses, there will be no risk of hindering conservation objectives of any MCZs with fish features (from underwater sound or any other impacts).	Fish and shellfish ecology	NRW		Agreed	Updated 09/01/2024, NRW (A) agree there is no direct overlap with fish features of MCSs of sound contours as the only Welsh MCZ is Skomer, which does not include any fish features.
				NE	Natural England defer to NRW regarding fish and shellfish ecology for the Mona project.	n/a	
				JNCC	Fish and Shellfish Ecology falls outside of JNCC's remit and we would not therefore look to comment further.	n/a	
				TWT	defer to NRW	n/a	
				Cefas		No comments in agreement log	
	11/07/2023	For all impacts, other than underwater sound, no significant effects on fish	Fish and shellfish ecology	NRW		Agreed	Agreement updated 09/01/2024
				NE	NE defer to NRW regarding MCZs in welsh waters with fish features.	n/a	
				JNCC	Fish and Shellfish Ecology falls outside of JNCC's remit and we would not therefore look to comment further.	n/a	
				TWT	defer to NRW	n/a	

Item	Meeting Date	Issue on which agreement is sought	Topic	Consultee	Progress of agreement in the EWG	Agreement?	Notes
23		sound, no significant effects on fish and shellfish receptors are predicted for the project alone and cumulatively.		Cefas		No comments in agreement log	
24	11/07/2023	Measures adopted as part of the project (as set out in Table 8.17 of the PEIR) are appropriate and agreed to ensure significant effects are avoided, other than underwater sound.	Fish and shellfish ecology	NRW		Agreed	Agreement updated 09/01/2024
				NE	For Mona, NE defer to NRW on this issue.	n/a	
				JNCC	Fish and Shellfish Ecology falls outside of JNCC's remit and we would not therefore look to comment further.	n/a	
				TWT		No comments in agreement log	
				Cefas		No comments in agreement log	
25	11/07/2023	The approach to underwater sound modelling, including soft starts and ramp ups is appropriate, noting that these will not be effective for all fish and shellfish receptors.	Fish and shellfish ecology	NRW	NRW Advisory do not agree that underwater sound modelling and assessment should be based on soft starts or ramp ups	Agreed	NRW Advisory are content to agree this given the acknowledgement that soft-start is not nessarily effective so can not be recognised as a mitigation for all species
				NE	For Mona, NE defer to NRW on this issue.	n/a	
				JNCC	Fish and Shellfish Ecology falls outside of JNCC's remit and we would not therefore look to comment further.	n/a	
				TWT		Agreed	
				Cefas,	Cefas agree that modelling including soft starts and ramp ups is fairly standard and agree that this approach is acceptable.	Agreed	
26	11/07/2023	The approach to underwater sound modelling based on presentation of both static receptors and those moving away from the source is appropriate.	Fish and shellfish ecology	NRW		Agreed	Update 09/01/2024 - NRW Advisory agree with this approach, but note that we will base our advice on the information provided for fish as static receptors, as NRW (A) does not agree with the use of the modelling outputs for fleeing receptors as the the assumptions made are not necessarily realistic or conservative, for the following reasons; - There is no evidence presented to support the use of the fleeing speed assumed, which will vary with species, life stage (size) and even environmental factors. - There is no empirical evidence to support fleeing, especially not at the rate and with the directness assumed in modelling. Available studies suggest every reaction from a short burst of swimming away, to startling/freezing, burying themselves in substrate, change of direction etc., furthermore the reaction will depend on the species and what fish are doing at the time i.e. feeding or mating.
				NE	For Mona, NE defer to NRW on this issue.	n/a	
				JNCC	Fish and Shellfish Ecology falls outside of JNCC's remit and we would not therefore look to comment further.	n/a	
				TWT	Both sessile and mobile receptors should be concidered in the approach to underwater sound modelling	Agreed	
				Cefas,		No comments in agreement log	
27	11/07/2023	Cod and herring should be considered of high sensitivity to underwater sound	Fish and shellfish ecology	NRW	NRW agree with the MMO that cod should be considered as having high sensitivity to sound.	Agreed	Agreement updated 09/01/2024
				NE	For Mona, NE defer to NRW on this issue.	n/a	
				JNCC	Fish and Shellfish Ecology falls outside of JNCC's remit and we would not therefore look to comment further.	n/a	
				TWT	Both cod and herring should be concidered of high sensitivity to underwater sound	Agreed	
				Cefas	Cefas maintain that cod should be classed as high sensitivity to underwater sound.	Agreed	
28	12/10/2023	For piling impacts, no significant effects are predicted on fish and shellfish receptors, other than cod and herring during the spawning period.	Fish and shellfish ecology	NRW		Agreed	Agreement updated 09/01/2024
				NE	For Mona, NE defer to NRW on this issue.	n/a	
				JNCC	Fish and Shellfish Ecology falls outside of JNCC's remit and we would not therefore look to comment further.	n/a	
				TWT	The change in foundation strategy should mitigate percussive noise impacts, however, the decision on foundation type will is not to be confirmed prior to consent. Pin piling will be more significant than	Agreed with caveat	
				Cefas		No comments in agreement log	
	12/10/2023	For piling impacts, although a significant effect (in EIA terms) is predicted on herring and cod spawning, any such effects will be managed and avoided through measures set out in the Piling	Fish and shellfish ecology	NRW		Under discussion	Update 09/01/2024 - It is not possible for NRW (A) to agree that effects to herring and cod spawning will be managed with a Piling Strategy, without the opportunity to review this document and any subsequent iterations.
				NE	For Mona, NE defer to NRW on this issue.	n/a	
				JNCC	Fish and Shellfish Ecology falls outside of JNCC's remit and we would not therefore look to comment further.	n/a	
				TWT	Subject to foundation strategy, any LSE limited to construction phase.	Under discussion	

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29		Measures set out in the Piling Strategy, which will be agreed with stakeholders post consent.		Cefas		No comments in agreement log	
30	12/10/2023	The regional benthic subtidal and intertidal ecology study area that was defined in the PEIR is appropriate for the baseline characterisation.	Benthic ecology	NRW	NRW Advisory agree with the regional benthic subtidal and intertidal area defined in the PEIR	Agreed	
				NE	For Mona, NE defer to NRW on this issue.	n/a	
				JNCC	As per the descriptions detailed in Vol 2, Chapter 7: Benthic subtidal and intertidal ecology, Section 7.1.3 Study area, JNCC are content that the regional benthic subtidal ecology study are that was defined is appropriate.	Agreed	
				TWT		Agreed	
				Cefas		No comments in agreement log	
31	12/10/2023	Sufficient site-specific and desktop data has been collated to appropriately characterise the baseline benthic subtidal and intertidal ecology environment to inform the EIA.	Benthic ecology	NRW	NRW Advisory have reviewed the Benthic Technical report and agree sufficient site-specific and desktop data has been collated to inform the EIA	Agreed	
				NE	For Mona, NE defer to NRW on this issue.	n/a	
				JNCC	JNCC previoiusly noted that the incorporation of site-specific surveys for the Mona Offshore Cable Corridor and the Zone of Influence (ZOI) have not been incorporated within the PEIR. While JNCC are aware that assessment of these study areas will be addressed in the Environmental Statement we cannot currently agree that sufficient site-specific and desktop data has been collated to appropriately characterise the baseline benthic subtidal ecology environment to inform the EIA.	Not agreed	
				TWT		Agreed	
				Cefas		No comments in agreement log	
32	12/10/2023	The benthic intertidal ecology baseline, including identification of IEFs, is agreed.	Benthic ecology	NRW	NRW Advisory agree with the identification of IEFs	Agreed	
				NE	NE defers to NRW for comments on the potential effects on benthic ecology from the Mona Offshore Wind Project	n/a	
				JNCC	JNCC's remit does not extend to the intertidal area. We therefore defer to NRW.	n/a	
				TWT		Agreed	
				Cefas		No comments in agreement log	
33	12/10/2023	No Annex I habitat features of the Menai Strait and Conwy Bay SAC are present in the overlap with the Mona Offshore Cable Corridor.	Benthic ecology	NRW	NRW Advisory agree after having reviewed the Benthic Technical report that there are no Annex I features of the Menai Strait	Agreed	
				NE	NE defers to NRW for comments on the Menai Strait and Conwy Bay SAC	n/a	
				JNCC	Menai Strait and Conwy Bay SAC fall within the inshore area, we therefore defer to NRW for comment.	n/a	
				TWT		Agreed	
				Cefas		No comments in agreement log	
34	12/10/2023	The correct designated site (i.e. the Menai Strait and Conwy Bay SAC), and appropriate benthic habitat features, have been identified and taken forward for consideration in the EIA and all other designated sites (including MCZs) with benthic features fall outside the ZoI and do not require assessment.	Benthic ecology	NRW	NRW Advisory agree the correct designated site has been identified and taken forward for consideration in the EIA. With regards to the benthic habitat features that have been screened in, it would be useful to overlap the project specific outputs of the physical processes assessment with the Annex I features of the Menai Strait and Conwy Bay SAC in order to see the spatial extent of the physical process impacts in the SAC. At present it is difficult to understand whether there is any potential interaction with other features of the SAC that have not been screened into the assessment e.g. Annex I Submerged or partially submerged sea caves feature. Until this is presented we are unable to confirm whether all features have been screened in	Under discussion	Update 09/01/2024 - It is not possible for NRW (A) to agree that all appropriate benthic habitats have been screened in without full understanding of any overlap between physical processes impacts and other SAC features. This position can be revised once we have
				NE	NE defers to NRW for comments on the Menai Strait and Conwy Bay SAC	n/a	
				JNCC	JNCC agree that any offshore sites designated for benthic habitats fall outside of the ZOI and therefore do not required further assessment.	Agreed	
				TWT	defer to remarks made by NRW	n/a	
				Cefas		No comments in agreement log	
35	12/10/2023	On the basis that there is no direct overlap with any Annex I habitat features of the SAC, there will be no LSE from long term habitat loss and temporary habitat disturbance and so these impact pathways can be screened out of the ISAA for the Menai Strait and Conwy Bay SAC (i.e. due to no overlap with any designated	Benthic ecology	NRW	NRW Advisory agree after having reviewed the Benthic Technical report that there are no Annex I features of the Menai Strait and Conwy Bay SAC present in the overlap with the Mona Offshore Cable Corridor. NRW Advisory therefore agree there will be no LSE from long term habitat loss and temporary habitat disturbance so these impacts can be screened out of the ISAA. However NRW Advisory advise that indirect impacts to benthic habitats from changes in physical processes should be screened into the ISAA as these changes can also lead to potential indirect impacts on Annex I features. We understand from discussions at the EWG that this impact has been scoped in for the operation phase.	Agreed with caveat	Update 09/01/2024 - NRW (A) agree that there is no overlap with Annex I features of the Menai Strait and Conwy Bay SAC and the Mona Offshore Cable Corridor, and therefore no LSE from long term habitat loss and temporary habitat disturbance. However indirect impacts to benthic habitats from changes in physical processes should be screened in to the ISAA.

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	12/10/2023	features and so no direct impacts).		NE	NE defers to NRW for comments on the Menai Strait and Conwy Bay SAC	n/a	
				JNCC	Menai Strait and Conwy Bay SAC fall within the inshore area, we therefore defer to NRW for comment.	n/a	
				TWT	defer to remarks made by NRW	n/a	
				Cefas		No comments in agreement log	
36	12/10/2023	In is appropriate to scope out accidental pollution from the benthic subtidal and intertidal ecology chapter (noting that effects from the release of bentonite (a chemically inert, natural clay) are assessed in the increased in SSC and sediment deposition impact pathway).	Benthic ecology	NRW	NRW Advisory agree it is appropriate to scope out Accidental Pollution from the benthic ecology EIA chapter provided standard mitigation practices are incorporated into the project design such as [illegible] CEMP.	Agreed	Updated 09/01/2024.
				NE	NE defers to NRW for comments on the potential effects on benthic ecology from the Mona Offshore Wind Project	n/a	
				JNCC	JNCC are content for accidental pollution to be scoped out from the perspective of offshore benthic ecology.	Agreed	
				TWT		Agreed	
				Cefas		No comments in agreement log	
37	12/10/2023	Noting the clarification points bulleted below, the potential impacts assessed represent a comprehensive list of potential effects on benthic ecology from the Mona Offshore Wind Project. - Habitat alteration/physical change to another sediment type is fully described and assessed in the assessment of long term habitat loss. - Secondary scour is scoped out of Volume 2, Chapter 1: Physical processes and an assessment is therefore no required in the benthic chapter - Impacts associated with the removal of marine growth from foundations during the maintenance phase spans several impact pathways. As such this impact has been considered within two impact pathway assessments: 1) increased SSC and sediment deposition (i.e. in relation to the	Benthic ecology	NRW	In the EWG held on the 11/07/2023, NRW (A) agreed with the applicant that if the project could commit to no cable protection on Constable Bank and in the Menai Strait and Conwy Bay SAC, then assessment of secondary scour could be scoped out and dealt with in the context of detailed design. There is now a commitment to not place any cable protection in Constable Bank and no Annex I features have been found in the section of the ECR that interacts with the Menai Strait and Conwy Bay SAC. Therefore NRW (A) agree secondary scour can be scoped out	Agreed	Update 09/01/2024 - However please refer to meeting minutes from 07/12/23. NRW Physical Process Specialist reiterated secondary scour has to be considered and there was an action from MP to revisit the draft assessments and ensure they have included all the studies and modelling used.
				NE	NE defers to NRW and JNCC for comments on the potential effects on benthic ecology from the Mona Offshore Wind Project	n/a	
				JNCC	JNCC is still of the opinion that Habitat Alteration / physical change to another sediment type should be scoped in and that assessing this under long term habitat loss does not fully encompass the consequences of habitat alteration / physical change to another sediment type. In addition, we maintain that secondary scour should also be scoped into the benthic chapter and not just assessed in the context of physical processes. JNCC are content with the two impact pathway assessments for marine growth but would reiterate that removal and deposition of marine growth may impact adjacent habitats in addition to impacting the vicinity of the wind turbine foundation.	Not agreed	
				TWT		Agreed	
				Cefas		No comments in agreement log	
38	12/10/2023	The list of projects screened into the CEA in the EIA and the in-combination assessment in the HRA are appropriate.	Benthic ecology	NRW	NRW Advisory understand that an updated HRA methodology note / long-list of projects screened into the CEA / in-combination assessment will be provided for review shortly. Following the list presented at PEIR, NRW A recommended inclusion of e.g. Offshore elements of the HyNet project, so it would be useful to review the final list prior to final agreement.	Under discussion	As above
				NE	For Mona, NE defer to NRW on this issue.	n/a	
				JNCC	JNCC is satisfied with the list of projects that have been screened in.	Agreed	
				TWT		Agreed	
				Cefas		No comments in agreement log	
39	12/10/2023	The list of projects screened into the CEA in the EIA and the in-combination assessment in the HRA are appropriate.	Fish and shellfish ecology	NRW	NRW Advisory understand that an updated HRA methodology note / long-list of projects screened into the CEA / in-combination assessment will be provided for review shortly. Following the list [illegible] at PEIR, NRW A recommended inclusion of e.g. Offshore elements of the HyNet project	Under discussion	As above
				NE	For Mona, NE defer to NRW on this issue.	n/a	
				JNCC	Fish and Shellfish Ecology falls outside of JNCC's remit and we would not therefore look to comment further.	n/a	
				TWT		Agreed	
				Cefas		No comments in agreement log	
	12/10/2023	The list of projects screened into the CEA in the EIA and the in-combination assessment in the HRA are appropriate.	Physical processes	NRW	NRW Advisory understand that an updated HRA methodology note / long-list of projects screened into the CEA / in-combination assessment will be provided for review shortly. Following the list presented at PEIR, NRW A recommended inclusion of e.g. Offshore elements of the HyNet project, so it would be useful to review the final list prior to final agreement.	Under discussion	As above
				NE	For Mona, NE defer to NRW on this issue.	n/a	
				JNCC	JNCC defer to NRW on matters relating directly to physical processes.	n/a	
				TWT		Agreed	

Item	Meeting Date	Issue on which agreement is sought	Topic	Consultee	Progress of agreement in the EWG	Agreement?	Notes
40				Cefas		No comments in agreement log	
41	12/10/2023	The impact pathways assessed for benthic subtidal ecology (intertidal detailed separately) will not result in significant effects in EIA terms given the implementation of the measures adopted as part of Mona Offshore Wind Project.	Benthic ecology	NRW	NRW Advisory are unable to agree to this until we have reviewed the assessments, following submission of the DCO application	Under discussion	Updated 09/01/2024
				NE	For Mona, NE defer to NRW on this issue.	n/a	
				JNCC	JNCC are unable to provide agreement on this issue until such times that we can fully assess the site-specific surveys analysis for the Mona Offshore Array Area, Cable Corridor and the Zone of Influence (ZOI). We appreciate that this information will be provided in the ES.	Not agreed	
				TWT	The measures implemented will miitgate LSE's from temporary habitat disturbance. LSE from long term habitat disturbance will require operational monitoring.	Under discussion	
				Cefas		No comments in agreement log	
42	12/10/2023	The impact pathways assessed for benthic subtidal ecology will not result in adverse effects on integrity of the Menai Strait and Conwy Bay SAC (or any other SAC) given the implementation of the measures adopted as part of Mona Offshore Wind Project.	Benthic ecology	NRW	NRW Advisory are unable to agree to this until we have reviewed the assessments, following submission of the DCO application	Under discussion	Updated 09/01/2024
				NE	For Mona, NE defer to NRW on this issue.	n/a	None
				JNCC	Menai Strait and Conwy Bay SAC fall within the inshore area, we therefore defer to NRW for comment.	n/a	
				TWT	The measures implemented will miitgate LSE's from temporary habitat disturbance. LSE from long term habitat disturbance will require operational monitoring.	Under discussion	
				Cefas		No comments in agreement log	
43	12/10/2023	None of the impacts on benthic intertidal IEFs at the landfall will result in significant effects, in EIA terms, given the implementation of the measures adopted as part of Mona Offshore Wind Project (including avoidance of direct impacts to clay and piddocks IEF in the intertidal).	Benthic ecology	NRW	NRW Advisory are unable to agree to this until we have reviewed the assessments, following submission of the DCO application	Under discussion	Updated 09/01/2024
				NE	For Mona, NE defer to NRW on this issue.	n/a	
				JNCC	The intertidal area fall outside of JNCC's remit, we therefore defer to NRW for comment.	n/a	None
				TWT	Acknowledging the commitment for the ECR WTW request further detail with regard to exit pits location and design in order to better understand the impact on benthic intertidal IEF's.	Under discussion	
				Cefas		No comments in agreement log	
44	12/10/2023	No cumulative effects that are significant in EIA terms are predicted	Benthic ecology	NRW	NRW Advisory are unable to agree to this until we have reviewed the assessments, following submission of the DCO application	Ongoing point under discussion	Updated 09/01/2024
				NE	For Mona, NE defer to NRW on this issue.	n/a	
				JNCC	JNCC are unable to provide agreement on this issue until such times that we can fully assess the site-specific surveys analysis for the Mona Offshore Array Area, Cable Corridor and the Zone of Influence (ZOI). We appreciate that this information will be provided in the ES.	Under discussion	
				TWT		No comments in agreement log	
				Cefas		No comments in agreement log	
45	12/10/2023	The measures adopted as part of the Mona Offshore Wind Project are sufficient and no additional measures are necessary as a result of the assessment conclusions.	Benthic ecology	NRW	NRW Advisory are unable to agree to this until we have reviewed the assessments, following submission of the DCO application	Ongoing point under discussion	Updated 09/01/2024
				NE	For Mona, NE defer to NRW on this issue.	n/a	
				JNCC	JNCC are unable to provide agreement on this issue until such times that we can fully assess the site-specific surveys analysis for the Mona Offshore Array Area, Cable Corridor and the Zone of Influence (ZOI). We appreciate that this information will be provided in the ES.	Under discussion	
				TWT		No comments in agreement log	
				Cefas		No comments in agreement log	

Appendix C: Evidence Plan Marine mammals EWG

C.1. Marine mammals EWG overview

Table C.3: Overview of marine mammals EWG consultation materials.

Date	Meeting	Information provided
17 February 2022	Marine mammals EWG meeting 1	Meeting minutes (C.2.1) Response from Natural England regarding the meeting minutes (C.2.2) Response from the MMO regarding the meeting minutes (C.2.3) Response from NRW regarding the meeting minutes (C.2.4) NRW's position statement on the use of Marine Mammal Management Units for screening and assessment in Habitats Regulations Assessments for Special Areas of Conservation with marine mammal features (C.2.5)
19 July 2022	Marine mammals EWG meeting 2	Meeting minutes (C.3.1) Response from Natural England regarding the meeting minutes (C.3.2) Response from the MMO regarding the meeting minutes (C.3.3) Morgan and Mona Offshore Wind Projects Note on Underwater Sound Modelling Methodology (C.3.4) Response from NRW regarding Morgan and Mona Offshore Wind Projects Note on Underwater Sound Modelling (C.3.5) Response from Natural England regarding the Morgan and Mona Offshore Wind Projects Note on Underwater Sound Modelling Methodology (C.3.6) Response from the MMO regarding the Morgan and Mona Offshore Wind Projects Note on Underwater Sound Modelling Methodology (C.3.7) Response from JNCC regarding the Morgan and Mona Offshore Wind Projects Note on Underwater Sound Modelling Methodology (C.3.8) Response from MWT regarding additional seal comments (C.3.9) Morgan and Mona Offshore Wind Projects Response to queries raised in the first Evidence Plan Marine Mammal EWG meeting (C.3.10) Response from APEM on queries regarding the Response to queries raised in the first Evidence Plan Marine Mammal EWG meeting note (C.3.11)

Date	Meeting	Information provided
17 November 2022	Marine mammals EWG meeting 3	Meeting minutes (C.4.1) Response from Natural England regarding the meeting minutes (C.4.2) Response from JNCC regarding the meeting minutes (C.4.3) Response from NRW regarding the meeting minutes (C.4.4) Mona and Morgan Clarification on Densities and Reference Populations Note (C.4.5) Response from JNCC regarding the Densities and Reference Populations (C.4.6) Response from Natural England regarding the Densities and Reference Populations (C.4.7) Response from NRW regarding the Densities and Reference Populations Note (C.4.8)
09 February 2023	Marine mammals EWG meeting 4	Meeting minutes (C.5.1) Response from Natural England regarding the meeting minutes (C.5.2)
29 June 2023	Marine mammals EWG meeting 5	Meeting minutes (C.6.1) Response from JNCC regarding the meeting minutes (C.6.2) Response from NRW regarding the meeting minutes (C.6.3) Response from Natural England regarding the meeting minutes (C.6.4) Response from Cefas regarding the meeting minutes (C.6.5) Minutes from the Isle of Man marine mammals meeting (C.6.6) Response from The Manx Wildlife Trust regarding the meeting minutes (C.6.7) Expert Working Group Technical Note (C.6.8) Response from the MMO regarding the EWG Technical Note (C.6.9) Response from NRW regarding the EWG Technical Note (C.6.10) Response from JNCC regarding the EWG Technical Note (C.6.11) Response from Natural England regarding the EWG Technical Note (C.6.12) Response from TWT regarding the EWG Technical Note (C.6.13) Final Density Agreement Confirmation (C.6.14) JNCC response to Final Density Agreement Confirmation (C.6.15) MMO response to Final Density Agreement Confirmation (C.6.16) Natural England response to Final Density Agreement Confirmation (C.6.17) NRW response to Final Density Agreement Confirmation (C.6.18)

Date	Meeting	Information provided
05 December 2023	Marine mammals EWG meeting 6	Meeting minutes (C.7) Response from NRW regarding meeting minutes (C.7.2) Response from JNCC regarding meeting minutes (C.7.3) Response from Cefas regarding meeting minutes (C.7.4)
-	Marine mammals EWG agreement log	Agreement log (C.8)

C.2. Marine mammals EWG meeting 1

C.2.1 Meeting minutes

MINUTES OF MEETING

Security Classification: Project Internal

Partners in UK offshore wind

MOM Number	:	20220217_Morgan and Mona MMammal EWG01	**REV. No.**	: F02
MOM Subject	:	Morgan and Mona Evidence Plan Marine Mammals Expert Working Group meeting 1.		

MINUTES OF MEETING

MEETING DATE	:	17/02/2022
MEETING LOCATION	:	Microsoft Teams
RECORDED BY	:	[redacted] (RPS)
ISSUED BY	:	[redacted] (RPS)

PERSONS PRESENT:

- [redacted] – bp (GV)
- [redacted] – bp (MP)
- [redacted] – bp (WD)
- [redacted] – RPS (KL)
- [redacted] – RPS (ST)
- [redacted] – RPS (TMc)
- [redacted] – RPS ( )
- [redacted] – Natural England (AuB)
- [redacted] – Natural England (OH)
- [redacted] – MMO (JS)
- [redacted] – MMO (SJ)
- [redacted] – JNCC (JW)
- [redacted] -JNCC (LM)
- [redacted] – JNCC (AG)
- [redacted] – NRW (LR)
- [redacted] – NRW (HS)
- [redacted] – Cefas (RF)
- [redacted] – TWT (GdJC)

ITEM NO:	DISCUSSION ITEM:	Responsible party	Date
1.	**Introduction** (Presented by KL) KL- This meeting is the first expert working group for marine mammals for Morgan and Mona. So far, two Evidence Plan (EP) Steering Group (SG) meetings for the projects have been held in November and December as well as the first Benthic (BE), Fish and Shell Fish (FSF) and Physical Processes (PP) EWG this morning to introduce the project and get the EP up and running.		

	The first few slides provide an introduction to the project, including how we envisage the Marine Mammal EWG working. TM (marine mammal specialist) will then run through the current surveys and any feedback we have already received on the current surveys.		
2.	**Overview of the Projects** (Presented by WD) bp are working with EnBW in a 50/50 partnership (the Applicants) to develop the Morgan and Mona offshore wind farms which are being progressed as two separate projects. These sites were awarded as part of The Crown Estate's Round 4 offshore wind leasing round and are currently at 'preferred bidder' status, subject to completion of the plan-level Habitats Regulations Assessment (HRA). The intention is for both projects to be developed as fixed bottom offshore wind farms. Morgan is the northern project, located in English waters, and Mona is the southern project, located mostly in Welsh waters. Together, they will have a combined capacity of 3GW. Morgan and Mona will be developed on similar but slightly staggered timescales and will be under separate consent applications. The Mona project is aiming to be operational in 2028 and the Morgan project is aiming to be operational in 2029. **Key dates** Both projects are currently at pre-scoping stage. The Applicants are working on the basis that The Crown Estate (TCE) will conclude the plan level HRA in spring 2022. The Applicants will then be in a position to sign the agreement for lease for seabed rights. Due to the size and nature of both projects, Morgan and Mona are both considered Nationally Significant Infrastructure Projects (NSIPs). The Applicants intend to submit separate Development Consent Order (DCO) applications for Morgan and Mona. Mona will also require a Welsh marine licence and the Applicants are in discussion with NRW Marine Licensing Team on the remit of this marine licence. Currently the Applicant is targeting the 2025 Contract for Difference (CfD) round, noting the recent announcement on annual CfD rounds. The scoping reports for both projects are planned to be submitted in April 2022. The intent is to have each project submission offset by a week as per the Planning Inspectorate's preference. The Applicants are currently undertaking pre-scoping engagement including local authority engagement. Throughout 2022 the Applicants will progress with pre-application activities including both offshore and onshore surveys. Local authority engagement and fisheries engagement have begun. The Applicants have also established a maritime navigation engagement forum. The Applicants aim to publish the Preliminary Environmental Information Report (PEIR) towards the end of 2022 with formal consultation scheduled for early 2023. The Mona DCO application is		

	currently planned to be submitted in Q4 2023 and the Morgan DCO planned for Q1 2024. **Indicative export cable corridor** The Applicants anticipate that there will be two Points of Interconnection (POIs), one for Morgan on the northwest coast of England and one for Mona on the north Wales coast. At the moment the Applicants are considering a number of POI options. The decision on the location of the POI for each Project is determined by National Grid and at this time we do not know where the POI will be. Once the Applicants have clarity around this, they will present this information to the SG. The Applicants have received feedback from TCE that scoping must be carried out on the full preferred bidder areas. This is to ensure consistency between the TCE plan level HRA and the round 4 scoping reports. The Applicants have refined down the preferred bidding area for Mona and are not currently looking to develop the northern section (the so called "dinosaur's head"). The figure on the slides shows the area currently considered as the Mona Potential Array Area, however scoping will be undertaken on the larger Mona preferred bidder area (including the "dinosaur head"). KL noted this is relevant to the slides on the aerial surveys which TM will discuss later. **Evidence plan process** (presented by KL) The EP process has been developed following the Planning Inspectorate and Defra guidance. The Applicants have also considered draft advice provided by Natural England [1]. The EP process is a mechanism for the Applicants to agree with the stakeholders what is needed to be included with the consent application and to discuss any issues or concerns. The aim is to agree as much as possible during the pre-application phase so only key issues are left for examination. The EP has historically been HRA focused however in line with recent best practice, the Applicants propose to extend this to include the EIA process for ecology topics, including designated sites such as SSSIs and MCZs. The Applicants are proposing to carry out a single EP process for both projects. The projects will have separate agreement logs to account for the differences between the projects ahead of the DCO applications. Meeting minutes will also note any differences between the projects.		
	EWG (presented by KL) The aim of the EWGs will be to discuss and where possible, agree key topics for the EIA and HRA so we are only left with key issues at examination. . The EP Template was issued to the SG early in 2021 and has been updated following receipt of comments. If there are any other comments, please let us know in writing after the meeting. The Applicants are seeking to agree the remit of the EWG following this meeting. The indicative timeline of the EWG meetings is subject to		

[1] Natural England (2021) Expectations for pre-application engagement and best practice guidance for the evidence plan process.

	change (particularly the latter meetings) but this gives stakeholders an indication of the number of meetings and expected timings to inform their resourcing over this time. Broad approach to EWGs as set out in the Ways of Working (WoW) document circulated prior to the meeting: • Information circulated to EWG 2 weeks ahead of meeting. • Meeting is held with attendees prepared to comment on materials provided. • Full meeting minutes will be taken, and agreement logs will be compiled where matters are agreed, and after each meeting the minutes and agreement log will be circulated. • Minutes and agreement logs to be returned/agreed within 2 weeks following receipt, alongside written comments on documents submitted. • The agreement logs and meeting minutes will ultimately be appended to the DCO application. HS- Slide 6 says that PEIR is expected to be published in Q4 2022 however Slide 10 says that the EWG meeting to discuss the baseline is in Q1 2023. I would like to check whether or not we will have an opportunity to discuss and agree the baseline before the PEIR consultation period. KL-The meetings that are later in the programme are on a very indicative timeline. The timings and scope of future EWG meetings will be discussed at the next EWG meeting once the Scoping Documents have been published. HS- The more that the EWG can discuss and agree where possible before the PEIR consultation the better. KL- The approach to the baseline characterisation is detailed in the scoping report and we would look to agree this imminently after the scoping opinion. Details of how the data analysis is to be undertaken hopefully can be agreed before the PEIR on the back of scoping.		
3.	**Marine Mammals** (Presented by TMc) The Mona marine mammal survey area does not include the top section ("dinosaur head") of Mona. The survey area includes a 10km buffer around the majority of the Mona Potential Array Area with a 4km buffer to the north. The ornithology/marine mammal aerial survey buffer was discussed with the SNCBs. The section where there is not a full 10km buffer is within the Morgan buffer area so across the two projects there is good data coverage. The Morgan marine mammal survey area includes a 10km buffer around the whole Potential Array Area. RPS will look at the design-based density assessments to get site specific densities for the study area which will be used for the EIA. HS- You have said that 12% of the surface has been analysed, has any power analysis been done on the suitability of the 12% figure?	**TMc to check if the**	15/03/2022

	TMc- When APEM developed the survey methods this was considered. Not sure if this was done specifically for this survey but this is APEM's typical approach. HS- It would be good to know if this value is used as standard or if it is specific to this site. More broadly NRW have concerns over the robustness of digital aerial surveys (DAS) for marine mammals depending upon the design. One trip per month, for example, may end up in very low sample numbers for some species which limits the ability of this data to generate robust density estimates for baseline characterisation. There are also limitations associated with the ability to confidently identify individuals to species level, depending on the quality of the images or video. TMc- Understand your points and concerns regarding the limitations of the survey however the site-specific surveys are only one piece of the jigsaw. We also use desktop data sources for marine mammal densities in the area and we can discuss which desk top data sources we are using for this. Furthermore we have marine mammal observers on our summer surveys recording sightings as supplementary data. However, it is also worth noting that boat based surveys also have difficulties e.g. sea states making detection tricky for small species. HS- It would be beneficial if a sample of real images that have been analysed for this project can be provided. Ones that represent the lower confidence limit for identifying an individual to species level or in adverse weather. TMc- APEM typically send a subsample of analysed images to an external QA marine mammal expert but it is noted that HS would appreciate sight of some example images and the Applicants can discuss with the APEM. HS-For previous projects, the DAS survey data was deemed to have limited species identification rates and density estimates from DAS have not been taken forward into assessment. TMc- Noted and to reiterate there is a QA process to ensure the best possible accuracy. Where there is some doubt in species identification an animal may be ID'd to a higher level e.g. 'dolphin' species. There may be some species that are more difficult to ID and as such existing data may be important in building up a picture of the baseline. As part of the remit of these EWGs, the Applicants want to make sure that SNCBs are satisfied with the baseline characterisation and what is taken forward to assessment. GV- Noted that the Applicants will provide the SNCBs with the necessary information regarding the QA methodology, but also made the point that the survey approach had been circulated to the SNCBs previously and was in line with (or exceeding) Industry best practice. Given that the 2-year survey programme is due to be completed this summer, and given the programme for submission of the Applications, there will not be an opportunity for re-survey. The Applicants will provide the evidence required to satisfy the SNCBs that the baseline will be characterised properly.	**12% is site-specific or a general approach.** **Applicants to discuss making some example DAS images available to NRW.**	15/03/2022

	HS- NRW understand that there is not necessarily a better survey method and there is not time to re-survey. NRW is likely to recommend the same as what was recommended for previous projects such as Awel y Mor, that site-specific density estimates are compared against existing data sources and then the most precautionary values are taken forward to the assessment. TMc- This would be a typical RPS approach. For DAS surveys there may be only a few species where there is enough data to produce density data. If this is the case, then for other species (with low number of sightings) RPS will use historical data e.g. SCANS III/SMRU seals at sea (Carter et al 2020) to inform the baseline. RPS would generally present a density range as well, as density can vary depending on season etc.		
4.	**Survey feedback (Presented by TMc)** Feedback was sought from SNCBs in 2020 prior to mobilising the surveys. As this was as combined survey with ornithology, a lot of the feedback was on ornithology and a 10 km buffer was deemed appropriate for red throated diver. The 10km was also considered to be a sufficient size to collect appropriate data on marine mammal distribution and density in the area. HS- NRW would consider this high level advice to be focused on birds, and that any advice about 'sufficiency' would pertain to birds only. Was it specifically asked if the 10km buffer was suitable for mammals? TMc- The 10km buffer was defined to account for both marine mammals and birds such as red throated diver. Feedback was received to say that 10km would be ideal especially considering proximity to the SPA designated for red throated diver. As it is a joint survey with ornithology, the expectation would be that there would not be a different buffer for marine mammals as for birds. HS- Can it be checked what was agreed and with who? KL- We can check and go back through the emails with the SNCBs and the project team. ***Post meeting note:*** *feedback received from stakeholders did flag red throated diver as a feature of the Liverpool Bay SPA as a reason for extending the survey area to 10km around the project boundary. The project decision to survey the 10km buffer around the arrays was based on this feedback, but but also noted that this would provide better coverage for marine mammals, for the purpose of EIA and HRA baseline characterisation than the existing best practice approach of a 4km buffer employed for both birds and marine mammals on the majority of (if not all) Round 2 and Round 3 windfarms.* Ultimately the project position is that the surveys are fit for the purposes of the marine mammal characterisation (alongside other data sources and acknowledging the limitations discussed during the meeting). Particularly when considering the Mona and Morgan data together, which includes overlap to the north of Mona and south of Morgan.		

5.	**Preliminary Results** (Presented by TMc) There were a number of species that were identified to species level and a number that could not be identified to species. For some species, where there is not enough data to create site-specific density estimates we would add in counts from the group. For example, for grey seals, we could include all seal counts, assuming they were grey seals, to give a precautionary estimate. HS- That is potentially a reasonable approach but NRW would need to see the detail and numbers before any specific advice is given on that approach. TMc- yes that is understood. Just to outline that we would not use the data if it cannot be used to get a species density estimate. We will use the site-specific data where we can. For grey seal we can use the approach described (i.e. assume all "seal spp" are likely to be grey seals) as this gives a conservative estimate but also will look at Carter et al (2020) seal maps for both harbour and grey seals to give density estimates for baseline. The only sighting so far for minke whale has been on a site investigation survey where the marine mammal observers recorded one minke whale. We are likely to scope this in as we would not want to rule anything out at this time unless we are confident. The marine mammal study area is the survey area (potential array areas with 10km buffer) plus the transmission infrastructure search area with a 10km buffer. The regional study area will also include the wider Irish Sea region. If there are SACs just outside this area then this may be slightly increased to include these for the HRA. Any projects for consideration in the cumulative assessment would be screened in on the basis of this regional study area. HS- NRW has a position on the use of management units (MU) as a regional study area. NRW would want this to be used for the HRA, for both screening of sites and screening of projects for the cumulative assessment. Populations within the MU are the populations that should be considered when assessing the number of individuals that may be affected against the population. HS- we can include the NRW position statement with our written response. LR noted this document was provided to the project in December – acknowledged by KL. TMc- The regional study area is used to provide context with respect to the proposed development area (e.g. distribution/abundance of key marine mammals in the proposed development area compared to the wider distribution/abundance in the Irish Sea) and is not the area used as reference populations. The reference populations are defined by the management units (MUs). Some of the MU are massive (e.g. for minke whale and common dolphin the MU covers the Celtic and Greater North Seas) and the assessment becomes too unwieldly if everything within the MU is considered. We would not screen in a project in the North Sea for example. We would be looking to get an agreement on the study area from all SNCBs. ***TMc post meeting note****: we also look at data for the eastern Irish sea which is relevant to understand distribution/abundance of marine*	**RPS to provide further detail on what the regional study area will be used for, including further clarity on**	15/03/2022

	mammals outside the boundaries of the proposed development area, particularly where Zones of Influence (ZoIs) could extend some distance from the boundary (e.g. subsea noise) and could go well beyond the area covered by marine mammal surveys. KL- Ordinarily we would not screen in an SAC in the North Sea for the Morgan or Mona projects due to the distance. An appropriate assessment would not screen in sites in the North Sea. HS- Bottlenose dolphin, grey seal and harbour porpoise are the Annex II species features of SACs in Wales, to which the HRA screening advice pertains. Their MUs are not as extensive. TMc- RPS consider the MU as a reference population and refer back to it but would use the regional study area rather than consider everything within the MU. It makes the assessment very cumbersome if the study area for the whole region. HS- Advice depends on what the regional study area is used for. MUs for common dolphin and minke whale would be relevant to the EIA rather than the HRA in Wales. TMc -It is important to get agreement on the study area for EIA as well as HRA. We can provide a more detailed description of what the regional study area will be used for. KL – Likely this will need to be broken down for the different elements of the application and agreed separately: Study area for the EIA; Screening distances for the LSE Screening (and approach to Appropriate Assessment following Screening); Projects and Plans to be considered in the Cumulative Effects Assessment. ***TMc post meeting note****- for HRA purposes for a given species we would suggest starting with SACs closest to the site and at the point (distance) at which a site get screened out, all other SACs within the MU for that same species at greater distances would also get screened out.*	**screening for HRA and CEA.**	
6.	**Desktop Data sources** (Presented by TMc) HS- NRW would suggest looking at data availability from the Manx Whale and Dolphin Watch around the Isle of Man. These show some sightings of Minke whale and HS would expect to see this species included in the assessment. Also, Seawatch Foundation may hold data which could be of use in the assessment. The Awel y Mor public PEIR marine mammal baseline document contains a useful summary of the data sources for marine mammals. For where there is no density estimate in SCANSIII, SCANSII may be recommended for use in its place. TMc welcomed these suggestions, as it's useful to have an early flag of datasets so they can be incorporated into the baseline sooner rather than later. MP- Project also had marine mammal observers on boats doing the geophysical and benthic surveys who observed one minke whale. TMc noted this was why this slide had been updated to include minke whale, but sources flagged by HS will also be useful to inform the baseline.		

	HS- NRW would rather see a short, proportionate assessment on species of very low densities rather than scoping them out. TMc and KL noted that these could be discussed as the baseline is developed. Important when considering species which are present at very low densities that if we use the SCANS block densities, these could considerably overestimate the effect on those species (e.g. number of individuals affected by underwater noise). As such we would not advocate this type of approach, but may favour undertaking a qualitative assessment that acknowledges the very low risk to these species. To discuss further in later EWG meetings.		
7.	**Next Steps** (Presented by KL) Confirmation on POIs from National Grid. Scoping scheduled for April 2022. The Applicants would seek agreement on the following points following the meeting: • Agreement on the Remit and Inputs to the EWG (as set out in Section 4.3 of the Evidence Plan Template); • Agreement on Ways of Working Documents, including timescales; • Agreement on broad approach to future surveys - that previous feedback has been considered in future scope; and Agreement on broad approach to characterisation for marine mammals.	**All- to fill in agreement log to provide progress of agreement for each of the points listed.**	15/03/2022
8.	**Close of meeting**		

C.2.2 Response from Natural England regarding the meeting minutes

Date: 10 March 2022
Our ref: DAS/UDS A000566 / 381726
Your ref: Marine Mammal EWG01

[redacted]
BP Alternative Energy Investments Limited

c/c [redacted]
RP

BY EMAIL ONLY

Customer Services
Hornbeam House
Crewe Business Park
Electra Way
Crewe
Cheshire
CW1 6GJ

0300 060 3900

Dear [redacted]

Discretionary Advice Service (Charged Advice) - UDS A000566
Contract Reference: BP EnBW Morgan and Mona Offshore Wind Farm
Consultation: Marine Mammal EWG01

This advice is being provided as part of Natural England's Discretionary Advice Service in accordance with the Quotation and Agreement dated 17 May 2021 to BP Alternative Energy Investments Limited.

The following advice is based upon the information presented in the Marine Mammal Expert Working Group (EWG) Meeting 1 (attended on 17 February 2022) and subsequent meeting notes provided on the 1 March 2022 by [redacted]

Natural England were asked to provide advice upon:

1. Agreement on the remit of the EWG;
2. Agreement on Ways of Working document;
3. Agreement on aerial surveys;
4. Agreement on Marine Mammals Study Area;
5. Agreement on broad approach to baseline characterisation.

1. Agreement on the remit of the EWG;

Natural England provided comment on the draft Evidence Plan, via a comments log, on 4 November 2021. It was our view that the Evidence Plan set out the basic framework of the Evidence Plan. This was ahead of the 1st Evidence Plan meeting on 16 November 2021. We welcome the update of the Evidence Plan (version F02, provided 4 February 2022) which has incorporated our earlier comments.

The remit of the Marine Mammal EWG as set out under 4.3 of the Evidence Plan (v F02) is appropriate and in line with Natural England's previous comments, we agree the remit as set out. The list of topics listed in 4.3.1 covers the majority of anticipated topics.
Very minor point but in the last bullet point, we anticipate that the monitoring options will be discussed prior to the finalisation of the In Principle Monitoring Plan – *the monitoring itself is typically finalised post-consent*.

We welcome the outlined timetable of future meetings and their focus as presented in Table 4.4.

Specific comment regarding Table 4.4 are as follows:

- Where the applicant has stated "timed to coincide with [application document]", could they please clarify at what point in the timeline of these application documents the timings will be targeted at? For example, if these will be timed to occur prior to submission of the documents, or following the receipt of

the consultation opinion on the various application documents? The precise timing will have implications for the scope of the discussion in the meeting and therefore their suitability.

-The final meeting coincides with the Mona application; will there be a similar final meeting that coincides with the Morgan application?

Whilst Natural England agrees with Natural Resources Wales in that the aim of the EWG is to agree the various topics listed it is acknowledged that it is not always possible to reach agreement on all topics. Agreement may also take longer on complex topics, or if there are many topics to review after a meeting, or if there is an action on either developers or SNCB to provide further information on previous discussions or advice to inform the discussion.

2. Agreement on Ways of Working document

We welcome the Evidence Plan Ways of working document (version F01, provided 4 February 2022) as a clear reference document.

Natural England agrees with the Ways of Working document which aligns with previous comments in terms of timescales for review and comment provided as part of our comments on the draft Evidence Plan (4 November 2022). As noted in the document, it may be necessary for timescales to be amended to ensure sufficient time to review and comment (e.g. large documents or multiple documents), in which case we will communicate and agree an alternative deadline.

Specific comments-

- On Table 2, fourth row: there is a repeat of “circulation of minutes and agreement logs”, based on the text in Figure 1 I believe this should read “Agree minutes and content of logs” or similar
- Could an outline of the chain of communications in Natural England be added? E.g go to case officer who will act as the main coordinator for input rather than going to specialist directly
- Could there be an additional line to say all issues/comments will be agreed to in writing after the meeting and there will be no verbal agreement
- In agreement with NRW, more information should be included on what is going to be communicated between meetings and how.

3. Agreement on aerial surveys

As the Mona site is located primarily in Welsh waters, Natural England defers to NRW as to the use of an appropriate buffer around Mona Potential Array Area

More generally in relation to aerial surveys:

Natural England is broadly supportive of using digital aerial survey data to characterise the marine mammal baseline in the region. The potential limitations to this survey method raised by the developer and NRW are acknowledged and it is agreed that a range of density estimates from other sources must also be presented, for comparison to the site-specific surveys. Depending on the outcomes of the survey, it may be that density estimates available in the literature are the most appropriate to be used in the assessment for certain species (for example, species which have no or low number of sightings, or low confidence associated with the sightings, in the surveys).

Natural England supports NRW in their concerns raised about the efficacy of digital aerial surveys in the Irish Sea, following from the recent outputs of the aerial surveys on the Awel y Mor OWF. These concerns are applicable to both Mona and Morgan. Natural England would also like sight of any example DAS images that are made available to NRW.

Natural England at this stage has not formally agreed the appropriateness of the 10km buffer for marine mammals specifically, noting that this buffer was originally proposed for ornithological purposes. Natural England consider that a 10km buffer is unlikely to be less suitable for the marine mammal surveys than a

4km buffer, which is the industry standard. The applicant has stated that the 10km buffer "would provide better coverage for marine mammals." Natural England would like to understand how the coverage is quantifiably "better" and the implications for the marine mammal impact assessment. Natural England requests that the applicant considers providing a short description in the EIA on this topic, which could for example compare the outcomes of a 10km buffer to the traditional 4km buffer.

4. Agreement on Regional Marine Mammals Study Area

Natural England requires a response from RPS on the purpose of the regional marine mammal study area before an agreement can be made on the extents proposed.

5. Agreement on broad approach to baseline characterisation

Natural England is in broad agreement to the approach to baseline characterisation, notwithstanding the aforementioned comment on the extent of the regional marine mammal study area to be characterised.

We consider that the revised list of likely species that was presented in the meeting, including minke whale, is appropriate.

With regards to the desktop data sources - consideration should be given to the inclusion of NGO/citizen observer data in the region. This would be particularly relevant for the more coastal areas, as these can provide local sightings information on areas of potential cable landfall. Natural England thanks and supports NRW in their detailed list of desktop data sources provided to the developer.

Natural England asks that the applicant explicitly include the results of the MMO observations (i.e. list all sightings) onboard the site investigation surveys in their baseline characterisation.

Natural England have set up a SharePoint Online (SPOL) site to share Natural England's advice on the environmental considerations and use of data and evidence to support offshore wind and cable projects in English waters. Advice provided on this site includes Natural England and Joint Nature Conservation Committee (JNCC)'s shared advice on 'Nature conservation considerations and environmental best practice for subsea cables in English inshore and UK offshore waters.'

The outputs of Natural England's project 'Offshore Wind Marine Environmental Assessments: Best Practice Advice for Evidence and Data Standards' are also provided. This project, produced in collaboration with DEFRA, the following reports are currently available;

- Phase I: Expectations for pre-application baseline data for designated nature conservation and landscape receptors to support offshore wind applications.
- Phase II: Expectations for pre-application engagement and best practice guidance for the evidence plan process.
- Phase III: Expectations for data analysis and presentation at examination for offshore wind applications.

You can access the new SPOL site from the following links:
Environmental considerations for offshore wind and cable projects - Home (sharepoint.com) or
https://defra.sharepoint.com/sites/WorkDelivery2512/SitePages/Home.aspx

Due to how SharePoint Online works, people outside of Defra will need to request access to the site before being able to view the advice documents, so there could be a slight delay for external stakeholders to access the site.

For clarification of any points in this letter, please contact me using the details provided below.

Yours sincerely

[redacted]
Strategic Coastal Lead Adviser
Coast and Marine Team
Cheshire, Greater Manchester, Merseyside & Lancashire Area Team
[redacted]

☐ The advice provided in this letter has been through Natural England's Quality Assurance process.

The advice provided within the Discretionary Advice Service is the professional advice of the Natural England adviser named below. It is the best advice that can be given based on the information provided so far. Its quality and detail is dependent upon the quality and depth of the information which has been provided. It does not constitute a statutory response or decision, which will be made by Natural England acting corporately in its role as statutory consultee to the competent authority after an application has been submitted. The advice given is therefore not binding in any way and is provided without prejudice to the consideration of any statutory consultation response or decision which may be made by Natural England in due course. The final judgement on any proposals by Natural England is reserved until an application is made and will be made on the information then available, including any modifications to the proposal made after receipt of discretionary advice. All pre-application advice is subject to review and revision in the light of changes in relevant considerations, including changes in relation to the facts, scientific knowledge/evidence, policy, guidance or law. Natural England will not accept any liability for the accuracy, adequacy or completeness of, nor will any express or implied warranty be given for, the advice. This exclusion does not extend to any fraudulent misrepresentation made by or on behalf of Natural England.

Cc commercialservices@naturalengland.org.uk

C.2.3 Response from the MMO regarding the meeting minutes

Marine Management Organisation

Marine Licensing
Lancaster House
Hampshire Court
Newcastle upon Tyne
NE4 7YH

T [redacted]
F [redacted]
www.gov.uk/mmo

[redacted]
Environmental Advisor
bp Alternative Energy Investments Ltd
(By email only)

Our reference:
ENQ/2021/00033

06 April 2022

Dear [redacted]

Morgan and Mona Offshore Windfarm – Expert Topic Group Meetings

The Marine Management Organisation (MMO) received the above document and accompanying comments for consideration on 04 February 2022. The MMO has reviewed the document alongside our advisors at Cefas and our comments are below:

Comments

Shellfisheries

1. Desktop data sources include the Northern Irish Sea Fish Trawl Surveys. Please note that this is unlikely to inform of shellfish abundances. At best, trawls (except for Nephrops if using an otter trawl) will provide presence/absence information at best. Shellfish (lobster, crab, whelks, cuttlefish) are typically targeted using specialised pots. The MMO would suggest interrogating MMO landings data to determine the extent of shellfish landings.

Underwater Noise

2. Timescales for Feedback (document F02 Ways of working document): Please note that although Cefas advisors can endeavour to provide comments and review minutes and contents of agreement logs within 2 weeks, the exact timeframes will ultimately depend on the deadlines specified by the MMO.

Benthic Ecology

3. The MMO requests confirmation that the benthic grab samples collected in relation to the developments will be processed to the recommend national processing guidelines (Worsfold and Hall, 2010) and that the resultant data will be made available as soon as possible.

4. The MMO note that there were several areas relevant to benthic ecology that were not discussed at the meeting (e.g., cumulative impacts, non-native invasive species, survey design and benthic analyses, electromagnetic fields, suitability of baseline

datasets, data processing and availability). The MMO is aware this is only the first group meeting but will expect these topics to be covered in the future.

Fisheries and Fish Biology

5. In the absence of confirmed export cable routes and cable landfall locations for the projects, the MMO are currently unable to comment, consider or advise on any potentially vulnerable fish receptors which may be affected by the construction activities associated with the construction and operational phases of the wind farms. The MMO will review this in more detail once landfall locations are confirmed.

6. During the expert topic meeting reference was made to the Cefas Pelagic ecosystem survey in the Western Channel and Celtic Sea (PELTIC) surveys and their potential use as a source of information/data to inform the baseline for fisheries. The MMO would advise that in the Irish sea the survey stations only go as far north as Llŷn Peninsula in North Wales, which is significantly further south of the proposed locations for Morgan and Mona. The day may be useful to provide broadscale information and data on pelagic species in the Irish Sea but may not be as useful for providing site-specific fisheries data for the windfarm study areas. See Annex1 for map of PELTIC survey stations.

Coastal Processes and Physical

7. No comments at this stage.

General- Benthic Scope of Works and the Intertidal Outline Scope Reports

8. The MMO note that Samantha Tuddenham sent an email on 01 April 2022 requesting comments on the benthic scope of works report revision 2 with a deadline of 19 April 2022. The MMO has advised previously that consultation with our advisors requires 4 weeks and there will be time either side for quality checks. Further discussions are required around the timescales the projects are proposing as the MMO do not currently find them appropriate.

Conclusion

The MMO notes there are no major concerns at this stage of the projects and has provided advice to ensure all aspects of the topics raised above are adequately covered. The MMO is still concerned however by the time the project expects the MMO to provide comments within and would encourage further discussion on this topic at the next catch-up meeting with the MMO.

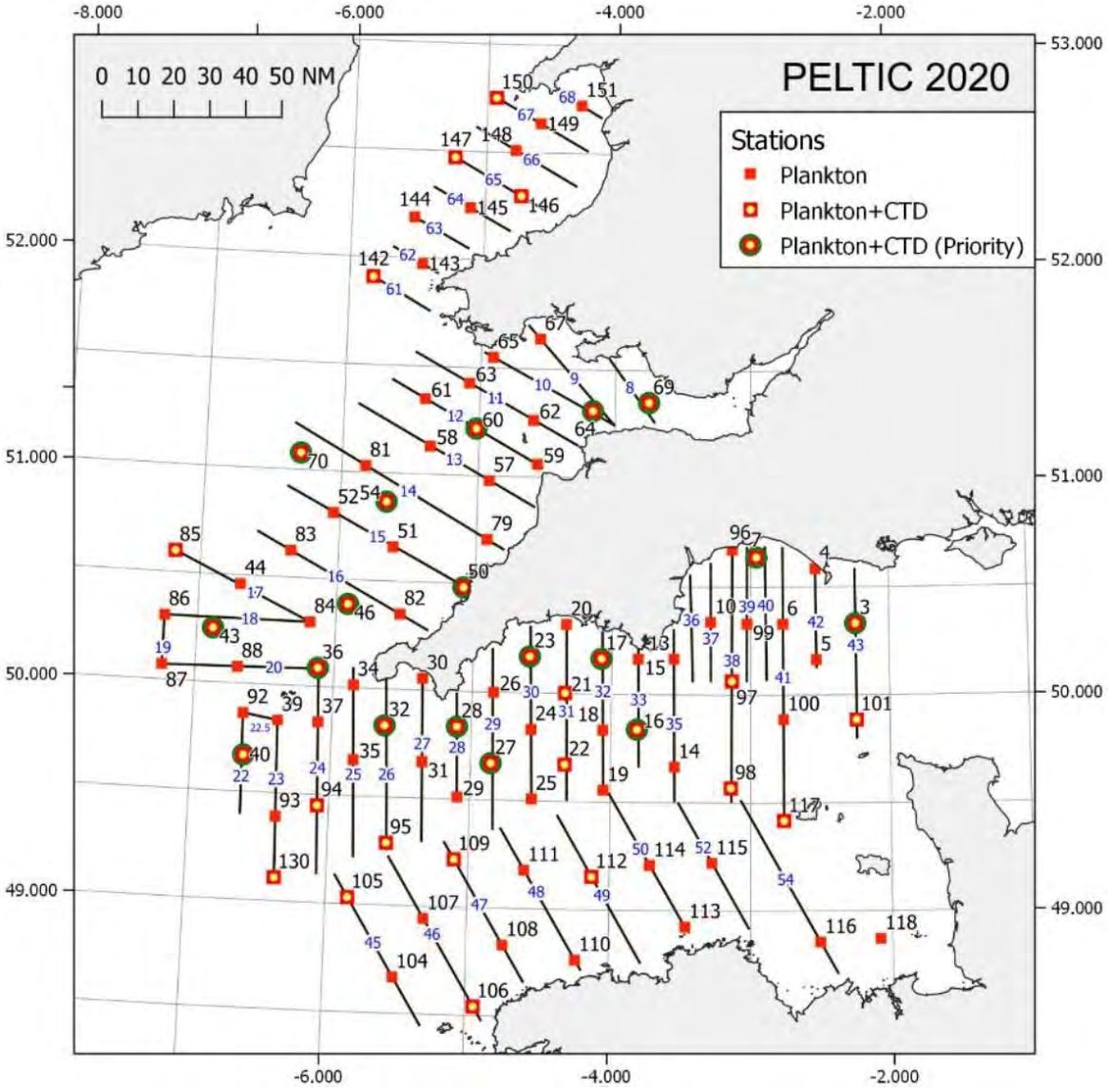
If you wish to discuss any of the points further, please don’t hesitate to contact me.

Yours sincerely,

[redacted]
Marine Licensing Case Officer

D [redacted]
E

Annex 1 – Map of Survey Stations for the PELTIC survey



C.2.4 Response from NRW regarding the meeting minutes

bp / EnBW Project Mona Marine Mammal Expert Working Group

[redacted]
Senior Marine Advisor

15th March 2022

Introduction

This advice is provided in response to the Project Morgan and Mona Marine Mammal Expert Working Group held on 17/02/22.

NRW advice in this document is provided (under a Discretionary Advice Service agreement) in respect of a proposal which will require an application for which Natural Resources Wales is a Statutory Consultee.

The customer acknowledges that the content of any advice or assistance provided by NRW is advisory only and that it shall not be deemed to bind or in any other way restrict NRW in performing its statutory functions.

The recipient acknowledges that:

- any advice given or materials or documentation provided by NRW do not constrain or bind NRW in respect of its statutory functions or its role as a statutory consultee or any decision NRW may make in relation to any application for a licence or permit;
- any advice given by NRW does not bind NRW in respect of any future representations it may make as statutory consultee or any decision NRW may make in relation to any application for a licence or permit;
- any views or opinions expressed by NRW are without prejudice to the consideration NRW may be required to give to any application or any future representations as statutory consultee or any decision NRW may make in relation to any application for a licence or permit;
- the final decision as to any representations made by NRW as statutory consultee will be based on all the relevant information available to NRW at the time it makes such representations;
- NRW cannot and does not give any guarantee as to the representations it may make as statutory consultee; and,
- any advice given by NRW may be overtaken by changes in available information, law, policy and guidance relevant to the subject matter of the advice.

Advisors Consulted:
Marine Mammals

Advice

Key Issues

- The 'Evidence Plan Ways of Working' document would benefit from clarity regarding the ways of working relating to intersessional communications.
- NRW (A) will make best efforts to reach an agreement on proportional but precautionary approaches as far as possible within our remit but note that this may not always be possible for all issues.
- NRW (A) understand that the timings indicated are indicative and subject to change, but we highlight the risk associated with the indicated publication of the PEIR in Q4 2022 (slide 6) potentially prior to the EWG agreeing the baseline characterisation in Q1 2023.
- NRW (A) highlight the need for careful consideration of Digital Aerial Survey (DAS) data quality and sample size when considering the suitability of the survey data to inform a baseline.

Detailed comments

Document: bp/EnBW MORGAN AND MONA ESIA Evidence Plan Ways of working document

The document may benefit from clarity regarding the ways of working relating to intersessional communications, for example, what level of information will be conveyed via meeting minutes versus briefing documents, although we acknowledge that this may be an ambiguous metric and not possible to outline in detail. Whilst some advice / decisions can be satisfactorily recorded in minutes, where the nature of the advice request and responses are complex, NRW (A) recommend that briefing documents are provided by the applicant with more formal written responses forming the basis of the record.

Document: bp/EnBW MORGAN AND MONA ESIA Evidence Plan Template
4.3 Marine Mammals; 4.3.1 Overview

The list of topics identified for the EWG to seek agreement on appears to cover the majority of anticipated content for assessments of the works. NRW (A) will make best efforts to reach an agreement on proportional but precautionary approaches as far as possible within our remit, but please note that this may not always be possible for all issues.

NRW (A) also highlight the need for sufficient time for review and revision in order to reach agreement on each topic, particularly where multiple topics are listed against a single quarter.

Document: Morgan and Mona Offshore Wind Projects marine mammals expert working group 1 slides

Stakeholder engagement timeline

- NRW (A) understand that the timings shown are indicative and subject to change, but we highlight the risk associated with the indicated publication of the PEIR in Q4 2022 (slide 6) potentially prior to the EWG agreeing the baseline characterisation in Q1 2023 (slide 10). Publication of the PEIR before sufficient engagement and discussion may result in concerns being raised which could be resolved prior.

Offshore Marine Mammal Surveys Survey Method

- If Digital Aerial Survey (DAS) data is to be used in environmental assessments, an assessment of the suitability of analysing data covering 12% of the survey area, such as a power analysis, should be provided to support the approach taken. Alongside this, evidence of sufficient levels of quality assurance should be provided to resolve any concerns regarding the detection probability or species identification confidence associated with the chosen method. This could include, for example, provision of sample images in a range of ID confidence scenarios and visibility conditions. Careful consideration of the confidence in results based on the sample sizes achieved, alongside other survey performance criteria such as seasonal coverage, should be made.

Survey Feedback

- NRW (A) advise caution in applying feedback on the survey design with respect to birds (as provided in our joint advice with JNCC and NE by email on 28/04/21), to marine mammals. Whilst we appreciate both mammal and bird surveys were mentioned, the specific question received via email on 23/03/21 came under the heading 'Bird Survey'. As such, any approval of indicated survey design was specifically related to ornithology and should not automatically be applied to other receptors.

Morgan and Mona Study Areas

- It is not clear for precisely what purpose these study areas are defined, so NRW (A) are unable to agree to them at this stage. To reach agreement, additional information should be provided, specifying what screening, assessment or other purposes the study areas are intended for, and taking into account the following:
  - Due to the mobile nature of all Annex II marine mammal features of Special Areas of Conservation (SACs), it is accepted that they do not stay within site boundaries. Where there is a potential and credible effect on the conservation objectives of a site, caselaw supports the need to consider offsite impacts (Moorburg case c-142/16 & Holohan case C-461/17).
  - NRW (A) generally consider that the appropriate scale at which to consider offsite impacts for marine mammals is the relevant species-specific Marine Mammal Management Unit (MMMU). NRW (A) consider SACs within an MMMU to be 'functionally linked' to the surrounding sea because evidence demonstrates a degree of connectivity between SACs and the wider area, and because SACs represent special areas of sea within the MMMU (Chapman & Tyldesley 2016, NRW 2022). For some pathways a different approach may also be relevant, however this depends on the weight of the

evidence supporting that approach and should be considered on a case-by-case basis in consultation with NRW (A).

Desktop data sources

Some additional data sources or informative documents should be considered for applicability to the desktop baseline study, including the following:

- Awel y Môr PEIR Volume 4, Annex 7.1: Marine Mammal Baseline Characterisation, available online; https://exhibition.awelymor.cymru/peir/
- Gwynt y Môr baseline surveys Description available in the Awel y Môr PEIR Volume 4, Annex 7.1
- Sea Watch Foundation data - North Wales (Sea Watch Foundation, 1960-2021). Description available in the Awel y Môr PEIR Volume 4, Annex 7.1
- Manx Whale and Dolphin Watch surveys (Manx Whale and Dolphin Watch (MWDW) 2007-2015) Description available in the Awel y Môr PEIR Volume 4, Annex 7.1
- Anglesey visual surveys Shucksmith et al. (2009)
- Anglesey towed acoustic surveys (Gordon et al. 2011)
- Wylfa Newydd surveys (Jacobs 2018)
- Morlais surveys (Royal Haskoning DHV 2019)
- Cardigan Bay bottlenose dolphin surveys (Lohrengel et al. 2018)
- An updated version of the Atlas of the Marine Mammals of Wales is in preparation
- The potential for both the telemetry and the density estimates associated with the work of Carter et al (2020) to be of use to the assessments should be considered.

NRW (A) cannot make recommendations regarding the approach to the baseline assessment for the projects until more detailed information is provided. However, we would be likely to recommend that all possible data sources, including those from DAS and the desktop study, are evaluated for quality and suitability and the most precautionary source with sufficient data quality be used in impact assessments. It may be appropriate to present multiple data sources in the final assessments.

Likely Key Species

The slides provided prior to the meeting did not include Minke Whale in the ‘likely key species’ list. While it is not clear exactly what is meant by likely key species, NRW are content that the revised list presented in the meeting, which included Minke whale, highlights the species we would expect to be included in the HRA (bottlenose dolphin, harbour porpoise, grey seal) and in the EIA (HRA species in addition to common dolphin, Risso’s dolphin, and Minke whale). Consideration of less common or transient species should also be made, particularly in the context of assessing any impacts on Annex IV European Protected Species.

Next Steps

In order to pursue agreement on the proposed subjects, we recommend the advice above be taken into account when providing documents for review and approval.

References

Gordon, J., D. Thompson, R. Leaper, D. Gillespie, C. Pierpoint, S. Calderan, V, J. Macaulay, and T. Gordon. 2011. Assessment of Risk to Marine Mammals from Underwater Marine Renewable Devices in Welsh waters Phase 2 - Studies of Marine Mammals in Welsh High Tidal Waters.

Jacobs. 2018. Wylfa Newydd Project 6.4.88 ES Volume D - WNDA Development App D13-6 - Marine Mammal Baseline Review. PINS Reference Number: EN010007. Application Reference Number: 6.4.88.

Lohrengel, K., P. Evans, C. Lindenbaum, C. Morris, and T. Stringell. 2018. Bottlenose Dolphin Monitoring in Cardigan Bay 2014-2016. Natural Resources Wales, Bangor. Available online; https://naturalresources.wales/evidence-and-data/research-and-reports/marine-reports/marine-and-coastal-evidence-reports/?lang=en

NRW (2022) NRW's position on the use of Marine Mammal Management Units for screening and assessment in Habitats Regulations Assessments for Special Areas of Conservation with marine mammal features v1.1

Royal Haskoning DHV. 2019. Morlais Project Environmental Statement: Chapter 12: Marine Mammals Vol.1. Applicant: Menter Môn Morlais Limited. Document Reference: PB5034-ES-012. Version F3.0.

Shucksmith, R., N. H. Jones, G. W. Stoyle, A. Davies, and E. F. Dicks. 2009. Abundance and distribution of the harbour porpoise (Phocoena phocoena) on the north coast of Anglesey, Wales, UK. Journal of the Marine Biological Association of the United Kingdom 89:1051-1058.

C.2.5 NRW's position statement on the use of Marine Mammal Management Units for screening and assessment in Habitats Regulations Assessments for Special Areas of Conservation with marine mammal features

Cyfoeth Naturiol Cymru
Natural Resources Wales

Position statement

NRW's position on the use of Marine Mammal Management Units for screening and assessment in Habitats Regulations Assessments for Special Areas of Conservation with marine mammal features

Document Owner: Marine Programme Board

What is this document about?

This document sets out Natural Resources Wales's (NRW) position on the use of Marine Mammal Management Units (MMMUs) and other approaches for screening[1] and assessment in Habitats Regulations Assessments (HRA) for Special Areas of Conservation (SACs) with marine mammal features.

It primarily describes the use of MMMUs as the relevant spatial scale for screening and inclusion of plans and projects in an in-combination assessment. The use of MMMUs is applied to most impact pathways, except for impact pathways where there is strong evidence that an alternative approach is appropriate (e.g. screening distances and disturbance from underwater noise). The use of an iterative/sequential Appropriate Assessment (AA) is advised to accompany the use of MMMUs at the screening stage. This is where an AA is first carried out on the closest site to the impact source / development and if an Adverse Effect on Site Integrity (AEOSI) cannot be ruled out, the next closest site is assessed and so on.

The Position Statement provides a steer on how NRW will consider information to inform HRA advice and present their advice to the Competent Authority.

Who is this document for?

The Position Statement is aimed at:

- Those within NRW who may be advising on Habitats Regulations Assessment (HRA) of SACs with marine mammal features
- NRW Marine Licensing Team, who may wish to understand how this advice should be applied
- Other Competent Authorities (CA) / regulators / UK Statutory Nature Conservation Bodies who may wish to understand our approach and consider its use in conducting HRA on sites with marine mammal features

[1] Screening is defined here as the first stage of HRA where plans or projects are checked to see if they would be likely to have or there is a possibility of a significant effect on a European site and follows Regulation 63 (1), 63 (2) and 67 (DTA Ecology 2020, HRA Handbook).

- Developers and their consultants who wish to understand this approach and submit applications with enough information to allow the CA to assess sites with marine mammal features in the same way

Development of this position

This Position was developed following discussion of a range of potential approaches to screening in HRA, with associated advisory and regulatory risks and benefits, at NRW's Strategic Marine Mammal Group (SMMG) (including MMMU subgroup), Offshore Renewable Energy Programme (OREP) and Marine Planning and Policy Delivery Group (MPPDG) meetings. External meetings and workshops were also organised to peer review the use of MMMUs in HRA. The approach was approved and adopted in October 2020 by the Marine Programme Board (MPB) within NRW.

This Position does not represent a legal opinion and should not be interpreted as such. Project developers and owners should be advised to seek their own independent legal advice on any matters arising in connection with this Position Statement in respect of a specific activity or development project.

This Position does not prejudice any advice that NRW might provide in our capacity as a statutory advisory or regulatory decision maker.

NRW will be review this Position Statement as and when relevant new evidence becomes available.

Contact for queries and feedback

[redacted]@cyfoethnaturiolcymru.gov.uk
Lead Specialist Advisor: Marine Species; Marine and Coastal Ecosystems Team, Sustainable Places Land and Sea Group, Natural Resources Management Policy Department.

Version History		
Document Version	**Date Published**	**Summary of Changes**
1.0	Oct-2020	
Review Date: Oct 2021		

To report issues or problems with this guidance contact Guidance Development

Cyfoeth Naturiol Cymru
Natural Resources Wales

Position Statement

Contents

1. Introduction

What are MMMUs?

Marine mammal management units (MMMUs) are considered to be relevant spatial scales for marine mammal species that represent our best understanding of the structure of biological populations and any ecological differentiation within such populations, and the spatial differences in human activities and management relevant for that population. The boundaries of MMMUs do not just represent population differentiation but also political boundaries (e.g. country/county) or boundaries relevant to the management of human activities (e.g. ICES divisions used for the collection of fisheries data and management of fisheries).

Since 2012, the Inter-Agency Marine Mammal Working Group (IAMMWG), comprising representatives of the UK's Statutory Nature Conservation Bodies (SNCBs) - Natural England (NE), Scottish Natural Heritage (SNH), Natural Resources Wales (NRW), Department of Agriculture, Environment and Rural Affairs (DAERA) and Joint Nature Conservation Committee (JNCC) – have developed and proposed MMMUs for the seven most common cetacean species around the UK. These were approved by the SNCBs' Chief Scientist Group and published in 2015[2] and have been adopted by SNCBs as the relevant spatial scales for conservation advice on key cetacean species in UK waters (Figure 1).

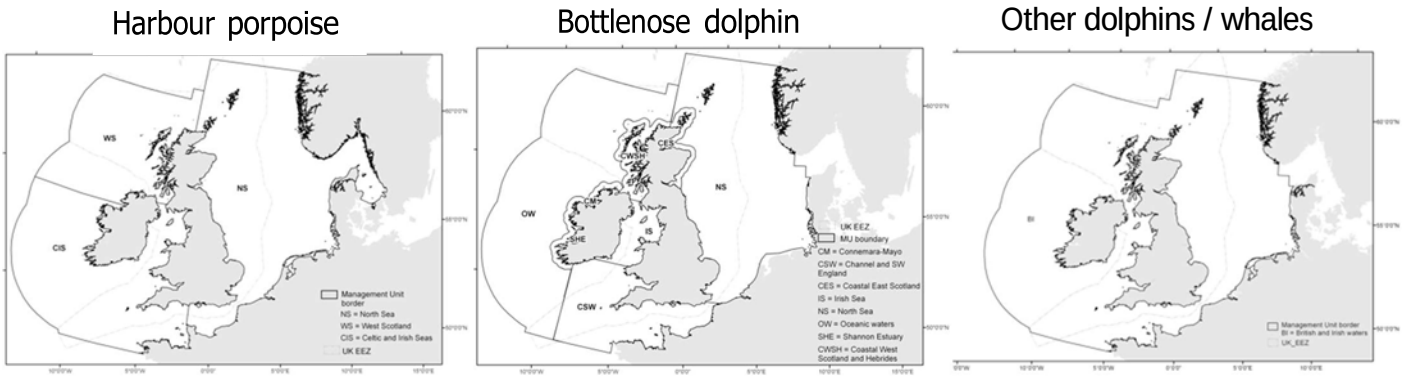


Figure 1. Interagency marine mammal working group (IAMMWG) marine mammal management units (MMMUs) for cetaceans[2]

Seal MMMUs were also developed by the IAMMWG at the same time but due to differences in how seals were managed in some parts of the UK (e.g. licensing in Scotland), seal MMMUs were not officially published and further work is required to develop these (Figure 2). Notably, the extent of the those MMMUs stopped at the UK boundary, unlike cetacean MMMUs which cover other Member State waters. This artificial UK boundary in the IAMMWG seal management units does not reflect known seal population movement and distribution or management boundaries eg ICES Areas. Although draft IAMMWG grey seal management units have been used in previous applications and NRW advice, we do not currently advocate their use. Until these are better defined by the IAMMWG, NRW suggest the use of the OSPAR Region III: Celtic

[2] IAMMWG (2015). Management Units for cetaceans in UK waters (January 2015). JNCC Report No. 547, JNCC Peterborough. Available at: https://hub.jncc.gov.uk/assets/f07fe770-e9a3-418d-af2c-44002a3f2872

Seas area as the appropriate interim management unit (Figure 2). Based on the best available evidence, this area reflects the most appropriate spatial scale of grey seal movements in the region, and currently the most plausible option among various management unit possibilities. This area has been used in our advice on recent significant marine project applications.

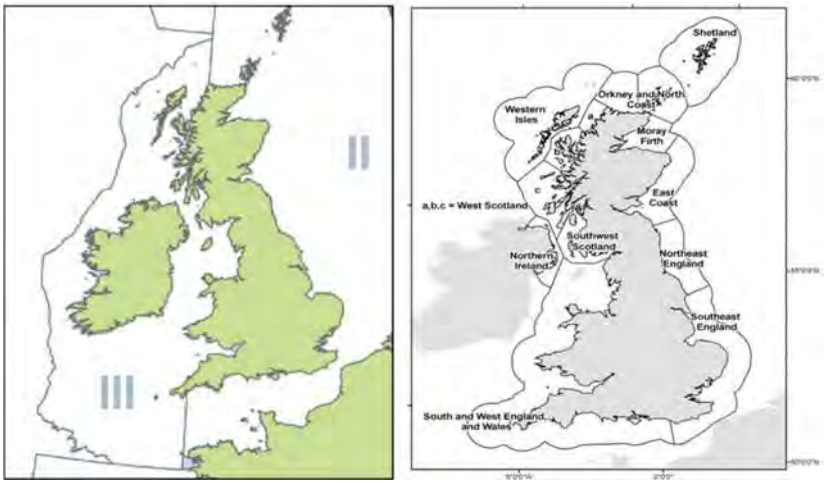


Figure 2. Example grey seal management units: OSPAR Region III: Celtic Seas (left); Draft IAMMWG management unit (right)

What are MMMUs used for?

MMMUs are used to inform conservation advice in several ways, including but not limited to, the relevant spatial scale for assessment of environmental impacts in marine casework (e.g. through HRA, EIA), and the appropriate scale for the selection of Marine Protected Areas e.g. harbour porpoise SACs. Cetacean MMMUs also have population abundance estimates associated with them which underpin conservation advice[3].

Not all UK SNCBs, however, use MMMUs as the spatial scale for considering impacts in HRA and may use different approaches in their advice. Evidence supporting a particular approach may differ between species and between sites and is unlikely to be equivalent for all sites and locations around the UK. As such, different approaches have developed that are suitable for the region at hand and need not be the same for each region. For example, based on the evidence in Wales, an approach that is appropriate in Wales with multiple marine mammal SACs in proximity of each other might not be appropriate for the North Sea where, in the case of harbour porpoise, there is a single SAC in a relatively large area.

While it is usually clear and obvious when an appropriate assessment (AA) is required for impacts from projects that occur inside or overlap with SAC boundaries, how we should assess impacts outside of site boundaries is less obvious. From critically reviewing caselaw on the application of Article 6 (HRA) outside site boundaries ('offsite impacts'), Article 6 can indeed apply beyond the boundary of the site where there is pathway to impact on the conservation objectives of the site[4]. The extent of functional linkage to sea

[3] IAMMWG (2020 in prep). Abundance estimates for cetacean Management Units in UK waters (2020). JNCC Report No. XX, JNCC Peterborough.
[4] DTA Ecology and BSG Ecology 2020. The parallel application of Article 6 (SACs) and Article 12 (strict protection of EPS) for mobile marine species. How should Article 6 be applied beyond the boundary of a

areas outside the site, however, is important here, and depends on the strength of evidence, which varies for species and location. As a point of principle, an impact occurring outside the site needs to adversely affect the achievement of the conservation objectives of the site concerned for it to be considered to affect site integrity.

Informed by these outcomes, this Position Statement represents NRW's advisory position on the use of MMMUs and other approaches relevant to marine mammals in casework advice for HRA, especially in relation to impacts that occur outside of site boundaries. It is advised that this approach is followed by staff in NRW advisory and permitting and this advice is given externally to developers and stakeholders.

2. NRW's position on using MMMUs in HRA

Due to the mobile nature of all Annex II marine mammal features, it is accepted that they do not stay within site boundaries. It is reasonable, therefore, to assume that should an activity occur outside a site, marine mammal features of the sites (several of them rather than just the occasional individual) could travel to and thus be impacted by that activity, wherever it may be in the management unit.

We generally consider that there is the potential for the MMMU to be 'functionally linked' to SACs given, in most cases, the evidence demonstrating the degree of connectiveness and the fact that SACs are dependent on the wider population within the MMMU and represent special areas of sea within it (see Appendix 2; see Chapman & Tyldesley 2016[5] for information on the concept of functional linkage). The Moorburg case (c-142/16) and the Holohan case (C-461/17) confirm the need to adequately consider offsite impacts, where there is a potential and credible effect on the conservation objectives of a site. When considering likely significant effects on site features from offsite impacts, we must consider the specifics of whether the marine mammal site feature can reach the impact and in doing so whether it would be adversely affected in relation to the conservation objectives of the site and not just whether the impact occurs inside or overlaps with the site. For example, where there is evidence of functional linkage between the area of disturbance and the site, there is a potential for disturbance to affect site integrity when it occurs outside the site and the impact footprint does not overlap with its boundary. However, the degree to which the disturbance affects the conservation objectives, depends on the wording of the objective, the species, the weight of evidence supporting the connection of the site feature to the area of functionally linked sea and the magnitude of the effect. For impact pathways that potentially result in injury or death, the impact to the population is more direct and permanent than that of disturbance, and more likely to credibly affect the conservation objectives of the site and its integrity.

In accordance with NRW's internal guidance on HRA, NRW's consideration of marine mammals in project HRAs is carried out in two stages of the process (the derogations are not covered in this document): Stage 1 – test of Likey Significant Effect; Stage 2 – Appropriate Assessment.

European site where a species is also subject to protection under Article 12? Advice to NRW, Final Report. Doc. Ref. 1060(d) Article 6/12 report. 58pp.

[5] Chapman C, Tyldesley D (2016). Functional linkage: How areas that are functionally linked to European sites have been considered when they may be affected by plans and projects - a review of authoritative decisions. Natural England Commissioned Reports, Number207.Available here

Stage 1 - Test of Likely Significant Effect

At this stage, the Competent Authority consider whether a project either alone or in-combination with other plans and projects is 'likely to have a significant effect' (LSE) on a European site by undermining its conservation objective(s). An LSE is a 'possible' significant effect whose occurrence cannot be excluded on the basis of objective information. There should be an impact pathway and credible evidence of the absence of a possible yet real risk for LSE to be excluded. If the competent authority does not believe the risk to be credible, it can be ruled out at TLSE stage.

This stage – sometimes called screening – is intended to be a preliminary examination rather than a detailed investigation: if detail is required to come to a view, then it is probable that an Appropriate Assessment (AA) is needed. If it is unknown or there is doubt as to an absence of LSE, then an AA should be carried out.

Potential impact pathways are considered, including those occurring outside of site boundaries, with a brief examination of whether there are any reasonably foreseeable effects to marine mammal features of a site (in relation to the conservation objectives) based on credible evidence of a real risk, or a hypothetical risk where guidelines exist.

When considering which sites to screen into the assessment (for each impact pathway and species feature), the relevant MMMU is used as the spatial scale for screening (Figures 3-5). If credible impact pathways are identified, or there is reasonable doubt as to absence of an effect from the relevant impact to a marine mammal Annex II feature, in view of the conservation objectives, then all sites with that feature within the relevant MMMU for that species should be screened in for AA.

For most impact pathways, particularly those associated with potential removals or injury, using the MMMU as the spatial scale for assessment (screening) is therefore most appropriate. For some pathways, eg underwater noise disturbance, a different approach may also be relevant, eg using screening distances. However, using alternative approaches to screening depends on the weight of the evidence supporting that approach and should be considered on a case by case basis in consultation with NRW.

NRW advise the use of MMMUs for screening in HRA but may consider other approaches where adequately justified.

Stage 2 - Appropriate Assessment

An AA is made to establish whether there is any adverse effect on site integrity (AEOSI) in view of the site's conservation objectives.

When projects, impacts and mobile site features occur outside of site boundaries, but within the relevant MMMU, we follow different general principles for assessing each species feature for the AA. There may be exceptions to these principles where expert judgement will be required on a case by case basis. In this Position Statement we cover

species that are features of Welsh SACs – bottlenose dolphin, harbour porpoise and grey seal:

- ***Bottlenose dolphin***

The high level of connectivity between Pen Llŷn a'r Sarnau and Cardigan Bay SACs, and the strong evidence that there is a single population of bottlenose dolphins using both sites means that it is likely that an impact that causes AEOSI to one site would cause the same to the other. Conversely, ruling out an AEOSI on one site is likely to also mean no AEOSI on the other but this would need to be assessed independently.

For bottlenose dolphin: an Appropriate Assessment should be carried out on both bottlenose dolphin SACs: Pen Llŷn a'r Sarnau and Cardigan Bay.

- ***Harbour porpoise***

SAC documentation specifies that the population of porpoise associated with the sites is that of the MMMU population: there is no specific number of porpoises associated with the site. The site Conservation Objectives for all harbour porpoise SACs in the MMMU are the same (see Appendix 1) and the sites are of equal importance to the species but vary by season.

For harbour porpoise: An Appropriate Assessment should be carried out on the closest site to the proposed plan or project location first. If AEOSI cannot be ruled out, a sequential/iterative assessment should be carried out considering the next closest site.

If AEOSI cannot be ruled out on the closest site first, then the next closest site is assessed and so on. Where AEOSI is ruled out on the closest site, it follows that there AEOSI would also be ruled out at more distant sites. The differing seasonal nature of the sites, however, should be borne in mind during the assessment.

- ***Grey seal***

Grey seal is a relatively complex feature to assess due to the seasonal changes to the population; the seals present at a site at one time of year (pupping) may be different to the seals present at another time (moulting/post-breeding). Yet there is a high degree of connectivity throughout the region (ie interim management unit). Some life cycle stages may also be more sensitive to certain impacts at certain times eg pupping and moulting. The conservation objectives of grey seal features largely relate to pupping but not exclusively; grey seal presence and distribution during non-breeding periods is also an important consideration in the AA.

Some locations in the region/management unit are also important non-breeding haul-outs (eg moulting, resting). Several haul-outs occur outside of SACs but seals that use these may be 'SAC animals' or associated with SACs. Additionally there are differences in the 'importance' of certain pupping locations within the region. Pembrokeshire Marine SAC is the key SAC which supports most grey seal pupping within the Celtic and Irish Seas part of the OSPAR Region III area (interim management unit). As such, this site

may need to be routinely assessed if grey seal is taken forward to assessment, but will depend on the specifics of the case. Similarly, there are regionally important pupping sites that are not within an SAC, e.g. around Anglesey, but are connected to other SACs in the region. It is advised that the connectivity of these sites outside SACs and their association with SACs is considered when making an AA, and expert judgement will likely be required on assessments of grey seal SAC features on a case by case basis.

In general terms, we suspect that animals from further away from the source of an impact are less likely to travel to that location and therefore be affected than those in closer proximity.

For grey seal: An Appropriate Assessment should be carried out on the closest site to the proposed plan or project location first. If AEOSI cannot be ruled out, a sequential/iterative assessment should be carried out considering the next closest site.

Pembrokeshire Marine SAC is also likely to require assessment depending on the specifics of the case.

If the AA is unable to rule out an AEOSI for the closest site, the next closest site should then be considered, and so on. Where an AEOSI is ruled out at the closest site, it is unlikely that AEOSI would occur on sites further away, although Pemrokeshire Marine SAC is likely to require assessment depending on the specifics of the case.

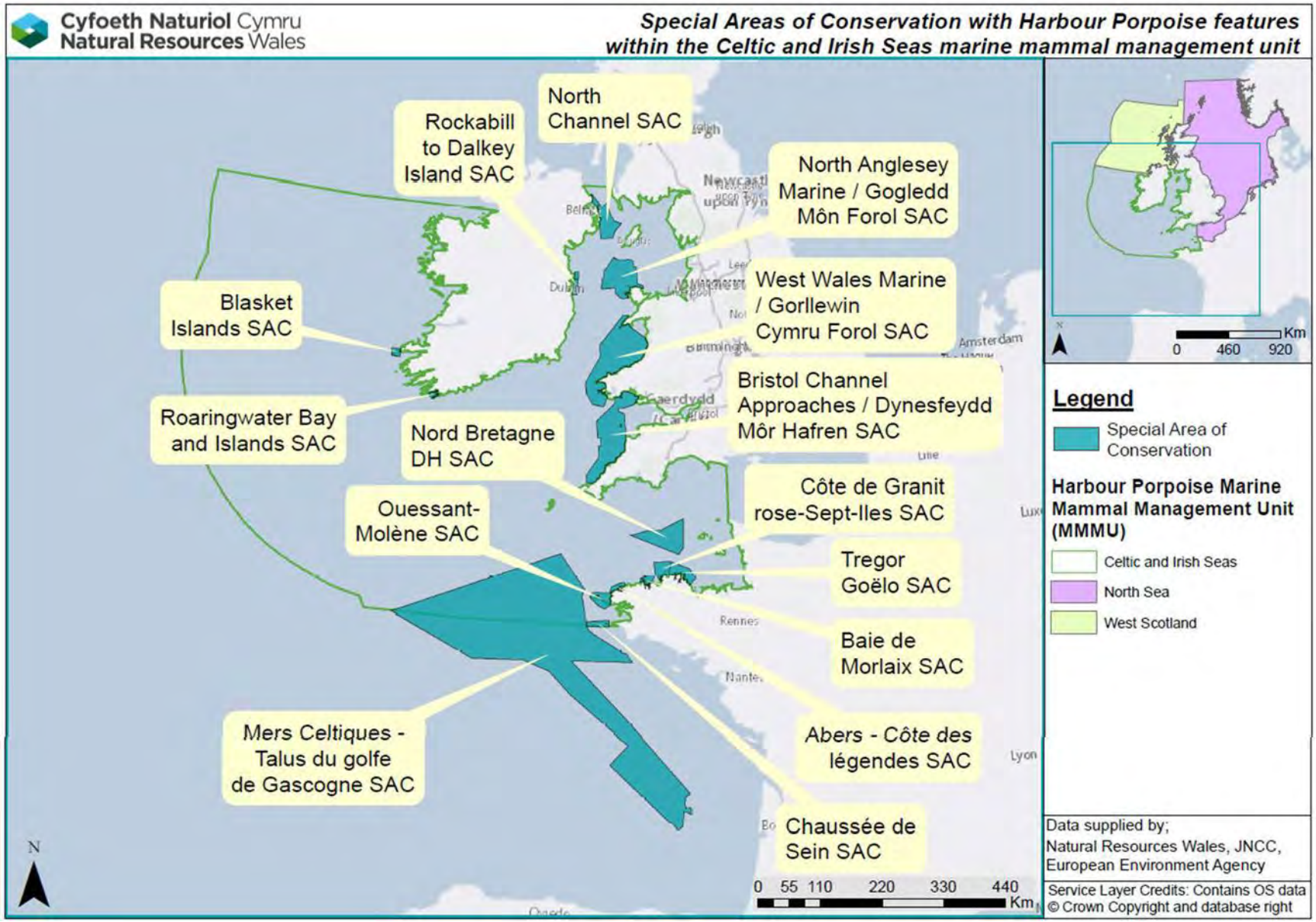


Figure 3. The Celtic and Irish Seas harbour porpoise MMMU and SACs within it.

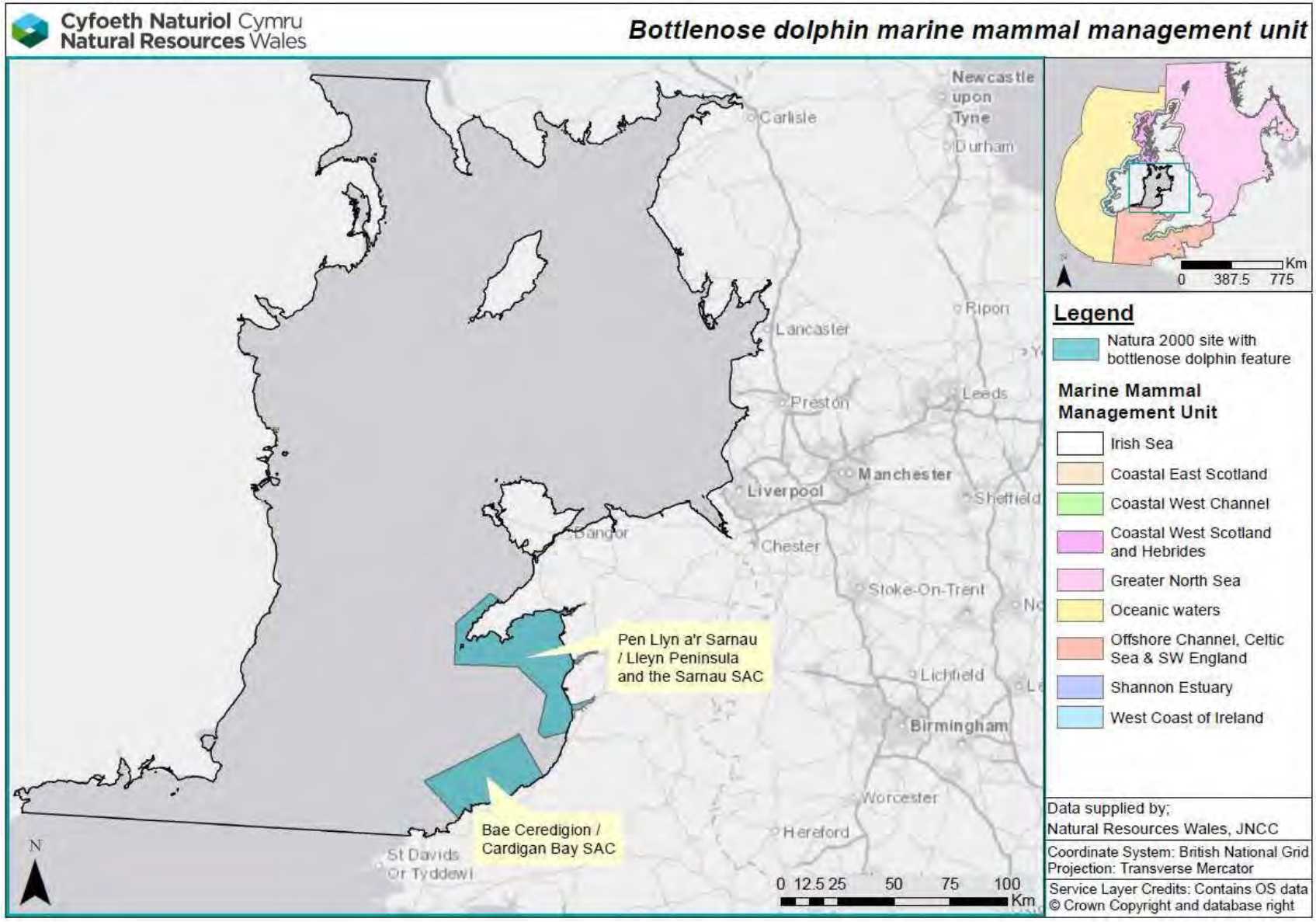


Figure 4. The Irish Sea bottlenose dolphin MMMU and SACs within it.

Figure 5. The OSPAR Region III interim MMMU for grey seal and SACs within it.

Appendices

Appendix 1: Conservation Objectives

Harbour porpoise

Harbour porpoise is a feature of four SACs in the CIS MMMU and three in welsh waters, North Anglesey Marine (NAM), West Wales Marine (WWM), Bristol Channel Approaches (BCA), and North Channel (NC). All sites are single feature sites (harbour porpoise only) and have common conservation objectives. The sites were identified as having persistently higher densities of harbour porpoises (Heinänen and Skov 2015) compared to other areas of the MMMU. This is likely linked to the habitats within the site providing good feeding opportunities. Therefore, operations within or affecting the site should be managed to ensure that the animals' potential usage of the site is maintained. The relevant conservation objective for collisions/removals is as follows (emphasis added with underlined font):

Harbour porpoise is a viable component of the site

This SAC has been selected primarily based on the long-term, relatively higher densities of porpoise in contrast to other areas of the MU. The implication is that the SAC provides relatively good foraging habitat and may also be used for breeding and calving. However, because the number of harbour porpoise using the site naturally varies (e.g. between seasons), there is no exact number of animals within the site.

The intent of this objective is to minimise the risk of injury and killing or other factors that could restrict the survivability and reproductive potential of harbour porpoise using the site. Specifically, this objective is primarily concerned with operations that would result in unacceptable levels of those impacts on harbour porpoises using the site. Unacceptable levels can be defined as those having an impact on the FCS of the populations of the species in their natural range. The reference population for assessments against this objective is the MMMU population in which the SAC is situated (IAMMWG 2015).

The harbour porpoise is also a European Protected Species (EPS) listed on Annex IV of the Habitats Directive and as such is protected under the Habitats Directive Article 12 and transposing regulations from deliberate killing (or injury), capture and disturbance throughout its range. In addition, Article 12 (4) of the Habitats Directive is concerned with incidental capture and killing. It states that Member States 'shall establish a system to monitor the incidental capture and killing of the species listed on Annex IV (all cetaceans). In the light of the information gathered, Member States shall take further research or conservation measures as required to ensure that incidental capture and killing does not have a significant negative impact on the species concerned'. Site based measures should therefore be aligned with the existing strict protection measures in place throughout UK waters.

Bottlenose dolphin and grey seals

Bottlenose dolphin are a feature of Cardigan Bay (CB) and Pen Llŷn a'r Sarnau (PLAS) SACs, both of which are in the Irish Sea MMMU. Grey seal is a feature of PLAS, CB and Pembrokeshire Marine (PM) SACs within Wales and there are several other SACs within the OSPAR Region III area (interim Management Unit).

In Wales, these species and welsh sites have common conservation objectives, the first of which is the most relevant, but aspects of the other objectives are also important for considering impacts from collisions/removals (emphasis added with underlined font).

Populations

The population is maintaining itself on a long-term basis as a viable component of its natural habitat. Important elements include:

• population size
• structure, production
• condition of the species within the site.
• for grey seal, populations should not be reduced as a consequence of human activity.
• for bottlenose dolphin and grey seal; Contaminant burdens derived from human activity should be below levels that may cause physiological damage, or immune or reproductive suppression "

Range

The species population within the site is such that the natural range of the population is not being reduced or likely to be reduced for the foreseeable future.

for bottlenose dolphin and grey seal:

•Their range within the SAC and adjacent inter-connected areas is not constrained or hindered
• There are appropriate and sufficient food resources within the SAC and beyond
• The sites and amount of supporting habitat used by these species are accessible and their extent and quality is stable or increasing
"

Supporting habitats and species

The presence, abundance, condition and diversity of habitats and species required to support this species is such that the distribution, abundance and populations dynamics of the species within the site and population beyond the site is stable or increasing. Important considerations include;

• distribution
• extent
• structure
• function and quality of habitat
• prey availability and quality.

As part of this objective it should be noted that;

• The abundance of prey species subject to existing commercial fisheries needs to be equal to or greater than that required to achieve maximum sustainable yield and secure in the long term.
• The management and control of activities or operations likely to adversely affect the species feature is appropriate for maintaining it in favourable condition and is secure in the long term.

• Contamination of potential prey species should be below concentrations potentially harmful to their physiological health.
• Disturbance by human activity is below levels that suppress reproductive success, physiological health or long-term behaviour "

Restoration and recovery
As part of this objective it should be noted that for the bottlenose dolphin, populations should be increasing.

Appendix 2: Evidence base underpinning MMMUs

The evidence varies for each of the Annex II marine mammal species. Species that are features of SACs around Wales are described below (common seal is not a feature of an SAC around Wales).

Harbour porpoise

Satellite telemetry in Denmark and Greenland indicates that some animals range widely while others show a degree of site fidelity (Nielsen *et al* 2018). However, there are no studies of harbour porpoise movements in UK - there has been no tagging of wild cetaceans in UK waters, and individual identification e.g. through photo ID, is not thought to be effective due to the general lack of identifying features and the small, elusive nature of the species. However, harbour porpoise are thought to be wide ranging (Read & Westgate 1997; Sveegaard et al 2011), and within the eastern North Atlantic they have generally been considered to behave as a 'continuous' biological population that extends from the French coasts of the Bay of Biscay northwards to the arctic waters of Norway and Iceland (Tolley & Rosel 2006; Fontaine et al 2007). For conservation and management purposes, it is useful to divide this population into smaller units where distinct habitat or human pressures – such as bycatch – exist. As such, three porpoise MUs – Celtic and Irish Seas, North Sea, Western Scotland - have been agreed around the UK (IAMMWG 2015; 2020 in prep), and given the evidence underpinning the creation of MUs, we consider the population associated with each MU to form a single inter-connected unit that represents an appropriate scale for wider management of the population.

Fontaine et al (2017), however, recently found some genetic and morphological differentiation in porpoise populations in the NE Atlantic. Around western parts of the British Isles and Bay of Biscay there is a mixing zone between Iberian and North Atlantic 'types' which has led the North Atlantic Marine Mammal Commission (NAMMCO) to propose separate stock identities for West Scotland/Ireland, Celtic Seas and Irish Seas (NAMMCO 2019; NAMMCO/IMR 2019). These stock assessment units differ from management units used by the IAMMWG (SNCBs) and the MSFD/ICES Assessment Units. Further work by the SNCBs is underway to examine these findings.

Bottlenose dolphin

There is strong evidence through photo-ID that coastal bottlenose dolphins in the Irish Sea do not tend to move into Celtic Seas or beyond and are relatively constrained to the Irish Sea Management Unit (Feingold & Evans 2014; Lohrengel et al 2018; Pesante et al 2008b). The largest population of coastal bottlenose dolphins in the UK is found in Cardigan Bay. The population ranges beyond the boundaries of Cardigan Bay (CB) and Pen Llŷn a'r Sarnau (PLAS) SACs (of which it is a feature of both), and has been observed throughout the wider management unit but not beyond (Pesante et al 2008a,b). Photo-ID evidence shows that most individual dolphins move between the two SACs, strongly supporting the idea that the populations of the two SACs are highly connected, and that there is likely a single generic population across the management unit (although a few individuals appear to be faithful to one particular site).

Cardigan Bay SAC is the principal SAC for bottlenose dolphin and was designated primarily (Grade A) for this species, whereas bottlenose dolphins are a secondary (Grade C) feature of PLAS SAC. However, there is no legislative reason why one site would be more important than the other, and given the strong evidence outlined above, we consider

the entire Irish sea MU to be a single inter-connected unit. We therefore consider the population associated with PLAS SAC and CB SAC to be the same and that this is broadly equivalent to the population of the wider MU for purpose of assessment of site integrity.

Grey seal

There is strong evidence (through photo-ID and tagging studies) that grey seals range among the three Welsh SACs and beyond throughout the regional seas (OSPAR Region III area: western coast of Great Britain and neighbouring areas) (Baines *et al*., 1995; Carter and Russell 2018; Cronin et al 2016; Jessopp et al 2013; Jones et al 2013; Keily et al 2000; Langley et al 2018, 2020; Pomeroy et al 2014; Russell et al 2017; Thompson 2011; Vincent et al 2005, 2017). The evidence shows that individual grey seals move between the sites, supporting the notion that the SACs are connected, and that there is likely a single generic population using the region. There is strong evidence that Pembrokeshire Marine SAC is the most important site in the region due to the highest numbers of pups being born there annually (Baines et al 1995; Keily et al 2000; McMath & Stringell 2006; Strong et al 2006).

Grey seals show strong site fidelity during the pupping season (Langley et al 2018, 2020; Pomeroy et al 2000), when they give birth and nurse pups on land. The population can therefore be considered a closed population during pupping time and the notion of a SAC population makes some sense during this time. Outside of this season, seals still rely on land for moulting and resting but are less site faithful, with animals dispersed over a wider area (SCOS 2017). Thus, we see a difference in the grey seal population distribution at different times of the year, and animals may be more sensitive to disturbance during pupping and moulting times. Nevertheless, the conservation objectives of Welsh SACs relate to the species in general rather than any specific life stage. It therefore makes sense to consider the population level effects at a wider scale and consider site specific evidence where available. We only have recent (within last 5 years) estimates of SAC level pup production for PLAS SAC. We have older data on pup production in Pembrokeshire Marine SAC and limited relevant data for CB SAC. We assert, however, that effects on the wider population should be considered when conducting HRA given the interconnectivity of the population in the region.

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C.3. Marine mammals EWG meeting 2

C.3.1 Meeting minutes

MINUTES OF MEETING

Security Classification: Project Internal

Partners in UK offshore wind

MOM Number	:	20220720_Morgan and Mona MMammal EWG02	**REV. No.**	:	F02
MOM Subject	:	Morgan and Mona Evidence Plan Marine Mammals Expert Working Group meeting 2.			

MINUTES OF MEETING

MEETING DATE	:	19/07/2022
MEETING LOCATION	:	Microsoft Teams
RECORDED BY	:	[redacted]
ISSUED BY	:	[redacted]

PERSONS PRESENT:

- [redacted]
- [redacted]
- [redacted] – bp (WD)
- [redacted] – RPS (KL)
- [redacted] - RPS (ST)
- [redacted]
- [redacted] – RPS (BP)
- [redacted]
- [redacted] Seiche (CB)
- [redacted]
- [redacted] – Natural England (AuB)
- [redacted] – Natural England (OH)
- [redacted] – MMO (DN)
- [redacted] JNCC (JW)
- [redacted] - JNCC (SC)
- [redacted] – NRW (LR)
- [redacted]
- [redacted] – TWT (GdJC)

APOLOGIES:

[redacted] - NRW (HS)

ITEM NO:	DISCUSSION ITEM:	Responsible party	Date
1.	**Project update (presented by WD)** bp are working with EnBW in a 50/50 partnership (the Applicants) to develop the Morgan and Mona Offshore Wind Projects, which are being progressed as two separate projects. Morgan is the northern project located in English waters, and Mona is the southern project located mostly in Welsh waters. Together, they will have a combined capacity of 3GW. Subject to consent, Morgan		

	and Mona will be delivered on similar but slightly staggered timescales and will be under separate consent applications. The Mona project is aiming to be operational in 2028 and the Morgan project is aiming to be operational in 2029. The Morgan and Mona Offshore Wind Projects are being developed as separate DCOs with separate landfalls. The Applicant is looking to sign The Crown Estate (TCE) Agreement for Lease this year. We now have final clarity from the National Grid regarding the results of the Pathway to 2030 Holistic Network Design review which has provided the onshore grid connection points for the Morgan and Mona Offshore Wind Projects. Mona will have a grid connection at the existing Bodelwyddan National Grid substation. Morgan will have a shared grid connection at the existing Penwortham National Grid substation with the Morecambe Offshore Wind Project which is being progressed jointly by Cobra and Floatation Energy. The two projects will share an onshore and offshore cable corridor however the projects will remain electrically separate. This means we have had to separate the Morgan generation and transmission assets. The Morgan (generation assets only) scoping report has been submitted to the Planning Inspectorate and the Applicant is working with Morecambe to deliver a joint scoping report, PEIR and DCO application for the transmission assets. The Morgan (generation assets only) and Mona (generation and transmission assets) PEIR submission will be at the end of Q1 2023. The Morgan (generation assets only) PEIR has been aligned with the Mona PEIR to allow the Applicant to properly consider the cumulative effects between the projects. This alignment is expected to continue to application.		
2.	**Responses to queries from EWG01 (presented by TMc)** A technical note addressing queries from EWG01 was distributed prior to this EWG meeting. It provided evidence of other examples of digital aerial surveys and the percentage cover that the contractor (APEM) have used and what has been agreed for other offshore wind farms around the UK. The technical note also included feedback on the request for power analysis. The Applicant wanted to highlight that that the aim of the aerial surveys is not to look for the ability to detect changes but for characterisation of the baseline. For marine mammals, the sighting rate is not high enough for meaningful power analysis. The Applicant will supplement the aerial surveys with available desk top data so that the survey is not the only data that is relied upon for the baseline characterisation. The technical note and meeting slides presented high- and low-confidence images and examples of how these images were assigned to species/species groups from the arial surveys and the approach to uncertain identifications. The Applicant explained that the purpose of the regional study area is to provide context to the project specific study area. The Applicant has defined the regional study area as the Irish Sea rather than all the relevant Management Units (MUs) as the Applicant does not consider		

	populations in the North Sea to be relevant for understanding the project in the wider region. The regional study area is also the areas within which the Applicant will undertake the screening for the Cumulative Effects Assessment (CEA) and Habitats Regulation Assessment (HRA) Likely Significant Effect (LSE) screening. The Applicant considers the Irish Sea to be sufficient to capture all potential likely significant impacts. TS- For the HRA [for bottlenose dolphin, harbour porpoise, grey seal], NRW would advocate the use of the relevant MUs as outlined in our Position Statement [NRW 2020]. NRW's position on the use of Marine Mammal Management Units for screening and assessment in Habitat Regulations Assessments for Special Areas of Conservation with marine mammal features. Position Statement 006. Natural Resources Wales, Bangor. For EIA/CEA, NRW understand that screening in sites from the North Sea – as part of the Celtic & Greater North Seas Management Unit [for common, Risso's, whitebeaked and white sided dolphin, and minke whale] - would be burdensome but restricting to the Irish Sea is limiting the species and impacts captured. NRW suggest considering using the MU for harbour porpoise (Celtic and Irish Sea MU) as a suitable/pragmatic option for other species ie adding the Celtic Sea area to the Irish Sea. TMc- Are NRW happy for the Applicant to use the step wise approach for LSE screening in sites where the Applicant will only screen in sites further away from the Morgan/Mona Offshore Wind Projects if Adverse Effect on Site Integrity (AEOSI) has been ruled out on the sites closer. TS- yes. *Post meeting note from TS: As outlined in our Position Statement, where there is evidence of a credible risk (and typically there is given the functional linkage within the relevant MU), all sites within the management unit should be screened in for LSE, but the Appropriate Assessment should concentrate on the closest site first for harbour porpoise, both Cardigna Bay/Pen lLyn a'rSarnau for bottlenose dolphin, and the closest site for grey seal (and probably Pembrokeshire marine SAC given its critical importance to the population in the region). If AEOSI can be ruled out for these closest/most relevant sites then it can (more than likely) be ruled out for more distant sites. Thus, this is a stepwise/sequential approach to HRA.* SC- JNCC would also like the routes to impacts to also be taken into account. In regard to CEA, can the same stepwise approach that will be undertaken for LSE screening be used for the CEA to screen in projects? KL- This is something RPS can take away and think about, however the processes are slightly different as the projects are screened in through a tiered approach which is a similar process but undertaken on a different basis. Adding in distance will increase the complexity of the CEA which may make it less comprehensible and informative.		
	Underwater Sound (presented by SS)		

	A technical paper detailing the underwater sound modelling methodology was distributed prior to this EWG meeting. Due to the size of the piles being considered for the Morgan/Mona Offshore Wind Projects (monopiles up to a maximum of 16m diameter), Seiche didn't consider that scaling up the percentage of energy from other piling events of different piles would be a suitably robust approach. Therefore Seiche has used a more detailed methodology for predicting the pile source levels. The model takes the design of the pile and predicts the source level for different pile depths and hammer energy using a hybrid finite element/parabolic equation model. This model is commonly used for European offshore wind farms. Seiche have used the maximum hammer energy being considered for the basic model set up. The piling scenarios are currently being finalised, following which, Seiche will carry out the detailed modelling. The use of a dose response approach to disturbance is considered most appropriate as it is more representative of reality (discussed further below). Particle motion will be dealt with through qualitative review, there are no thresholds available in the literature for particle motion. RPS and Seiche will review all available literature. Seiche have an external peer review stage where the model and the assumptions made will be reviewed to ensure they are best practice and fit for purpose. The model will use the assumption that marine mammals will be moving, and will use the recommended swim speeds from the literature. The assumption is that they will continuously flee the noise source in a straight line. A stationary model will be used for fish, although Seiche will also model a mobile receptor to present a more realistic scenario. The Applicant wants to highlight that there is a lot of conservatism built into the assessment. There is conservatism in the criteria being used, the maximum project design criteria that are being used and the most conservative swim speeds are being considered. KL- Does the EWG have any suggestions on the cut off between impulsive and non-impulsive sound, e.g. how far away from a source does the impulsive piling sound become continuous sound. OH- NE are on the steering group for the ORJIP working group considering this. The project is still in the early stages so there are no preliminary results to share. GV- The Applicant can control the strike rate as part of the soft start and noise mitigation, but the strike rate can't be changed during the functional piling. Strike rate can be considered in the modelling. RF- Consecutive piling should be considered in the assessment, the number of piles within 24hrs should also be considered.	**EWG to provide any**	

	SS- Would the assumption be that the marine mammals would continue to flee between piling events. RF- There would also be the potential for them to return so this also needs to be considered. GV-Is there a cut off in terms of where consecutive piling should be considered as continuous noise e.g. how close do piling events have to be before it is considered continuous sound. RF- This depends on the type of piling proposed and the duration of each piling event. SS- In the periods between piling events, marine mammals would have swum far beyond the range at which sound is impulsive. It is not practical or representative of reality to consider this as impulsive noise. TMc- We simplify the assessment down to the spatial and temporal worst-case scenario so that it doesn't lead to over complication of the assessment, making it hard to read and understand. RPS will provide a log of what we are including in the assessment and our justification.	**papers on evidence of effects of cable laying specifically (over the vessel doing the cable laying)** **RPS to provide a log of what has been included in the next EWG and justification.**	**22/08/22** **TBC**
3.	**Dose response (presented by TMc)** This approach is taken for most offshore wind farms and was developed for the Beatrice offshore wind farm. The approach should use a proportional response, where animals close to a piling location will experience a higher rate of disturbance. For pinnipeds, below 130db unweighted SEL, the Applicant would consider that there isn't a disturbance. OH- The dose response curves have been developed for offshore wind farms in the North Sea, a different location from the Morgan and Mona Offshore Wind Projects. Can RPS provide some information on why they are considered appropriate for the Irish Sea populations. There is also a second paper on dose response for seals- Whye *et al* 2020. TMc- We are using the best available data and we acknowledge the limitations in that the does response curves were developed for a different geographic region – this will be noted as a caveat to the assessment. TS- Is it valid to use the harbour porpoise dose response for other cetaceans? TMc- This will be another caveat on the assessment, but this is the best information we have. The alternative is a threshold approach (NMFS) using mild and strong disturbance and would be the same for cetaceans and pinnipeds. For dose response there are different	**RPS to review Whyte *et al* paper**	**22/08/2022**

	thresholds for cetaceans and pinnipeds so more robust and also we have to use the most up to date data available. SC- The Beatrice offshore wind farm study was undertaken on pin piles, not monopiles. When the assessment is written, it needs to be very clear on the methodology and state caveats and assumptions. TS- It might be useful to present a comparison of the harbour porpoise dose response to other species and the National Marine Fisheries Service (NMFS) thresholds to compare the different numbers. Noted that all caveats and limitations associated with the dose response approach need to be set out clearly. TMc- When RPS undertakes the assessment we will present a range of densities, a maximum and realistic scenario. If we presented too many variations the assessment becomes very complicated and very difficult to follow. If would be more productive for RPS to choose a best approach, agree that and clearly state it in the assessment. TS- Comparison of other species dose responses and thresholds could be done and presented at an earlier stage as part of an EWG rather than taking it through to the assessment itself. *Post meeting note from TS: An important point here is that a D/R which calculates the decreasing numbers of animals per isopleth is not suitable to determine the spatial area/footprint of ensonification of significant disturbance for harbour porpoise HRA as a 20%/10% spatial area overlap is required. Equating numbers of animals (proportions per isopleth) to area is not possible using a D/R*		
4.	**Interim baseline (presented by BP)** KL- Due to time constraints we will not present the interim baseline however the slides will be provided with the meeting minutes.		
5.	**Scoping Opinion (presented by KL)** KL- The desk top data and site specific survey data do not show that harbour seal and white beaked dolphin are key species. As the assessment it intended to be proportional and consider likely significant effects, the Applicant proposed to scope out these species. TS- White beaked dolphin can definitely be scoped out. AuB - NE also agree that white beaked dolphin can be scoped out. TS- For LSE Screening the screening paper stated that a 100km buffer was to be used for screening but then it also stated that the MUs were to be used. How will this work? KL- The LSE Screening will take into account foraging ranges and connectivity. Harbour seal were recorded in low densities and have low foraging ranges which is why they were scoped out. TS- I wouldn't expect any significant adverse effect on harbour seal however it would be good to consider it in the assessment. Carter et al		

	2022 used a range of 440km for grey seal. The 100km buffer is dated and the distance over which they are considered should be updated. KL- The primary concern for harbour seals is for the LSE screening rather than the EIA? TS- Wouldn't necessarily recommend it's in one and not the other. OH- We would also suggest that harbour seals should be scoped in due to the observations during the geophysical survey so there is evidence that they are present even if it is in low densities. TMc- The Applicant will include harbour seal in the EIA and HRA.		
6.	**LSE screening (presented by KL)** The Applicants have looked at the MUs next to the Morgan and Mona Offshore Wind Projects and looked at the foraging ranges for seals to identify the SACs with connectivity. KL noted that the foraging ranges for seals can be looked at again the context of the Carter *et al*. information, particularly in relation to sites on the east coast of Ireland and potential connectivity with these and the Morgan and Mona Offshor Wind Projects. OH- Has there been consideration of the Isle of Man populations? KL- The Applicant has contacted the Manx Wildlife Trust and the Manx Whale and dolphin trust to request their data, and this has been included in the baseline characterisation.	**RPS to reconsider foraging ranges for seals in the context of the Carter *et al* information.**	**22/08/22**
7.	**Discussion and next steps (presented by KL)** Outlined next steps for meeting minutes and agreement logs (attached). The Applicant is seeking agreement on the approach paper presented and points raised during the meeting.		
8.	**Close of meeting**		

C.3.2 Response from Natural England regarding the meeting minutes

Date: 19 August 2022
Our ref: DAS/UDS A000566 / 400336
Your ref: Morgan and Mona Marine Mammal Expert Working Group 02

[redacted]
BP Alternative Energy Investments Limited

c/c [redacted]
RPS/ Energy

Hornbeam House
Crewe Business Park
Electra Way
Crewe
Cheshire CW1 6GJ

T [redacted]

BY EMAIL ONLY

Dear [redacted]

Discretionary Advice Service (Charged Advice) - UDS A000566
Contract Reference: BP EnBW Morgan and Mona Offshore Wind Farm
Consultation: Morgan and Mona Offshore Windfarm Marine Mammal EWG02

This advice is being provided as part of Natural England's Discretionary Advice Service in accordance with the Quotation and Agreement dated 17 May 2021 to BP Alternative Energy Investments Limited.

The following advice is based upon the information presented in the Marine Mammal Expert Working Group (EWG) Meeting 2 (attended on 19 July 2022).

Natural England were asked to provide advice upon:

1. Agreement on the approach to baseline characterisation;
2. Agreement on the approach to noise modelling following clarifications provided in EWG;
3. Agreement on approach to LSE Screening for Marine Mammals;
4. Agreement that white-beaked dolphin be scoped out of the EIA and HRA;
5. Agreement that the Celtic and Irish Sea (Harbour Porpoise MMMU) is an appropriate study area for dolphin and minke whale.

1. Agreement on the approach to baseline characterisation

During the Marine Mammal EWG Meeting 2, the interim baseline was not presented by RPS due to time constraints. It was proposed that the slides from the presentation were to be provided following the meeting for review and comment. We request that a copy of the presentation slides or a paper is provided in order to inform our position and provide comment.

2. Agreement on the approach to noise modelling following clarifications provided in EWG

We have provided our advice (dated 21 June 2022, our reference 393968) on the Underwater Sound Modelling Methodology Technical Note provided by RPS (dated 24 May 2022). We do not believe that definite answers have been provided for the following queries raised by Natural England:

- modelling of underwater noise from piling and unexploded ordnance (UXO) scenarios, including mitigation or low noise methods;
- the worst-case spatial and temporal scenario that will be modelled and inclusion of consecutive

piling;
- the locations for modelling;
- the inclusion of temporary threshold shift (TTS);
- operational noise.

It is our understanding that RPS will be producing a log of aspects to be included in the underwater noise assessment and justification for these for the next EWG, therefore we will await further information before agreeing with the noise modelling approach.

Within the EWG Meeting 2, there was a request for any papers on evidence of effects of cable laying to be provided. Evidence[1] from the Norfolk Boreas offshore wind farm indicates that some aspects of the cable laying process (e.g. dredging and trenching) can have higher source levels than that of the vessel noise alone. We would welcome any evidence from the applicant that supports their position that the noise from cable laying is within the noise of the vessel, or further consideration of noise levels of the cable laying process.

3. Agreement on approach to LSE Screening for Marine Mammals

Natural England broadly agree with the approach to identification of sites and features for Likely Significant Effect Screening as set out within the meeting. However, in addition to the foraging ranges, we advise that telemetry of seals in the area should be used to identify protected sites with connectivity to the project. Furthermore, the Special Area of Conservation (SAC) Specific Distribution Maps produced by Carter *et al.* (2022)[2], (set out in section 10 in the Supplementary Material) should also be used to inform connectivity between sites and the project boundary and Zone of Influence. With regards to cetaceans, we agree that the relevant species-specific Management Unit (MU) should be used.

4. Agreement that white-beaked dolphin be scoped out of the EIA and HRA

As set out in the Agreement log (provided 8 August 2022), Natural England agree that white-beaked dolphin is scoped out of the Environmental Impact Assessment (EIA) and Habitat Regulations Assessment (HRA). The meeting minutes currently attribute our comment to Sarah Canning of the Joint Nature Conservation Committee (JNCC) and should be amended to prevent confusion and present an accurate portrayal of the meeting.

5. Agreement that the Celtic and Irish Sea (Harbour Porpoise MMMU) is an appropriate study area for dolphin and minke whale

Natural England agree that the Celtic and Irish Sea Marine Mammal Monitoring Units (MMMU) for harbour porpoise are an appropriate study area for dolphin species and minke whale. The larger study area is more biologically appropriate for wide-ranging species, such as minke whale, and is also more precautionary in that it can capture more distant sites for the HRA and projects for the EIA Cumulative Effects Assessment (CEA).

For clarification of any points in this letter, please contact me using the details provided below.

Yours sincerely

[redacted]
Strategic Coastal Lead Adviser
Coast and Marine Team

[1] Norfolk Boreas Offshore Wind Farm Appendix 5.4 Underwater Noise Assessment Environmental Statement; Volume 3. Subacoustech Environmental Ltd. June 2019, Version 1.

[2] Carter, M.I.D., Boehme, L., Cronin, M.A., Duck, C.D., Grecian, W.J., Hastie, G.D., Jessopp, M., Matthiopoulos, J., McConnell, B.J., Miller, D.L., Morris, C.D., Moss, S.E.W., Thompson, D., Thompson, P.M. and Russell, D.J.F., 2022. Sympatric Seals, Satellite Tracking and Protected Areas: Habitat-Based Distribution Estimates for Conservation and Management. Frontiers in Marine Science 9:875869. doi: 10.3389/fmars.2022.875869

Cheshire, Greater Manchester, Merseyside & Lancashire Area Team
[redacted]

☒ The advice provided in this letter has been through Natural England's Quality Assurance process.

The advice provided within the Discretionary Advice Service is the professional advice of the Natural England adviser named below. It is the best advice that can be given based on the information provided so far. Its quality and detail is dependent upon the quality and depth of the information which has been provided. It does not constitute a statutory response or decision, which will be made by Natural England acting corporately in its role as statutory consultee to the competent authority after an application has been submitted. The advice given is therefore not binding in any way and is provided without prejudice to the consideration of any statutory consultation response or decision which may be made by Natural England in due course. The final judgement on any proposals by Natural England is reserved until an application is made and will be made on the information then available, including any modifications to the proposal made after receipt of discretionary advice. All pre-application advice is subject to review and revision in the light of changes in relevant considerations, including changes in relation to the facts, scientific knowledge/evidence, policy, guidance or law. Natural England will not accept any liability for the accuracy, adequacy or completeness of, nor will any express or implied warranty be given for, the advice. This exclusion does not extend to any fraudulent misrepresentation made by or on behalf of Natural England.

Cc commercialservices@naturalengland.org.uk

C.3.3 Response from the MMO regarding the meeting minutes

MINUTES OF MEETING

Security Classification:
Project External

Partners in UK offshore wind

MOM Number	:	20231205_Morgan and Mona MM	**REV. No.**	: F01
MOM Subject	:	Morgan and Mona Evidence Plan marine mammals meeting		

MINUTES OF MEETING

MEETING DATE	:	05/12/23
MEETING LOCATION	:	Microsoft Teams
RECORDED BY	:	[redacted]
ISSUED BY	:	

PERSONS PRESENT:

- [redacted] – bp (SR)
- [redacted] – bp (MP)
- [redacted] – bp (GV)
- [redacted] – bp (DH)
- [redacted] – RPS (ST)
- [redacted] RPS (BP)
- [redacted] – RPS (LB)
- [redacted] – NRW (SB)
- [redacted] JNCC (AG)
- [redacted] – NRW (NFM)
- [redacted] – NRW (EL)
- [redacted] – NRW (PB)
- [redacted] JNCC (JW)
- [redacted] – NRW (PM)
- [redacted] – Natural England (MNW)
- [redacted] – NRW (NP)
- [redacted] – Natural England (EW)
- [redacted] – Cefas (RF)
- [redacted] – TWT (BS)

ITEM NO:	DISCUSSION ITEM:	Responsible party	Date
1.	**<u>Project updates (presented by MP)</u>** The Mona and Morgan Generation projects description for the Applications are now finalised and the assessments are almost complete. Mona is aiming to submit the application at the end of February 2024 and Morgan Generation is aiming to submit the applications after Easter 2024. Any further comments and completion of the agreement logs before the Christmas break would be appreciated as we are now at a critical time and are unable to include anything new at this stage. All previous stakeholder comments have been considered.		

	Following responses to the Mona and Morgan Generation Preliminary Environmental Information Report (PEIR), the project design envelope has been reviewed and updated. The Mona and Morgan Array Areas have been reduced in size, mainly in response to shipping and navigation and commercial fisheries consultation. The slide (slide 5) provides links to the offshore newsletters for Mona and Morgan Generation that were published in September 2023 and present key offshore updates. The minimum spacing between offshore infrastructure has been increased to 1,400 m both within and between rows. The maximum number of wind turbines has been reduced from 107 to 96 for both Mona and Morgan Generation. The rotor diameter of the largest wind turbine has increased from 280 m to 320 m for both Mona and Morgan Generation. Monopiles have been removed from the list of foundation options included in the project design envelopes. Gravity base foundations and jackets on suction buckets or pin piles (drilled or driven) are retained. No cable protection higher than 70 cm will be installed within in the Menai Strait and Conwy Bay SAC. The percentage of export cable requiring cable protection has been reduced to not exceed 10% of the total length within the SAC. Additionally, no more than a 5% reduction in water depth will occur at any point along the export cables without prior written approval from the Licensing Authority in consultation with the MCA. In addition, we can confirm that the Mona export cables will be installed under the intertidal area from below MLWS to above MHWS onshore via trenchless techniques. Open-cut trenching within the intertidal area has been removed for the project design envelope. This will remove any direct impact to the clay and piddock habitat in the intertidal area. The project has also made a significant reductions to the volume of seabed preparation material in the Mona and Morgan Generation Array Areas and the Mona Offshore Cable Corridor. NP- Does the project team anticipate any potential for slippage in the programme? This is useful to understand so that we can plan our resourcing for next year MP- At this stage we are not planning for potential programme slippage. NP- Does the EWG already have the up to date agreement logs? ST- Yes these were sent out with the slides ahead of the meeting.		
2.	**<u>Mona Assessment updates (presented by BP)</u>** Monopiles have been removed from the project design and the assessment now considers pin piling as the only form of piles. The maximum hammer energy has been reduced from 5,500kJ for monopiles presented in the Preliminary Environmental Information Report (PEIR) to 4,400kJ for pin piles. Most foundations will be piled up to a maximum of 3,000kJ but up to 16 foundations may be pile with a hammer energy up to 4,400kJ. The		

	projects have committed to no concurrent piling at the maximum hammer energy of 4,400kJ and with concurrent piling only occurring for the foundations installed with a maximum of 3,000 kJ. A maximum separation distance of 15 km will be used for concurrent piling. This will minimise the likelihood of disturbance to marine mammals by limiting the ensonified area as there is greater overlap in ensonified areas when piling occurs closer together. A minimum separation distance of 1.4 km will be used for concurrent piling. This will minimise the likelihood of injury to marine mammal and fish species in the immediate vicinity of piling operations by limiting the spatial overlap of areas of the highest ensonification during concurrent piling. Measures apply to both Mona and Morgan Generation. <u>Haul out connectivity</u> The densities and management units that form the regional marine mammal study area were agreed via the Final Agreements with MM EWG technical note sent to the EWG in September. Thank you for quick responses. In the second EWG meeting, it was advised that a qualitative assessment of grey seal haul-out sites should be presented. Further detail has been added on haul out connectivity for grey seals throughout the regional marine mammal study area. This approach is applicable for both Mona and Morgan Generation. We utilised the SMRU telemetry data provided for Mona and Morgan Generation, for the four SMUs covering the Irish Sea. So we digitised grey seal haul out sites, and then applied a 5 km buffer around each haul out site. A 5 km radius was used, as this was used in the Carter *et al.* 2022 maps and allows more tracks to be captured or tied to a haul out site than for example a 1 kilometre buffer. We then identified any adult or pups that crossed the marine mammal study area (so for Mona this comprises the Mona Array Area and the cable corridor plus a buffer) and crossed within the 5 km buffer region around any haul out site. Seals were shown to cross numerous haul out sites, with 3.9 being the average number of haul out sites visited per seal, but a maximum of nine visited by one seal. This has allowed us to provide some quantification of grey seal connectivity within the regional marine mammal study area and add context to our assessment of barrier effects. <u>CEA screening region for seals</u> The Mona and Morgan Generation impacts assessment used the combination of four seal management units as the Grey Seal Reference Population (GSRP) and this has been assessed alongside OSPAR Region III.		

	The GSRP consists of the 4 seal MUs (12 Wales, 13 Northwest England, 14 Northern Ireland and 1 SW Scotland) plus two Ireland regions plus the Isle of Man region. For Mona, iPCoD modelling for grey seal has been undertaken against both GSRP and OSPAR Region III for both the project alone and cumulative assessments. The approach to Morgan Generation will be discussed later in the meeting. Following S42 and EWG feedback, OSPAR Region III has been used as extended screening area for grey seal – for offshore wind projects only to allow a proportionate approach to assessment. For harbour seal, the Harbour Seal Reference Population (12 Wales, 13 NW England, 14 Northern Ireland) is used as the relevant screening area. The list of cumulative projects has been updated and the marine mammal assessments have been updated with any changes to information available. Some projects for example have gone to Tier 1 from Tier 2 or Tier 3 to Tier 2 since PEIR. White Cross has now submitted their application for consent so they are now included under tier 1 and the assessment and iPCoD modelling has been updated to account for this. For grey seal, White Cross sits approximately 7 km outside the GSRP but the reported underwater sound contours extend up to 12 km, so this project has been included for assessment against the GSRP as a precautionary approach. Whilst the majority of Tier 2 projects do not have numbers in the public domain, Tier 2 projects with quantitative information are included, as was in PEIR, and for the Mona Offshore Wind Project includes the Morgan Offshore Wind Project: Generation Assets, Morecambe Offshore Wind Project: Generation Assets, Morgan and Morecambe Transmission Assets. NP- Llyr 1 and Llyr 2 are the wrong way round in the CEA other projects/plans figure. BP- Thank you, we will update the figure. NP- To confirm, will you accept comments on the slides and today's discussion after the EWG? MP- Yes please provide any comments as soon as possible. <u>Results: Injury and disturbance from piling</u> For both Mona Offshore Wind Project and Morgan Offshore Wind Project: Generation Assets, the project alone assessment of injury and disturbance from elevated underwater sound during piling has no significant impact in Environmental Impact Assessment (EIA) terms. As for PEIR, the cumulative assessment concluded a potential significant impact for bottlenose dolphin in the context of the Irish Sea MU, against a background of a declining small population. The EIA therefore presents a precautionary significant impact for the project cumulatively with all other projects considered in the Irish Sea MU. In addition to primary and tertiary measures adopted, the project has committed to the development of an Underwater Sound Management Strategy (UWSMS) to reduce any significant impacts.	**Applicant to updated the CEA figure in the Environmental Statement**	For the Environmental Statement

	The primary aim is to reduce any residual significant impact after primary and tertiary measures have been implemented. Although no significant impacts for projects alone were concluded, the applicant acknowledges the contribution to the soundscape.		
3.	**<u>Underwater Sound Management Strategy (presented by ST)</u>** Site Integrity Plans have historically been applied to projects in the Southern North Sea (SNS), in particular those within or close to the Southern North Sea SAC, which is designated for harbour porpoise. In these SIP's there are defined thresholds for cumulative effects of piling – 10% in a particular season, or 20% on a particular day. Mona and Morgan Generation are not predicted to reach the 10% area threshold for the nearest harbour porpoise SAC (i.e. North of Anglesey Marine SAC), either alone or in-combination with other projects. As such, a SIP, similar to those used in the Southern North Sea SAC, is not considered appropriate to manage underwater sound impacts. At PEIR, outstanding concerns were raised with respect to: • Bottlenose dolphin populations, including those associated with Welsh SACs; • Cumulative concerns about potential impacts of piling on cod spawning; • Concerns about potential piling impacts on herring spawning. The Applicant is looking to agree a mechanism (similar to SIPs) that allow us to agree an approach to managing the potential underwater sound impacts post consent, when more details of the project construction for the individual projects, and more detail on cumulative projects in the region, is known. We are producing an Underwater Sound Management Strategy (UWSMS) to do this. The UWSMS would allow the projects to focus on underwater sound for multiple receptors (fish and marine mammals). The project will submit an outline of the UWSMS with the applications so the stakeholders and Secretary of State can have confidence that this will be effective and agreed post consent. The UWSMS would set out the detailed refined project design pre-construction (e.g. the number of foundations that will need piling may be reduced, hammer energies may be revised etc.) as the application collects more information on the ground conditions. The version developed post-consent will contain any further environmental information e.g. cod and herring stock or spawning grounds. These have previously been used post-consent in discussion on underwater sound impacts. The impact assessments within applications assume all the piling is occurring at the same time and therefore you end up with a large, conservative assessment. In reality, all cumulative projects may not be piling at the same time therefore the cumulative impacts will likely be reduced from what has been assumed in the final		

	applications. This has been the experience for SIPs where impacts have been reduced due to phasing of projects. The UWSMS will set out potential mitigation options which could be employed if there are residual concerns about the cumulative impacts of underwater noise following refined project design. These are often agreed in principle at the application stage with final agreement achieved post consent with the final project design. Slide 15 presents the working table of content for the UWSMS. This may still be subject to change. An outline of the UWSMS will be submitted with the application for consent along side the MMMP. The main advice the applicant is looking for is whether this approach would be acceptable. This approach was presented at the steering group and the project generally received positive feedback. We are trying to put forward a process where the projects can continue towards consent and the detail can be discussed post-consent when further information is available. Post Meeting note from NRW: *The proposed Underwater Sound Management Strategy appears acceptable in principle, although we would need to have sight of the detailed version before being able to confirm full agreement.*	**Stakeholders to confirm whether the UWSMS is an acceptable approach to manage underwater sound impacts**	Complete
4.	**<u>Injury and disturbance during UXO clearance (presented by BP)</u>** The assessment has considered a range of UXO sizes and the maximum design scenario is based on high order clearance of 907 kg UXO. This is a highlight precautionary approach as the most likely maximum is 130 kg UXO. The assessments assumed standard industry mitigation (Marine mammal observers, Passive Acoustic Monitoring) plus Acoustic Deterrent Devices and soft starts for piling. The assessment concluded no significant effect for bottlenose dolphin, short-beaked common dolphin, Risso's dolphin, minke whale, grey seal and harbour seal for Permanent Threshold Shift (PTS). When a maximum UXO size of 907 kg is considered, for harbour porpoise there is some residual effect (small number of animals potentially exposed to sound levels that could elicit PTS), which has led to the conclusion of moderate adverse significance. The most likely maximum is 130 kg which is mitigatable and discussed in the Marine Mammal Mitigation Protocol. There is no significant impact for behavioural disturbance (using Temporary Threshold Shift as proxy) for any species. Details will be agreed post-consent when further information on UXO parameters are available. The project has committed to a hierarchy approach to UXO clearance. • Avoid UXO • Clear UXO with low order techniques		

	• Clear UXO with high order techniques. Low order techniques or avoidance of confirmed UXO are not always possible and are dependent upon the individual situations surrounding each UXO. Given that it is possible that high order detonation may be used the MMMP also includes mitigation to reduce the risk of injury from UXO clearance. The UWSMS would consider both project alone and cumulative scenarios; reducing project alone effect would reduce contribution to CEA. RF-B- Have Effective Deterrent Ranges been considered (for disturbance) in addition to the TTS thresholds? BP- In the EIA, TTS has been applied as a proxy, for piling we do use EDRs. We will get back to you regarding UXO. *Post meeting note: we currently have used TTS ranges for assessing UXO in the HRA, however we are reviewing the use of EDRs for the application for consent.* *Post meeting note from NRW: NRW would have no issue with the use of both TTS and EDRs in the HRA.*		
5.	**<u>Morgan Generation updated assessment (Presented by LB)</u>** The majority of the Morgan assessment is aligned with Mona. The approach to the iPCoD modelling for cumulative impacts differs to Mona. The parameters for modelling will be the same as for Mona for harbour porpoise and minke whale. For bottlenose dolphin, the most precautionary fecundity rate of 0.22 (rather than 0.3) will be modelled. For Mona, both were modelled but due to the large number of cumulative scenarios for Morgan Generation, only one fecundity rate will be modelled. For grey seal, only the most pragmatic precautionary management units, which comprises the GSPR rather than OSPAR Region III will be modelled as this is a more precautionary approach. Morgan Generation won't model both due to the large number of cumulative scenarios for Morgan Generation. The project is looking for agreement on this approach. NP- From the explanation provided, this appears reasonable – however, this needs to be discussed with the technical advisors before NRW (A) can confirm acceptance or otherwise. As per Mona, a six year time step will be presented alongside the 25 year model run length. *Post meeting note from NRW: For bottlenose dolphin, NRW agrees that the approach to the iPCoD modelling is sensible and acceptable. For grey seal NRW would prefer the use of OSPAR III rather than GSPR. However, as Morgan is mostly in English waters*	**Stakeholders to confirm that the approach to iPCoD modelling for bottlenose dolphin and grey seal is acceptable.**	Complete

	NRW find it acceptable to defer to Natural England on the preferred method for IPCoD modelling of grey seals. *NRW welcomes the decision to present a six year time step alongside the 25 year model run length.*		
6.	**<u>Morgan Generation Section 42 comments (presented by LB)</u>** There is one specific Section 42 comments for Morgan Generation that we would like to highlight. Natural England responded to say "In order to establish what % of the reference population (Management Unit) classes as significant, appropriate thresholds should be defined. Define appropriate thresholds for % of reference population predicted to be impacted by an activity, to aid assessment of the appropriate level of magnitude". There is a lack of understanding on the trigger point at which population level effects occur and equally a lack of understanding of the trigger point for effects in terms of percentage of the population. There isn't any guidance available on which to base a threshold therefore the assessment has used expert judgment. MNW- Understand that there isn't any guidance on where to set the threshold however without a threshold at which the impact becomes significant then the conclusions will always be not significant. It is a natural question but potential not one to be answered now for these projects. SR- We have used expert judgment in the assessments but if there is guidance available that could be provided to the project, that would be welcome. DH- There are examples of where thresholds have been set, these are fairly arbitrary though. Sound like we are looking for an opinion on a threshold and then analysis of what the project results look like against that threshold. SR- Is anyone aware of if guidance on this is coming out through the Environmental Standards? BS- We are involved in the Morlais project, which is different technology and for collision risk but they have conducted some work to set thresholds on collision for marine mammals. If this is available, we will send it over. *Post meeting note from TWT: having conducted a quick review the material on appropriate thresholds and collision rate modelling (CRM) for Morlais is restricted. I appreciate a different technology but the work to determine disturbance and species thresholds is comparable. Once it is releasable I will ensure it is made available to you.*		
7.	**<u>Updates to the HRA (presented by LB)</u>** For harbour porpoise, screening has been undertaken using the Celtic and Irish Sea MUs. For bottlenose dolphin, screening has been undertaken using the Irish Sea MU. For grey seal, screening has been undertaken using the four seal MUs. Following NRWs S42 advice, OSPAR Region III been considered to identify any additional		

	sites with grey seal as a qualifying feature, which may have connectivity with the Mona Offshore Wind Project. Telemetry data used to screen out additional sites that did not show connectivity. For harbour seal, the screening was undertaken using the Harbour Seal Regional Population (HSRP), typical foraging range of species (50 km) and seal telemetry. The approach to the assessment of disturbance resulting from piling in the ISAA now presents both EDRs and area-based threshold approaches. Dose response assessment has been removed based on S42 feedback. The EDRs used are 15 km as they are for pin piles not monopiles. For harbour porpoise only, the unweighted threshold of 143 dB re 1µPa will be used to represent the minimum fixed generalised response threshold (Tougaard, 2021) at which significant disturbance could occur. For all other species, the NMFS level-B harassment threshold of 160 dB SPLrms will be applied for piling alongside the relevant EDR (NMFS, 2005). No Adverse Effect on Integrity (AEoI) has been predicted for harbour porpoise, grey seal or bottlenose SAC for the project alone and in-combination. *Post meeting note from NRW: It is unclear whether these updates refer to only the Morgan ISAA, or both Mona + Morgan ISAAs. If this section includes Mona, the approach to use OSPAR III to identify additional grey seal sites and screen out any additional sites that did not show connectivity is pragmatic given that all three Welsh SACs with GS as a feature will be screened in (Pembrokeshire Marine SAC being crucial given its importance as a major pupping site). Confirmation is being sought over whether the intent is to use an iterative assessment on the SACs that were screened in, in accordance with NRWs position statement on the use of management units in HRA?* *Applicant response: These updates refer to the Mona ISAA. In accordance with NRW's position statement and guidance, an iterative assessment has been used on the Welsh SACs screened in.*		
8.	**<u>Agreement logs (presented by ST)</u>** As discussed in previous EWG meetings we have made good progress on methodologies, and these have been logged in the agreement logs. The next aim is to map out progress towards conclusions and mitigation agreements as we move to application submission. The projects are looking to agree topics now based on the PEIR and project update and information provided in this presentation, and other EWG discussions. The projects are aware that there will be some items under discussion and so agreements will be made once these discussions take place and as the projects progress the advice received from the PEIR and EWGs. The agreement log includes a request for agreement that for the project alone there will not be any adverse effects on integrity of designated sites. This is based on the PEIR and updates shown today that there is no greater magnitude of impact than was presented at PEIR. The applicant understands the EWG will wish to		Ongoing

	see the full cumulative assessment ahead of providing agreements on impact levels, but we wanted to highlight that we are not in a position of significant/adverse effects or impacts for Mona or Morgan Gen. Some additional items in the agreement log and others have been flagged as under discussion, and some have been flagged as agreed. We would like to map a pathway to agreement and where we want to progress to, up to application. These logs will form framework for statements of common ground.	**Stakeholders to review and update the agreement log**	
9.	**<u>Next Steps (presented by ST)</u>** The meeting minutes and agreement logs will be circulated 2 weeks after the meeting. Thank you very much for all your input over the last few years to this Evidence Plan process.		

C.3.4 Morgan and Mona Offshore Wind Projects Note on Underwater Sound Modelling Methodology

Partners in UK offshore wind

MORGAN AND MONA OFFSHORE WIND PROJECTS

Note on Underwater Sound Modelling Methodology

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Image of an offshore wind farm

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Prepared by:	Prepared for:
Seiche	**Morgan/Mona Offshore Wind Ltd.**

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1.1 Introduction

1.1.1.1 Sound is readily transmitted into the underwater environment and there is potential for the sound emissions from the Morgan and Mona Offshore Wind Projects to affect marine mammals, fish and benthic receptors. Generally at close ranges (for example 100's m to several kms) from sources that generate high sound levels, permanent or temporary hearing impairment may occur to marine species while at a very close range (for example 10's m) physical injury impacts may be possible. At long ranges (eg 10's kms) the introduction of additional sound sources could potentially cause short-term behavioural changes, for example to the ability of species to communicate and to determine the presence of predators, food, underwater features, and obstructions.

1.1.1.2 The primary purpose of the underwater sound modelling study is to predict the likely range at which sound levels decrease to below available threshold criteria for potential impacts, such as the onset of permanent threshold shifts in hearing, which is commonly considered to represent injury (vs. a temporary threshold shift) and behavioural effects on different marine fauna when exposed to the different anthropogenic sounds that occur during different phases of the Morgan and Mona Offshore Wind Projects. The results from this study will be used to inform the Fish and shellfish ecology and Marine mammal impact assessments. Consequently, the sensitivity of species, magnitude of impact and significance of effect from underwater sound associated with the Morgan and Mona Offshore Wind Projects are addressed within the relevant EIA topic chapters separately to the underwater sound modelling study.

1.1.1.3 Underwater sound and vibration sources during construction may include piling for the wind turbine foundations (using impact or drilled installation techniques) and will include the use of barges and vessels, heavy machinery, and generators on the vessels. Sources of underwater sound and vibration during operation will include operational wind turbines as well as various maintenance vessels and activities.

1.1.1.4 This technical note provides information on the following topics:

- Potential sources of underwater sound
- Methods for determining source sound levels
- Sound propagation modelling methodologies;
- Exposure modelling
- Thresholds for injury and disturbance.

1.2 Activities and sound sources to be modelled

1.2.1.1 The Mona Offshore Wind Project scoping report, published on 5th May 2022 includes the following activities within the project design envelope:

- Site preparation activities including clearance of unexploded ordnance (UXO), boulder clearance and sandwave clearance
- Installation of monopile and jacket (pin-pile) foundations for wind turbine generators, offshore substation platforms and the offshore booster substation (and potential use of drilled or impact piles)
- Range of construction vessels including:
  - Main installation and support vessels
  - Tug/Anchor handlers
  - Cable lay installation and support vessels
  - Guard vessels
  - Survey vessels (e.g. for geophysical or geotechnical surveys)
  - Seabed preparation vessels for boulder removal, grapnel, pre-sweep/levelling
  - Crew transfer vessels
  - Scour protection installation vessels
  - Cable protection installation vessels.
- Operational wind turbines
- Operational vessels including:
  - Crew transfer vessels/workboats
  - Jack-up vessels
  - Cable repair vessels
  - Excavators or backhoe dredger.
- Decommissioning activities and vessels.

1.2.1.2 Whilst the Morgan Offshore Wind Project scoping report has not yet been published, the activities listed above are expected to be included within the project design envelope.

1.3 Proposed injury and disturbance thresholds

1.3.1.1 Sound propagation models can be developed to allow the predicted received sound level at different distances from the source to be calculated. To determine the consequence of these received levels on any marine fauna which might experience exposure to such sound emissions, it is necessary to relate the levels to available impact threshold criteria.

1.3.2 Marine mammals

1.3.2.1 It is proposed to utilise the permanent threshold-shift (PTS) and temporary threshold-shift (TTS) threshold values set out in Southall *et al.* (2019) which are based on a combination of un-weighted peak pressure levels and mammal hearing weighted (m-weighted) sound exposure levels (SEL). The m-weighting function is designed to represent the bandwidth for each group within which acoustic exposures can have auditory effects. The categories include:

- Low-frequency (LF) cetaceans: i.e. marine mammal species such as baleen whales.
- High-frequency (HF) cetaceans: i.e. marine mammal species such as dolphins, toothed whales, beaked whales and bottlenose whales.
- Very high-frequency (VHF) cetaceans: i.e. marine mammal species such as true porpoises, river dolphins and pygmy/dwarf sperm whales and some oceanic dolphins (generally with auditory centre frequencies above 100 kHz).
- Phocid pinnipeds (PCW): i.e. true seals.
- Other marine carnivores (OCW): including otariid pinnipeds (e.g., sea lions and fur seals), sea otters and polar bears.

1.3.2.2 The PTS/TTS threshold criteria proposed in Southall *et al*. (2019) are for two different types of sound as follows:

- Impulsive sounds which are typically transient, brief (less than one second), broadband, and consist of high peak sound pressure with rapid rise time and rapid decay (ANSI, 1986; 2005; NIOSH, 1998). This category includes sound sources such as seismic surveys, impact piling and underwater explosions
- Non-impulsive sounds which can be broadband, narrowband or tonal, brief or prolonged, continuous or intermittent and typically do not have a high peak sound pressure with rapid rise/decay time that impulsive sounds do (ANSI, 1995; NIOSH, 1998). This category includes sound sources such as continuous running machinery, sonar, and vessels.

1.3.2.3 The Southall *et al*. (2019) updated marine mammal threshold criteria were published in March 2019. The paper utilised the same hearing weighting curves and thresholds as presented in the preceding US technical guidance document (NMFS 2018) with the main difference being the naming of the hearing groups and introduction of additional thresholds for animals not covered by NMFS (2018). This document uses the Southall (2019) naming convention for marine mammal hearing groups and it is proposed to adopt these for the underwater sound study technical report.

1.3.2.4 At further distances, beyond the area in which hearing impairment may occur, effects on marine mammal behaviour may occur. Significant (i.e., non-trivial) disturbance may occur when there is a risk of animals incurring sustained or chronic disruption of behaviour or when animals are displaced from an area, with subsequent redistribution being significantly different from that occurring due to natural variation. Behavioural responses are widely recognised as being highly variable and context specific (Southall *et al.*, 2007; 2019; 2021). Assessing the severity of such impacts and development of probability-based response functions continues to be an area of ongoing scientific research interest (Southall *et al.,* 2021; Graham *et al.,* 2019).

1.3.2.5 In discussion with the marine mammal technical team for the Project at RPS Energy it is proposed to assess disturbance to marine mammals quantitatively by considering the proportional response of individuals exposed to decreasing sound levels with increasing distance from the sound source. Empirical evidence from piling at the Beatrice Offshore Wind Farm (Moray Firth, Scotland) (Graham *et al.,* 2019) and Horns Rev offshore wind farm (Brandt *et al.,*2011) demonstrated that the probability of occurrence of harbour porpoise (measured as porpoise positive minutes) increased exponentially moving further away from the source. Graham *et al.* (2019) showed a 100% probability of disturbance at an (un-weighted) SEL of 180dB re 1µPa^{2}s, 50% at 155dB re 1µPa^{2}s and dropping to approximately 0% at an SEL of 120dB re 1µPa^{2}s and the data were subsequently used to develop a dose-response curve.

1.3.2.6 Similarly, a telemetry study undertaken by Russell *et al*. (2016) investigating the behaviour of tagged harbour seals during pile driving at the Lincs offshore wind farm in the Wash found that there was a proportional response at different received sound levels. Dividing the study area into a 5km x5 km grid, the authors modelled SEL_{ss} levels and matched these to corresponding densities of harbour seals in the same grids during periods of non-piling versus piling to show change in usage. The study found that there was a significant decrease during piling at predicted received SEL levels of between 142dB and 151dB re 1µPa^{2}s.

1.3.2.7 The approach to be employed for the Project is therefore to plot unweighted single pulse SEL contours in 5dB increments and apply the appropriate dose-response curve to estimate the number of animals that would be disturbed by piling within each stepped contour. For cetaceans, the dose- response curve will be applied from the Beatrice data (Graham *et al.,* 2019) whilst for pinnipeds the dose-response curve will be applied using Russell *et al.* (2016) (Figure 1.1 and Figure 1.2 below).

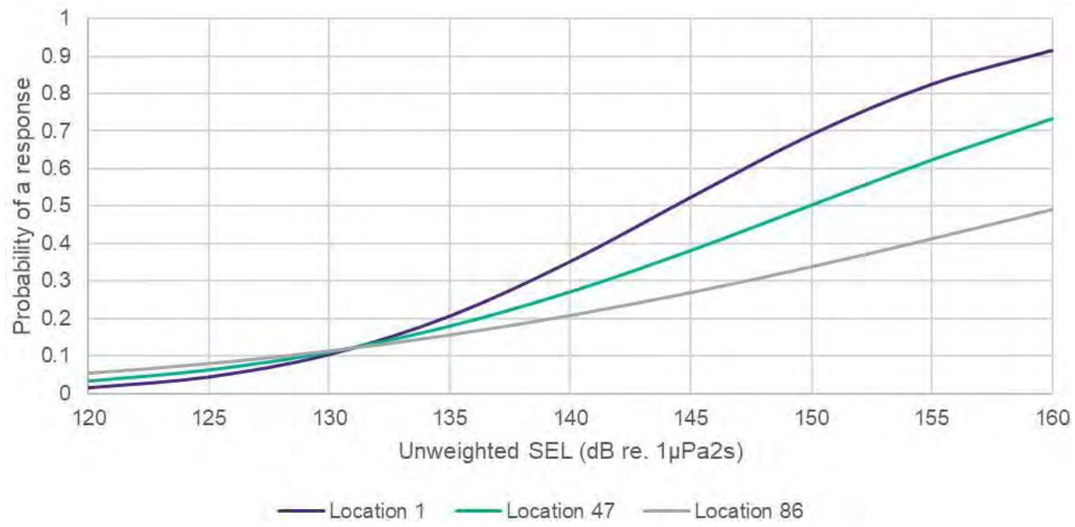

Figure 1.1: The Probability of a Harbour Porpoise Response (24h) in Relation to the Partial Contribution of Unweighted Received Single-Pulse SEL for the First Location Piled (Purple Line), the Middle Location (green line) and the Final Location Piled (Blue Line). Reproduced with Permission from Graham *et al*. (2019).

1.3.2.8 This is an accepted approach to assessing potential behavioural effects of sound from piling and has been applied at other UK offshore windfarms (for example Seagreen Alpha/Bravo and Hornsea Three).

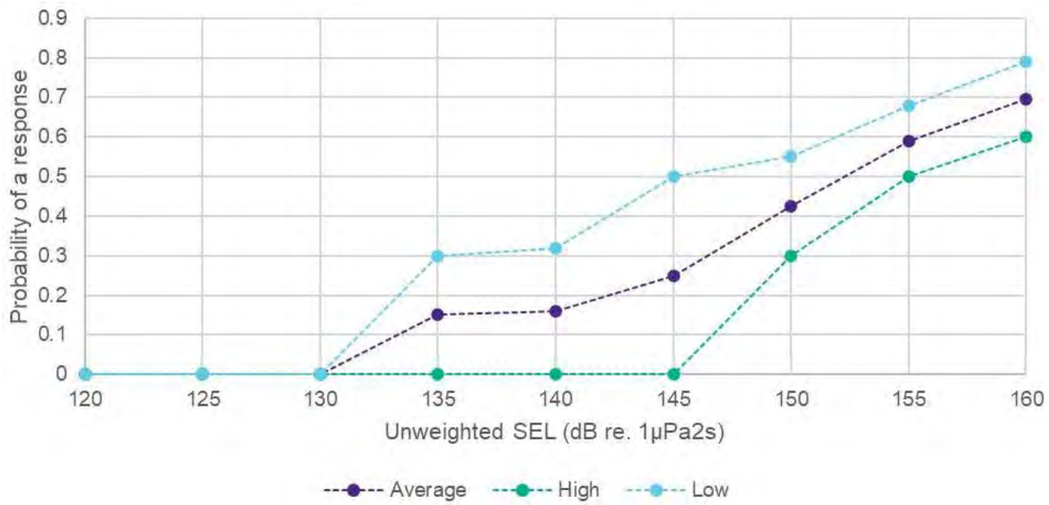

Figure 1.2: The Probability of Response for Seals due to Piling in Relation to Unweighted Received Single-Pulse SEL at 5dB Increments. Adapted from Russell *et al*. (2016).

1.4 Fish, larvae and sea turtles

1.4.1.1 For fish, the most relevant criteria for injury are considered to be those contained in the Sound Exposure Guidelines for Fishes and Sea Turtles (Popper *et al*. 2014). These guidelines do not group by species but instead broadly group fish into the following categories based on their anatomy and the available information on hearing of other fish species with comparable anatomies:

- Group 1: fishes with no swim bladder or other gas chamber (e.g. elasmobranchs, flatfishes and lampreys). These species are less susceptible to barotrauma and are only sensitive to particle motion, not sound pressure. Basking sharks, which do not have a swim bladder, also fall into this hearing group
- Group 2: fishes with swim bladders but the swim bladder does not play a role in hearing (e.g. salmonids). These species are susceptible to barotrauma, although hearing only involves particle motion, not sound pressure
- Group 3: Fishes with swim bladders that are close, but not connected, to the ear (e.g. gadoids and eels). These fishes are sensitive to both particle motion and sound pressure and show a more extended frequency range than Groups 1 and 2, extending to about 500 Hz
- Group 4: Fishes that have special structures mechanically linking the swim bladder to the ear (e.g. clupeids such as herring, sprat and shads). These fishes are sensitive primarily to sound pressure, although they also detect particle motion. These species have a wider frequency range, extending to several kHz and generally show higher sensitivity to sound pressure than fishes in Groups 1, 2 and 3
- Sea turtles: There is limited information on auditory criteria for sea turtles and the effect of impulsive sound is therefore inferred from documented effects to other vertebrates. Bone conducted hearing is the most likely mechanism for auditory reception in sea turtles and, since high frequencies are attenuated by bone, the range of hearing are limited to low frequencies only. For leatherback turtle the hearing range has been recorded as between 50 and 1,200Hz with maximum sensitivity between 100 and 400Hz
- Fish eggs and larvae: separated due to greater vulnerability and reduced mobility. Very few peer-reviewed studies report on the response of eggs and larvae to anthropogenic sound.

1.4.1.2 The most recent criteria for disturbance are considered to be those contained in Popper *et al*. (2014) which set out criteria for disturbance due to different sound sources. The risk of behavioural effects is categorised qualitatively in relative terms as “high”, “moderate” or “low” at three distances from the source: “near” (i.e., in the tens of metres), “intermediate” (i.e., in the hundreds of metres) or “far” (i.e., in the thousands of metres). The assessment of behavioural effects will also be supported by numerical modelling to allow for some quantification of the likely behavioural effects on fish and shellfish receptors, alongside the qualitative thresholds recommended by Popper *et al*. (2014) in order to better understand the risk to fish and shellfish species and populations within the zone of influence of the Morgan and Mona Offshore Wind Projects. These will be presented to and discussed with the Benthic Ecology, Fish and Shellfish Ecology and Physical Processes Expert Working Group as part of the Evidence Plan consultation.

1.4.1.3 The effects of particle motion will therefore be dealt with by qualitative review as opposed to quantitative modelling.

1.5 Pile source level determination

1.5.1 Summary of general concepts

1.5.1.1 The sound generated and radiated by a pile as it is driven into the ground is complex, due to the many components which make up the generation and radiation mechanisms. Larger pile sizes can require a higher energy in order to drive them into the seabed, and different seabed and underlying substrate types can require use of different installation techniques including varying the hammer energies and the number of hammer strikes. In addition, the seabed characteristics can affect how sound propagates from the pile through the sub-surface geology, thus fundamentally affecting the acoustic field around the activity. The type of hammer method used (i.e. the force-impulse characteristics) can also affect the sound characteristics.

1.5.1.2 Underwater sound source level is usually quantified using a decibel (dB) scale with values generally referenced to 1µPa pressure amplitude as if measured at a distance of 1m from a hypothetical, infinitesimally small source (often referred to as the Source Level). This quantity is often referred to as an equivalent monopole source level. In practice, it is not usually possible to measure at 1m from a large structure, which in reality is more akin to a distributed sound source, but the metric allows comparison and reporting of different source levels on a like-for-like basis. In reality, for a large sound source such as a monopile, this conceptual point at 1m from the (theoretical, infinitesimally small) acoustic centre does not exist. Furthermore, the energy is distributed across the source and does not all emanate from this imagined acoustic

centre point. Therefore, the stated sound pressure level at 1 m does not occur at any point in space for these large sources. In the acoustic near field (i.e. close to the source), the sound pressure level will be significantly lower than the value predicted by the Source Level.

1.5.1.3 A useful measure of sound used in underwater acoustics is the Sound Exposure Level, or SEL. This descriptor is used as a measure of the total sound energy of an event or a number of events (e.g., over the course of a day) and is normalised to one second. This allows the total acoustic energy contained in events lasting a different amount of time to be compared on a like for like basis. The SEL is defined as:

$$SSSSSS = 10lllllll_{10}\left(\frac{1}{t}\int_{0}^{T} \frac{pp^2(tt)}{pp_{rrrrr}^2}\, ddtt\right)$$

1.5.1.4 where T is the integration time of the sound "event", $pp^2(tt)$ is the squared sound pressure at a time tt and $pp_{rrrrr}^2 tt_{rrrrrr}$ is the reference time-integrated squared sound pressure of 1μPa²s. For impulsive sounds it has become customary to utilise the T90 time period for calculating and reporting rms sound pressure levels. This is the interval over which the cumulative energy curve rises from 5% to 95% of the total energy and therefore contains 90% of the sound energy.

1.5.1.5 It is common practice for sound modelling studies for UK offshore wind farms to estimate source levels for piling based on existing measurements of other similar piles, extrapolation of data or assumptions about the percentage of the hammer energy which is emitted into the water as sound. Such methods are useful for estimating source levels for piling for pile sizes, installation methodologies and hammer energies that are similar to those for which measurement data already exist. However, potentially widescale errors could occur by extrapolating these measurement data well beyond the scale of the operations for which they were intended.

1.5.1.6 For the Morgan and Mona Offshore Wind Projects, it is proposed to use piles which are of a significantly larger diameter than those for which any real-world measurement data is readily and openly available (e.g. potential monopile foundations of up to 16m diameter[1]). Consequently, it is considered that the use of existing empirical data for smaller monopile dimensions would not be a suitably robust method to use for estimating the source level for impact piling for the Morgan and Mona Offshore Wind Projects.

1.5.2 Proposed pile source modelling method

1.5.2.1 The source sound modelling methodology for piling will use a finite element (FE) model that will be set up for a representative location of the sites, applying the pile design and the surrounding soil conditions. The FE model allows for a detailed calculation of the excitation force due to the hammer, the resulting pile and soil reactions as well as the nearfield sound propagation in the water column. The general modelling approach exhibits a number of feasible simplifications, such as the reduction to a 2-dimensional rotational-symmetric problem, partly homogenised soil parameters, etc. and has been thoroughly validated within multiple measurement campaigns (Lippert *et al*. 2016; von Pein *et al*. 2017; 2019; 2021).

1.5.2.2 The methodology is capable of taking into account a number of variables including:

- Monopile geometries (e.g. diameter, wall thickness, profile)
- Water depth at the pile locations and surrounding bathymetry
- Sound velocity profiles in the soil at the pile locations (definition of s-wave and p-wave velocities and density for each soil layer)
- Specification of the type of impact hammer, the connecting devices between hammer and pile (like anvil, anvil ring, follower, etc), and the energy level
- Hammer type and energy, including velocity and force time profiles to describe the excitation by the hammer impact acting at the pile head.

1.5.2.3 In addition to the modelled hammer energy scenarios, an estimation of the effect on the sound levels when changing the hammer energy in the range between minimum and maximum hammer energy will be performed based on a linear scaling law.

1.5.2.4 The piling scenarios have not yet been finalised, but it is envisaged that these will include the following phases:

- Initiation (including slow-start)
- Soft start
- Ramp up
- Full power piling.

1.5.2.5 Mitigation methods such as use of ADDs and engineering means of reducing sound emissions will be investigated as part of the sound modelling exercise if required.

1.6 Source levels for other activities

1.6.1 Construction, operational and decommissioning activities

1.6.1.1 A wealth of experimental data and literature-based information is available for quantifying the sound emission from different construction operations. This information review will be employed to characterise their acoustic emission in the underwater environment. For a large number of activities such as seabed preparation, trenching and rock placement, sound from the vessels themselves (e.g. propeller, thrusters and sonar, if used) dominates the emission level. For any sources or activities where no measurement data exists, estimates of the source level will be based on a proxy for that source based on measurements of similar types of sources.

1.6.2 UXO clearance

1.6.2.1 Sound modelling for UXO clearance will be undertaken using the methodology described in Soloway and Dahl (2014). The equation provides a simple relationship

[1] As set out in Table 3.3 of the Mona Offshore Wind Project EIA Scoping Report, 5th May 2022.

between distance from an explosion and the weight of the charge (or equivalent TNT weight) but does not take into account bottom topography or sediment characteristics.

$$PP_{pprrpppp} = 52.4 \times 10^{6} \left(\frac{RR}{WW^{1/3}} \right)^{-1.13}$$

1.6.2.2 Where W is the equivalent TNT charge weight and R is the distance from source to receiver.

1.6.2.3 Since the charge is assumed to be freely standing in mid-water, unlike a UXO which would be resting on the seabed and could potentially be buried, degraded or subject to other significant attenuation, this estimation of the source level can be considered conservative.

1.6.2.4 According to Soloway and Dahl (2014), the SEL can be estimated by the following equation:

$$SSSSSS = 6.14 \times llllll_{10} \left(WW^{1/3} \left(\frac{RR}{WW^{1/3}} \right)^{-2.12} \right) + 219.$$

1.6.2.5 In order to compare to the marine mammal hearing weighted thresholds, it will be necessary to apply the frequency dependent weighting functions at each distance from the source. This will be accomplished by determining a transfer function between unweighted and weighted SEL values at various distances based on an assumed spectrum shape and taking into account molecular absorption at various ranges. Furthermore, if there is potential for more than one UXO clearance event per day then this will be taken into account in the exposure calculation.

1.6.2.6 According to Robinson *et al*. (2020), low-order deflagration produces a much lower amplitude of peak sound pressure than high-order detonations. The study concluded that peak sound pressure during deflagration is due only to the size of the shaped charge used to initiate deflagration and, consequently, that the acoustic output can be predicted for deflagration as long as the size of the shaped charge is known. Sound modelling for deflagration or other low-yield methods will therefore be based on the methodology described for detonations, using a smaller donor charge size.

1.7 Sound propagation modelling methodology

1.7.1.1 Seiche proposes to utilise a robust, peer-reviewed sound propagation model for the Morgan and Mona Offshore Wind Projects in order to assess the effects of sound on marine life. In choosing the propagation model, it is important to ensure that it is applicable to the Morgan and Mona Offshore Wind Projects and surrounding area, including consideration of environmental variables, source types and frequency content etc.

1.7.1.2 There are a number of models available for modelling of underwater sound propagation from a source. These include:

- Ray-tracing (e.g. BOUNCE, BELLHOP)
- Normal Modes (e.g. KRAKEN, KRAKENC)
- Parabolic Equation (e.g. RAM, RAMS)
- Fast-Field or Wavenumber Integration (e.g. SCOOTER)
- Energy Flux (e.g. Weston Energy Flux model)
- Semi-empirical (e.g. Rogers, Marsh-Schulkin).

1.7.1.3 The National Physics Laboratory (NPL) Review of Underwater Acoustic Propagation Models (Wang *et al.,* 2014) provides a useful overview of many of these models and some of the pros and cons of using them in different situations, such as different water depths[2] and for different frequency ranges over which the calculation must be performed[3]. The suitability of some of the models is summarised in Table 1.1 below.

Table 1.1: Suitability of various sound propagation models for different frequency ranges and at different water depths (Wang *et al*., 2014).

Green – suitable; Amber – suitable with limitations; Red – not suitable or applicable

Shallow water – low frequency	Shallow water – high frequency	Deep water – low frequency	Deep water – high frequency
Ray theory	Ray theory	Ray theory	Ray theory
Normal mode	Normal mode	Normal mode	Normal mode
Wave number integration	Wave number integration	Wave number integration	Wave number integration
Parabolic equation	Parabolic equation	Parabolic equation	Parabolic equation
Energy flux	Energy flux	Energy flux	Energy flux

1.7.1.4 The use of Parabolic Equation (PE) models for predicting sound from piling activities is well established in peer-reviewed literature as well as in practice. One limitation of PE modelling is that the high computational requirements at higher frequencies means that it is typically limited to frequencies below 1kHz (Wang *et al.*, 2014). This means that use of the PE model alone can miss out the frequencies of most interest in assessing the effects of sound on high-frequency (HF) or very high-frequency (VHF) marine mammals when comparing against Southall *et al.* (2019) hearing-weighted SEL thresholds. Consequently, the model is often supplemented at higher frequencies by use of another model such as ray tracing. As assessment of HF and VHF cetaceans is an important outcome for the sound modelling assessment, then using PE modelling combined with another solver for higher frequencies is the more robust method (compared to using PE modelling alone). For this reason, Seiche has utilised combined PE and ray tracing modelling on a number of occasions for sources including seismic source arrays and piling. However, the use of two different models

[2] *There is no defined transition from deep to shallow water applicable for all situations. Acoustically, shallow water conditions exist whenever the propagation is characterised by multiple reflections with both the sea surface and bottom (Etter, 2013). Consequently, the depth at which water can be classified as acoustically deep or shallow depends upon numerous factors including the sound speed gradient, water depth, frequency of the sound and distance between the source and receiver.*

[3] *The frequency range for the calculation will depend on the frequency characteristics of the source and the required frequency range for the receiver – for example different hearing groups of marine mammals, fish etc.*

can lead to discontinuities in the resultant attenuation terms where the two models meet, at the limits of their frequency validity. It is also significantly more time intensive to implement two separate models.

1.7.1.5 Sound modelling studies were undertaken by NPL for Greater Gabbard and Hornsea Offshore Wind One using the Weston Energy Flux model (Weston 1971; 1976; 1980a; 1980b). The Weston Energy Flux methodology is openly available through peer-reviewed publications and has been subjected to comparative studies in a number of publications and peer reviewed-papers (e.g. Etter 2013; Toso *et al*. 2014). According to the NPL review report (Wang *et al.,* 2014) the method is suitable across a wide range of frequencies in shallow waters. Given the Weston Energy Flux model's known provenance and applicability, the water depth at the Morgan and Mona Offshore Wind Projects as well as the model's use in previous modelling studies for OWFs in the UK, Seiche proposes to adopt this model as the primary modelling methodology for the Morgan and Mona Offshore Wind Projects. In addition, Seiche proposes to carry out a comparative calibration against other propagation models (including the AcTUP based Parabolic Equation solver (RAMGeo) and AcTUP based Normal Mode solver (KrakenC) to ensure that the model outputs are robust and consistent regardless of the choice of model.

1.7.1.6 As an additional check, it is proposed to calibrate the sound propagation modelling for pile installation against the source model which uses a hybrid Finite Element and Parabolic Equation solver to determine the Source Level for piling as well as the sound field out to a few hundred metres.

1.7.1.7 Relevant model input parameters (e.g. sediment, geological layers, bathymetry, sound speed gradient) will be chosen based on a combination of project specific data combined with the information gathered from the publicly available literature. These parameters will be fed into the propagation model routine. The frequency-dependent loss of acoustic energy with distance (transmission loss, TL) values will then be evaluated along different transects around the source points. The propagation loss for the Weston model is calculated using one for the four formulae detailed in Table 1.2, depending on the distance of the receiver location from the source, and related to the frequency and the seafloor conditions such as depth and its composition.

Table 1.2: Regions of transmission loss derived by Weston (1971).

Region	Transmission Loss	Range of validity
Spherical	$TTSS = 10\log_{10}[RR^2]$	$RR < \frac{HH_{pp}}{2\theta\theta_{cc}}$
Channelling	$TTSS = 10\log_{10}\left(\frac{RRHH_{pp}HH_{bb}}{2HH_{cc}\theta\theta_{cc}}\right)$	$\frac{HH_{pp}}{2\theta\theta_{cc}} < RR < \frac{6.8HH_{pp}}{\alpha\alpha\theta\theta_{cc}^2}$
Mode stripping	$TTSS = 10\log\left(10^{\left(\frac{RRHH_{pp}HH_{bb}}{5.22}\alpha\alpha\int_0^{RR}\frac{ddRR}{HH^3}\right)^{1/2}}\right)$	$\frac{6.8HH_{pp}}{\alpha\alpha\theta\theta_{cc}^2} < RR < \frac{27kk^2HH_{pp}^3}{(2\pi\pi)^2\alpha\alpha}$
Single mode	$TTSS = 10\log_{10}\left(\frac{RRHH_{pp}HH_{bb}}{\lambda\lambda} + \frac{\lambda\lambda^2\alpha\alpha}{8}\int_0^{RR}\frac{ddRR}{HH^3}\right)$	$RR > \frac{27kk^2HH_{pp}^3}{(2\pi\pi)^2\alpha\alpha}$

1.7.1.8 In Table 1.2, RR is range from the source, HH is the range-dependent depth, HH_{pp} is the depth at the source, HH_{bb} is the depth at the receiver, HH_{cc} is the minimum depth along the bathymetry profile (between the source and the receiver), $\theta\theta_{cc}$ is the critical grazing angle (related to the speed of sound in both seawater and the seafloor material), $\lambda\lambda$ and kk are the wavelength and wavenumber respectively, and $\alpha\alpha$ is the seabed reflection loss gradient.

1.7.1.9 The spherical spreading region exists in the immediate vicinity of the source, which is followed by a region where the propagation follows a cylindrical spread out until the grazing angle is equal to the critical grazing angle $\theta\theta_{cc}$. Above the critical grazing angle in the mode stripping region an additional loss factor is introduced which is due to seafloor reflection loss, where higher modes are attenuated faster due to their larger grazing angles. In the final region, the single-mode region, all modes but the lowest have been fully attenuated.

1.7.1.10 For estimation of propagation loss of acoustic energy at different distances away from the sound source location (in different directions), the following steps will be considered.

- The bathymetry information around this chosen source point will extracted from the GEBCO database up to 80km (where possible) in 72 different transects
- A calibrated Weston Energy model will be employed to estimate the TL matrices for the range of frequencies of interest (e.g. one-third octave bands from 25Hz to 80kHz) along the 72 different transects
- The source level values calculated will be combined with the TL results to achieve a frequency and range dependant received level (RL) of acoustic energy around the chosen source position
- The marine mammal weightings will be employed for injury, TTS and PTS impact ranges for different marine mammal groups, which will be calculated using relevant metrics (from Southall *et al*. 2019) and by employing a fleeing marine mammal model where necessary.
- The cumulative hearing weighted SELs are then calculated by summing each individual pulse along the transects
- Ranges to peak sound pressure threshold values are calculated based on the single pulse unweighted peak sound pressure level
- Contours will also be produced for the relevant metrics, including the unweighted single pulse SEL contours in 5dB steps used as an input to the marine mammal behavioural disturbance model.

1.7.1.11 The peak sound pressure level can be calculated from SEL values via the empirical fitting between pile driving SEL and peak SPL data, given in Lippert et al. (2015), as $SPL_{pk} = 1.43 \times SSSSSS - 44.0$.

1.7.1.12 Root mean square (rms) sound pressure levels can be calculated assuming a typical T90 pulse duration (i.e., the period that contains 90% of the total cumulative sound energy) of 100ms. It should be noted that in reality the rms T90 period will increase significantly with distance which means that any ranges based on rms sound pressure

levels at ranges of greater than a few kilometres are likely to be significant over-estimates and should therefore be treated as over precautionary.

1.7.1.13 The propagation and sound exposure calculations will be conducted over a range of geological and sediment conditions, water column depths and geographic extents to determine the likely range for injury and disturbance.

1.7.1.14 It should be borne in mind that sound levels (and associated range of effects) will vary depending on actual conditions at the time (day-to-day and season-to-season) and that the model predicts a typical worst-case scenario. Considering factors such as animal behaviour and habituation, any injury and disturbance ranges should be viewed as indicative and probabilistic ranges to assist in understanding potential impacts on marine life rather than lines either side of which an impact will or will not occur.

1.7.1.15 It should be noted that the above modelling methodologies are not suitable for modelling the non-linear shock wave propagation caused by detonations. Consequently, propagation modelling for UXO will follow the semi-empirical methodology (Soloway and Dahl, 2014) as described previously.

1.8 Sound exposure calculations

1.8.1.1 As well as calculating the peak pressure un-weighted sound levels at various distances from each source, it is also necessary to calculate the cumulative SEL for a marine mammal or fish (in the case of marine mammals, using the relevant hearing weightings).

1.8.1.2 In order to carry out this calculation, it will be assumed that the animal will swim away from the sound source at the onset of activities. For impulsive sounds, such as pile driving, the calculation considers each pulse to be established separately resulting in a series of discrete SEL values of decreasing magnitude with increasing distance. As the animal swims away from the sound source, the exposure it experiences will become progressively more attenuated; the cumulative SEL is derived by logarithmically adding the SEL to which the animal is exposed as it travels away from the source. This calculation will be used to estimate the approximate minimum start distance for an animal in order for it to avoid being exposed to sufficient sound energy to result in the onset of potential injury. It should be noted that the sound exposure calculations are based on the simplistic assumption that the animal will continue to swim directly away at a constant relative speed. The real-world situation is more complex, and the animal is likely to move in a more complex manner.

1.8.1.3 Consequently, the cumulative SEL exposure depends on:

- The animal's assumed swim speed (and direction)
- The hammer strike rate and distance moved between each pulse
- The hearing weighted SEL per pulse at the receiver location.

1.8.1.4 For continuous sources (e.g. drilled piling, vessels) the calculation will be performed based on the SEL to which an animal is exposed to for each second of exposure in a similar way to the above.

1.8.1.5 The assumed swim speeds for animals likely to be present in the development area are set out in Table 1.3.

Table 1.3: Assessment swim speeds of marine mammals and fish that are likely to occur within the Irish Sea for the purpose of exposure modelling.

a As a sensitivity check exposure modelling will also be performed for stationary fish.

Species	Hearing group	Swim speed (m/s)	Source reference
Harbour seal *Phoca vitulina*	Phocid Carnivores in Water (PCW)	1.8	Thompson et al. (2015)
Grey seal *Halichoerus grypus*	Phocid Carnivores in Water (PCW)	1.8	Thompson *et al.* (2015)
Harbour porpoise *Phocoena phocoena*	Very High Frequency (VHF)	1.5	Otani *et al.* (2000)
Minke whale *Balaenoptera acutorostrata*	Low Frequency (LF)	2.3	Boisseau et al. (2021)
Bottlenose dolphin *Tursiops truncatus*	High Frequency (HF)	1.52	Bailey *et al.* (2010)
White-beaked dolphin *Lagenorhynchus albirostris*	High Frequency (HF)	1.52	Bailey *et al.* (2010)
Short beaked common dolphin *Delphinus delphis*	High Frequency (HF)	1.52	Bailey *et al.* (2010)
Risso's dolphin *Grampus griseus*	High Frequency (HF)	1.52	Bailey *et al.* (2010)
Basking shark *Cetorhinus maximus*	Group 1 fish	1.0	Sims *et al.* (2000)
All fish hearing groups[a] (excluding basking sharks)	Group 1 to 4 fish	0.5	Popper *et al.* (2014)

1.8.1.6 As an additional sensitivity analysis modelling will be carried out for fish assuming a swim speed of 0m/s (i.e. stationary).

1.8.1.7 Exposure modelling will be undertaken for single pile installation as well as for potential simultaneous piling at more than one foundation location.

1.8.1.8 Exposure scenarios will include consideration of:

- Slow start (e.g. starting with a slower hammer strike rate)
- Soft start (starting with a lower hammer energy)
- Ramp up (slowly increasing the hammer energy for a period of time after soft start);
- Full power piling
- ADD – if required.

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C.3.5 Response from NRW regarding Morgan and Mona Offshore Wind Projects Note on Underwater Sound Modelling Methodology

Morgan & Mona Offshore Wind Projects: Underwater Sound Modelling Methodology

[redacted]sor

20th June 2022

Introduction

This advice is provided in response to the **Morgan and Mona Offshore Wind Projects Note on Underwater Sound Modelling Methodology Version F01 Dated 24th May 2022.**

NRW advice in this document is provided (under a Discretionary Advice Service agreement) in respect of a proposal which will require an application for which Natural Resources Wales is a Statutory Consultee.

The customer acknowledges that the content of any advice or assistance provided by NRW is advisory only and that it shall not be deemed to bind or in any other way restrict NRW in performing its statutory functions.

The recipient acknowledges that:

- any advice given or materials or documentation provided by NRW do not constrain or bind NRW in respect of its statutory functions or its role as a statutory consultee or any decision NRW may make in relation to any application for a licence or permit;
- any advice given by NRW does not bind NRW in respect of any future representations it may make as statutory consultee or any decision NRW may make in relation to any application for a licence or permit;
- any views or opinions expressed by NRW are without prejudice to the consideration NRW may be required to give to any application or any future representations as statutory consultee or any decision NRW may make in relation to any application for a licence or permit;
- the final decision as to any representations made by NRW as statutory consultee will be based on all the relevant information available to NRW at the time it makes such representations;
- NRW cannot and does not give any guarantee as to the representations it may make as statutory consultee; and,
- any advice given by NRW may be overtaken by changes in available information, law, policy and guidance relevant to the subject matter of the advice.

NRW Advisory Technical Specialists Consulted:
Marine Mammals
Marine & Estuarine Fish

Advice

Key Issues:

- NRW (Advisory) welcome the information provided within the Underwater Sound Modelling Methodology and the intention to undertake site-specific noise modelling to support the environmental assessment of the project.

- NRW (A) do not recommend applying a dose-response curve developed for harbour porpoise to all cetacean species when carrying out an EIA to assess the number of animals that would be disturbed by piling.

- NRW (A) advise that further information is provided to justify using the dose-response curve in Russell *et al.*, (2016) developed for harbour seal, as a proxy to assess number of grey seals disturbed by piling.

Detailed comments:

- It would be useful in *Section 1.3.2.1 Marine Mammals,* if the applicant could clarify which weighting function will be used. The older M-weighting functions were proposed in Southall *et al.,* (2007), based on human C-weighting functions, whereas the weighting functions in Southall *et al*., (2019) are based on hearing group audiograms.

- With reference to *Section 1.3.2.7 Marine Mammals,* NRW (A) would not recommend applying a dose-response curve developed for harbour porpoise to all cetacean species when carrying out an EIA to assess the number of animals that would be disturbed by piling. Whilst NRW (A) acknowledge the precautionary approach taken, this will likely lead to overestimates for species in different hearing groups. The applicant should either justify this approach in detail (with reference to published material) or preferably specify a method used to assess disturbance for cetaceans other than harbour porpoise, i.e. bottlenose dolphin, minke whale, Risso's dolphin, common dolphin and white-beaked dolphin (as listed in *Table 1.3: Assessment swim speeds of marine mammals and fish that are likely to occur within the Irish Sea for the purpose of exposure modelling*). Possible options for bottlenose dolphin, for example, could include US level B harassment levels (NMFS, 2005), or thresholds based on previous studies e.g. single-strike SEL of 129-133 dB re 1µPa^{2}s (Graham *et al*., 2017), or single-strike SEL 128 dB re 1µPa^{2}s (Fernandez-Betelu *et al*., 2021).

- NRW (A) note the proposal to use the dose-response curve in Russell *et al.,* (2016) developed for harbour seal as a proxy for grey seal. Whilst we are satisfied with the approach proposed, NRW (A) recommend that the applicant provides further information to validate this approach, referencing published materials demonstrating similar behavioural reactions to pile driving between grey seal and harbour seal (e.g. Gotz & Janik, 2010; Aarts *et al.,* 2018).

- NRW (A) note and agree with the proposed method to assess numbers of harbour porpoise disturbed using dose-response curves for the purpose of the Environmental Impact Assessment (EIA). However, NRW (A) draw attention to the fact that when assessing potential adverse effects on a harbour porpoise site for Habitats Regulations Assessment (HRA) purposes, the SAC Conservation Objective requires significant disturbance to be avoided at site level. Significant disturbance was defined as follows in JNCC *et al.,* (2020):

  "Noise disturbance within a SAC from a plan/project, individually or in combination, is considered to be significant if it excludes harbour porpoise from more than:
  1) *20% of the relevant area of the site in any given day; or*
  2) *an average of 10% of the relevant area of the site over a season."*

  In this regard, an area-based assessment should be carried out where the extent of habitat that is ensonified to a level that might produce significant disturbance is determined. For the purpose of carrying out an HRA for a harbour porpoise site, NRW (A) has ranked potential methods in order of preference and would advise the use of Fixed Noise Thresholds over Effective Deterrence Ranges (EDRs – where these exist), to obtain the area ensonified to a level that might produce significant disturbance.

- For harbour porpoise, NRW (A) recommend the use of a noise threshold of 143 dB re 1µPa^{2}s single-strike SEL (Brandt *et al.,* 2018; Heinis *et al.,* 2019) or its equivalent VHF-weighted 103 dB re 1µPa threshold (Tougaard, 2021) as the extent of disturbance for impulsive noise sources. This threshold is the modelled average of six different studies of full-scale pile driving operations (Brandt *et al.,* 2018) and therefore represents the greatest amount of empirical data.

- With reference to *Sections 1.5 Pile Source Level Determination – 1.8 Sound Exposure Calculations***,** NRW (A) agrees with the methodology proposed so far to determine source levels, sound propagation modelling, and sound exposure calculations.

- NRW (A) note in *Section 1.5 Pile source level determination*, that slow-start and ramping up are included in the scenario modelling. These are recognised as good practice, especially for marine mammals. However, it appears that some newer piling rigs may not be capable of operating at below full strike rates, in which case only energy levels can be adjusted – it would therefore be useful to confirm that slow-start is possible.

- With reference to *Section 1.6.2 UXO clearance*, NRW (A) would like to clarify whether high order detonations are being modelled to present a worst case scenario, if low-order deflagration is not possible?

- The applicant should provide more information in *Section 1.6.2.5 UXO clearance,* regarding any plans to carry out more than one UXO clearance event per day, and how cumulative exposure to multiple detonations would be modelled.

- NRW (A) welcomes the intention to include modelling of fish as both fleeing and stationary receptors and would welcome further discussion through the relevant Expert Working Group regarding the appropriate fleeing speed and duration of 'fleeing' response for selected receptor species. In general, NRW (A) advise that all spawning fish should be modelled as stationary receptors as a worst-case scenario.

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C.3.6 Response from Natural England regarding the Morgan and Mona Offshore Wind Projects Note on Underwater Sound Modelling Methodology

Date: 21 June 2022
Our ref: DAS/UDS A000566 / 393968
Your ref: Underwater Sound Modelling Methodology Technical Note

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T [redacted]

[redacted]
BP Alternative Energy Investments Limited

BY EMAIL ONLY

Dear [redacted]

Discretionary Advice Service (Charged Advice) - UDS A000566
Development proposal: BP EnBW Morgan and Mona Offshore Wind Farm
Consultation: Underwater Sound Modelling Methodology Technical Note

This advice is being provided as part of Natural England's Discretionary Advice Service in accordance with the Quotation and Agreement dated 17 May 2021 to BP Alternative Energy Investments Limited.

Thank you for your consultation on the above dated and received on 24 May 2022.

The following advice is based upon the information within;

- Morgan and Mona Offshore Wind Projects: Note on Underwater Sound Modelling Methodology. RPS (dated 24 May 2022).

Overarching comments

Natural England welcomes the opportunity to provide comment on the additional detail presented in this technical note, which supplements the Environmental Impact Assessment (EIA) Scoping Reports for the Morgan and Mona projects. However, please note that Cefas are the underwater noise specialist advisers to the MMO, therefore we defer to Cefas on technical comments on the underwater sound modelling.

It would be beneficial to consider modelling piling with noise abatement systems in place, to understand the possible reduction in underwater noise (and associated impacts) if such mitigation methods are used. Similarly, noise abatement for Unexploded Ordnance (UXO) clearance where deflagration is not an option should also be considered.

We advise it would also be beneficial for the underwater noise modelling to qualitative describe the distances to which underwater noise produced by the project would be detectable above ambient noise.

There are project(s) being undertaken under the Offshore Renewables Joint Industry Programme (ORJIP)[1] that may have relevance to the underwater noise modelling for this project. If needed, we can relay the outputs of these projects when they become available.

We provide detailed comments and advice below within our remit.

Detailed comments

[1] Offshore Renewables Joint Industry Programme (ORJIP)

1.1 Introduction

Natural England agrees that auditory injury comprises Permanent Threshold Shifts (PTS), nevertheless we would expect to see a quantitative assessment of the Temporary Threshold Shift (TTS) impact ranges and the number of animals within those ranges.

We advise that some activities associated with cable laying may also produce noise, such as trenching and rock placement. These activities should be given consideration in the underwater noise modelling. It should not be assumed that the noise from such activities will be contained within the noise from the vessels, without supporting evidence.

1.3 Proposed injury and disturbance thresholds

We are content for either the Southall *et al.* (2019)[2] or NMFS (2018)[3] naming convention for marine mammal hearing groups to be used, so long as one is used consistently.

We note that the proposed sources for the dose-response curves for harbour porpoise and pinnipeds are derived from Offshore Wind Farm projects in the North Sea, whereas the Morgan and Mona projects are in the Irish Sea and therefore overlap with different populations that may differ in their reactions.

- We request further clarity on the applicability of the sources for the does-response curves for the marine mammals populations in the Morgan and Mona projects area.

We advise the outputs from Whyte *et al.* (2020)[4] which provides a dose-response curve for seals in relation to decreasing Sound Exposure Levels (SELs) should be considered.

Three dose-response curves have been presented on Figure 1.1 for harbour porpoise. Similarly, in Figure 1.2, three dose-response curves are presented, termed “average”, “high” and “low” for seals.

- We request clarification on how the three dose-response curves will be used.

1.5 Pile source level determination

We welcome more information on the piling scenarios, once available.

1.6 Source levels for other activities

For the avoidance of doubt, we expect to see the underwater noise from operational wind turbines quantified in the underwater noise modelling report.

We are supportive of the underwater noise emissions modelling from deflagration. As outlined in the recent position statement[5], deflagration is the preferred method for UXO clearance, and high order should only be used as a last resort.

1.7 Sound propagation modelling methodology

We welcome the comparison between acoustic models for sense-checking the model results. Further sense checking against modelling for other offshore wind farms in the area should be considered.

- We request clarification on the number of locations that will be modelled, and the rationale for the chosen modelling location(s).

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[2] Southall, B.L., Finneran, J.J., Reichmuth, C., Nachtigall, P.E., Ketten, D.R., Bowles, A.E., Ellison, W.T., Nowacek, D.P. and Tyack, P.L., 2019. Marine mammal noise exposure criteria: Updated scientific recommendations for residual hearing effects. Aquatic Mammals, 45(2), pp.125-232.

[3] NMFS. 2018. “2018 Revision to: Technical Guidance for Assessing the Effects of Anthropogenic Sound on Marine Mammal Hearing (Version 2.0).” NOAA Technical Memorandum NMFS-OPR-59. National Oceanic and Atmospheric Administration.

[4] Whyte, K.F., Russell, D.J.F., Sparling, C.E., Binnerts, B., and Hastie, G.D., 2020. Estimating the effects of pile driving sounds on seals: Pitfalls and possibilities. The Journal of the Acoustical Society of America 147, 3948.

[5] Policy paper Marine Environment: unexploded ordnance clearance joint interim position statement. Updated 13 January 2022.

The document states that contours will be generated for unweighted SELs.

- We request clarification of whether the contours or a single range will be used to calculate the number of animals within the impact zones.

1.8 Sound exposure calculations
Table 1.3 sets out the swim speeds of marine mammals and fish for the purpose of exposure modelling. With respect to marine mammals these are broadly aligned with those we would expect to see. However, we advise that for the purpose of exposure modelling, all fish hearing groups (Group 1 to 4, excluding megafauna such as basking shark) should be assessed as static receptors (as per our response to the Mona Offshore Windfarm EIA Scoping, our reference 390930).

Currently, there is not consensus within scientific literature for most fish species as to whether a directional fleeing response is elicited as a reaction to disturbance from underwater noise. While fleeing responses are observed frequently, the direction and duration of such a response is highly variable. Variations have also been noted between species, and it can be dictated by the habitat, environmental conditions and life stage.

We welcome the inclusion of exposure modelling for simultaneous piling, if this is within the project design envelope.

- We request clarification as to whether consecutive piling (i.e. multiple piles, one after the other) is also within the project design envelope.

For clarification of any points in this letter, please contact me using the details provided below.

Yours sincerely
[redacted]

Strategic Coastal Lead Adviser
Coast and Marine Team
Cheshire, Greater Manchester, Merseyside & Lancashire Area Team
[redacted]

☒ The advice provided in this letter has been through Natural England's Quality Assurance process.

The advice provided within the Discretionary Advice Service is the professional advice of the Natural England adviser named below. It is the best advice that can be given based on the information provided so far. Its quality and detail is dependent upon the quality and depth of the information which has been provided. It does not constitute a statutory response or decision, which will be made by Natural England acting corporately in its role as statutory consultee to the competent authority after an application has been submitted. The advice given is therefore not binding in any way and is provided without prejudice to the consideration of any statutory consultation response or decision which may be made by Natural England in due course. The final judgement on any proposals by Natural England is reserved until an application is made and will be made on the information then available, including any modifications to the proposal made after receipt of discretionary advice. All pre-application advice is subject to review and revision in the light of changes in relevant considerations, including changes in relation to the facts, scientific knowledge/evidence, policy, guidance or law. Natural England will not accept any liability for the accuracy, adequacy or completeness of, nor will any express or implied warranty be given for, the advice. This exclusion does not extend to any fraudulent misrepresentation made by or on behalf of Natural England.

Cc [redacted]

C.3.7 Response from the MMO regarding the Morgan and Mona Offshore Wind Projects Note on Underwater Sound Modelling Methodology

Marine Management Organisation

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Our reference: DCO/2022/00003

(By email only)

11 July 2022

Dear [redacted]

Morgan and Mona Offshore Wind projects – Underwater Sound Modelling Methodology

The Marine Management Organisation (MMO) received the above documents on 06 June 2022 for consideration.

BP has been successful in their bid to be preferred applicants in the round 4 windfarms and is proceeding on this basis that they will be constructing two offshore windfarms in the Irish Sea off the West Coast of England with some parts of the windfarm area being within Welsh Waters. The Windfarms are called Morgan and Mona.

The project has now produced a technical note for underwater noise and have requested comments from their stakeholders. The MMO have reviewed the document and have the following comments below.

Comments

The document appears to cover all potential impacts appropriately. Section 1.2 lists the activities and sound sources to be modelled. These include site preparation activities such as the clearance of unexploded ordnance (UXO), the installation of monopile and pin pile foundations, various construction vessels (including cable lay installation vessels, survey vessels, seabed preparation vessels and cable protection vessels), operational wind turbines and operational vessels. Potential impacts (in terms of injury and disturbance) on marine mammals and fish receptors will be assessed.

Minor Comment: Currently, there are no noise exposure thresholds for marine invertebrates, thus, the noise modelling will focus on marine mammals and fish species. Nevertheless, it is important to note that studies conducted thus far have revealed a range of negative effects from noise on marine invertebrates (e.g. Solan et al., 2016), and assessments should draw on the peer-reviewed literature where relevant, to support assessment conclusions.

Modelling

The modelling proposed to determine the risk of potential impact on marine mammal and fish species is appropriate, robust and follows best practice. The technical note describes the various models and approaches that will be used. The final assessment should also be transparent, providing the relevant modelling details.

Minor comment: Table 1.3 in the technical note provides the receptor swim speeds that will be applied for the cumulative sound exposure modelling. As per para 1.8.1.6, “an additional sensitivity analysis modelling will be carried out for fish assuming a swim speed of 0m/s” (i.e. a stationary receptor). It is appropriate that a stationary fish receptor will also be considered. The MMO is not aware of current evidence to support ‘fleeing’ in fish. For this reason, the main assessment outcomes and considerations should be based on a stationary fish receptor (and the predicted results based on a fleeing receptor. If you wish to include these, they should be provided for context/information only).

Following on from the previous point, the swim speed for harbour porpoise in Table 1.3 (1.5 m/s) is in keeping with other underwater noise assessments. The proposed swim speed for minke whale is conservative (2.3 m/s compared to 3.25 m/s observed in other assessments). Generally, other assessments have used 1.5 m/s as the swim speed for all other marine mammal species, including seals, although 1.8 m/s for seals is reasonable. Consultation is required with Natural England and the SNCBs for their comments on the proposed swim speeds.

Minor comment: Para 1.8.1.7: “Exposure modelling will be undertaken for single pile installation as well as for potential simultaneous piling at more than one foundation location”. Please note that the total number of piles (monopiles and/or pin piles) to be installed in a 24-hour period should also be considered in the noise modelling.

Section 1.6.2 UXO clearance: It is appropriate that sound modelling for UXO clearance will be undertaken using the methodology described in Soloway and Dahl (2014). The peak sound pressure (SPLpeak) is the most appropriate metric to use for instantaneous injury (e.g. Permanent Threshold Shift (PTS)) from UXO detonation (rather than the Sound Exposure Level).

Thresholds for injury/modelling

The thresholds proposed for marine mammals and fish are appropriate.

For marine mammals, it is proposed to utilise the permanent threshold-shift (PTS) and temporary threshold-shift (TTS) threshold values set out in Southall et al. (2019) which are based on a combination of un-weighted peak pressure levels and mammal hearing weighted (m-weighted) sound exposure levels (SEL) (para 1.3.2.1 of the technical note). These thresholds for injury are appropriate and follow best practice.

For disturbance, it is proposed to use dose-response curves based on data from Graham et al. (2019) for cetaceans, and from Russel et al. (2016) for pinnipeds (seals). Dose-response

curves are a more sophisticated approach to quantifying the risk of behavioural responses (compared to the application of simplistic sound level thresholds) and this is in keeping with other wind farm developments.

For fish, it is appropriate that the Popper et al. (2014) criteria will be utilised. The Popper criteria do not provide quantitative criteria for disturbance, however. The risk of behavioural effects is categorised qualitatively in relative terms as “high”, “moderate” or “low” at three distances from the source. Para 1.4.1.2 states that “the assessment of behavioural effects will also be supported by numerical modelling to allow for some quantification of the likely behavioural effects on fish and shellfish receptors, alongside the qualitative thresholds recommended by Popper et al. (2014) in order to better understand the risk to fish and shellfish species and populations within the zone of influence of the Morgan and Mona Offshore Wind Projects. These will be presented to and discussed with the Benthic Ecology, Fish and Shellfish Ecology and Physical Processes Expert Working Group as part of the Evidence Plan consultation”. The MMO agree that this is a sensible approach and way forward (whilst nevertheless recognising the uncertainties surrounding the application of simplistic sound level thresholds for behaviour).

Summary

The proposed modelling methodology as specified in the technical note is largely appropriate and fit for purpose. The MMO have made a number of recommendations which have been noted as ‘minor comments’ throughout.

If you require any further information, please do not hesitate to contact me using the details provided below.

Yours sincerely

[redacted]
Marine Licensing Case Officer
D
E [redacted]

References

Graham, I. M., Merchant, N. D., Farcas, A., Barton, T. R., Cheney, B., Bono, S., & Thompson, P. M. (2019). Harbour porpoise responses to pile-driving diminish over time. Royal Society Open Science, 6, 190335.

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pp.125-232.

C.3.8 Response from JNCC regarding the Morgan and Mona Offshore Wind Projects Note on Underwater Sound Modelling Methodology

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JNCC Reference: OIA-08763
Date: 22/06/2022

Dear [redacted]

Morgan and Mona Offshore Wind Projects, Note on Underwater Sound Modelling Methodology: Version F01

Thank you for consulting JNCC on the Morgan and Mona Offshore Wind Projects, Note on Underwater Sound Modelling Methodology (Version F01), dated 24 May 2022, which we received on 24 May 2022.

The JNCC advice contained within this minute is provided (under a Discretionary Advice Service agreement) as part of our advisory role relating to nature conservation in UK offshore waters (beyond territorial limit). We have subsequently concentrated our comments on aspects of the documents that we believe relate to offshore waters.

Any advice or assistance provided by JNCC via our Discretionary Advice Service is advisory only, and with reference to the General terms and conditions for DAS chargeable services, JNCC excludes any warranty that the advice provided by its officers represents JNCC's opinion or otherwise binds JNCC when acting as a Statutory Consultee.

Marine Mammal Comments

JNCC are generally accepting of the technical note for underwater sound modelling, with some minor comments and suggestions:

- **Page 3, section 1.3.2.1:** We are satisfied with the approach taken to assess marine mammal impacts using PTS and TTTs based on SEL. JNCC define auditory injury as PTS only although an assessment of TTS can provide useful context, so we are pleased to see that both are being included.
- **Page 4, section 1.3.2.5**: We have concerns about using the dose-response curve based on harbour porpoise only for all cetaceans. Although harbour porpoise are more sensitive to noise and this would likely provide a conservative estimate of

disturbance for other species, it is unclear how applicable this response curve is to the other hearing groups listed in Southall (2019[1]). Harbour porpoise also have a very different ecology to other species, meaning a different assessment approach may be needed for different species. We recommend further justification for this approach is included and a discussion with the Expert Working Group (EWG) to agree a suitable approach.

- **Page 4, section 1.3.2.7**: This approach is relatively new and seems to be being used more widely, but JNCC are not familiar with the technical details of this method and so we cannot accurately assess the appropriateness of this technique. We suggest this be discussed in one of the upcoming EWG meetings to explain and clarify the methodology is appropriate.
- **Page 5, section 1.4, Fish, larvae and sea turtles:** This is not JNCC's area of expertise so we assume another agency (e.g., Cefas) will comment this section.
- **Page 6, section 1.5.2.5**: To understand the effectiveness of these mitigation methods, please clarify whether you will you be modelling the propagation and impacts of ADDs.
- **Page 9, section 1.8.1.2, Table 1.3**: JNCC agree with the swim speeds in Table 1.3. Generally, we would assume swim speeds of 1.5m/s for all cetaceans except minke whales; while some species e.g. harbour porpoise, have been reported as swimming faster, these more precautionary speeds allow for individual differences in behavioural response.
- **Page 9, section 1.8.1.7:**
    - We have assumed that we will find out the specific locations for piling at a later date. Depth of the site is noted to be 45m – 29m below LAT (scoping report, EN010137-000011-EN010137, page 48). Propagation modelling should ensure that the range of depths in the site are covered.
    - The maximum number of monopiles noted in the scoping report (EN010137-000011-EN010137, page 53, Table 3.3) is 107 and concurrent piling is noted to be two at a time. Modelling should account for these planned activities.

Please contact me with any questions regarding the above comments.

Yours sincerely,

[redacted]

Senior Marine Mammal Adviser

Email: [redacted]

Telephone: [redacted]

[1] Southall B, Finneran J, Reichmuth C, Nachtigall P, Ketten D, Bowles A, Ellison W, Nowacek D, Tyack P. 2019. Marine Mammal Noise Exposure Criteria: Updated Scientific Recommendations for Residual Hearing Effects. Aquatic Mammals 45, 125-232.

C.3.9 Response from MWT regarding additional seal comments

From: [redacted]

Subject: Mona and Morgan OWF additional seal comments
Date: 04 August 2023 10:59:24
Attachments: [redacted]

Hi All

As discussed in the meeting, below is some additional information that may be useful for the marine mammal section, specifically around Manx seals.

Historic data (before I started at MWT, so at least 9.5 years ago)
SMRU/St Andrews Uni satellite tagged a number of seals in Strangford Lough and two of them travelled to the Isle of Man. One visited several times and headed to the Sound, the area between the Isle of Man and the Calf of Man. The other individual travelled north around the point of Ayre, north of Ramsey Bay. I have included 3 screen shots that I have. They are not my data and I'm unsure where they came from so please do not sue them within your final documents.

SMRU/St Andrews sent us some photos of satellite tagged seals in 2019 but I think they were tagged in 2017 from the Dee Estuary area and one of the seals did make it to the Calf of Man during breeding season. The track is attached. Again please don't use this image as its not mine but it looks like it certainly passed through the wind farms general area. The contact was Matt Carter and Debbie Russell at St Andrews, should you require more information.

Through are photo ID work on the Calf of Man we have matched one seal (Tulip Belle) with the Cornwall Seal Group Research Trust. She has been moving between the Calf and Cornwall for several years and has bred on the Calf. The contact at Cornwall is Sue Sayer. She generates a spreadsheet of where and when they are seen and that might provide useful for you. We have had another match only this week with another seal from Cornwall that was in Manx waters (near Fleshwick, north of Port Erin) and it was confirmed by its flipper tag and obvious scar on its side.
So "our" seals are very mobile within the Irish and Celtic seas.

Seal numbers in Manx waters
Just to confirm seal numbers around the Island. Our Island wide survey in 2017 counted 365 seals but was a one off snap shot during October and November. The work in 2007 by Manx BirdAtlas (now Manx Birdlife) surveyed every month and recorded around 200 individuals in October. Their highest count was 405 in January, showing variability in the abundance. The Calf of Man seal catalogue has around 450 individuals but this covers the span of the programme from 2009 to 2022, so you can imagine that some of the early individuals are not seem now and that each year new individuals are appearing. Clearly we don't have 450 seals visiting the Calf in each pupping season.

Manx haul out sites

Further to what you will have extracted from our Manx reports I would also add that more recently the Point of Ayre (most northerly point of the Island) has become an important haul out site for predominantly grey seals. Numbers vary but over 100 are being seen fairly regularly. The highest count is around 160. What we don't know is if this site is over spill as the population is increasing or whether they have moved here from elsewhere. It is nevertheless an important site now and worth including in your report. In addition to that and not necessarily relevant but worth mentioning is the Manx Wildlife Trust back in 2000's did some work on highlighting important areas that have a high value for wildlife and although this was mainly focused on terrestrial features there are 6 sites highlighted as important sites for seals. They are the Calf of Man, Gob Garvain, Santon head, Maughold Head, Clay head and Contrary head. These sites are not legal recognised, such as SPAs or SACs, but any development within one is given consideration by the planners. So might be worth including them in the report for haul out sites, if not already mentioned. Below is a link to the government website where the sites can be viewed along with other marine designations.
https://manngis.maps.arcgis.com/apps/webappviewer/index.html?id=74e6bd8c85534835b80dea94a4180a11
For more information on what Wildlife Sites are please go to our website for details
https://www.mwt.im/terrestrial/wildlife-sites-are-places-are-high-wildlife-value

I hope this is useful and if you have any questions please ask. I'm on leave next week but will reply on my return.

Kind regards

[redacted]

Manx Wildlife Trust - **Manx Wildlife for the Future**
Treisht Vanninagh Y Doogys Feie - ***Bea-Feie Vannin son y traa ry-heet***

Stay connected. Find us on [redacted]

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C.3.10 Morgan and Mona Offshore Wind Projects Response to queries raised in the first Evidence Plan Marine Mammal EWG meeting

Partners in UK offshore wind

MORGAN AND MONA OFFSHORE WIND PROJECTS

Response to queries raised in the first Evidence Plan Marine Mammal Expert Working Group meeting

Image of an offshore wind farm

06 July 2022
F01

1 RESPONSE TO QUERIES RAISED DURING THE FIRST EVIDENCE PLAN MARINE MAMMALS EXPERT WORKING GROUP MEETING

Table 1.1: Response to queries raised during the first Evidence Plan Marine Mammals Expert Working Group Meeting.

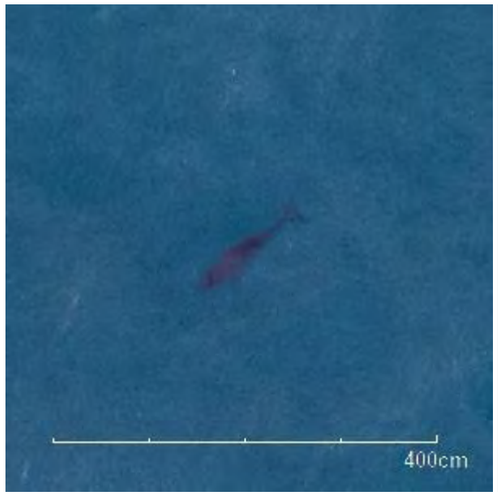
Query date	Query from	Query	Applicant response
17/02/2022	NRW	Query if the 12% of the sea surface analysed by APEM for the aerial survey is site specific or a general approach.	The digital aerial survey uses a grid-based design which collects 30% coverage of the sea surface and analyses a subset equating to ~12% of the sea surface. Crucially, studies have been undertaken which suggest that baseline surveys should collect a minimum of 10% coverage (BSH, 2013). It is important to note that this study was in relation to transect-based surveys, and it has been suggested that due to the high number of replicates achieved from grid-based surveys this method requires less coverage compared to transect-based surveys (Coppack et al. 2017; Weidauer et al. 2016). Due to the lack of historic data within the survey area, the survey design process relied on similar projects which been previously agreed by statutory nature conservation bodies (SNCBs) as suitable for baseline characterisation. Two examples include: Norfolk Boreas which analysed an 8% grid and Gwynt y Môr which analysed a 12% grid. From analysis done so far on the aerial survey data for Morgan and Mona, calculations from effort data demonstrate for Mona survey area, the mean area actually processed was 15.2% (± 0.12%), and for the Morgan area this was 12.9% (±0.04%) (figures in parentheses are standard errors). These values are higher than the 10% previous minimum coverage suggested by literature (BSH, 2013) and coverage accepted by previous projects. Due to the lack of historic data within the survey area and wider region a power analysis was not undertaken before the survey commenced. As stated in the Natural England best practice document, “typically power is expressed as the probability of detecting a change of *x* % at a probability of *y”* and therefore it is not appropriate to do a power analysis at this stage as we are carrying out baseline characterisation, not monitoring a change over time. We understand the requirement for evidence-based design from SNCBs. APEM will provide 24 months of data per project (Morgan and Mona), which include the design-based estimates with confidence limits and precision (CVs) for abundance and density. The coefficient of variation (CV) is a measure of relative variability and is the ratio of the standard deviation to the mean. Typically, the level of precision that we would be looking to achieve through the power analysis is that of less than 0.16. As the data has been collected and analysed, we are able to see through the data what the level of precision achieved is. For seabirds, if you look at key species such as guillemot and razorbill you will find the precision from the data is lower than 0.16 for peak count month and this in itself is evidence that the survey is robust with the required precision for birds. For marine mammals however, it is unlikely that low CVs would be obtainable. It is not always possible to achieve the 0.16 target precision on species with lower abundances, as the calculation uses both the sample number and encounter rate. To get a sufficient sample size for cryptic species, in particular species that spend the majority of their life underwater such as cetaceans, the level of survey effort required exceeds what can be reasonably expected. CVs will be higher for marine mammals, due to very low sighting numbers given their life history, so the difference between raw counts would be proportionally greater. Precision estimates reach close to the desired 0.16 target precision (e.g. harbour porpoise = 0.2), but obtaining a low CV for all species would be difficult. CVs for marine mammal abundances can be large (Taylor et al., 2007), and detecting population trends is difficult due to small sample size and relatively large uncertainty in abundance or density estimates (Authier *et al.*, 2020). Expert groups (ICES, 2008; 2014; 2016) have discussed this at length, but statistical power to detect change remained low (ICES, 2016; OSPAR, 2017). Furthermore, there will be big differences between species and months due to abundance and distribution within the survey area. Where possible during density modelling, species categories were grouped to give higher sample numbers to improve power and CVs and provide more conservative estimates of density for grey seal and harbour porpoise. When carrying out model-based density estimates, based on the frequency of occurrence of known species across the aerial survey area, unidentified seal species were considered most likely to be grey seal and as such were grouped together to produce a more conservative estimate of grey seal density. It must be noted whilst unidentified seals were assigned to grey seal, this does not discount the possibility that unidentified seal species may have been harbour seal. Similarly, harbour porpoise was initially modelled as a variable in its own right, but to increase sample size and improve model robustness, this was also pooled with animals identified as “Dolphin/Porpoise”; labelled together as “porpoise species”. As with grey seals, this grouping does not discount the possibility that some individuals may have been dolphin species, but by pooling the data, a more conservative density for harbour porpoise could be estimated alongside estimations for high confidence sightings per species. Furthermore, as discussed in the first EWG, the aerial data is not the primary data source for baseline characterisation. Key data sources include SCANS-III (Hammond *et al.,* 2021), JCP-III data (Paxton *et al.,* (2016), ObSERVE surveys (Rogan *et al.,* 2018), monthly densities from Waggitt *et al.* (2020), and seal at-sea usage maps (Carter *et al.,*2020; 2022). Data has also been purchased from Manx Wildlife Trust, Manx Whale and Dolphin Watch and SMRU to aid with robust evidence-based baseline characterisation based on a broad range of sources. Densities from the aerial survey data modelling have so far been lower than values in those sources mentioned, and the most precautionary estimates will be used for assessment. Thus the 12% survey coverage is good enough to provide a characterisation when combined with the other desktop data sources, and lower coverages have been acceptable on other projects which have progressed through consenting.

Query date	Query from	Query	Applicant response
17/02/2022	NRW	Request for a sample of real images from the aerial survey that represent the lower confidence limit for identifying an individual to species level or in adverse weather.	APEM use the precautionary principle and only identify species to a level we are 100% confident with. An accurate identification is based upon species level ID; if a target cannot be identified to species level it will be assigned to the next taxonomic level possible. Examples of species identification are presented in section 1.1 below. APEM analysts have access to identification guides and a reference library to aid in the identification of marine mammals. As part of the image analysis process the size of individuals can also be measured which can also aid in species identification. Every survey image goes through a quality assurance process where at least two members of staff quality check the identification. Avian identifications are reviewed by ornithological specialists with extensive experience in identifying birds from digital aerial still images. Marine mammal identification is reviewed by our in-house marine mammal team. APEM's marine mammal consultancy team incudes: Helen Hedworth: Principal Marine Mammal Consultant, with experience of environmental impact assessment coordination, and marine mammal and noise monitoring and mitigation for offshore and coastal development projects. Dr Ross Culloch: Technical Specialist, Ross joined APEM at the end of February 2022 from Marine Scotland Science, bringing a wealth of expertise in the field of marine mammal ecology, conservation and management. Ashleigh Kitchiner; a Senior Marine Mammal Consultant with a comprehensive knowledge of marine mammal ecology and six years of experience in providing services from survey design and execution to post-processing analysis.
17/02/2022	NRW	Request for further detail on what the marine mammal regional study area will be used for, including further clarity on screening for HRA and CIA.	The regional marine mammal study is defined in order to provide a regional context for marine mammals as a comparison to the Project marine mammal study area (which represents the Project area plus a 4-10km buffer). For example, this allows us to understand the distribution of marine mammals across the region in relation to the Project and whether, for key species, the densities within the Proposed Development area are similar to or higher/lower than the surrounding region. In addition, for some impacts – in particular subsea noise – the spatial scale may extend beyond the Project marine mammal study area and therefore by gathering data from the wider region we can help to quantify the effects on key marine mammal species. The Regional marine mammal study area is also the area within which we base our screening for projects considered in the Cumulative Effects Assessment (CEA). The Irish Sea covers a large geographic area and whist we appreciate that this does not capture the whole population range for some key species (as defined by Management Units (MUs)), we believe that it is sufficiently large to capture any potential for projects to interact cumulatively for wide ranging species. We believe that it would be too cumbersome to undertake CEA screening on the basis of MUs: this would include projects in the North Sea during the initial compilation of the CEA long list. We do not believe that there is the potential for cumulative effects to occur on such large geographic scales. The use of the Irish Sea to define our Regional study area does not mean that we do not consider the populations at the MU level. The MUs will be presented as part of the baseline assessment and will be used as reference populations against which to assess impacts. Further information on the approach to Likely Significant Effects Screening for the purposes of HRA will be provided to the EWG in due course.

1.1 Example images of marine mammals from aerial surveys

1.1.1 Mona Snags – Marine Mammal Low Confidence

Dolphin/Porpoise



Dolphin Species

Grey Seal

Seal Species

Marine Mammal Species

1.1.2 Mona Snags – Marine Mammal High Confidence

Harbour porpoise

Bottlenose dolphin (High confidence snags)

Grey seal

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C.3.11 Response from APEM on queries regarding the Response to queries raised in the first Evidence Plan Marine Mammal EWG meeting note

commercial in confidence

15th April 2022

APEM Ref: P4623

RE: p/EnBW - Morgan and Mona: Marine Mammal EWG01 action

To Whom It May Concern:

APEM Ltd (APEM) have been commissioned on behalf of BP Alternative Energy Investments Ltd (BP) to conduct monthly digital aerial surveys of the Mona and Morgan Development Areas. The aim of the work is to assess the abundance and distribution of birds and marine megafauna within the development area and surrounding 10 km buffer area.

Regarding the use of 12% and whether any power analyses has been carried out to justify the use of 12%. Please could APEM provide information to support to the statistical validity of this approach that we can present.

The digital aerial survey uses a gird-based design which collects 30% coverage of the sea surface, of which 12% is analysed. Due to the lack of historic data within the survey area and wider region a power analysis was not undertaken before the survey commenced. However, studies have been undertaken which suggest that baseline surveys should collect a minimum of 10% coverage (BSH, 2013). It is important to note that this study was in relation to transect-based surveys, it has been suggested that due to the high number of replicates achieved from grid-based surveys this method requires less coverage compared to transect-based surveys (Coppack *et al*. 2017; Weidauer *et al.* 2016). Due to the lack of historic data within the survey area, the survey design process relied on similar projects which been previously agreed by statutory nature conservation bodies (SNCB's) as suitable for baseline characterisation. Two examples include: Norfolk Boreas which analysed an 8% grid and Gwynt y Môr which analysed a 12% grid.

Marine Mammal Identification

APEM use the precautionary principle and only identify species to a level we are 100% confident with. An accurate identification is based upon species level ID, if a target cannot be identified to species level it will be assigned to the next taxonomic level possible, examples of species ID can be seen in Appendix 1. APEM analysts have access to identification guides and a reference library to aid in the identification of marine mammals. As part of the image analysis process the size of individuals can also be measured which can also aid in species identification. Every survey image goes through a quality assurance process where at least two members of staff quality check the identification. Avian identifications are reviewed by ornithological specialists with extensive experience in identifying birds from digital aerial still images. Marine mammal identification is reviewed by our in-house marine mammal team. APEM's marine mammal consultancy team incudes Helen Hedworth; a Principal Marine Mammal Consultant, with experience of environmental impact assessment coordination, and marine mammal and noise monitoring and mitigation for offshore and coastal development projects. Dr Ross Culloch; a Technical Specialist, Ross joined APEM at the end of February 2022 from Marine Scotland Science, bringing a wealth of expertise in the field of marine mammal ecology, conservation and management. Ashleigh Kitchiner; a Senior Marine Mammal Consultant with a comprehensive

knowledge of marine mammal ecology and six years of experience in providing services from survey design and execution to post-processing analysis.

Yours sincerely

Name

[redacted]

Refences

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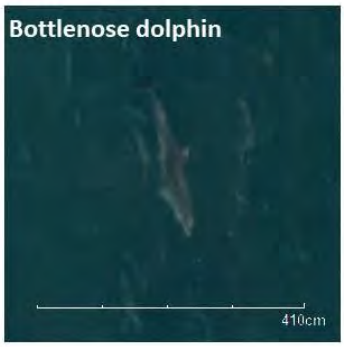
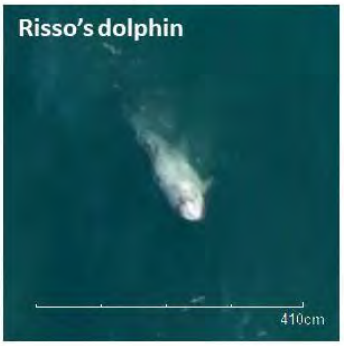
Weidauer, A., Coppack, T., Stefen, U. and Grenzdörfer, G., 2016. Monitoring seabirds and marine mammals by georeferenced aerial photography. *International Archives of the Photogrammetry, Remote Sensing & Spatial Information Sciences*, *41*.

Appendix 1

Mona Snags – Marine Mammal High Quality





Please note the quality of snags in lower than that of the original images.

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C.4. Marine mammals EWG meeting 3

C.4.1 Meeting minutes

MINUTES OF MEETING

Security Classification: Project Internal

Partners in UK offshore wind

MOM Number : 20221117_bpEnBW_MM EWG03_MoM **REV. No.** : F02

MOM Subject : Mona and Morgan generation Marine Mammal Expert Working Group 03

MINUTES OF MEETING

MEETING DATE : 17/11/2022

MEETING LOCATION : MS Teams

RECORDED BY : [redacted](RPS)

ISSUED BY : [redacted](RPS)

PERSONS PRESENT:

- [redacted]bp (GV)
- [redacted] bp (MP)
- [redacted]- bp (RS)
- [redacted]- bp (DH)
- [redacted]- RPS (KL)
- [redacted]- RPS (ST)
- [redacted]- RPS (TMc)
- [redacted]- RPS (BP)
- [redacted]- RPS (LB)
- [redacted] JNCC (JW)
- [redacted]- JNCC (AG)
- [redacted]- MMO (GR)
- [redacted]- Natural England (MNW)
- [redacted]- NRW (LR)
- [redacted]- NRW (NM)
- [redacted]- NRW (SB)
- [redacted]- NRW (RN)
- [redacted]- TWT (GJC)
- [redacted]- DEFA, Isle of Man Government (PD)
- [redacted]- Cefas (RF)

Apologies

- [redacted]- Natural England (AuB)
- [redacted]- JNCC (LM)
- [redacted]- bp (IG)

ITEM NO:	DISCUSSION ITEM:	Responsible party	Date
1.	**Project update (presented by MP)** bp are working with EnBW in a 50/50 partnership (the Applicants) to develop the Morgan Offshore Wind Project Generation Assets ('Morgan (Generation Assets)')and the Mona Offshore Wind Projects ('Mona'), which are being progressed as two separate projects. Morgan (Generation Assets) is the northern project located in English waters, and Mona is the southern project located mostly in Welsh waters. Together, they will have a combined capacity of 3GW. The Morgan Offshore Wind Project and the Morecambe Offshore Windfarm (developed by Cobra Instalaciones Servicios, S.A. and Flotation Energy plc) have been scoped into the Pathways to 2030 workstream under the Offshore Transmission Network Review (OTNR). Under the OTNR, the National Grid Electricity System Operator is responsible for conducting a Holistic Network Design Review to assess options to improve the coordination of offshore wind generation connections and transmission networks. The output of this process concluded that the Morgan Offshore Wind Project and the Morecambe Offshore Windfarm should share a transmission assets route corridor to a shared grid connection location at Penwortham in Lancashire. Both projects support the Holistic Network Design Review conclusions and intend to collaborate on a shared route corridor. The Morgan and Morecambe Transmission Assets project will be subject to a separate DCO. This consenting approach will provide a formal structure for the projects to collaborate, allows for integrated consideration of cumulative effects and streamlining the process with a single consent which should be simpler for stakeholders. The Applicants therefore intend to set up a separate Evidence Plan Process (EPP) to cover the Morgan and Morecambe Transmission Assets. The Mona and Morgan (Generation Assets) EPP will progress as planned and be separate from the Morgan and Morecambe Transmission Assets EPP. Mona is being taken forward as a seperate DCO including both the generation and transmission assets. The individual Morgan (Generation Assets) and Mona PEIR submissions will be at the end of Q1 2023. The two PEIR submissions have been aligned to allow the Applicant to properly consider the cumulative effects between the projects. The Morgan and Morecambe Transmission Assets PEIR is likely to be submitted in Q3 2023.		
2.	**Actions from EWG02 (presented by BP, RPS)** There were some queries from the first marine mammal EWG regarding the baseline characterisation. These will be discussed later in the meeting. We will also discuss the agreement on the approach to underwater sound modelling, approach to LSE screening for marine mammals, agreement on the use of dose response curves and UXO clearance methods.		

3.	**<u>Interim baseline information (presented by BP, RPS)</u>** We have provided the key sources used to characterise the baseline. In the last EWG we agreed that we would use Management Units (MUs) for each species reference populations. These have been taken forward to the assessment. For the Cumulative Effects Assessment (CEA) we have focused on the Irish Sea and Celtic Sea to ensure a proportionate assessment which focuses on the area within which there is a likely impact receptor pathway. NRW have recommended several reference populations. We can take forward the use of OSPAR region III and use the MU as sub populations within the iPCoD model to provide a more proportionate assessment of the population. PD- Can you explain how the Isle of Man (IoM) marine mammal populations have been taken into account. BP- OSPAR region III covers the IoM and includes the IoM waters. For the MUs, these go up to the edge of the borders of the IoM waters. We do take into account the IoM seal populations from the Carter *et al* 2022 maps which show the densities across the whole Irish Sea, including the IoM populations. These populations have been taken forward to the qualitative population assessments. PD- Whichever populations are included in the assessment they should include the IoM populations. The IoM has important marine mammal populations and animals do not start at political borders. We are happy to provide the data where available for these assessments. TMc- The IoM populations will be considered in the assessment. NM- We agree that the Seal MU (SMU) 12 would be too small of a reference population. However, using a number of SMUs wouldn't adequately capture the range of grey seals, especially to the south. NRW would recommend the use of OSPAR region III. Tagging data has shown that grey seal can travel from Wales to southwest England and the west coast of Ireland up to the shelf edge. NRW acknowledges that the use of OSPAR region III could dilute the impact, but the size of the MU is likely appropriate to the level of connectivity between grey seal colonies. Whereas SMUs stop at political boundaries (UK territorial waters) which does not reflect the movement of animals. Population models are sensitive to the spatial boundaries you choose. If this doesn't match the biological population boundaries, and there's a lot of movement of animals in and out of the Management Unit you've defined, then that will affect the results of your model which could give misleading results. NRW did carry out some population modelling trials of four MU approaches for grey seal at four different scales, because no decision has been taken as of yet on an appropriate spatial scale for a grey seal Management Unit among SNCBs. As a result of these trials, we concluded that ideally when running population models we'd recommend a smaller MU (though still quite large) which includes ICES sub-areas VIIa, g, h, f, and e, since this fits the tracking data better, but there's still some uncertainty on this. It's also provisional and internal,	**IoM to provide any marine mammal population data** **Applicant to consider the use of OSPAR region three for the population modelling but for this to be supported**	15/12/22 Complete

	so until the interagency group comes to an agreement on an approach we'll need to keep to our interim MU to retain consistency in our advice. TMC- Does the population for OSPAR region III provided by NRW include the IoM population? NM- Yes, this population includes the IoM population. MNW- Natural England agree with NRW on using OSPAR region III. However as this is such a large area it may lead to local impacts on seal haul out sites being overlooked. Hornsea Project Four looked at local grey seal haul out sites qualitatively. If there is enough information, then a high-level qualitative assessment can be done on these populations i.e qualitative assessment of movements from key haul out sites to the project area. TMC- Can you provide further details of how this was carried out on Hornsea Project Four? MNW- The full assessment is available on the Planning Inspectorate website. This would be Natural England's suggestion for how to make the assessment precautionary for local populations while considering the connectivity of the wider population. KL- Action for the applicant to consider the use of OSPAR region III for the population modelling but for this to be supported by a qualitative assessment on the local haul out sites. PD- The IoM would support NRW comments and Natural England's suggestion. The IoM would be happy to provide any data required if available. NM- Natural England's suggestion make sense, but I will take it back to NRW and provide NRWs position in writing after the meeting. GJC- TWT hold grey seal count data for the haul out site on Walney Island if you do go with that approach. Post meeting note: *NRW Advisory support the suggestion made by NE*.	**by a qualitative assessment on the local haul out sites.** **NRW to provide feedback on the suggestion to present a qualitative assessment on local haul out sites.** **TWT to provide seal count data for the haul out site on Walney Island**	Complete 15/12/22
4.	**<u>Overview of data sources (Presented by BP, RPS)</u>** Data has been purchased from the Manx Wildlife Trust, Manx Whale and Dolphin Watch and SMRU. We have looked at the new Joint Cetacean Data Programme portal and are continuing to check for any additional data sets. We are aware that the Welsh marine atlas is being prepared but will not be available in time for inclusion in the Preliminary Environmental Information Report (PEIR). We will consider it in the application if it is available.		
5.	**<u>Agreement on impact assessment baseline populations</u>** The highest densities across the literature and site-specific surveys have been taken forward to the assessment. **Harbour Porpoise**	**NRW to provide an**	

	Density taken forward to the Mona assessment is 0.097 which is from the Mona digital aerial surveys. However NRW have advised that the Welsh marine atlas is used. NM- NRW advised the use of the Welsh marine atlas as it comprises 30 years of survey data and highlighted the higher densities around the Isle of Anglesey. It avoids the issues of using snapshot survey data. NRW can't present the shapefiles for the Welsh marine atlas until the final version of the report is published. NRW can provide densities for an area of search if the applicant provides a shapefile for the area of search. NRW also noted that the location of Mona is fairly near to the borders between Scans III Block E and Block F. Taking into account the usual propagation ranges of noise from monopiling, then noise would be expected to propagate into the next block, block F where densities are much higher than either Block E or the aerial survey density. BP- We would suggest the use of quarterly mean densities for harbour porpoise rather than the absolute maximum densities over the whole season. This is so that the assessment doesn't end up being over precautionary and will be a more accurate value for a bio season. Can NRW share the maps from the Welsh marine atlas with the rest of the EWG? NM- This will need to be subject to an internal NRW discussion, since we're finalising our methodology for querying the data. MNW- Natural England agrees with using the Welsh marine atlas. This provides further details to SCANS data. Natural England would like to consider the values used and provide feedback. If possible, it would be good to see the difference between the maximum and mean densities proposed. TMc- We will provide the search area shapefile to NRW for them to provide the average density for the July bio-season and confidence limits. *Post meeting note: Following the EWG we would like to request any harbour seal data available for the IoM. We are looking to include an estimate of harbour seal populations within IoM waters in our reference populations if possible. Does the Isle of Man have anything comparable to the seal Management Units provided by SCOS?* **Bottlenose dolphin** Density taken forward to the Mona assessment is 0.035 which is from Lohrengel *et al* 2018. NM- From some preliminary queries carried out on the composite map, the max densities within the Welsh marine atlas are within the values for the Cardigan Bay area and the SCANS values. The max densities for the Liverpool Bay are 0.015 animals per km2. In the final version of the Awel y Mor Environmental Statement, they amended their assessment of bottlenose dolphin to the 20m noise contour instead of a 6 km coastal zone, based on discussion with their EWG pre-application. TMc- Concerned that if Welsh marine atlas maximum densities for bottlenose dolphin are used this would result in vast overestimate of the numbers of animals affected. Animals from the Cardigan Bay population move offshore and around the IoM in groups (i.e. are not	**estimated timeframe of when the Welsh marine atlas will be published.** **The EWG to consider and feedback on the densities used for harbour porpoise.** **NRW to confirm if the maps from the Welsh marine atlas can be shared with the EWG.** **The applicant to provide area of search shapefile to NRW** **NRW to provide the average density and confidence limits for the area of search from the Welsh marine atlas** **DEFA, IoM to provide any harbour seal population data**	Complete Complete Complete Completed 15/12/22 15/12/22

	evenly distributed) and use of the map could result in double counting. The grid cells in the density map would add up to greater than the Irish Sea population, which when noise contours are applied will show that the proportion of the Welsh population affected will be well in excess of 100%. Can NRW recommend an alternative approach to overlaying the noise contours on the BND atlas as we think this is going to result in an unrealistic assessment. Would they be content with using, for example a 6km coastal buffer or 20m depth contour (whichever is preferrable) overlaid on the Welsh marine atlas instead? LR- Please can the applicant clearly set out the concerns/queries for the EWG in the meeting minutes. **Short beaked dolphin** Densities have been agreed via the population densities note circulated before the EWG[1]. **Rissos dolphin** Densities have been agreed via the population densities note circulated before the EWG. **Minke whale** Densities have been agreed via the population densities note circulated before the EWG. **Grey Seal** Underwater sound contours have been overlaid with the Carter *et al* 2022 density maps. Average density calculated from grid cells within Project study areas (Mona/Morgan generation) to apply to estimate of PTS effects. **Harbour Seal** Underwater sound contours have been overlaid with the Carter *et al* 2022 density maps. Average density calculated from grid cells within Project study areas (Mona/Morgan generation) to apply to estimate of PTS effects.	**NRW to consider if there is an alternative approach to overlaying noise contours on the BND atlas that would be acceptable**	Complete
6.	**<u>Approach to assessment (presented by BP, RPS)</u>** We have used the dose response curves from Graham *et al*. 2019. The same dose response curve has been applied for all cetaceans due to the lack of other approach for other species. NM- NRW Advisory agree with this approach in the interests of being pragmatic. As long as the assessment is written with clear assumptions and any caveats. It is useful to present the results for the National Marine Fisheries Services (NMFS) results in parallel especially for minke whales. TMc- We have referred to the NMFS thresholds in the PEIR assessment.		

[1] Morgan Mona EWG clarifications on MU technical note issued to the EWG on 03 Septemer 2022.

	NM- Is the applicant proposing to apply the dose response for the assessment for the harbour porpoise SAC? KL- We will pick this up in the Likely Significant Effect (LSE) section of the meeting. **Cumulative assessment** We are using a tiered system for the CEA. We have assumed the worst case scenario, that projects may be piling at the same time, that the maximum design scenario is constructed for each project and the piling is distributed evenly across construction phase for each project. Modelling has been carried out across all tier 1 projects (Mona, Awel y Mor and Erebus). KL- As more information becomes available on the tier 2 projects (e.g. Morecambe), we will incorporate these into the modelling for the Applications. The PEIR will include a quantitative assessment for the tier 2 projects, where information on projects is available.		
7.	**<u>Initial underwater sound modelling outputs</u>** Underwater sound modelling has been undertaken on three piling locations which are based on their proximity to sensitive areas. Consecutive piling has been modelled over 24h. Temporary threshold Shift (TTS) thresholds have been used as a proxy for disturbance Unexploded Ordnance (UXO) clearance. RF- Has the injury range for both TTS and PTS have been included in the assessment? TMc- Permanent Threshold Shift (PTS) has been carried forward to the assessment. The ranges for TTS are in the underwater sound Technical Report but haven't been included in the assessment. RF- Cefas would recommend the use of Effective Deterrent Range (EDR) (i.e. 26km range) for the UXO assessment. Concern is the use of TTS as a proxy would underestimate disturbance. **Post meeting clarification:** To provide further context here, TTS occurs at much higher sound exposures, and so will underestimate the risk of disturbance. Therefore, our recommendation is to use the EDR for UXO clearance. TMc- Disturbance is not the main concern for UXO as detonation is very short term and not as important as TTS. EDR are more typically applied for the Habitats Regulations Assessment (HRA) so we can discuss this in the HRA section of the meeting. *Cefas post meeting note: Agree that auditory injury is one of the primary concerns from UXO detonation, although disturbance still needs to be appropriately considered.* NM- NRW hasn't signed up to the EDR guidance so would prefer this to be presented alongside the TTS ranges. Current methods available for the modelling of UXO tend to give overprecautionary range predictions. Applying TTS (although we're aware it's inherently the least precautionary behavioural disturbance threshold) we can		

	counterbalance the precautionary nature of predictions from UXO models. TMc- If we consider TTS ranges for high order clearance of UXO, ranges of 14.8km for harbour porpoise and 17.7km for minke whale are predicted. If we consider the largest UXO the TTS is 28km for harbour porpoise and 34km for minke whale. This suggests that the EDR and TTS ranges are of a similar magnitude. We can present the EDR alongside the TTS. MNW- Natural England support the use of the EDR and these can be presented alongside TTS ranges as per suggestion by NRW. How is a sensitive area defined when choosing the piling locations to model? KL- We consider proximity to protected areas, spawning grounds, locations close to the coast where you would expect high densities of marine mammals. NM- The results of using the dose response curves on species other than harbour porpoise are likely to be conservative. This should be mentioned when discussing results from the model in the assessment. TMc- We would generally not present numbers that we know are over conservative as the numbers have the potential to be considered without the caveats. NMW- Happy to leave this discussion with the Applicant and NRW. Natural England will provide a written response when more information can be provided. TMc We also wanted to highlight that the iPCoD modelling is very sensitive to the parameters being used, with small alterations to parameters leading to large changes in results (e.g. populations increasing or decreasing). KL- RPS will review the Awel y Mor Environmental Statement to review their iPcOD model. Awel y Mor reported a stable population. NM- Awel y Mor did carry out follow up IPCoD modelling on harbour porpoise. They found that there were no biologically significant adverse effects from piling disturbance. They compared the unimpacted populations with the impacted populations. They also found the model very sensitive to input parameters.	**RPS to share initial iPcOD model results with the EWG when available.**	Early 2023
8.	**<u>Mitigation considerations- piling</u>** The Applicant is looking for agreement on defining the mitigation zone using the dual metric approach of SPLpk and SELcum. NM- Whilst NRW Advisory agree that the SELcum is inherently precautionary as a method, it is the only metric currently available to assess cumulative impacts We are aware there is some research being done to improve estimates (e.g. work by Kastelein, Von Benda Beckman, Finneran etc), but current consensus is that we do not have enough data to apply any of these initial findings to the impact assessment yet. Our advice would be to use the dual metric approach and assess whichever metric results in the largest ranges. TMc- The SELcum have larger impact ranges that will lead to a requirement for long duration use of ADDs. There needs to be a balance		

	between having long use ADDs which introduce additional sound. We have had previous feedback from other UK stakeholders not to use SELcum so wanted to ensure we are following best practice. RF-Cefas recognises the uncertainty with the dual metric, but Cefas would recommend the dual metric with the worst case being assessed. Sound abatement at the source would be recommended to avoid the long use of ADDs. **Post meeting note:** We recognise that there are uncertainties and difficulties associated with predicting the true levels of sound exposure over long periods of time. However, the MMMP should focus on mitigating both the predicted SPL_{peak} and SELcum impact ranges. Agree with Tessa's comment about the need to balance ADD use, as such devices introduce additional noise into the marine environment. Noise abatement measures, such as bubble curtains, can reduce the noise at source. MNW- Natural England is in line with comments from NRW and Cefas. It is understood that the dual metric may be over precautionary but there is no other available method, so this is what is recommended at the moment. Natural England shares concerns with Cefas on the prolonged use of ADDs and supports use of sound abatement. RF- For UXO clearance Cefas have previously advised the used of bubble curtains for high order detonation. **Post meeting note:** This is on the basis that high order detonation is a last resort (i.e. where low order methods are not feasible for whatever reason).		
9.	**<u>Approach to LSE Screening (presented by KL)</u>** We have received feedback on the seal foraging distances used in the HRA. The EWG asked us to review the Carter *et al* 2022 paper. We have reviewed these and incorporated them into the LSE Screening criteria. We have extended the number of sites considered in the LSE screening in line with the Carter *et al* 2022 paper and looking at tagging/tracking data to determine potential connectivity with the project boundaries (as presented on slides). In the Appropriate Assessment, asequential approach will be undertaken, in line with NRW advice. If an adverse effect on integrity on a site can be excluded, then the same can be concluded for site(s) further away. This approach will also be taken for the Morgan generation assets assessment. NM- The sequential approach is fine; this is what is in NRWs position statement. However for grey seal we would advise that all sites within OSPAR region III are scoped in. *Post-meeting note (NRW): NRW Advisory agree to the use of Carter et al 2022 ranges for LSE screening.* KL- We will look at this and consider if any other SAC have the potential to be included. However, previous advice through the Evidence Plan process was to review Cartel *et al*. 2022 and similar studies to take a proportionate approach (i.e. identifying a credible link between the project and SACs/features, based on tracking/tagging data).	**Applicant to consider if any other sites within OSPAR region III should be included in the LSE screening** **JNCC to provide a written**	Complete

	MNW- Natural England would expect the standard approach of all sites in English waters screened into the ISAA should have an assessment, rather than taking the sequential approach proposed by NRW. Natural England is in support of using Carter *et al* 2022 to inform LSE Screening. AG- JNCC will provide a written response after the meeting on sites to be screened into the LSE screening. PD- As the IoM is not part of the EU or UK the IoM designed sites are not subject to the HRA legislation. However, we would request that the IoM designated sites are explicitly considered. KL- The IoM designated sites will not be in the LSE screening or the Information to Support Appropriate Assessment (ISAA). However, the IoM designated sites will be considered in the environmental impact assessment, where any impact on their specific features has been identified. KL- The applicant would like feedback from the EWG on whether the dose response curve or the EDRs should be used in the HRA. NM- In addition to the 26km EDR, NRW would recommend a fixed threshold for single strike SEL for assessing adverse effects in a harbour porpoise SAC against the 20%/10% criteria. This is because a D/R curve fundamentally can't link numbers disturbed to area ensonified other than as a proxy. The preferred threshold is 143db which is the threshold used in the Netherlands and Denmark. Thresholds of 140dB (ASCOBANS), 143 dB single strike SEL (Brandt e*t a*l, 2018[2]) or 145dB (Lucke *et al*., 2009[3]) would also be acceptable. KL- Following the Crown Estate Plan Level HRA, the intention was to use the EDRs for the HRA. Ideally we do not want to present multiple parallel assessments which would considerably increase the volume of material produced (and to be reviewed by stakeholders). TMc-Our concern over the thresholds approach set out by NRW would be that it doesn't take into account the dissipation of impulsive sound over distance or site-specific conditions. RF- Cefas would usually advise against using fixed thresholds and the preference would be to use the dose response curve and would need to see justification / literature for use of thresholds. **Post meeting note:** RF- Cefas would usually advise against using fixed thresholds for behaviour and the preference would be to use an appropriate dose response curve or EDR. However, Cefas would be happy to review additional evidence presented to support a different distance on the basis of behavioural response studies. NM- The fixed threshold approach is for area assessment for harbour porpoise SACs only, for other species and for EIA, the dose response curve is acceptable.	**response after the meeting on sites to be screened into the LSE screening** **NRW to provide supporting paper for the 143db threshold** **NRW to provide Brant *et al* 2018.** **RPS to consider use of thresholds suggested by NRW**	Complete Complete Complete Complete

[2] Brandt, Miriam & Dragon, AC & Diederichs, Ansgar & Bellmann, MA & Wahl, V & Piper, W & Nabe-Nielsen, Jacob & Nehls, Georg. (2018). Disturbance of harbour porpoises during construction of the first seven offshore wind farms in Germany. Marine Ecology Progress Series. 596. 10.3354/meps12560.

[3] Lucke, Klaus, Ursula Siebert, Paul A. Lepper, and Marie-Anne Blanchet. 2009. "Temporary Shift in Masked Hearing Thresholds in a Harbor Porpoise (*Phocoena Phocoena*) after Exposure to Seismic Airgun Stimuli." The Journal of the Acoustical Society of America 125 (6): 4060–70

	AG- JNCC is signed up to the EDR approach so that is our recommendation. MNW- NE support the use of EDRs but have no objections to using thresholds alongside EDR. RF- For the consecutive piling scenarios, can the underwater sound TR include information on the assumptions being made regarding animal movements? e.g. swim speeds. **Post meeting note:** Fleeing speeds but also details such as the time (e.g. onset of activity) or noise level at which animals are assumed to begin responding; the speed and direction in which they flee; whether there is a maximum distance or minimum sound level at which animals will cease to respond; whether animals are assumed to continue fleeing, remain stationary, or return toward the noise source during temporary cessations in noise-generating activity. TMc- Yes, the swim speeds are in the underwater sound TR. We have assumed directional movement away from the piling source, this is also presented in the underwater sound TR. KL noted that ideally advice given on Mona and Morgan (Generation Assets) projects (e.g. densities, baseline populations, Management Units) as set out above should be consistent with other Irish Sea developers. This will ensure a consistent approach to cumulative and in-combination assessments. These become problematic in the CEA if different projects are adopting different approaches.	**RPS to review the advice and methodologies used for the Awel y Mor application.**	Complete
10.	**<u>Discussion and next steps</u>** The applicant is seeking agreement on: • Agreement on approach to baseline characterisation. • Agreement on approach to densities and baseline populations. • Agreement on approach to underwater sound modelling following clarifications provided in EWG. • Agreement on approach and sites screened LSE Screening for Marine Mammals. Next steps: • Meeting minutes to be circulated 2 weeks following the EWG. • Agreement logs to be circulated following EWG. The EWG04 will be organised in Q1 2023 To discuss Morgan Generation baseline and initial assessment outputs, including cumulative effects.		

C.4.2 Response from Natural England regarding the meeting minutes

Date: 15 December 2022
Our ref: DAS/UDS A000566 / 412776
Your ref: Morgan and Mona Marine Mammal Expert Working Group 03

[redacted]
BP Alternative Energy Investments Limited

c/c [redacted]
RPS/ Energy

Hornbeam House
Crewe Business Park
Electra Way
Crewe
Cheshire CW1 6GJ

T [redacted]

BY EMAIL ONLY

Dear [redacted]

Discretionary Advice Service (Charged Advice) - UDS A000566
Contract Reference: BP EnBW Morgan and Mona Offshore Wind Farm
Consultation: Morgan and Mona Offshore Windfarm Marine Mammal EWG03

This advice is being provided as part of Natural England's Discretionary Advice Service in accordance with the Quotation and Agreement dated 17 May 2021 to BP Alternative Energy Investments Limited.

The following advice is based upon the information presented in the Marine Mammal Expert Working Group (EWG) Meeting 3 (attended on 17 November 2022 by [redacted].

Natural England were asked to provide advice upon:

1. Agreement on approach to baseline characterisation
2. Agreement on approach to densities
3. Agreement on approach to underwater sound modelling, following clarifications
4. Agreement on approach and sites screened LSE Screening for Marine Mammals

Detailed comments

1. Agreement on approach to baseline characterisation

Natural England agree with Natural Resources Wales (NRW) on using OSPAR region III for grey seals. However, as this is such a large area it may lead to local impacts on seal haul out sites being overlooked. We therefore suggest that applicant also conduct a high-level qualitative assessment on local populations (as has been undertaken for Hornsea Project Four). It would be Natural England's advice in order to make the assessment precautionary for local populations while considering the connectivity of the wider population.

2. Agreement on approach to densities

Natural England agree on the approach to densities and reference populations for Risso's dolphin, short beaked dolphin, minke whale, and also on the densities for grey seal.

However, we cannot yet agree on approach to densities and reference populations for bottlenose dolphin considering that further discussions are required between the applicant and NRW on the best approach for using the data from the Welsh Marine Atlas.

We also cannot yet agree on approach to densities and reference populations for harbour porpoise

considering that NRW is yet to provide the average density and confidence limits for the area of search from the Welsh Marine Atlas. However, Natural England agrees with using the Welsh marine atlas as this provides further details to SCANS data. Natural England would like to consider the values used and provide feedback. If possible, it would be good to see the difference between the maximum and mean densities proposed.

3. Agreement on approach to underwater sound modelling, following clarifications

Natural England agree on the use of dual metric approach SPLpk and SELcum with the worst case being assessed.

Natural England's advice is to present Effective Deterrent Range (EDR) alongside Temporary threshold Shift (TTS) for UXOs.

4. Agreement on approach and sites screened LSE Screening for Marine Mammals

Natural England agree on approach to screening of sites for Annex II marine mammals. We would expect the standard approach of all sites in English waters screened into the Information to Support Appropriate Assessment should have an assessment, rather than taking the sequential approach proposed by NRW.

Natural England is in support of using Carter *et al.* (2022) to inform Likely Significant Effect Screening of seal sites.

For clarification of any points in this letter, please contact [redacted] on 07471 003933 or by email at [redacted]. Elliott will be taking over as case officer for the Morgan and Mona projects, and the Morgan and Morecambe transmission from January 2023.

Yours sincerely

[redacted]
Strategic Coastal Lead Adviser
Coast and Marine Team
Cheshire, Greater Manchester, Merseyside & Lancashire Area Team
[redacted]

☒The advice provided in this letter has been through Natural England's Quality Assurance process.

The advice provided within the Discretionary Advice Service is the professional advice of the Natural England adviser named below. It is the best advice that can be given based on the information provided so far. Its quality and detail is dependent upon the quality and depth of the information which has been provided. It does not constitute a statutory response or decision, which will be made by Natural England acting corporately in its role as statutory consultee to the competent authority after an application has been submitted. The advice given is therefore not binding in any way and is provided without prejudice to the consideration of any statutory consultation response or decision which may be made by Natural England in due course. The final judgement on any proposals by Natural England is reserved until an application is made and will be made on the information then available, including any modifications to the proposal made after receipt of discretionary advice. All pre-application advice is subject to review and revision in the light of changes in relevant considerations, including changes in relation to the facts, scientific knowledge/evidence, policy, guidance or law. Natural England will not accept any liability for the accuracy, adequacy or completeness of, nor will any express or implied warranty be given for, the advice. This exclusion does not extend to any fraudulent misrepresentation made by or on behalf of Natural England.

Cc [redacted]

C.4.3 Response from JNCC regarding the meeting minutes

From: [redacted]
To:
Cc:
Subject: RE: Morgan Mona marine mammal EWG03 meeting
Date: 15 December 2022 17:00:24
Attachments: [redacted]

CAUTION: This email originated from outside of RPS.

Hi [redacted]

Please see JNCC's response to the EWG actions below. I have also attached the updated agreement log.

We are content with the minutes and have no comments to make.

- The EWG to consider and feedback on the densities used for harbour porpoise assessment (15/12/22)
    - The APEM Mona aerial survey density is notably smaller than the SCANS-III block E density. We recommend using either the SCANS density or the Marine Mammal Atlas as recommended by NRW for a more conservative estimate.
- JNCC to provide a written response after the meeting on sites to be screened into the LSE screening (15/12/22)
    - JNCC support a sequential approach to site screening, in line with advice from Natural England. JNCC delegate any advice on seals to NE and NRW as these are inshore sites and typically inshore species and therefore not in JNCC's remit.

Please let me know if you have any questions.

Kind regards,

[redacted] BSc(Hons)
Offshore Industries Adviser
Marine Management Team
JNCC, Inverdee House, Baxter Street, Aberdeen, AB11 9QA
Tel: [redacted]
Email: [redacted]

C.4.4 Response from NRW regarding the meeting minutes

Project Mona & Morgan Marine Mammal EWG03 NRW Actions

[redacted]
Senior Marine Advisor

15th December 2022

Introduction

This advice is provided in response to the Meeting Actions from the Marine Mammal EWG 03 which took place on 17th November 2022.

NRW advice in this document is provided (under a Discretionary Advice Service agreement) in respect of a proposal which will require an application for which Natural Resources Wales is a Statutory Consultee.

The customer acknowledges that the content of any advice or assistance provided by NRW is advisory only and that it shall not be deemed to bind or in any other way restrict NRW in performing its statutory functions.

The recipient acknowledges that:

- any advice given or materials or documentation provided by NRW do not constrain or bind NRW in respect of its statutory functions or its role as a statutory consultee or any decision NRW may make in relation to any application for a licence or permit;
- any advice given by NRW does not bind NRW in respect of any future representations it may make as statutory consultee or any decision NRW may make in relation to any application for a licence or permit;
- any views or opinions expressed by NRW are without prejudice to the consideration NRW may be required to give to any application or any future representations as statutory consultee or any decision NRW may make in relation to any application for a licence or permit;
- the final decision as to any representations made by NRW as statutory consultee will be based on all the relevant information available to NRW at the time it makes such representations;
- NRW cannot and does not give any guarantee as to the representations it may make as statutory consultee; and,
- any advice given by NRW may be overtaken by changes in available information, law, policy and guidance relevant to the subject matter of the advice.

Receptors Consulted:
Marine Mammals

Actions

NRW to provide feedback on the suggestion to present a qualitative assessment on local haul out sites

NRW Advisory (A) agree with the suggestion to present a qualitative assessment on local haul out sites in addition to the use of the OSPAR III management unit as the relevant population scale.

NRW to confirm if the maps from the Welsh marine atlas can be shared with the EWG

These maps have necessarily been shared on an 'Official-Sensitive' basis, so we kindly ask that they are not distributed further at this stage.

NRW to provide the average density and confidence limits for the area of search provided by RPS from the Welsh Marine Atlas

This action is currently in progress. NRA (A) are awaiting further response and some additional clarification from the authors.

NRW to consider if there is an alternative approach to overlaying noise contours on the BND atlas that would be acceptable

NRW (A) recommend the use of an alternative fixed noise threshold, such as the 160dB SPL_{rms} threshold for impulsive noise (NMFS 1995, 2005) over the use of a harbour porpoise dose response curve. While the latter is a pragmatic approach, harbour porpoise are likely to be more sensitive to the effects of pile-driving than bottlenose dolphin. This is likely to lead to over-precautionary results, which the number of individuals impacted in the initial modelling carried out by the applicant would suggest.

The indications from the literature indicate that bottlenose dolphin (and minke whale) are more tolerant to noise than harbour porpoise. For bottlenose dolphin, whilst there is currently insufficient data for a species-specific threshold, a few studies have looked at their reactions to impulsive sounds (but not enough for a definite threshold). Graham *et al*. (2017) studied reactions of bottlenose dolphins (and porpoises) to impact and vibratory pile driving noise of small-diameter monopiles. Dolphins did not flee the study area, but stayed away from the vicinity of the construction site. Received sound exposure levels (single pulse SEL, unweighted) were estimated to be between 129 and 133 dB re. 1 μPa^2s . Fernandez-Betelu *et al*. (2021) also studied the response of bottlenose dolphins to pile driving noise, but from larger piles at the Beatrice and Moray East offshore wind farms. Dolphins remained in the area, but some changes in their behaviour were noted. Received sound exposure levels (single pulse SEL, unweighted) were estimated to be 128 dB re. 1 μPa^2s.

NRW to provide supporting paper for the 143db threshold

Please find attached: Brandt *et al*. (2018), Heinis *et al*. (2019), and Tougaard (2021), in addition to a table from Tougaard (2021), which summarises the relevant studies of full-scale pile driving operations on which this threshold is based.

NRW (A) recommends that bespoke noise modelling is required for any proposed activity that may generate impulsive noise (e.g. pile driving, seismic surveys). An unweighted noise threshold of 143 dB re 1µPa^{2}s (or 103 dB re 1µPa^{2}s VHF-weighted) single strike sound exposure level is recommended to represent the minimum noise threshold at which disturbance would occur from impulsive noise sources (Brandt *et al*. 2018; Heinis *et al*. 2019). The 143 dB re 1µPa^{2}s noise contour should be displayed on a map of the area to find the extent of overlap with the SAC, and the extent of the area of the SAC that would experience noise disturbance can then be determined. This threshold is the modelled average of six different studies of full-scale pile driving operations (see attached figure) and thereby represents the largest amount of empirical data (Tougaard, 2021).

NRW to provide Brandt et al. 2018

Please find attached: Brandt *et al*. (2018), Heinis *et al*. (2019), and Tougaard (2021).

NRW to provide an estimated timeframe of when the Welsh marine atlas will be published

NRW (A) currently estimate publication of the Welsh Marine Atlas in Quarter 1 2023.

References

- Brandt MJ, Dragon AC, Diederichs A, Bellmann MA, Wahl V, Piper W, Nabe-Nielsen J, Nehls G. 2018. Disturbance of harbour porpoises during construction of the first seven offshore wind farms in Germany. Mar. Ecol. Prog. Ser. 596: 213 – 232.

- Fernandez-Betelu O, Graham IM, Brookes KL, Cheney BJ, Barton TR, Thompson PM. 2021. Far-Field Effects of Impulsive Noise on Coastal Bottlenose Dolphins. Front. Mar. Sci. 8.

- Graham IM, Pirotta E, Merchant ND, Farcas A, Barton TR, Cheney B, Hastie GD, Thompson PM. 2017. Responses of bottlenose dolphins and harbor porpoises to impact and vibration piling noise during harbor construction. Ecosphere. 8.

- Heinis F, de Jong CAF, von Benda-Beckmann S, Binnerts B. 2019. Framework for Assessing Ecological and Cumulative Effects–2018 Cumulative effects of offshore wind farm construction on harbour porpoises. Rijkwaterstaat Sea and Delta.

- Tougaard J. 2021. Thresholds for behavioural responses to noise in marine mammals - Background note to revision of guidelines from the Danish Energy Agency.

C.4.5 Mona and Morgan Clarification on Densities and Reference Populations Note

1 EWG 03 CONSULTATION ON DENSITIES AND REFERENCE POPULATIONS

In advance of the next Expert Working Group (EWG), we are seeking written agreement on use of densities of key marine mammal species and marine mammal reference populations in our Environmental Impact Assessment.

1.1 Densities of key species

For densities we have used a range that represents the average density to the maximum density. We are focusing on Mona for this consultation and will present the Morgan densities in the next EWG meeting. Densities per species which are to be used in the assessment are presented in Table 1, with the reference and justification for use.

Table 1 Summary of marine mammal receptors to be considered in the EIA together with relevant densities and references.

Species	Density (Animals per km^2)	Reference
Harbour porpoise	Mona = 0.086 to 0.097	Using a range from SCANS-III (Hammond *et al.*, 2021) for Block F density value to the highest absolute design-based bio-season density from site-specific aerial survey data in the Mona Array Area plus a buffer (i.e. digital aerial survey area).
Bottlenose dolphin	Mona = 0.0082 to 0.035	Using a range based upon the offshore densities given in SCANS-III (Hammond *et al.*, 2021) for adjacent Block E (as none observed for Block F) and high-density coastal area (6km from coast) density in outer Cardigan Bay from Lohrengel *et al.* (2018). Consistent with approach used in Awel y Mor.
Short-beaked common dolphin	Mona = 0.018	SCANS-II (Hammond *et al.*, 2013) for Block O, as no values for SCANS-III.
Risso's dolphin	Mona = 0.0313	SCANS-III (Hammond *et al.*, 2021) for adjacent Block E, as none observed for Block F.
Minke whale	Mona = 0.0173	SCANS-III (Hammond *et al.*, 2021) for adjacent Block E, as none observed for Block F.
Grey seal	Mona offshore = 0.0368	Carter *et al* (2022) values – average densities calculated to per km^2 from 25km^2 cells for the Mona marine mammal study area. Offshore densities are from the Mona aerial survey area, whilst inshore densities are the average for the Mona Offshore Cable Corridor.
	Mona inshore = 0.196	
Harbour seal	Mona offshore = 0.0002	
	Mona inshore = 0.0008	

For all species the underwater sound assessment is undertaken on the basis of the spatial area of effect, from areas within modelled noise contours multiplied by the densities given in Table 1. For bottlenose dolphin, it can be reasonably assumed that most bottlenose dolphins will be located within a 6km region from the coastline, and those coastal areas may be comparable to other high use areas in the regional marine mammal study area (such as in outer Cardigan Bay which has higher densities, as described in Lohrengel *et al.*, 2018). Therefore the assessment is based on the noise contours overlapping with the 6km zone from the coast. This was the approach taken in Awel y Mor.

1.2 Reference populations

As part of the impact assessment for the Mona Offshore Wind Farm, we use reference populations at a relevant spatial scale to assess proportions of species populations potentially impacted by the project (particularly for underwater sound). For cetaceans, we are using relevant management units (MUs) from the Inter-Agency Marine Mammal Working Group (IAMMWG) for our reference populations, and for pinnipeds we are using seal MUs (SMUs) from SCOS.

For pinnipeds in the vicinity of the proposed development (harbour seal and grey seal), the offshore wind projects overlap two SMUs (12 Wales and 13 NW England), however, in the wider Irish and wider Celtic Sea, there are four SMUs (12 Wales, 13 NW England, 14 Northern England, 1 SW Scotland). Telemetry studies from Sea Mammal Research Unit (SMRU) show potential connectivity with offshore wind projects and the surrounding four SMUs for grey seal (Figure 1) and harbour seal (Figure 2). For grey seals there is also some additional connectivity with the West Scotland MU but taking a precautionary approach and thus not adding additional populations to dilute any effects, we have excluded this SMU and plan to use the four SMUs that overlap the Irish Sea.

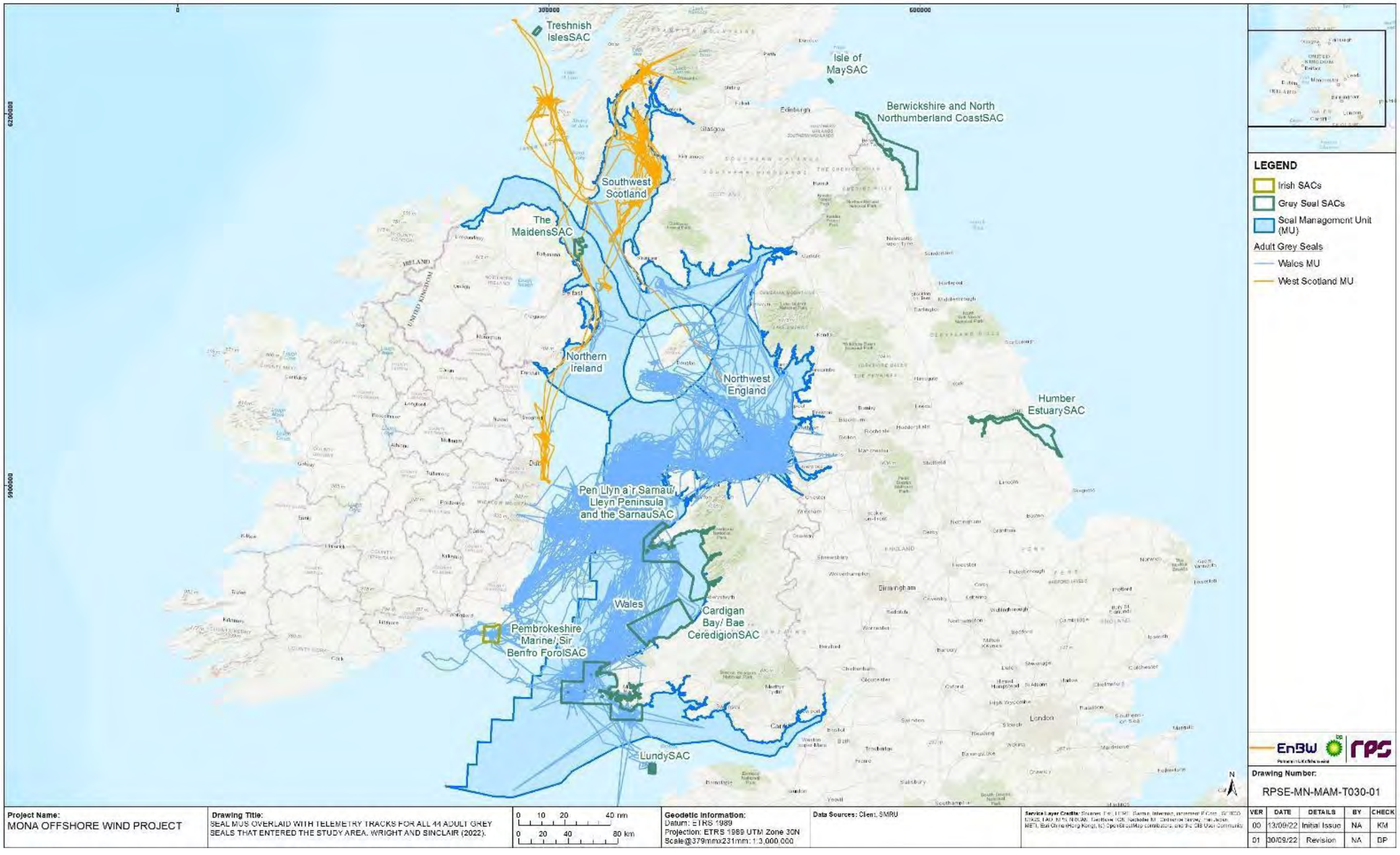

Figure 1: Seal MUs and telemetry tracks for 44 adult grey seals that entered the regional marine mammal study area. Data provided by SMRU (Wright and Sinclair, 2022).

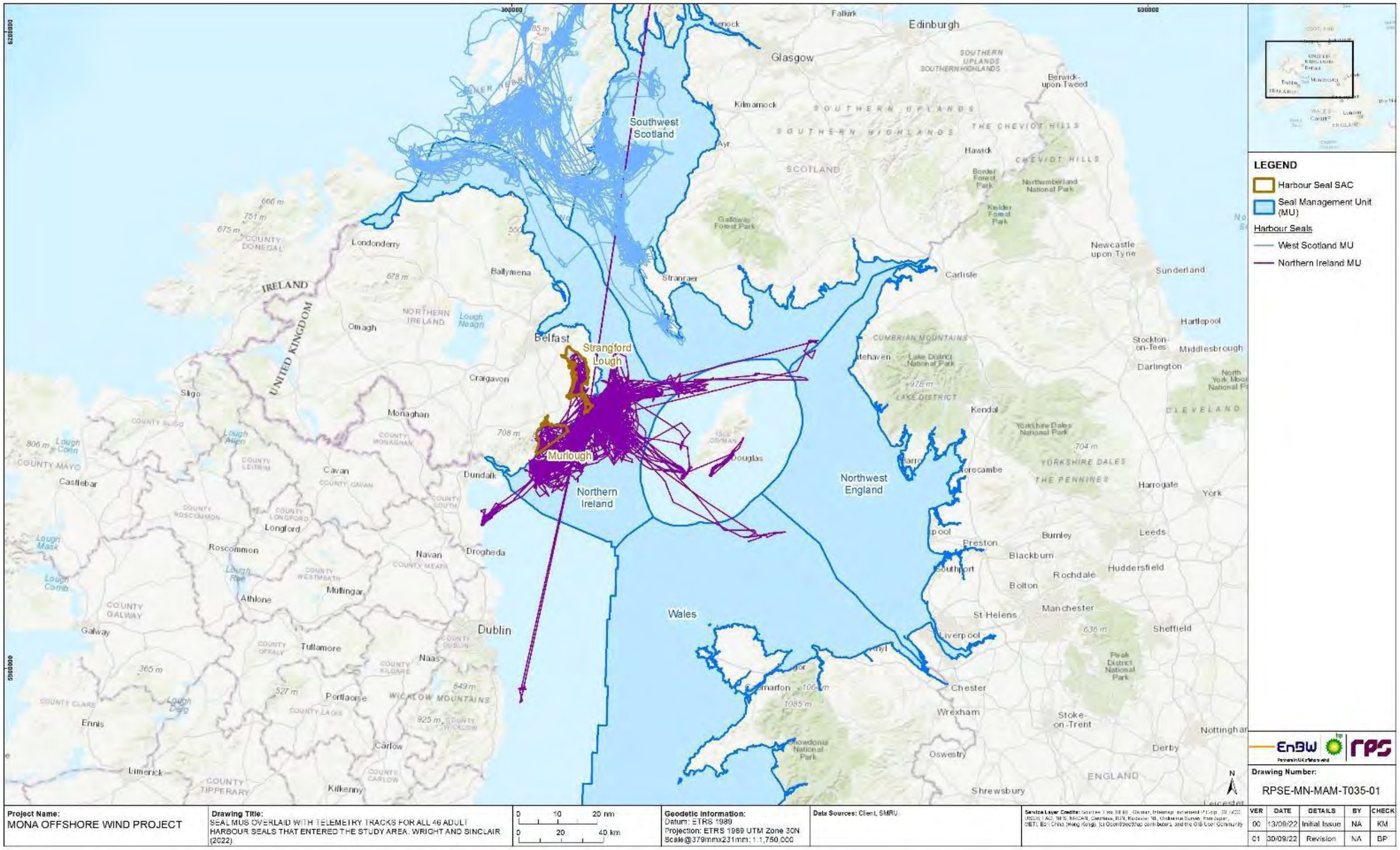

Figure 2: Seal MUs and telemetry tracks for 46 adult harbour seals that entered the regional marine mammal study area. Data provided by SMRU (Wright and Sinclair, 2022).

1.3 Summary

We seek agreement from stakeholders on the items in Table 2.

Table 2: Items to be agreed via consultation with members of the EWG.

Item	Date	Issue on which agreement is sought
1	30/09/2022	Use of densities of key marine mammal species as outlined in Table 1.
2	30/09/2022	Use of 6km coastal region for bottlenose dolphin densities, as in Awel y Mor.
3	30/09/2022	Use of the cumulative population estimates of all four SMUs as an appropriate reference population against which to assess population impacts from the project for grey seals and harbour seals.
4	30/09/2022	Using the relevant MUs from IAMMWG for cetaceans as a reference population against which to assess impacts is acceptable. For harbour porpoise this is the Celtic and Irish Sea MU, for bottlenose dolphin this is the Irish Sea MU, for short-beaked common dolphin/Risso's dolphin/Minke whale this would be the Celtic and Greater North Seas MU.

1.4 References

Hammond, P. S., C. Lacey, A. Gilles, S. Viquerat, P. Börjesson, H. Herr, K. Macleod, V. Ridoux, M. Santos, M. Scheidat, J. Teilmann, J. Vingada, and N. Øien. (2017) Estimates of cetacean abundance in European Atlantic waters in summer 2016 from the SCANS-III aerial and shipboard surveys. Wageningen University. 40p.

Hammond, P. S., C. Lacey, A. Gilles, S. Viquerat, P. Börjesson, H. Herr, K. Macleod, V. Ridoux, M. Santos, M. Scheidat, J. Teilmann, J. Vingada, and N. Øien. (2021) Estimates of cetacean abundance in European Atlantic waters in summer 2016 from the SCANS-III aerial and shipboard surveys. Revised June 2021.

Lohrengel, K., Evans, P.G.H, Lindenbaum, C.P, Morris, C.W and Stringell, T.B (2018) Bottlenose Dolphin Monitoring in Cardigan Bay, 2014 – 2016. NRW Evidence Report 191, 162 pp, Natural Resources Wales, Bangor.

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C.4.6 Response from JNCC regarding the Densities and Reference Populations Note

[redacted]
Senior Marine Consultant
RPS | Energy
Goldvale House
27-41 Church Street West
Woking
Surrey
GU21 6DH

JNCC Reference: OIA-09024
Date: 17 October 2022

Dear [redacted]

Morgan and Mona Offshore Wind Projects – Expert Working Group 03 Consultation on Densities and Reference Populations

Thank you for consulting JNCC on the bp/EnBW, Expert Working Group 03 Marine Mammal Densities and Reference Populations consultation, which we received on 3 October 2022.

The JNCC advice contained within this minute is provided (under a Discretionary Advice Service agreement) as part of our advisory role relating to nature conservation in UK offshore waters (beyond the territorial limit). We have subsequently concentrated our comments on aspects of the documents that we believe relate to offshore waters.

Any advice or assistance provided by JNCC via our Discretionary Advice Service is advisory only, and with reference to the General terms and conditions for DAS chargeable services, JNCC excludes any warranty that the advice provided by its officers represents JNCC's opinion or otherwise binds JNCC when acting as a Statutory Consultee.

Marine Mammal Comments

Whilst we agree with the methodology and figures obtained for the cetaceans species in Table 1, we do question how the densities were obtained for the two pinniped species, given that the reference provided does not supply individual densities for each individual 25km^2 cell (only density maps are provided). We would therefore appreciate more detail regarding how these densities were derived.

JNCC agrees with the use of a 6km coastal region for bottlenose dolphin densities, in line with the methodology used for Awel-y-Môr.

We are happy with the approach being taken with regard to the seal Management Units (MUs).

JNCC also agree with the cetacean MUs being used as reference populations.

Please contact me with any questions regarding the above comments.

Yours sincerely,

[redacted]

Offshore Industries Adviser

Email: [redacted]

Telephone: [redacted]

C.4.7 Response from Natural England regarding the Densities and Reference Populations Note

From: [redacted]
To:
Subject: RE: Morgan and Mona Offshore wind Marine Mammal EWG
Date: 20 October 2022 11:56:58
Attachments: [redacted]

CAUTION: This email originated from outside of RPS.

Date: 20 October 2022
Our ref: DAS/UDS A000566 / 408924
Your ref: Morgan and Mona - Marine Mammals EWG: Clarification on MUs

[redacted]
BP Alternative Energy Investments Limited

c/c [redacted]
RPS/ Energy

Dear [redacted]

Discretionary Advice Service (Charged Advice) - UDSA000566
Contract Reference: BP EnBW Morgan and Mona Offshore Wind Farm
Consultation: Morgan and Mona - Marine Mammals EWG: Clarification on Mus

This advice is being provided as part of Natural England's Discretionary Advice Service in accordance with the Quotation and Agreement dated 17 May 2021 to BP Alternative Energy Investments Limited.

The following advice is based upon the information presented in the briefing note '*Morgan Mona EWG Clarification on MUs*' (titled 'EWG 03 CONSULTATION ON DENSITIES AND REFERENCE POPULATIONS') provided by Samantha Tuddenham, RPS by email (3 October 2022).

Comments

The proposed approach regarding the densities and reference population appears appropriate but considering that Mona Offshore Wind Farm is in Welsh waters we defer to Natural Resources Wales to provide the agreement.

Nonetheless, we would like to seek a clarification on the following point, which will also apply for Morgan Offshore Wind Farm once the densities have been presented:

- Can the applicant please clarify how they are going to use multiple densities (i.e. average and maximum) (Table 1 *Summary of marine mammal receptors to be considered in the EIA together with relevant densities and references*)?

For clarification of any points in this email, please contact me using the details provided below.

The advice provided in this letter has been through Natural England's Quality Assurance process. The advice provided within the Discretionary Advice Service is the professional advice of the Natural England adviser named below. It is the best advice that can be given based on the information provided so far. Its quality and detail is dependent upon the quality and depth of the

information which has been provided. It does not constitute a statutory response or decision, which will be made by Natural England acting corporately in its role as statutory consultee to the competent authority after an application has been submitted. The advice given is therefore not binding in any way and is provided without prejudice to the consideration of any statutory consultation response or decision which may be made by Natural England in due course. The final judgement on any proposals by Natural England is reserved until an application is made and will be made on the information then available, including any modifications to the proposal made after receipt of discretionary advice. All pre-application advice is subject to review and revision in the light of changes in relevant considerations, including changes in relation to the facts, scientific knowledge/evidence,policy, guidance or law. Natural England will not accept any liability for the accuracy, adequacy or completeness of, nor will any express or implied warranty be given for, the advice. This exclusion does not extend to any fraudulent misrepresentation made by or on behalf of Natural England.

Yours sincerely,
Aurelie

[redacted]
Strategic Coastal Lead Adviser
Coast and Marine Team
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Mobile: [redacted]
[redacted]

ne-email-signature

From: [redacted]
Sent: 03 October 2022 14:50
To: [redacted]

C.4.8 Response from NRW regarding the Densities and Reference Populations Note

Project Mona & Morgan Marine Mammal EWG03 NRW Actions

[redacted]

15th December 2022

Introduction

This advice is provided in response to the Meeting Actions from the Marine Mammal EWG 03 which took place on 17th November 2022.

NRW advice in this document is provided (under a Discretionary Advice Service agreement) in respect of a proposal which will require an application for which Natural Resources Wales is a Statutory Consultee.

The customer acknowledges that the content of any advice or assistance provided by NRW is advisory only and that it shall not be deemed to bind or in any other way restrict NRW in performing its statutory functions.

The recipient acknowledges that:

- any advice given or materials or documentation provided by NRW do not constrain or bind NRW in respect of its statutory functions or its role as a statutory consultee or any decision NRW may make in relation to any application for a licence or permit;
- any advice given by NRW does not bind NRW in respect of any future representations it may make as statutory consultee or any decision NRW may make in relation to any application for a licence or permit;
- any views or opinions expressed by NRW are without prejudice to the consideration NRW may be required to give to any application or any future representations as statutory consultee or any decision NRW may make in relation to any application for a licence or permit;
- the final decision as to any representations made by NRW as statutory consultee will be based on all the relevant information available to NRW at the time it makes such representations;
- NRW cannot and does not give any guarantee as to the representations it may make as statutory consultee; and,
- any advice given by NRW may be overtaken by changes in available information, law, policy and guidance relevant to the subject matter of the advice.

Receptors Consulted:
Marine Mammals

Actions

NRW to provide feedback on the suggestion to present a qualitative assessment on local haul out sites

NRW Advisory (A) agree with the suggestion to present a qualitative assessment on local haul out sites in addition to the use of the OSPAR III management unit as the relevant population scale.

NRW to confirm if the maps from the Welsh marine atlas can be shared with the EWG

These maps have necessarily been shared on an 'Official-Sensitive' basis, so we kindly ask that they are not distributed further at this stage.

NRW to provide the average density and confidence limits for the area of search provided by RPS from the Welsh Marine Atlas

This action is currently in progress. NRA (A) are awaiting further response and some additional clarification from the authors.

NRW to consider if there is an alternative approach to overlaying noise contours on the BND atlas that would be acceptable

NRW (A) recommend the use of an alternative fixed noise threshold, such as the 160dB SPL_{rms} threshold for impulsive noise (NMFS 1995, 2005) over the use of a harbour porpoise dose response curve. While the latter is a pragmatic approach, harbour porpoise are likely to be more sensitive to the effects of pile-driving than bottlenose dolphin. This is likely to lead to over-precautionary results, which the number of individuals impacted in the initial modelling carried out by the applicant would suggest.

The indications from the literature indicate that bottlenose dolphin (and minke whale) are more tolerant to noise than harbour porpoise. For bottlenose dolphin, whilst there is currently insufficient data for a species-specific threshold, a few studies have looked at their reactions to impulsive sounds (but not enough for a definite threshold). Graham *et al*. (2017) studied reactions of bottlenose dolphins (and porpoises) to impact and vibratory pile driving noise of small-diameter monopiles. Dolphins did not flee the study area, but stayed away from the vicinity of the construction site. Received sound exposure levels (single pulse SEL, unweighted) were estimated to be between 129 and 133 dB re. 1 μPa^2s . Fernandez-Betelu *et al*. (2021) also studied the response of bottlenose dolphins to pile driving noise, but from larger piles at the Beatrice and Moray East offshore wind farms. Dolphins remained in the area, but some changes in their behaviour were noted. Received sound exposure levels (single pulse SEL, unweighted) were estimated to be 128 dB re. 1 μPa^2s.

NRW to provide supporting paper for the 143db threshold

Please find attached: Brandt *et al*. (2018), Heinis *et al*. (2019), and Tougaard (2021), in addition to a table from Tougaard (2021), which summarises the relevant studies of full-scale pile driving operations on which this threshold is based.

NRW (A) recommends that bespoke noise modelling is required for any proposed activity that may generate impulsive noise (e.g. pile driving, seismic surveys). An unweighted noise threshold of 143 dB re 1µPa^{2}s (or 103 dB re 1µPa^{2}s VHF-weighted) single strike sound exposure level is recommended to represent the minimum noise threshold at which disturbance would occur from impulsive noise sources (Brandt *et al*. 2018; Heinis *et al*. 2019). The 143 dB re 1µPa^{2}s noise contour should be displayed on a map of the area to find the extent of overlap with the SAC, and the extent of the area of the SAC that would experience noise disturbance can then be determined. This threshold is the modelled average of six different studies of full-scale pile driving operations (see attached figure) and thereby represents the largest amount of empirical data (Tougaard, 2021).

NRW to provide Brandt et al. 2018

Please find attached: Brandt *et al*. (2018), Heinis *et al*. (2019), and Tougaard (2021).

NRW to provide an estimated timeframe of when the Welsh marine atlas will be published

NRW (A) currently estimate publication of the Welsh Marine Atlas in Quarter 1 2023.

References

- Brandt MJ, Dragon AC, Diederichs A, Bellmann MA, Wahl V, Piper W, Nabe-Nielsen J, Nehls G. 2018. Disturbance of harbour porpoises during construction of the first seven offshore wind farms in Germany. Mar. Ecol. Prog. Ser. 596: 213 – 232.

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- Graham IM, Pirotta E, Merchant ND, Farcas A, Barton TR, Cheney B, Hastie GD, Thompson PM. 2017. Responses of bottlenose dolphins and harbor porpoises to impact and vibration piling noise during harbor construction. Ecosphere. 8.

- Heinis F, de Jong CAF, von Benda-Beckmann S, Binnerts B. 2019. Framework for Assessing Ecological and Cumulative Effects–2018 Cumulative effects of offshore wind farm construction on harbour porpoises. Rijkwaterstaat Sea and Delta.

- Tougaard J. 2021. Thresholds for behavioural responses to noise in marine mammals - Background note to revision of guidelines from the Danish Energy Agency.

C.5. Marine mammals EWG meeting 4

C.5.1 Meeting minutes

MINUTES OF MEETING

Security Classification: Project Internal

Partners in UK offshore wind

MOM Number	:	20230209_bpEnBW_MM EWG04_MoM	**REV. No.**	:	F02
MOM Subject	:	Mona and Morgan Generation Offshore Windfarms Marine Mammal Expert Working Group 04			

MINUTES OF MEETING

MEETING DATE	:	09/02/2023
MEETING LOCATION	:	MS Teams
RECORDED BY	:	[redacted] (RPS)
ISSUED BY	:	[redacted] (RPS)

PERSONS PRESENT:

- [redacted] – bp (MP)
- [redacted] – bp (DH)
- [redacted] – RPS (KL)
- [redacted] – RPS (ST)
- [redacted] – RPS (BP)
- [redacted] – RPS (Lbu)
- [redacted] RPS (CL)
- [redacted] – JNCC (LM)
- [redacted] – Natural England (MNW)
- [redacted] – Natural England (LBr)
- [redacted] – Natural England (EW)
- [redacted] – NRW (LR)
- [redacted] – NRW (NM)
- [redacted] – NRW (SB)
- [redacted] – TWT (GJC)
- [redacted] – DEFA, Isle of Man D)
- [redacted] – Cefas (RF)
- [redacted] – MMO

Apologies

- [redacted] – MMO (GR)
- [redacted] – bp (GV)
- [redacted] – JNCC (JW)
- [redacted] – JNCC (AG)

ITEM NO:	DISCUSSION ITEM:	Responsible party	Date
1.	**Project update (presented by MP)** The Applicant is expecting to submit the Mona and Morgan Generation Preliminary Environmental Information Reports (PEIR) at the end of March 2023. Statutory consultation will then take place in April and May 2023. We have increased the duration of statutory consultation to 47 days as it runs over the Easter holidays so we hope this will give stakeholders more time to read and respond to the PEIRs'. Only the first year of data from the digital aerial surveys was available to feed into the Morgan Gen PEIR. The surveys end in March 2023 and the full two years of data will be incorporated into the Environmental Statement to accompany the DCO application. The Applicant will consult with the Expert Working Group (EWG) in summer 2023 to provide an update on the site-specific data and to confirm if there are any changes to the assessment as a result of the second year of data.		
2.	**Actions from EWG03 and progress of agreement (Lbu)** There are two actions remaining from the last marine mammal EWG meeting. The first is that the Isle of Man (IoM) Gov were going to provide any seal data they had for the IoM. PD- Has the Applicant checked with the Manx Wildlife Trust (MWT)? They hold most of the seal data. The harbour seal population is not very large on the IoM. KL- We have been in touch with the MWT and the Manx Whale and Dolphin Trust (MWDT). We have the non-seal data from the MWDT and grey/harbour seal data from MWT but we will follow up with an email to set out the data that we currently hold for PEIR and please can the IoM gov let us know if there are any data sources missing. The second action from the last marine mammal EWG is for Natural Resources Wales (NRW) to send RPS the densities (plus confidence limits) for the RPS area of search, drawn from Welsh Marine Atlas data. NM- We have looked at the RPS area of search and we will send over the data soon. There is one outstanding query with the modellers on the density maps. When that is resolved, we will be able to send the data. LR- The slides say the Welsh Marine Atlas data would need to be received within a certain timeframe for RPS to be able to include it in the Environmental Statement. Is there a more definite deadline that we can work to? Lbu – End of March 2023 would be the realistic deadline for when we could receive the data and include it in the Environmental Statement. It sounds like it will be available soon so hopefully that is achievable.	**RPS to send DEFA, IoM Gov an email outlining the data sources currently in the PEIR.** **IoM to check list and provide any further updates to data source.** **NRW to send Welsh Marine Atlas Data for areas of search requested.**	Completed Ongoing Completed
3.	**Data not included in PEIR (Lbu)** As described at the start of the meeting, only the first year of data from the digital aerial surveys was available to feed into the Morgan Gen PEIR. The surveys end in March 2023 and the full two years of data will be		

	incorporated into the Environmental Statement. While the 18 month report does not feed into the PEIR, we have reviewed it and sightings data is very similar to that of the first year of data, and we are not expecting any changes to the assessments as a result of the second year of data. Further data will be consulted on via the EWG and results discussed and included in Environmental Statement.		
4.	**<u>Morgan Gen Interim baseline (Lbu)</u>** The approach to the baseline characterisation for Morgan Gen is the same as presented for Mona in the last EWG meeting. We have used three seal management units (SMUs) for harbour seal (NW England, Wales and Northern Ireland). The Scotland SMU has been removed for Morgan due to lack of connectivity with the Morgan Generation assets, as demonstrated by telemetry studies. For grey seal, we have used four SMUs (NW England, Wales, Northern Ireland and Scotland SMU) due to connectivity with all four, the IoM reference population, east Ireland and southeast Ireland regions from Duck and Morris (2019) plus OSPAR Region III. Key data sources for Morgan Gen are the same as presented for Mona in the last EWG meeting. Harbour porpoise densities for Morgan Gen are slightly higher than for Mona. We have taken forward to the assessment the absolute design-based bio-season density from the Morgan site specific aerial survey data = 0.247 animals per km^2. For bottlenose dolphin, it can be reasonably assumed that most bottlenose dolphins will be located within a 6km region from the coastline, and those coastal areas may be comparable to other high use areas in the regional marine mammal study area. Even though the Morgan Array Area does not overlap with this 6km region, the highest densities from outer Cardigan Bay from Lohrengel *et al*. (2018) have been taken forward to the assessment (0.035 animals per km^2) as a precautionary approach. For short beaked common dolphin the same density as was selected for Mona was taken forward to the Morgan Gen assessment – SCANS-II Block O (0.018 animals per km^2). For Risso's dolphin the same density as was selected for Mona was taken forward to the Morgan Gen assessment – SCANS-II Block E (0.0313 animals per km^2). For minke whale the same density as was selected for Mona was taken forward to the Morgan Gen assessment – SCANS-II Block E (0.0173 animals per km^2). For grey seal, only one density value was taken forward to the assessment (for the Morgan Array area) as the Morgan Transmission Assets will be subject to a separate consent application. Densities for Morgan Gen were slightly higher than for Mona at 0.0412 animals per km^2 from Carter *et al*. (2022). For harbour seal, only one density was taken forward to the assessment (for the Morgan Array area) as the Morgan Transmission Assets will be subject to a separate consent application. Densities for Morgan Gen were		

	slightly higher than for Mona at 0.0005 animals per km^2 from Carter *et al* (2022).		
5.	**Approach to assessment (Lbu)** The approach to the EIA for Morgan Gen is the same as was presented for Mona in the previous EWG meeting. The cumulative assessment has taken a tiered approach where projects are placed into tiers based on where they are in the planning process, information available in the public domain, and when they will become operational. Population modelling (iPCoD) was carried out for Tier 1 projects – Morgan Gen plus Awel y Môr, with sequential piling (previous year) at Project Erebus, and for Mona which is a Tier 2 project but we hold quantitative data for. All other projects in Tier 2 do not have the data available in the public domain that would be needed to include them in the population modelling. Therefore an assessment of those projects has been done qualitatively. If further data becomes available on these projects between PEIR and the Environmental Statement, then this will be taken into account and a quantitative assessment will be undertaken where possible. Any updated data will be taken into account up to three months before application to allow it to be included in the assessment.		
6.	**Initial underwater sound modelling outputs (Lbu)** The approach to underwater sound modelling for Morgan Gen is the same as presented for Mona in the last EWG meeting. Modelling showed that underwater noise contours which represent the greatest spatial range are those associated with concurrent piling for two piles (when compared to single piling, or consecutive piling of two piles). The ranges are very similar to the modelling for Mona. PTS ranges presented are very similar for Morgan Generation compared to Mona. Ranges presented include primary mitigation. With the implementation of ADDs as tertiary mitigation, the thresholds for PTS were not exceeded for HF cetaceans or seals. Residual ranges of effect for concurrent piling (maximum spatial scenario), using the SELcum metric were 20m (no more than one animal) for harbour porpoise and just over a 1km for minke whale (no more than one animal). For behavioural responses, as with Mona, a dose response approach was applied where unweighted sound exposure level single strike (SEL_{ss}) contours were plotted in 5dB isopleths in decreasing increments from 180dB to 120dB re.1µPa^{2}s using the highest modelled received sound level. Disturbance during piling was predicted to have far-reaching effects across the north part of the Irish Sea, noting however, that the extent is likely to be an overestimate as it assumes that the sound maintains its impulsive characteristics at large distances, which is considered unlikely to be the case. As a comparison with the NMFS 2005 thresholds for mild and strong disturbance, the 150dB SELs contour, which equates to the 160dBrms contour from NMFS 2005 is relatively localised. Beyond this point disturbance is considered to be mild.		

	When overlaying behavioural noise contours with Carter *et al.* (2022) seal at-sea usage densities, it can be seen that areas of strong disturbance response overlap with low densities of grey and harbour seal, and higher densities overlap with contours representing mild disturbance responses. The piling locations selected to be taken forward for modelling have been chosen to be closest to the marine mammal high density areas. *Post meeting note from Cefas: Are the residual ranges of effect for concurrent piling correct? We can provide further comments on the noise modelling once we have reviewed full details of the assessment and approach.* *Applicant response: Yes, this is correct. Range with 30 mins ADD was 20m for harbour porpoise and 1,221m for minke whale for the Morgan Generation Assets.*		
7.	**<u>Cumulative assessment results (LBu)</u>** The tables in the accompanying slides show the number of animals disturbed from the Tier 1 projects and Mona in addition to the Morgan Generation project. The results presented are for Morgan but are representative for Mona as well. The numbers of animals disturbed is based on the maximum spatial scenario with concurrent piling. They do not take into account any of the measures adopted as part of the Morgan generation assets. 39 bottlenose dolphin (13.3% of the Irish Sea MU) could be disturbed by simultaneous piling at Morgan and Awel Y Môr (Tier 1), and 33 bottlenose dolphin (10.97%) at Morgan Generation and Mona (Tier 2). Assessments found that most of the disturbance at Morgan and Awel Y Môr would occur in offshore waters where densities of bottlenose dolphin are lower. iPCoD modelling showed a small difference between the impacted and unimpacted population size over time, although the model statistics suggests that this falls within the natural variation of the population. The cumulative impact could result in potential reductions to lifetime reproductive success to some individuals in the Irish Sea MU population. The effect on bottlenose dolphin will, therefore, potentially be of moderate adverse significance for the bottlenose dolphin Irish Sea MU population, which is significant in EIA terms, but of minor adverse significance for the wider Offshore Channel and Southwest England MU plus Irish Sea MU population, which is not significant in EIA terms. This is a conservative assessment as it has several layers of precaution built in (e.g. in the noise modelling, the project parameters and the approach to assessment, particularly for the concurrent piling scenario). PD- We are in touch with Orsted on the IoM wind farm, we could put you in touch with the Orsted team to see if you would need to include them in the cumulative assessment. KL- Thank you for the offer, the Applicant is in touch with Orsted however the detail we need to be able to include the project in the cumulative assessment will likely only be available when the EIA is concluded and is in the public domain.		

	MP- The scoping report for the IoM wind farm is not in the public domain therefore we have not been able to consider it in the cumulative assessment. LR- Would it be possible to present the approximate piling and construction dates in the PEIR? KL- Yes this is in the PEIR. The cumulative assessment sets out the construction period for all the tier 1 and 2 projects.		
8.	**<u>Cumulative assessment- PEIR to Es (LBu)</u>** The Applicant is looking to reduce the impact of piling from the project alone for both Morgan Gen and Mona. This is currently being investigated so we do not have any details to share, but we will investigate topics such as project refinements and noise abatement. It will be discussed with the EWG when we have further details. KL- The assessment shows that for bottlenose dolphin, some populations may be affected so the Applicant is looking at what the project can commit to, to reduce the impact of the project on this receptor (with consequent benefits to other receptors). Please read the detail at PEIR and consider the evidence included in PEIR to support the conclusion that has been made, particularly for other species. PD- At what phase would the details of measures to reduce the impact be available? KL- The PEIR will be published soon and this will contain the initial assessment. The Applicant has started investigating what can be done to reduce the project alone effect. The intention is that after we have received the section 42 response, will have an EWG meeting and the Applicant will be able to provide an update on the progress of the work investigating reducing the piling impact. We are unlikely to have all the details and updated assessment outputs at that meeting. We may have another EWG meeting at the end of the summer to provide an update on the updated assessments. The Applicant aims to discuss the key topics in the DCO application with the EWG before submission so there are no surprises. PD- When the additional measures are developed is the model then run again to see how this would affect the population? KL- Yes, the final application will have a revised marine mammal assessment with revised modelling if required. Any changes to the Morgan Generation project and additional data are to be taken into account, and this will be run through the population modelling.		
9.	**<u>Population modelling (LBu)</u>** The population modelling simulates the mean population difference between the impacted and un-impacted population to provide comparison of the type of changes that could occur resulting from natural environmental variation, demographic stochasticity and human-induced disturbance. The parameters used in the population modelling were those provided by NRW. Population modelling was undertaken for piling only, for the project alone and the cumulative assessment. The model itself has		

	been built from expert elicitations however it has some limitations e.g. it does not take into account the locations of the other projects included (for example, how far away Project Erebus is) and it doesn't incorporate density dependent elicitation. The population model only allows for the assessment of harbour porpoise, bottlenose dolphin, minke whale and grey seal currently. We have used the most conservative demographic parameters. We would prefer to stay consistent with the assessments for the other projects in the Irish Sea to allow more meaningful comparison. PD- Risso's dolphins are important around the IoM, has that species been considered? LBu - A full assessment has been carried out on Risso's dolphin for the project alone and with cumulative projects. The iPCoD model provides additional justification and evidence for the assessment, but a robust assessment has been caried out for Risso's dolphin without the modelling. The iPCoD model does not currently have the required detailed parameters for modelling for Risso's dolphin. For concurrent piling at the project alone, the impacted population of bottlenose dolphin only had one fewer individual than the unimpacted population after 25 years. For all other species, whilst the modelling outputs predict declining population trajectories, there was predicted to be very little difference between the impacted and unimpacted populations. Therefore for all species it was considered that there is no potential for long term population impacts from the project alone. For concurrent piling in the cumulative assessment, there were five fewer bottlenose dolphin in the impacted population compared to the unimpacted population after 25 years. This is in the context of an already declining population. PD- Why does the impacted population not revert back to the unimpacted population after 20 years? BP- This cannot be attributed to one factor alone, but it is likely due to the susceptible nature of the species (e.g. low fertility rate, 9 years before first birth of calf) of bottlenose dolphin. If you have an impacted population, it would take a high fertility rate and high survival rates to recover to the levels of the unimpacted population, which bottlenose dolphin does not have. The population is declining, and therefore with or without the impact, it is not a growing population. This is also in the context of a small population.		
10	**<u>Approach to agreement (KL)</u>** The focus now is on the approach to agreement as part of the EPP remit and building towards the statement of common ground that will be submitted with or soon after the application for consent. When you read the PEIR we would appreciate it if you could think about agreement on the baseline and assessments, keeping in mind the agreements we are aiming for, for the application. If you do not agree with what is in the PEIR, please focus on what the Applicant can provide to get agreement. It is important to note that the HRA and EIA process are a step in the process to agree how the Applicant can build these projects with minimal impact to the		

	environment. The Applicant is looking to get as much agreement as possible before the application. CL- As you are reading PEIR, if you have any questions or if there is anything we can do to aid your understanding or navigation of the PEIR, please get in contact with KL or ST.		
11	**<u>Next steps (KL)</u>** Next steps: • Meeting minutes to be circulated 2 weeks following the EWG. • If applicable, agreement logs to be circulated following EWG. The EWG05 will be organised in summer 2023 to discuss the section 42 response and updates for the Environmental Statement.		

C.5.2 Response from Natural England regarding the meeting minutes

Date: 13 March 2023
Our ref: DAS/UDS A000566 / 412776
Your ref: Morgan and Mona Marine Mammal Expert Working Group 04

[redacted]
BP Alternative Energy Investments Limited

c/c [redacted]
RP

Hornbeam House
Crewe Business Park
Electra Way
Crewe
Cheshire CW1 6GJ

T [redacted]

BY EMAIL ONLY

Dear [redacted]

Discretionary Advice Service (Charged Advice) - UDS A000566
Contract Reference: BP EnBW Morgan and Mona Offshore Wind Farm
Consultation: Morgan and Mona Offshore Windfarm Marine Mammal EWG04

This advice is being provided as part of Natural England's Discretionary Advice Service in accordance with the Quotation and Agreement dated 17 May 2021 to BP Alternative Energy Investments Limited.

The following advice is based upon the information presented in the Marine Mammal Expert Working Group (EWG) Meeting 4 (attended on 09 February 2023 by [redacted] .

Natural England were asked to provide advice upon:

1. Agreement on approach to densities and reference populations – harbour porpoise
2. Agreement on approach to densities and reference populations – bottlenose dolphin

Detailed comments

Natural England agrees with the current approach to densities and reference population for harbour porpoise/bottlenose dolphins. However, Natural England reserves the right to review its position after the inclusion of the densities from the Welsh Marine Atlas.

For clarification of any points in this letter, please contact me using the details below.

Yours sincerely
[redacted]

Marine and Coastal Lead Adviser
Coast and Marine Team
Cheshire to Lancashire Area Team
[redacted]

☒The advice provided in this letter has been through Natural England's Quality Assurance process.

The advice provided within the Discretionary Advice Service is the professional advice of the Natural England adviser named below. It is the best advice that can be given based on the information provided so far. Its quality and detail is dependent upon the quality and depth of the information which has been provided. It does not constitute a statutory response or decision, which will be made by Natural England acting corporately in its role as statutory consultee to the competent authority after an application has been submitted. The advice given is therefore not binding in any way and is provided without prejudice to the consideration of any statutory consultation response or decision which may be made by Natural England in due course. The final judgement on any proposals by Natural England is reserved until an application is made and will be made on the information then available, including any modifications to the proposal made after receipt of discretionary advice. All pre-application advice is subject to review and revision in the light of changes in relevant considerations, including changes in relation to the facts, scientific knowledge/evidence, policy, guidance or law. Natural England will not accept any liability for the accuracy, adequacy or completeness of, nor will any express or implied warranty be given for, the advice. This exclusion does not extend to any fraudulent misrepresentation made by or on behalf of Natural England.

Cc [redacted]

C.6. Marine mammals EWG meeting 5

C.6.1 Meeting minutes

MINUTES OF MEETING

Security Classification: Project External

Partners in UK offshore wind

MOM Number	:	20230629_Morgan and Mona MM	**REV. No.**	:	F02
MOM Subject	:	Morgan and Mona Evidence Plan marine mammals EWG meeting 5			

MINUTES OF MEETING

MEETING DATE	:	29/06/2023
MEETING LOCATION	:	Microsoft Teams
RECORDED BY	:	[redacted] (RPS)
ISSUED BY	:	[redacted] RPS)

PERSONS PRESENT:

- [redacted] bp (GV)
- [redacted] – bp (SR)
- [redacted] bp (DH)
- [redacted] – RPS (KL)
- [redacted] – RPS (ST)
- [redacted] – RPS (BP)
- [redacted] – RPS (TMc)
- [redacted] – JNCC (JW)
- [redacted] – JNCC (LM)
- [redacted] – JNCC (AG)
- [redacted] – MMO (AP)
- [redacted] – Natural England (EW)
- [redacted] – NRW (LR)
- [redacted] – NRW (EL)
- [redacted] – Martin – NRW (NFM)
- [redacted] – NRW (SB)
- [redacted] – Cefas (RF)
- [redacted] – TWT (BS)

ITEM NO:	DISCUSSION ITEM:	Responsible party	Date
	Project updates (presented by GV) Statutory consultation on the Mona and Morgan Generation PEIRs ended on 4th June. The Applicant appreciates all the feedback; we are currently reviewing all the responses and how they can be addressed. From the statutory consultation feedback and parallel activities, the Applicant has been considering a number of project updates. There are several updates to the project description envelope that are expected to be included in the application. The Applicant is looking to reduce the Mona Array Area and the Morgan Generation Array Area. They are expected to be reduced from what was presented in PEIR and lie wholly within the array areas presented in the PEIR. The Mona Array Area is anticipated to		

	be reduced by approximately 33% and lie wholly within Welsh offshore waters. The Morgan Array Area is anticipated to be reduced by approximately 10%. The primary driver for these reductions is shipping and navigation, specifically ensure safety of navigation. The need for changes for the project design envelope has been highlighted through engagement with a number of the ferry companies in the Irish Sea. The reductions have also been driven through consultation with aviation and other sea users receptors. The layout principles for both Mona and Morgan Generation are expected to be updated to increase the spacing requirements between offshore structures, the specific updates will be communicated in due course. These updates are to address concerns from commercial fisheries. The Applicant is anticipating that monopile foundations will be removed from the project design envelope. The foundations options remaining will be gravity base or jackets (which may be pin piled or suction bucket foundations). This is being driven by the ground conditions. The Applicant expect there to be a mixed foundation solution taken forward to the application, likely to be a mix of jacket and gravity base foundations. The smallest wind turbine option is being removed from the project design envelope due to feedback from the supply chain that this turbine option will not be available at the time of construction. The rotor diameter will therefore also increase from 280m to 320m and this is also based on feedback from the supply chain on the parameters for the wind turbines that will be available at the time of construction. <u>Post meeting note:</u> *The rotor diameter will increase from 280m to 320m not 340m, as set out in the slide pack. The slide pack has been updated and is circulated alongside these meeting minutes.* The Applicant is also reviewing the parameters for the design envelope following the section 42 statutory consultation responses. Any updated parameters will be fully explained and justified within the application. GV asked if anyone had any questions or comments. No response or questions raised.		
	<u>Actions from the last EWG (presented by BP)</u> RPS sent DEFA, IoM Government a list of data sources currently in the PEIR. DEFA, IoM were to check list of data sources in PEIR and provide any further data sources if required. IoM government did not identify any additional data sources in their response to statuary consultation therefore we consider this closed. NRW have sent the Welsh Marine Atlas Data for areas of search requested for harbour porpoise and bottlenose. We note the Welsh Marine Mammal Atlas has been released and shapefiles are available on the data portal, and we have received		

	access to shapefiles. We will review densities for the Environmental Statement.		
	<u>Section 42 responses - overarching (presented by KL)</u> The Applicant and RPS have been working through all the S42 responses, looking to the project design envelope and the environmental assessment. There were a couple of key responses that we wanted to raise to the EWG. There were several requests for the projects to undertake assessments for historic projects where quantitative information required to include them in the cumulative and in-combination assessments is not available. The cumulative and in-combination assessment can only be undertaken on publicly available data and it may not be appropriate to undertake analysis for other projects. There is also no precedent for that type of analysis – this is to be discussed at the Offshore Ornithology EWG tomorrow. The IoM offshore windfarm is in the early stage of the planning process and we expect the scoping report to be published in the autumn. We will incorporate the information in the public domain into the cumulative and in-combination assessment for Mona and Morgan Generation, in line with the Tiered approach. There were a few comments on the site specific data available to be included in the PEIR. The benthic data for the Mona Offshore Cable Corridor and the zone of influence for the Mona and Morgan Array Areas will be presented in the July benthic, fish and shellfish and physical processes EWG. For marine mammals and offshore ornithology, the 24 months of survey data for Morgan Generation will be presented and discussed in the October EWG meetings for those topics. Natural England provided comments on the Morgan Generation and the Morgan and Morecambe Offshore Wind Farms: Transmission Assets (Transmission Assets) applications to ensure that a whole project assessment is undertaken. Are there specific topics or receptors that are of particular concern for the cumulative assessment for Morgan Generation and the Transmission Assets together? The Applicant is considering how human topic cumulative impacts are addressed and we have strategies for those impacts. For Morgan Generation, we will be undertake a whole project assessment within the cumulative effects assessment (CEA). The Transmission Assets will be included within the CEA as a separate section so it clearly presents the impact of the Morgan Offshore Wind Project as a whole project. We can only base the CEA on information in the public domain. These projects are subject to separate consent applications so there will always be difficulty regarding what information is available at the time of application. However, that is why the tiered approach to CEA was developed and adopted and we feel		

	the approach set out in the slides adequately addresses the concerns raised. We will circulate the slides after the meeting so you can review the approach to CEA in full. Please can the stakeholders provide their feedback in writing with the meeting minutes.	**Stakeholders to provide their feedback on the approach to the CEA for Morgan Generation**	Complete
	Section 42 responses – marine mammals (presented by BP) S42 Response: The Applicant received feedback from several stakeholders that noise abatement should be included in the dMLs. The Applicant will be following the required guidance at the time of construction. We are expecting further guidance to come out of the ongoing Defra workstream. The Applicant also received responses that the impact assessment should be based on modelling with no ADDs. As we have done for PEIR, most assessments are modelled with and without ADDs to demonstrate how effective ADDs are. The assessment is based on an indicative standard maximum of 30 minutes ADD use. Our understanding is that ADDs are included as part of mitigation as a standard industry measure (such as PAM/MMO) and is therefore considered a tertiary mitigation measure. It would be unrealistic to base modelling on scenarios with no ADD, as this will not happen. Therefore whilst an indicative ADD duration is modelled, further detail on ADD duration and use will be included in the Marine Mammal Mitigation Protocol (MMMP) which will be refined and agreed post consent. LR- We can take this away and provide a response. S42 Response: NRW statutory consultation response did not agree with using a dose-response approach in parallel with the EDR approach for assessing disturbance in harbour porpoise SACs for the HRA, however JNCC and Natural England did agree with using the EDR approach. NRW recommend using an unweighted noise threshold of 143 dB re 1µPa2s (or 103 dB re 1µPa VHF-weighted) to represent the minimum fixed noise threshold at which significant disturbance to harbour porpoise could occur for the application. The Applicant suggested approach is to present this 143 threshold alongside the EDR for the HRA. The dose response approach will be removed for the HRA only. The dose response will be retained for the EIA. JW- If stakeholders disagree on the approach then we are happy to see both methods presented. NFM- Yes this would be fine to see both approaches presented. <u>Post meeting note:</u> *NRW originally helped develop the EDR approach in conjunction with other SNCBs but divested from endorsing the SNCB guidance to allow greater flexibility when assessing disturbance in Welsh waters. NRW have recently developed their own position statement on assessing disturbance in harbour porpoise SACs, which can be found online. As can be noted in the position statement, NRW do not explicitly exclude the use of EDRs (they have previously been used in their advice, e.g. for*	**NRW to provide a response to the proposed modelling approach regarding ADDs.** **JNCC to feedback on the inclusion of the UXO activities in the DCO consent rather than a separate marine licence.**	Complete Complete

	geophysical surveys). NRWs approach has been to rank different approaches, and as a result of this our preferred method for assessing the impacts of pile driving from behavioural disturbance is to use the 143 dB noise threshold. Furthermore, NRW note that in their comments on the PEIR NRW asked for a presentation of the results of both approaches in parallel, and this was also suggested in an earlier EWG (November 2022). *NRW have provided a link to their position statement on assessing disturbance in harbour porpoise SACs* Assessing behavioural disturbance of harbour porpoise from underwater noise (cyfoethnaturiol.cymru) S42 Response: JNCC statutory consultation response recommended a separate marine licence for UXO activities. The project assessment includes all types of noise and this includes UXO clearance. The worse case scenario is assessment for potentially significant impacts associated with the project. This is in line with the Planning Act 2008 and the Planning Inspectorate guidance for assessing a whole project. LM- I will take this away and request further feedback. GV- Under the Planning Act 2008, the purpose of the DCO was to act as a single consent covering all activities associated with a project. This was created to move away from a project requiring multiple different consents. TMc- Once further details of the UXO clearance are known post-consent then the MMMP would be updated to reflect this and ensure the measures are appropriate. S42 Response: NRWs statutory consultation response recommended using the Welsh Marine Atlas data and have provided the densities and data for the project to use. We will be considering those densities for taking forward to the application assessment. S42 Response: NRW recommended using the updated Welsh Marine Atlas (WMA) data and they have provided the relevant species densities and shapefiles. For bottlenose dolphin, we are proposing to no longer use the 6km coastal zone with a higher density. We are going to apply one density from the WMA across the whole study area. Is the EWG content with using one density across the whole study area for bottlenose dolphin and are they happy with using the WMA densities? TMc- We will be providing a table of the densities being taken forward to the assessment within the meeting minutes for stakeholders to consider. Please see Table 1 on page 9 of these minutes. S42 Response: JNCC do not agree with use of SCANS III Block E estimate for Minke Whale, they recommend using the UK wide mean density. During the EWG process, JNCC agreed approach via pre-EWG03 meeting note which included minke whale densities. RPS consider it preferable to use more site-specific data where	**EWG to feedback on whether they can agree to one density across the whole study area for bottlenose dolphin and if using densities from the Welsh Marine Atlas is appropriate.** **EWG to review the table of species densities and confirm agreement or provide feedback.**	Complete Complete

	applicable which is more proportionate to the area. We will be revisiting the densities taken forward to the assessment based on the latest relevant up-to-date data sources and will provide densities and reference populations as a table within the meeting minutes for agreement with EWG. Please see Table 1 on page 9 of these minutes. LM – In principle JNCC are happy for the application to use the WMA densities. With any estimate of densities there is a lot of uncertainty so we would suggest that the most conservative estimate is used. TMc- RPS agree with this approach and we would look to use the most precautionary density in the assessment. However, there is a balance between using a broad scale density vs a regional specific one and the most conservative estimate may not be proportionate. The densities chosen need to make sense within the regional context so that the assessment is conservative but proportionate. <u>Post meeting note:</u> *NRW would suggest that this could be less of an issue of proportionality, and more of an issue of data robustness. NRW generally agree with the approach that the most conservative estimate is taken (so as to be able to cover the "worst case scenario"), however if more robust data is available (e.g. Welsh Marine Mammal Atlas densities, based on 30 years of survey data), then this should take priority over snapshot surveys e.g. Scans III which take place every 11 years .* <u>Post meeting note:</u> *RPS note NRW and NE response for short-beaked common dolphin and propose instead to take forward the average density value from the Welsh Marine Mammal Atlas (Evans and Waggitt, 2023) for the Mona array area (0.0006 animals per km^2) (over the density for the marine mammal study area 0.0046 animals per km^2). This is the most robust data source, taking priority over the snapshot SCANS II surveys. Please see update to Table 1 on page 9.* S42 Response: Natural England requested that group size is taken into account when assessing the numbers potentially injured via UXO clearance. RPS's approach is to use average density across all cells for the study area, multiplied by the area of effect to give the number of animals impacted. The average density estimate used already takes into account group size. We therefore cannot make further assumptions for group size. Please can the EWG confirm they are happy with this approach to use average density across all cells for the study area. <u>Post meeting note:</u> *NRW is in agreement with NE over taking group size into consideration. Whilst this does not necessarily need to be included quantitatively as part of the assessment, it is a point which should be acknowledged qualitatively in the text of any upcoming drafts of the assessment, and in particular in any draft mitigation plans.* KL noted that the project could look at including some qualitative text in the assessment that notes the numbers are presented using	**EWG to confirm agreement or feedback on the approach to use average density (which accounts for group size) across all cells for the study area for assessment of UXO clearance.** **EWG to provide advice on the sensitivity scores to be used for PTS.** **EWG to provide any further advice on how they would like to see the assessment of disturbance from vessels.** **EWG to confirm if there are any other projects they would like to see considered for the CEA/in-combination assessments.** **EWG to confirm or feedback on approach to include consider the Irish Sea management unit for bottlenose dolphin**	Complete Complete Complete Complete Complete

	average densities and that group size is already taken into account in these density estimates. S42 Response: NRW responded to suggest that while we agree with a sensitivity of high for all receptors for PTS, a sensitivity of medium would also be acceptable. Natural England agreed with the assigned sensitivity scores which was high for PTS. We will revisit the assessment but would like further clarification from the EWG on advice regarding what sensitivity score should be used for PTS. EW- Suggest that Natural England and NRW discuss this on cross SNCB calls. KL- We understand that SNCBs can have different views but we would like some agreement or advice on what should be included in the application in regard to this conflicting advice. We are happy with the current approach but any further advice would be welcome. S42 Response: NRW responses to state that it is unrealistic to assess injury and disturbance from vessel use by presenting a sum of the impact ranges of all vessels within each OWF and further information is required to support the assessment for vessel disturbance. RPS will review the approach and revise the EIA and HRA where applicable. Is there any other suggestions on how stakeholders want to see this addressed? TMc- Was there a specific example we could look at? LR- We will have to take that question away. The CEA will be reviewed and revised with any updates to the status of projects with any new information in the public domain. The statutory consultation suggested several other projects for consideration in the CEA. Are there any other projects that stakeholders would like considered? <u>Post meeting note:</u> *In NRWs PEIR comments, NRW provided an example of how this could be done, referring to the Wylfa assessment. Although other approaches can be taken.* S42 Response: iPCoD modelling for bottlenose dolphin: Statutory consultation requested that the two populations of bottlenose dolphin in the area will need to be assessed separately as the Management Units cover different ecotypes. The suggestion for the assessment is therefore to only use the Irish Sea Management Unit for bottlenose dolphin only, which comprises the inshore ecotype (rather than combining MUs). This means Project Erebus would be scoped out as it is outside the Irish Sea Management Unit. Please can the EWG feedback on if this approach would be acceptable. NFM- We will take this away.	**EWG to confirm agreement or provide feedback on approach to use the OSAPR region III and the combined populations for the grey seal reference population.** **Isle of Man to confirm the estimate of 400 seals for Manx population is suitable.** **Isle of Man gov to confirm what further details they would like to see for Risso's dolphin** **Isle of Man gov to confirm content with approach to bottlenose dolphin assessment?**	Complete Complete Complete Complete

	TMc- It is not uncommon to have different CEA study areas for different species, we have done this for other offshore wind farm applications. S42 Response: NRW have suggested using the OSPAR REGION III for the Grey Seal reference population used in the assessment. In the current assessment we use both OSPAR Region III and a "Grey Seal Reference population". This reference population is the sum of population estimates from four seal management units that cover the Irish Sea, as well as an Isle of Man estimate (400 seals from Howe, 2018) and two Irish estimates from Duck and Morris (2019). These are combined to give one reference population against which we assess impacts. We are looking for agreement on using the two approaches. LR- We will take this away. *<u>Post-meeting note:</u> Noting detailed response from NRW which notes presenting OSPAR Region III and GSRP in parallel is beneficial and mentioned that when screening in projects if a smaller area is proposed (other than OSPAR III) for grey seal and justified, NRW (A) would not anticipate ruling it out.* *Noting, Natural England do not have objections on presenting OSPAR region III alongside MUs for comparison but advise that then more precautionary one should be taken further to the assessment.* *RPS: We will present the impact assessment for project alone against both the OSPAR Region III and the Grey Seal Reference population (GSRP) in parallel. Whilst we acknowledge there is some disagreement about the appropriateness of the SMU boundaries, we have not limited the assessment to the single MU in which the project lies and have instead used the sum of four SMUs (based upon counts in SCOS 2020 with the updated scalar of 25.15% from SCOS (2021)) plus an estimate from Isle of Man (Howe, 2018) plus East of Ireland and Southeast of Ireland estimates from Morris and Duck (2019) = 12,909 grey seal. This is based upon the telemetry study provided by SMRU which shows high levels of connectivity with designated haul out sites in the Irish Sea and wider Celtic Sea, we feel this captures the wide-ranging mobile nature of the species but allows a proportionate and relevant population assessment.* *For the screening for the CEA, we will be using the GSRP rather than OSPAR Region III as it provides optimal coverage of the wide-ranging nature of the species but allows for a pragmatic approach to screening. Noting NE comments to take forward the most precautionary to assessment.* *The GSRP lies within the cumulative screening area agreed during the EWG02 (Irish Sea extending into the Celtic Sea rather than the entire extent of the largest MU: the Celtic and Greater North Seas (CGNS) MU) but is more proportional and applicable to the species (as was done with using the IS MU for bottlenose dolphin) and broadly aligns with ICES areas 7.a, g and f. The maximum foraging ranges from Carter et al. (2022) for example does not specify the time travelled per day, and it is known grey seals can travel for*	**Circulate the Offshore Ornithology slides to stakeholders prior to EWG meeting.**	Completed

	many days (e.g. Cronin et al. (2013) mean foraging trip duration was 1.7 days, longest being over 15 days). *Therefore, we suggest the GSRP is suitable to take forward for the cumulative assessment, as a species-specific approach (as with the Irish Sea MU for bottlenose dolphin).* S42 Response: NRW provided a response to the screening distance used for projects assessed cumulative with site investigation surveys. The PEIR uses the maximum ranges over which impacts could occur to screen in project to the CEA. The spatial range is less for the site investigation surveys so we would suggest using a more proportional screening criteria so we don't screen in projects over 100km away. Using this method also provides a proportionate criteria for a cut off for screening projects rather than an arbitrary range. <u>Post meeting note:</u> *NRW(A) would not agree with this approach. Screening ranges for cumulative assessments are based on population boundaries, given the scope of a cumulative assessment is to assess the impact of multiple projects on the same population, and thus cannot be described as arbitrary.* <u>Post meeting note</u>*: RPS note NRW's response, we propose to screen using the CEA area of the Irish Seas and wider Celtic Sea (rather than the maximum impact ranges used in PEIR) and then use a proportionate number to assume how many will be happening at the same. For example, previous OWF assessments have assumed up to 4 site-investigation surveys to occur at the same time in North Sea (see Hornsea 4) whilst up to 1 assumed in Irish Sea (see Awel y Mor).* S42 Response: The Isle of Man government responded to request specific evidence of the consideration of Risso's dolphins. We have included Risso's in the detailed quantitative assessment – can the IoM clarify further detail they would like? S42 Response: The Isle of Man Government responded to highlight that the Cardigan Bay and Manx winter population of bottlenose dolphins on the east coast are believed to be the same group based on Photo ID data. This should be acknowledged, and yet there is no specific assessment of the Manx population in this section. RPS specifically referenced this movement of individuals in impact assessment, and the assessment captures this. We can add further detail on impacts on bottlenose within Manx waters but providing a specific Manx assessment does not support suggestion they are the same dolphin population. Can the IoM confirm they are happy with this approach? KL- Are there any further comments that anyone want to highlight? BS- For future meetings, sight of the slides ahead of the meeting will improve the usefulness of the meetings.		

	LR- This would be NRW preference as well. We need to see the slides ahead of the meeting in order to provide any advice as agreed in our Ways of Working for the Evidence Plan. KL- Noted, the programme for these projects are very tight so it has made it difficult to put this together after the statutory responses. We would like to circulate the slides in advance and for future EWGs we will circulate slides in advance. We would therefore now look for feedback following the meeting minutes. KL and ST took an action to circulate the Offshore Ornithology slides immediately after the EWG to give the relevant stakeholders early sight of these ahead of the EWG meeting tomorrow.		
	<u>Update to assessment (presented by BP)</u> This section presented a summary of the proposed updates to the assessment. We will add unweighted noise threshold of 143 dB re 1µPa ^{2}s (or 103 dB re 1µPa VHF-weighted) to represent the minimum fixed noise threshold at which significant disturbance could occur for ES, alongside the EDR. We will add in seal count data from Walney Island, which has been provided by The Wildlife Trust. We will add in the additional year of aerial survey data for Morgan Offshore Wind Project. We will include additional new data sources where applicable: • Welsh Marine Mammal Atlas (Waggitt and Evans, 2023) • New SCANS III density estimates from Lacey *et al.* (2022) • Update to latest SCOS (2021) estimates TMc- Does this capture everything the EWG were anticipating in terms of addressing the statutory responses. Please follow up in writing after the meeting if you think there is anything that has been missed.	**Provide written confirmation of any additional updates anticipated by the EWG.**	Complete
	<u>Agreement logs (presented by KL)</u> The latest agreement logs were circulated in May and it would be useful if stakeholders could review their positions within those agreement logs and update them now the PEIR has been reviewed. Parallel to that the Applicant and RPS is working through the statutory consultation responses and looking at where we consider agreement has been reached. If stakeholders can provide feedback on agreement logs to date and then following the EWGs, we will circulate the meeting minutes two weeks after the meeting but the agreement logs may be a week or so behind that to incorporate the statutory consultation feedback.	**Stakeholders to provide updated EWG agreement logs to reflect the information provided in the PEIR.**	Complete

	Next Steps (presented by KL) KL noted that meeting minutes are to be circulated 2 weeks following the meeting, with agreement logs circulated after the meeting minutes. Next EWG meeting planned for October 2023.		

Table 1: Marine mammal species densities and reference populations to be included in the Environmental Statement.

Species	***Density to be used in Final ES (animals per km²)***	***Source and justification for use***	***Reference population and source to be used in Final ES***
Harbour porpoise	0.2773	Average density from the maximum composite shapefiles from the **Welsh Marine Atlas (Evans and Waggitt, 2023)** for the updated Mona array area. These values are slightly higher than NRW value provided (0.27357), but this is due to new array area, and are higher than the density estimate for the Mona marine mammal study area - the most precautionary chosen. The Welsh Marine Atlas (Evans and Waggitt, 2023) is available at: 646: Modelled Distributions and Abundance of Cetaceans and Seabirds of Wales and Surrounding Waters (cyfoethnaturiol.cymru) and provides modelled density distributions for those species sufficiently common to model, based upon vessel and aerial sighting data from 1990 to 2020. For PEIR, the density was 0.097 based upon site specific surveys but the Welsh Marine Atlas was requested for use during the EWG and S42 for the ES. ***Change from agreed approach in PEIR.***	Celtic and Irish Sea MU = 62,517 animals (IAMMWG, 2022; 2023)
Bottlenose dolphin	0.00171	Average density from the maximum composite shapefiles from the **Welsh Marine Atlas (Evans and Waggitt, 2023)** for the Mona marine mammal study area, as is higher than the estimate for the updated array area only. For PEIR, the approach was to use a higher coastal buffer zone (0.035), but use of one single density from the Welsh Marine Atlas was requested during the EWG and S42 for the ES. ***Change from agreed approach in PEIR.***	Irish Sea MU = 293 animals (IAMMWG, 2022; 2023)
Short-beaked common dolphin	0.074	Density value for the aerial survey area (updated Mona array area plus 7.06-15.68 km buffer) from Waggitt *et al.* (2020). This value is the most precautionary estimate compared to the Welsh Marine Atlas (0.0006 animals per km²), Lacey *et al.* (2022) density (0.005) and SCANS II Block O Estimate (0.018). For PEIR, the SCANS II density for Block O was used (0.018 animals per km²), in the absence of SCANS III block estimates and agreed with EWG.	Celtic and Greater North Seas MU = 102,656 animals (IAMMWG, 2022; 2023)

Species	*Density to be used in Final ES (animals per km²)*	*Source and justification for use*	*Reference population and source to be used in Final ES*
		<u>Post meeting note:</u> NRW would not recommend the use of density values from Waggitt et al. (2020), given that in the pulication it was stated that: "Because of these caveats, outputs should not be used as a representation of absolute densities and fine-scale distributions at the present time." We would instead recommend the use of densities from the newest version of the Atlas which is based on an updated version of the methodology used in Waggitt et al. (2020) *<u>Post meeting note:</u> RPS note NRW and NE response for short-beaked common dolphin and propose instead to take forward the average density value from the Welsh Marine Mammal Atlas (Evans and Waggitt, 2023) for the Mona array area (**0.0006** animals per km²).* ***<u>Change from agreed approach in PEIR.</u>***	
Risso's dolphin	0.0313	This value from SCANS-III (Hammond *et al*., 2021) for adjacent Block E is the most precautionary estimate compared to the Welsh Marine Atlas (0.001 animals per km²), and Waggitt *et al.* (2020) (0.001 animals per km²) densities. Risso's not included in maps by Lacey *et al* (2022). For PEIR, SCANS-III (Hammond *et al*., 2021) for adjacent Block E used, as none observed for Block F and was agreed by EWG. ***<u>No change from agreed approach in PEIR.</u>***	Celtic and Greater North Seas MU = 12,262 animals (IAMMWG, 2022; 2023)
Minke whale	0.0173	This value from SCANS-III (Hammond *et al*., 2021) for adjacent Block E is the most precautionary estimate compared to the Welsh Marine Atlas (0.006 animals per km²), Waggitt *et al* (2020) (0.007 animals per km²) and is comparable to Lacey *et al*. (2022) density maps which are not Irish sea specific (0.018 animals per km2), with SCANS Blocks widely accepted. For PEIR, SCANS-III (Hammond *et al*., 2021) for adjacent Block E used, as none observed for Block F and was agreed by EWG. ***<u>No change from agreed approach in PEIR.</u>***	Celtic and Greater North Seas MU = 20,118 animals (IAMMWG, 2022; 2023)
Grey seal	Offshore density 0.037	Density for the aerial survey area (updated Mona array area plus 7.06-15.68 km buffer) from Carter *et al.* (2022). For PEIR, density was also 0.037 animals per km². ***<u>No change from agreed approach in PEIR.</u>***	Two reference populations included: **1) "Grey seal reference population":** Sum of four SMUs (based upon counts in SCOS 2020 with scalar of 0.23 from Russell et al. 2016;): 12 Wales = 3,766, 13 NW England = 1,046, 14 Northern Ireland = 2,113, SW Scotland = 2,163) plus an estimate of 400 from Isle of Man (Howe, 2018)
	Inshore density 0.180	Density for the cable corridor area plus 10 km buffer from Carter *et al.* (2022). For PEIR, density was 0.196 animals per km². ***<u>Change from agreed approach in PEIR.</u>***	

Species	*Density to be used in Final ES (animals per km²)*	*Source and justification for use*	*Reference population and source to be used in Final ES*
			plus East of Ireland (1,749) and Southeast of Ireland (2,326) from Morris and Duck (2019) = 13,563 grey seal. *<u>Post meeting note:</u>* *These estimates have been updated using an updated scalar from SCOS (2021). Sum of four SMUs (based upon counts in SCOS 2020 with updated scalar of 25.15 from SCOS 2021): 12 Wales = 3,579, 13 NW England = 994, 14 Northern Ireland = 2008, SW Scotland = 2,056) plus an estimate of 400 from Isle of Man (Howe, 2018) plus East of Ireland (1,662) and Southeast of Ireland (2,211) from Morris and Duck (2019) = 12,909 grey seal.* **2) OSPAR Region III estimate** = 60,780 from OSPAR QSR report for 2023
Harbour seal	Offshore density 0.0002	Density for the aerial survey area (updated Mona array area plus 7.06-15.68 km buffer) from Carter *et al.* (2022). For PEIR, density was also 0.0002 animals per km². ***<u>No change from agreed approach in PEIR.</u>***	Sum of the Wales (13), Northern Ireland (1,405) and Northwest England MU (6) latest population estimates per SMU in SCOS (2021) = 1,424 harbour seal.
	Inshore density 0.001	Density for the cable corridor area plus 10 km buffer from Carter *et al.* (2022). For PEIR, density was also 0.001 animals per km². ***<u>No change from agreed approach in PEIR.</u>***	

C.6.2 Response from JNCC regarding the meeting minutes

JNCC responses to actions raised in EWG05

1. EWG to provide their feedback on the approach to the CEA for Morgan Generation (27th July 2023) > As this action relates to Morgan only, JNCC defer to Natural England in the matter.

2. EWG to provide updated EWG agreement logs to reflect the information provided in the PEIR. (14th July 2023) > Completed (19 July).

3. EWG to provide written confirmation of any additional updates that were expected by the EWG. (27th July 2023) > JNCC have no comments to make on this.

4. EWG to feedback on whether they can agree to one density across the whole study area for bottlenose dolphin and if using densities from the Welsh Marine Atlas is appropriate. (27th July 2023) > JNCC defers to Natural Resources Wales on this point.

5. EWG to review the table of species densities and confirm agreement or provide feedback. (27th July 2023) > JNCC are happy with the densities for the specified marine mammal species, on the basis that they are either the most site-specific, or the most precautionary densities available.

6. EWG to confirm agreement or feedback on the approach to use average density (which accounts for group size) across all cells for the study area for assessment of UXO clearance. (27th July 2023) > JNCC agrees with the approach to use average density across all cells for the study area, multiplied by the area of effect to give the number of animals impacted.

7. EWG to provide any further advice on how they would like to see the assessment of disturbance from vessels. (27th July 2023) > JNCC have no feedback to offer on this point.

8. EWG to confirm if there are any other projects they would like to see considered for the CEA/in-combination assessments. (27th July 2023) > JNCC recommend the consented (but not yet constructed) Awel y Môr offshore wind farm is also included in the CEA/in-combination assessments.

9. EWG to confirm or feedback on approach to include consider the Irish Sea management unit for bottlenose dolphin cumulative assessment. (27th July 2023) > we defer to NRW on this point.

10. EWG to provide advice on the sensitivity scores to be used for PTS. (27th July 2023) > This is currently scored as high for all marine mammal receptors. As a minimum, we would recommend that the sensitivity remains as high for harbour porpoises, given their sensitivity to impulsive noise and the potential for cumulative exposure. However, given the irreversibility of PTS, plus the fact that all cetaceans in UK waters rely on sound to some degree for survival, we would recommend that the scores remain as high for all species.

11. EWG to confirm agreement or provide feedback on approach to use the OSAPR region III and the combined populations for the grey seal reference population. (27th July 2023) > We defer to NRW on this point.

12. Isle of Man to confirm the estimate of 400 seals for Manx population is suitable. (27th July 2023) > N/A for JNCC.

13. Isle of Man gov to confirm what further details they would like to see for Risso's dolphin. (27th July 2023) > N/A for JNCC.

14. Isle of Man gov to confirm content with approach to bottlenose dolphin assessment. (27th July 2023) > N/A for JNCC.

15. NRW to provide a response to the proposed modelling approach regarding ADDs. (27th July 2023) > N/A for JNCC.

16. JNCC to feedback on the inclusion of the UXO activities in the DCO consent rather than a separate marine licence. (27th July 2023) > As with the advice provided by Natural England in their best practice guidance documents, JNCC recommend that a separate Marine Licence is applied for post consent, rather than including UXO clearance as a licensed activity in the DCO/deemed marine license. Submitted a separate licence application following the investigative surveys of potential UXOs enables a more realistic scenario to be assessed and proportional mitigation applied. It is beneficial to include a highlight level assessment in the environmental statement (e.g. can be a qualitative assessment) to demonstrate impacts can be mitigated however too little is known at the pre-consent stage to enable a realistic assessment of risk.

17. RPS to circulate the Offshore Ornithology slides to stakeholders prior to EWG meeting (complete) > N/A for JNCC.

C.6.3 Response from NRW regarding the meeting minutes

Projects Mona & Morgan Marine Mammal EWG05 NRW Response

[redacted]
Senior Marine Advisor

27th July 2023

Introduction

This advice is provided in response to the Meeting Actions from the **fifth Mona and Morgan Marine Mammal Expert Working Group (EWG05), which took place on 29th June 2023**.

NRW advice in this document is provided (under a Discretionary Advice Service agreement) in respect of a proposal which will require an application for which Natural Resources Wales is a Statutory Consultee.

The customer acknowledges that the content of any advice or assistance provided by NRW is advisory only and that it shall not be deemed to bind or in any other way restrict NRW in performing its statutory functions.

The recipient acknowledges that:

- any advice given or materials or documentation provided by NRW do not constrain or bind NRW in respect of its statutory functions or its role as a statutory consultee or any decision NRW may make in relation to any application for a licence or permit;
- any advice given by NRW does not bind NRW in respect of any future representations it may make as statutory consultee or any decision NRW may make in relation to any application for a licence or permit;
- any views or opinions expressed by NRW are without prejudice to the consideration NRW may be required to give to any application or any future representations as statutory consultee or any decision NRW may make in relation to any application for a licence or permit;
- the final decision as to any representations made by NRW as statutory consultee will be based on all the relevant information available to NRW at the time it makes such representations;
- NRW cannot and does not give any guarantee as to the representations it may make as statutory consultee; and,
- any advice given by NRW may be overtaken by changes in available information, law, policy and guidance relevant to the subject matter of the advice.

Advisors Consulted:
Marine Mammals

Actions

- **EWG to provide their feedback on the approach to the CEA for Mona and Morgan Generation**

  NRW Advisory (A) do not agree with the approach outlined for screening cumulative impacts for site investigation surveys for marine mammals. Given that the scope of a cumulative assessment is to assess the impact of multiple projects on the same population, screening ranges should be based on population boundaries, and thus cannot be described as 'arbitrary' (as per S42 response in the EWG05 Meeting Minutes). Due to animals from a given population moving around over wide areas, for an accurate assessment setting, both the temporal range and the correct population boundary (by using an appropriate screening distance) are required.

  Since 2015 the agreed population boundaries for cetaceans have been the Management Units (MU – IAMMWG 2015) as these adequately capture the known ranges of these species given their highly mobile nature and functional linkage to areas outside of the SAC boundaries (NRW, 2022). In a previous EWG (EWG02), following a suggestion by the developer, NRW (A) agreed that the use of the Celtic and Irish sea MU would be a pragmatic screening distance for all cetacean species with very large MUs such as Minke whale and dolphin species other than Bottlenose dolphin (BND). For these species, unlike e.g. Harbour Porpoise (HP) and BND, there is much more uncertainty over the exact population boundaries or the existence of smaller sub-populations, which means that their current MUs are (likely disproportionately) large and therefore using a smaller boundary would be pragmatic in this case.

  Here, it is being suggested that a smaller screening area based on the impact radius is used, citing reasons of pragmatism / proportion. However, no justification or evidence has been presented that such an impact radius would adequately represent the population boundaries and therefore it is unclear how the use of an impact radius as a screening distance would be more proportionate. If too small a screening radius is selected, there is a risk of excluding projects which impact the same population and therefore a risk of underestimating the cumulative impact.

- **EWG to provide written confirmation of any additional updates that were expected by the EWG.**

  No further additional updates expected other than addressing comments already provided in our PEIR response.

- **EWG to feedback on whether they can agree to one density across the whole study area for bottlenose dolphin and if using densities from the Welsh Marine Atlas is appropriate.**

  NRW (A) recommend the use of densities from the Welsh Marine Mammal Atlas. As previously mentioned, the Atlas links 30 years of sightings and effort data with a number of other environmental parameters.

- **EWG to review the table of species densities and confirm agreement or provide feedback.**

  For short-beaked common dolphin NRW (A) do not recommend the use of density values from Waggitt et al., (2020), given that in the publication it was stated that: *"Because of these caveats, outputs should not be used as a representation of absolute densities and fine-scale distributions at the present time."* NRW (A) recommend the use of densities from the newest version of the Atlas instead, which is based on an updated version of the methodology used in Waggitt et al., (2020).

  NRW (A) agree with the remaining species densities and reference populations provided in *Table 1: Marine mammal species densities and reference populations to be included in the Environmental Statement*, appended to the draft Meeting Minutes received via email on 13th July 2023 (16:35).

- **EWG to confirm agreement or feedback on the approach to use average density (which accounts for group size) across all cells for the study area for assessment of UXO clearance.**

  NRW (A) is in agreement with NE over taking group size into account. While this does not necessarily need to be included quantitatively as part of the assessment, it is a point which should be acknowledged qualitatively in the text of any upcoming drafts of the assessment, and in particular in any draft mitigation plans.

- **EWG to provide any further advice on how they would like to see the assessment of disturbance from vessels.**

  In our PEIR comments, NRW (A) provided an example of how this could be done, referring to the Wylfa assessment which considered disturbance based on the travel paths of vessels used by the project. This is by no means prescriptive and other approaches can be taken.

  NRW (A) advise against basing assessment conclusions on assumptions that marine mammals are anticipated to demonstrate some degree of habituation to sound from vessels, as this may overlook the extent of a potential impact pathway. Whilst it is reasonably likely that boat noise as a stressor is tolerated by marine mammals, absence of displacement is not evidence of absence of all detrimental consequences to animals. Responses may be physiological which are harder to detect, and animals may react by reducing foraging which leads to energy intake costs (e.g. harbour porpoise, see Rojano-

Donate et al., (2023) - presented at Oceanoise 2023), or making deeper dives increasing swimming effort, and ceasing echolocation and foraging for several minutes (Wisniewska et al., 2018). Thus the presence of vessels almost certainly has an energetic cost to harbour porpoise. Similar / related findings were made by e.g. Pirotta et al., (2013, 2015), Dyndo et al., (2015), Oakley et al., (2017), Marley et al., (2017a, 2017b). Other arguments such as, '*the increase in number of vessels will be small when compared to the baseline shipping traffic'*, should ideally also be quantified.

In future, ideally, direct measures of the associated energetic costs of exposure would be available for Population Consequence of Disturbance (PCoD) models, to link disturbance parameters to fitness and population dynamics, however work on this is still ongoing.

- **EWG to confirm if there are any other projects they would like to see considered for the CEA/in-combination assessments.**

  NRW (A) have no further additions to the comments already provided in our PEIR response.

- **EWG to confirm or feedback on approach to include consider the Irish Sea management unit for bottlenose dolphin cumulative assessment.**

  NRW (A) have no further comments in addition to those already provided in our PEIR response. As mentioned, the two populations of bottlenose dolphins (Irish Sea MU, and Offshore Channel and Southwest England MU) will need to be assessed separately (or alternatively only assess the Irish Sea MU population) as there is no evidence to support the presence of a unified population composed of both MU populations. In line with NRW's position statement on using MUs as screening distances (PS0006 MMMUs in HRA Position statement May22 (naturalresources.wales)), only projects within the Irish Sea MU will need screening in for the purpose of the CEA/in-combination assessment. NRW (A) therefore have no concerns with scoping out project Erebus for the cumulative assessment, particularly given that their assessment focused on quantifying impacts to the Offshore MU.

- **EWG to provide advice on the sensitivity scores to be used for PTS.**

  Following agreement with NE, NRW (A) recommend maintaining a sensitivity score of high for all species, and a magnitude of medium.

- **EWG to confirm agreement or provide feedback on approach to use the OSPAR region III and the combined populations for the grey seal reference population.**

- As discussed in a previous EWG (EWG03, November 2022) and as advised in previous comments, NRW (A) recommend using both approaches in parallel.

  There is some disagreement about the appropriateness of the boundaries of the SMUs – which only extend to UK waters – especially in SW Britain where photo-ID data and recent

telemetry studies demonstrate movements of seals not only around the Irish Sea, but also encompassing Southwest England, Northwest France and Ireland (Vincent et al. 2017, Russell et al. 2019, Carter et al. 2020, Langley et al. 2020, Luck et al. 2020). As outlined in our position statement, NRW utilise the OSPAR Region III area (west coast of UK + Ireland) as an interim MU for the species (NRW, 2022).

That said, the use of the combined SMU populations in parallel would be beneficial. During EWG 03, NE proposed that the combined SMU population be retained so as to avoid local impacts on seal haul out sites being overlooked, whilst also considering the connectivity of the wider population. NE also suggested using Hornsea Project Four as an example of how to consider local grey seal haul out sites qualitatively. If there is enough information, then a high-level qualitative assessment can be done on these populations i.e. qualitative assessment of movements from key haul-out sites to the project area. NRW (A) agree with and support this approach.

Finally, in our PEIR comments, NRW (A) mentioned that when screening in projects if a smaller area is proposed (other than OSPAR III) for grey seal and justified, NRW (A) would not anticipate ruling it out. This is in reference to previous correspondence between NRW (A) and RPS on population numbers and population parameters to be used for IPCoD modelling. NRW presently utilise the large OSPAR Region III area (west coast of UK + Ireland) as an interim MU for the species – this MU was used in recent marine development applications and is the basis for reporting under OSPAR and MSFD. While we would still advise the use of OSPAR III for screening, we are conscious that a large MU could be somewhat un-pragmatic. To this end, alternatives such as (1) the maximum foraging range of 448 km (Carter et al., 2022); (2) ICES divisions 7a,e,f,g,h; or (3) ICES divisions 7a,b,e,f,g,h,j would still be acceptable as screening distances.

- **NRW to provide a response to the proposed modelling approach regarding ADDs.**

  Following further discussion and agreement with NE, NRW (A) recommend modelling the impact ranges without ADDs in parallel.

C.6.4 Response from Natural England regarding the meeting minutes

Date: 27 July 2023
Our ref: DAS/UDS A009203 434568
Your ref: Morgan and Mona Marine Mammal EWG05 29th June 2023

[redacted]
RPS/ Energy
Goldvale House
27-41 Church Street West
Woking
Surrey
GU21 6DH

cc [redacted]
RPS

Hornbeam House
Crewe Business Park
Electra Way
Crewe
Cheshire
CW1 6GJ

[redacted]

BY EMAIL ONLY

Dear [redacted]

Discretionary Advice Service (Charged Advice): UDS A009203
Development proposal: Morgan Generation and Mona Offshore Windfarm
Consultation: Morgan and Mona Marine Mammal EWG05

This advice is being provided as part of Natural England's Discretionary Advice Service (DAS) in accordance with the Quotation and Agreement dated 23rd May 2023 to Morgan Offshore Wind Limited & Mona Offshore Wind Limited.

The following advice forms Natural England's response to the meeting minutes provided for the Morgan and Mona Marine Mammal EWG05 attended by Natural England on 29th June 2023.

Natural England were asked to provide feedback on the following:

- The approach to CEA for Morgan Generation
- Bottlenose dolphin density and use of Welsh Atlas
- Species densities table
- The approach to use average density (which accounts for group size) across all cells for the study area for assessment of UXO clearance
- Approach to bottlenose dolphin cumulative assessment
- Sensitivity scores to be used for PTS
- Use of the OSAPR region III and the combined populations for the grey seal reference population.

Detailed comments

Approach to CEA for Morgan Generation

Natural England provided comments on CEA in PEIR where we recommended application of the tiered approach for cumulative assessment as outlined in the Best Practice Guidelines Phase III. Further to this, we are not able to agree at this point on CEA approach as our comments need to be addressed for the project on its own before we could consider cumulative assessment. In terms of IPOCD modelling, we support NRW advice that a 6 year modelling period is more suitable than 25

years.

Bottlenose dolphin density and use of Welsh Atlas

Natural England agrees with the use of the one density across the whole study area for bottlenose dolphin referencing the Welsh Marine Mammal Atlas. As the Welsh Marine Mammal Atlas is the latest and most relevant evidence for densities in the project area, Natural England agrees to its use going forward unless new evidence (e.g. two years of site specific surveys or SCAN IV) reveals higher densities.

Species densities table

Natural England advice on species densities is outlined in the Best Practice Guidelines Phase III: *"The most precautionary density estimate (i.e. highest) should then be selected for use within the assessment. If a density estimate is selected which is not the highest, robust evidence is required to justify why it is the most appropriate option."*
We agree that the Welsh Marine Mammal Atlas represents the robust evidence in certain instances such as in the case of harbour porpoise and bottlenose dolphins. However, we are not able to agree on the approach to all species before seeing the final densities obtained from the two years of site specific surveys.
We note that densities from Waggitt *et al.* 2019 are proposed for short-beaked common dolphin. We query this decision as the author of the paper does not advise that their maps are used in this way: *"Because of these caveats, outputs should not be used as a representation of absolute densities and fine-scale distributions at the present time. Instead, it is recommended that outputs be used as a general illustration of relative densities and broad-scale distribution over several decades".* Thus ,Natural England do not agree that this is the relevant reference for the short-beaked common dolphin density.

The approach to use average density (which accounts for group size) across all cells for the study area for assessment of UXO clearance

Natural England acknowledges that the standard methodology has been used to calculate the number of animals that could be potentially impacted within the relevant PTS/TTS zones. This approach works well for species such as seals or harbour porpoise, but it is not ecologically relevant for social, gregarious species such as bottlenose dolphin, Risso's dolphin or short-beaked common dolphin when it comes to mitigation. Considering that these animals predominantly occur in groups larger than 1, then more than 1 animal could be potentially injured or disturbed within the impact zone in a 'real life' setting. This then makes the previous calculations incorrect and it does not constitute the most precautionary approach. Thus, this needs to be acknowledged and taken into account when selecting appropriate mitigation measures. Natural England is content for this to be acknowledged in the same paragraph following the calculations based on the standard approach for these species. NB, this comment is relevant for other activities not only UXO clearance. We are happy to discuss this further at future EWGs.

Approach to bottlenose dolphin cumulative assessment

Natural England is content with the proposed approach to consider the Irish Sea management unit for bottlenose dolphin cumulative assessment.

Sensitivity scores to be used for PTS

In this instance, Natural England, in line with NRW, advise that sensitivity of the receptors should be scored 'High' while the appropriate score for magnitude should be 'Medium'.

Use of the OSAPR region III and the combined populations for the grey seal reference population

As agreed during the previous EWG, Natural England do not have objections on presenting OSPAR

region III alongside MUs for comparison. We advise that then more precautionary one should be taken further to the assessment.

For clarification of any points in this letter, please contact me using the details provided below.

Yours sincerely,

[redacted]
Marine and Coastal Lead Adviser
Coast and Marine Team
Cheshire to Lancashire Area Team
[redacted]

☒ The advice provided in this letter has been through Natural England's Quality Assurance process

The advice provided within the Discretionary Advice Service is the professional advice of the Natural England adviser named below. It is the best advice that can be given based on the information provided so far. Its quality and detail is dependent upon the quality and depth of the information which has been provided. It does not constitute a statutory response or decision, which will be made by Natural England acting corporately in its role as statutory consultee to the competent authority after an application has been submitted. The advice given is therefore not binding in any way and is provided without prejudice to the consideration of any statutory consultation response or decision which may be made by Natural England in due course. The final judgement on any proposals by Natural England is reserved until an application is made and will be made on the information then available, including any modifications to the proposal made after receipt of discretionary advice. All pre-application advice is subject to review and revision in the light of changes in relevant considerations, including changes in relation to the facts, scientific knowledge/evidence, policy, guidance or law. Natural England will not accept any liability for the accuracy, adequacy or completeness of, nor will any express or implied warranty be given for, the advice. This exclusion does not extend to any fraudulent misrepresentation made by or on behalf of Natural England.

Cc [redacted]

Annex 1
European Protected Species

A licence is required in order to carry out any works that involve certain activities such as capturing the animals, disturbance, or damaging or destroying their resting or breeding places. Note that damage or destruction of a breeding site or resting place is an absolute offence and unless the offences can be avoided (e.g. by timing the works appropriately), it should be licensed. In the first instance it is for the developer to decide whether a species licence will be needed. The developer may need to engage specialist advice in making this decision. A licence may be needed to carry out mitigation work as well as for impacts directly connected with a development. Further information can be found in Natural England's 'How to get a licence' publication.

If the application requires planning permission, it is for the local planning authority to consider whether the permission would offend against Article 12(1) of the Habitats Directive, and if so, whether the application would be likely to receive a licence. This should be based on the advice Natural England provides at formal consultation on the likely impacts on favourable conservation status and Natural England's guidance on how the three tests (no alternative solutions, imperative reasons of overriding public interest and maintenance of favourable conservation status) are applied when considering licence applications.

Natural England's pre-submission Screening Service can screen application drafts prior to formal submission, whether or not the relevant planning permission is already in place. Screening will help applicants by making an assessment of whether the draft application is likely to meet licensing requirements, and, if necessary, provide specific guidance on how to address any shortfalls. The advice should help developers and ecological consultants to better manage the risks or costs they may face in having to wait until the formal submission stage after planning permission is secured, or in responding to requests for further information following an initial formal application.

The service will be available for new applications, resubmissions or modifications – depending on customer requirements. More information can be found on Natural England's website.

C.6.5 Response from Cefas regarding the meeting minutes

From: [redacted]
Sent: 17 August 2023 10:43
To: [redacted]
Cc:
Subject: RE: Morgan Generation & Mona fifth marine mammal EWG meeting

CAUTION: This email originated from outside of RPS.

Hi [redacted]

Apologies for the delay in responding – this email got lost!

Please see comments from CEFAS Underwater Noise Team: "I largely defer to Natural England and SNCBs this time, as the meeting primarily focused on the comments received from Natural England and NRW.

I did follow up with [redacted] after the meeting, as we (Cefas) had a number of comments on the PEIR that were mostly in relation to the underwater noise modelling report, which I assume will be addressed at ES. However, given the project updates to remove the monopile foundations, I expect that the (noise) assessment will be revised anyway. [redacted] did confirm that RPS are revising the underwater noise modelling based on the updated piling parameters/PDE. The reason RPS didn't raise anything in particular in the EWG was because their noise specialists did not have anything they felt they needed to raise in the meeting. [redacted] did say that they will check in with them and confirm if there are any clarifications they would need to get in writing; but otherwise, they are looking to incorporate Cefas comments and feedback into the final ES."

The MMO have also reviewed the minutes and are content that they summarise the meeting.

Many thanks

[redacted] **(Hons), MSc I Marine Licensing Case Officer I PCS London & South East Branch Representative | His Majesty's Government – Marine Management Organisation.**
Direct Line: [redacted] I Mobile: [redacted] I Email: [redacted] I Lynx House, 1 Northern Road, Cosham, Portsmouth, PO6 3XB
Website Twitter Facebook Linkedin Blog Instagram Flickr YouTube Google+ Pinterest

My pronouns are [redacted]

I'm a PCS Member. If you aren't a member you can join here https://www.pcs.org.uk/get-involved/why-join-pcs

Our MMO Values: Together we are **Accountable, Innovative**, **Engaging** and **Inclusive**

Enabling sustainable growth in our marine area

The MMO 'call for evidence - MMO assessment of fishing impacts in marine protected areas - Stage 2' is now open. To respond please go to Citizen Space: https://consult.defra.gov.uk/mmo/call-for-evidence-stage-2/

- JNCC to feedback on the inclusion of the UXO activities in the DCO consent rather than a separate marine licence. (27th July 2023)
- RPS to circulate the Offshore Ornithology slides to stakeholders prior to EWG meeting (complete)

Please can you provide feedback on these minutes via tracked changes by **27th July 2023**. If after this date we have received no comments, the minutes will be assumed to be accepted.

Kind Regards,

[redacted]
Senior Marine Consultant
RPS | Energy
Goldvale House
27-41 Church Street West
Woking, Surrey GU21 6DH, United Kingdom
[redacted]
Digital Business Card

C.6.6 Minutes from the Isle of Man marine mammals meeting

From: [redacted]
Sent: 24 October 2023 13:57
To: [redacted]
Subject: RE: Mona Morgan Generation species densities

CAUTION: This email originated from outside of RPS.

Dear [redacted]

The WTW agrees with the RPS justification for the use of the 2 species dependant approaches to determine MM densities.

Thank you for the inclusion and opportunity to review the proposed methodology.

Best Wishes,

[redacted]

[redacted]
Swyddog Cynllunio Morol (Cymru) – Ynni Adnewyddadwy ar y Môr
Marine Planning Officer (Wales) – Offshore Renewable Energy

Wildlife Trust (Wales) / Ymddiriedolaeth Natur (Cymru)

From: [redacted]
Sent: 23 October 2023 11:52
To [redacted]
Cc [redacted]
Subject: Mona Morgan Generation species densities

Dear All,

Following EWG feedback on the Marine Mammal (MM) Technical Note (submitted 11th September 2023), final densities to be taken forward to assessments for Mona Offshore Wind Project and Morgan Offshore Wind: Generation Assets were agreed.
We note the responses from Natural England to the aforementioned Technical Note, stating: "*Please note that SCANS IV report has been published (SCANS-IV survey (tiho-hannover.de)) and it would be a valuable addition to the baseline characterisation given that it provides the newest data on distribution and abundance of cetaceans in the area*" And "*NE maintains the stand on the densities used in assessment i.e. to use Welsh Marine Mammal Atlas for*

agreed species unless new data reveals evidence of greater densities (SCANS IV and 2 years of site specific surveys).”

RPS has reviewed the methodology and relevant densities presented in the SCANS IV survey report and will include this data as a baseline characterisation source in technical reports for both projects. The densities that will be applied to the assessments for all cetacean species are those as agreed through EWG05 and/or the associated MM Technical Note (i.e. no changes from the MM Technical Note are proposed). Therefore, the Welsh Marine Mammal Atlas (for harbour porpoise, bottlenose dolphin and short-beaked commons dolphin) and SCANS III densities (Risso’s dolphin and minke whale) have been used for the assessment.

For harbour porpoise, bottlenose dolphin and short-beaked common dolphin the densities applied to the assessment are those derived from the Welsh Marine Mammal Atlas (WMMA) (Evans and Waggitt, 2023) as agreed through the MM Technical Note. WMMA uses 30 years of data from 1990 to 2020 from dedicated aerial and vessel surveys (including SCANS surveys) across Wales and the surrounding waters to produce modelled density distribution maps at a 2.5 km2 resolution. Crucially, the study is designed to quantify broad level habitat preferences and seasonality of species within regions of interest. This allows a robust representation of densities at a fine scale within the Irish Sea, rather than broad-scale densities derived from a single survey season conducted over a short timescale e.g. SCANS IV surveys. SCANS IV surveys were carried out between 28 June and 15 August 2022 (for those blocks in the Irish Sea), and densities are presented as blocks (e.g. Block CS-E has a surface area of 12,274 km2). As highlighted in Lacey et al. (2022) (which modelled density surfaces from SCANS III data) large scale line transect surveys (such as SCANS) are not designed to collect data at a sufficiently small spatial scale necessary to generate estimates of abundance for small coastal populations, such as the bottlenose dolphin ecotype found in the Irish Sea MU. The 2.5 km2 resolution modelled in the WMMA however, does allow for such fine-scale detail. Therefore, the Welsh Marine Mammal Atlas densities have been used for the assessment.

For Risso’s dolphin and minke whale, the densities applied to the assessment are those derived from SCANS III block E (in the absence of block F estimates), as agreed through EWG05 and the MM Technical Note. Whilst the SCANS IV survey is the latest of the SCANS surveys, the densities presented in SCANS IV are lower than equivalent densities from SCANS III and therefore to deviate from the agreed approach would result in the application of less conservative densities estimates. Therefore, we have taken the precautionary approach of using the SACNS III density data for these species.

In conclusion, after consideration of SCANS IV, the existing agreed densities as outlined in the MM Technical Note represents the most robust and appropriate approach, and therefore no change is required for the applications for consent.

Please can you confirm that this approach is the most appropriate for the Mona and Morgan projects by 6th November?

Kind Regards,

[redacted]
Senior Marine Consultant
RPS | Energy
Goldvale House
27-41 Church Street West
Woking, Surrey GU21 6DH, United Kingdom
[redacted]
Digital Business Card

C.6.7 Response from The Manx Wildlife Trust regarding the meeting minutes

MINUTES OF MEETING

Security Classification:
Project External

Partners in UK offshore wind

MOM Number : 20230803_Morgan and Mona MM **REV. No.** : F02

MOM Subject : Morgan and Mona Evidence Plan marine mammals IoM meeting

MINUTES OF MEETING

MEETING DATE : 03/08/23

MEETING LOCATION : Microsoft Teams

RECORDED BY : [redacted] (RPS)

ISSUED BY : [redacted] (RPS)

PERSONS PRESENT:

- [redacted] – bp (SR)
- [redacted] – bp (MP)
- [redacted] – RPS (KL)
- [redacted] – RPS (ST)
- [redacted] – RPS (BP)
- [redacted] – RPS (TMc)
- [redacted] – MWT (LH)
- [redacted] – MWDW (BM)
- [redacted] – IoM (PD)

ITEM NO:	DISCUSSION ITEM:	Responsible party	Date
1.	**Project updates (presented by MP)** Statutory consultation on the Mona and Morgan Generation PEIRs ended on 4th June. The Applicant appreciates all the feedback; we are currently reviewing all the responses and how they can be addressed. From the statutory consultation feedback and parallel activities, the Applicant has been considering a number of project updates. There are several updates to the project description envelope that are expected to be included in the application. The Applicant is looking to reduce the Mona Array Area and the Morgan Generation Array Area. They are expected to be reduced from what was presented in PEIR and lie wholly within the array areas presented in the PEIR. The Mona Array Area is anticipated to be reduced by approximately 33% and lie wholly within Welsh offshore waters. The Morgan Array Area is anticipated to be reduced by approximately 10%. The primary driver for these reductions is shipping and navigation, specifically ensure safety of navigation. The need for changes for the project design envelope has been highlighted through engagement with a number of the ferry companies in the Irish Sea. The reductions have also been driven through consultation with aviation and other sea users receptors.		

	The layout principles for both Mona and Morgan Generation are expected to be updated to increase the spacing requirements between offshore structures, the specific updates will be communicated in due course. These updates are to address concerns from commercial fisheries. The Applicant is anticipating that monopile foundations will be removed from the project design envelope. The foundations options remaining will be gravity base or jackets (which may be pin piled or suction bucket foundations). This is being driven by the ground conditions. The Applicant expect there to be a mixed foundation solution taken forward to the application, likely to be a mix of jacket and gravity base foundations. The smallest wind turbine option is being removed from the project design envelope due to feedback from the supply chain that this turbine option will not be available at the time of construction. The rotor diameter will therefore also increase from 280m to 320m and this is also based on feedback from the supply chain on the parameters for the wind turbines that will be available at the time of construction.		
2.	**<u>Actions from the last EWG (presented by BP)</u>** RPS sent DEFA, IoM Government a list of data sources currently being used in the PEIR. DEFA, IoM were to check list of data sources in PEIR and provide any further data sources if required. IoM government did not identify any additional data sources in their response to statuary consultation. We wanted to check that there were no additional data that the IoM government would like to see included. LH- There may be an updated annual report from the Calf of Man. This is unlikely to be different for what you have already seen previously. KL- Have you had a look at the PEIR? LH- No we haven't had a chance to read the PEIR. PD sent over the specific questions for this meeting. *Post meeting note: Further to the recent meetings and communications between MWT, MWDW, IoM Gov. and RPS, The Isle of Man Government is content that the most recent and relevant data sources have been provided. It is understood that 4 years of data has been collected, but the usual, most recent two years is likely to be used for the EIA process.* *Post meeting note: The Applicant would like to clarify that 24months of site-specific digital aerial survey data has been collected and these will all be included in the consideration of the species-specific densities to take forward to the EIA.* **<u>Section 42 responses - overarching (presented by KL)</u>** The IoM offshore windfarm is in the early stage of the planning process and we expect the scoping report to be published in the	**RPS to send over the list of data sources to be used in the assessment** **IoM to provide feedback on the data sources used for the assessment**	Complete Complete

	autumn. We will incorporate the information in the public domain into the cumulative and in-combination assessment for Mona and Morgan Generation, in line with the Tiered approach. LH- Orsted have undertaken four years of data collection in Manx waters so they should have information available within 3-12nm zone from the coast of the IoM. KL- bp are in discussions with Orsted regarding data and information sharing. When this information is in the public domain and we have access to it then we will include the information in the assessments where possible. Mona and Morgan Generation have both completed 24 months of digital aerial surveys to provide site specific data. However, this will be put into the context of the wider baseline from other desktop data sources, including sources from Isle of Man and other wind farms in the Irish Sea. There were a few comments on the site specific data available to be included in the PEIR. The benthic data for the Mona Offshore Cable Corridor and the zone of influence for the Mona and Morgan Array Areas will be presented in the July benthic, fish and shellfish and physical processes EWG. For marine mammals and offshore ornithology, the 24 months of survey data for Morgan Generation will be presented and discussed in the October EWG meetings for those topics. Natural England provided comments on the Morgan Generation and the Morgan and Morecambe Offshore Wind Farms: Transmission Assets (Transmission Assets) applications to ensure that a whole project assessment is undertaken (i.e. Combined Transmission and Generation assessment). For Morgan Generation, we will be undertaken a whole project assessment within the cumulative effects assessment (CEA). The Transmission Assets will be included within the CEA as a separate section so it clearly presents the impact of the Morgan Offshore Wind Project as a whole project. We can only base the CEA on information in the public domain. These projects are subject to separate consent applications so there will always be difficulty regarding what information is available at the time of application. However, that is why the tiered approach to CEA was developed and adopted and we feel the approach set out in the slides adequately addresses the concerns raised.		
3.	**<u>Section 42 responses – marine mammals (presented by BP)</u>** S42 Response: The Isle of Man government responded to request specific evidence of the consideration of Risso's dolphins. We have included Risso's in the detailed quantitative assessment – can the IoM clarify further detail they would like? We have considered Risso's equally with the other key species. BM- If you have included Risso's in the key species and they are considered fully then we don't have any further comments. PD may have had something specific in relation to this. Action for Peter to feedback on this.	**Isle of Man gov to confirm what further details they would like to see for**	Complete

	PD- We need to see that the IoM has been fully considered. Risso's should be included in the baseline even if not sighted during the surveys. If the MWDW has been consulted and they are content with the information provided then the IoM gov is content. BM- The MWDW have photo ID of Risso's dolphins that show connectivity between the Isle of Man and Cornwall. Risso's are not in Manx waters in winter but they are present in the summer months and movement is up and down the Irish Sea. PD- One of the specific issues was ensuring that you have all the appropriate data for Risso's dolphins in Manx waters e.g. the effort data that goes with the counts data. MWDW have effort data that can be provided. Also, the modelling of the sensitivity of species to underwater sound covers a range of species and range of frequencies. Bottlenose dolphins were included but we need to see that Risso's have also been taken into account in the noise assessment. TMc – We can add further detail in the report that bottlenose dolphin and Risso's are both high frequency cetaceans and so would have been considered together. We can make this more clear in the reports. KL- For all the species, we will look to ensure there is specific reference to the populations associated with the Manx waters so it's really clear to the Isle of Man gov where we have considered the species within IoM waters. We want to make things as clear as possible for all our stakeholders, noting the different priorities/approaches in different jurisdictions. Post meeting note: Further to the recent meetings and communications between MWT, MWDW, IoM Gov. and RPS, and noting the comments from MWDW, the Isle of Man Government is content that Risso's dolphin have been adequately included in the assessment. This approach is noted and accepted by IoM Government. S42 Response: The Isle of Man have suggested a restricted baseline by using a single reference and excluding the IoM from the SMRU report. We have used the Carter *et al* (2022) maps to cover the IoM and these are the densities we have taken forward to the assessment. SMRU does not hold any further data in relation to the IoM. The SMRU data is an additional data source rather than the only data source that has been used in the assessment. We will include further reference to the data that we have used. LH- Through photo ID work and satellite tagging we know that we have overlap of the Manx population of grey seals with the Cornwall, Strangford Loch and Dee Estuary populations. SMRU have been in contact for tagging data at the Dee Estuary and one seal from the study was recorded at the Calf of Man. Bearing in mind the barrier effects for movements would be important. BP- Is that photo ID study publicly available?	**Risso's dolphin** **MWT to confirm the applicant can use these minutes for a 'personal comms' reference to explain connectivity of grey seals around the IoM**	Complete

	LH- It was more a discussion with SMRU rather than a published report. We can send an email explaining this through to you. KL- Even a personal comms reference would be really useful to give a good idea of how seals are using the data. LH- The MWT data is very limited and very local (only referring to the number of seals in Manx waters) so there could be high variability. It just needs to be clear that you have used the best data available. BP- We have used a value of 400 seals for the size of the Isle of Man seal management unit. This was taken from the Manx Environmental Assessment. Are you happy with 400 grey seals for the IoM. LH- This sounds about right. The 2017 seal report estimated 365 grey seal. The female catalogue from the seal reports from the Calf stands at over 400 but they won't be there all the time. TMc- When the MWT are responding can you provide some personal communication on the grey seal population size. *Post meeting note: Comments noted, and IoM Government is content with MWT comments and that these responses and actions will provide the appropriate consideration of grey seals in Manx waters.* S42 Response: The Isle of Man Government responded to highlight that the Cardigan Bay and Manx winter population of bottlenose dolphins on the east coast are believed to be the same group based on Photo ID data. This should be acknowledged, and yet there is no specific assessment of the Manx population in this section. RPS specifically referenced this movement of individuals in impact assessment, and the assessment captures this. We can add further detail on impacts on bottlenose within Manx waters but providing a specific Manx assessment does not support suggestion they are the same dolphin population. Can the IoM confirm they are happy with this approach? BM- This makes sense. We don't know where all the dolphins come from. We know that some in Manx waters are from Cardigan Bay but we have also recorded dolphins that are not from Cardigan Bay so there is evidence that the populations are mixing. It is worth acknowledging that summer dolphins in Cardigan Bay may be subject to impacts in Manx waters. PD- If BM confirms they are comfortable with the approach to PD then IoM can confirm that they have consulted with the MWDW and are content with the project approach. The main concern was to ensure that the lifecycle component should be considered properly. The population should be considered a whole population and their seasonality. *Post meeting note: Further to the recent meetings and communications between MWT, MWDW, IoM Gov. and RPS, and noting the comments from MWDW, the Isle of Man Government is content that bottlenose dolphin have been adequately included in the assessment.*	**Isle of Man to confirm the estimate of 400 seals for Manx population is suitable.** **Isle of Man gov to confirm content with approach to bottlenose dolphin assessment?**	Complete Complete

4.	**<u>Update to assessment (presented by BP)</u>** This section presented a summary of the proposed updates to the assessment. We will add unweighted noise threshold of 143 dB re 1µPa ^{2}s (or 103 dB re 1µPa VHF-weighted) to represent the minimum fixed noise threshold at which significant disturbance could occur for ES, alongside the EDR. PD- Does this approach relate to the Cumulative assessment? KL- The thresholds are used to inform the overlap between the SAC and the noise contours for the project. This threshold is specifically for the harbour porpoise SAC. You look at specific thresholds and add in the ranges for the other cumulative projects that may be piling at the same time. You then look at this against the conservation objectives of the designated site. PD- As the IoM designated sites are not under the habitats regulations does that mean they are not applicable to this. TMc- It is not that we don't consider sites or features in Manx waters, it is that they are fully assessed in the EIA, rather than the HRA, which is specific to European sites so not relevant to the Isle of Man. PD- Are these thresholds the basic standards that you would use to assess impacts on features of all SACs. TMc- The EDR threshold is used for harbour porpoise SAC and the unweighted noise threshold of 143 dB re 1µPa ^{2}s is also developed for harbour porpoise. There isn't a threshold available for every species due to insufficient data but we could potentially consider using the unweighted noise threshold as a precautionary threshold for other species. We will add in seal count data from Walney Island, which has been provided by The Wildlife Trust. We will add in the additional year of aerial survey data for the Morgan Offshore Wind Project. We will include additional new data sources where applicable: • Welsh Marine Mammal Atlas (Waggitt and Evans, 2023) • New SCANS III density estimates from Lacey *et al.* (2022) • Update to latest SCOS (2021) estimates.		

C.6.8 Expert Working Group Technical Note

From: [redacted]
To:
Cc:
Subject: Mona and Morgan OWF additional seal comments
Date: 04 August 2023 10:59:24
Attachments: [redacted]

Hi All

As discussed in the meeting, below is some additional information that may be useful for the marine mammal section, specifically around Manx seals.

Historic data (before I started at MWT, so at least 9.5 years ago)
SMRU/St Andrews Uni satellite tagged a number of seals in Strangford Lough and two of them travelled to the Isle of Man. One visited several times and headed to the Sound, the area between the Isle of Man and the Calf of Man. The other individual travelled north around the point of Ayre, north of Ramsey Bay. I have included 3 screen shots that I have. They are not my data and I'm unsure where they came from so please do not sue them within your final documents.

SMRU/St Andrews sent us some photos of satellite tagged seals in 2019 but I think they were tagged in 2017 from the Dee Estuary area and one of the seals did make it to the Calf of Man during breeding season. The track is attached. Again please don't use this image as its not mine but it looks like it certainly passed through the wind farms general area. The contact was Matt Carter and Debbie Russell at St Andrews, should you require more information.

Through are photo ID work on the Calf of Man we have matched one seal (Tulip Belle) with the Cornwall Seal Group Research Trust. She has been moving between the Calf and Cornwall for several years and has bred on the Calf. The contact at Cornwall is Sue Sayer. She generates a spreadsheet of where and when they are seen and that might provide useful for you. We have had another match only this week with another seal from Cornwall that was in Manx waters (near Fleshwick, north of Port Erin) and it was confirmed by its flipper tag and obvious scar on its side.
So "our" seals are very mobile within the Irish and Celtic seas.

Seal numbers in Manx waters
Just to confirm seal numbers around the Island. Our Island wide survey in 2017 counted 365 seals but was a one off snap shot during October and November. The work in 2007 by Manx BirdAtlas (now Manx Birdlife) surveyed every month and recorded around 200 individuals in October. Their highest count was 405 in January, showing variability in the abundance. The Calf of Man seal catalogue has around 450 individuals but this covers the span of the programme from 2009 to 2022, so you can imagine that some of the early individuals are not seem now and that each year new individuals are appearing. Clearly we don't have 450 seals visiting the Calf in each pupping season.

Manx haul out sites

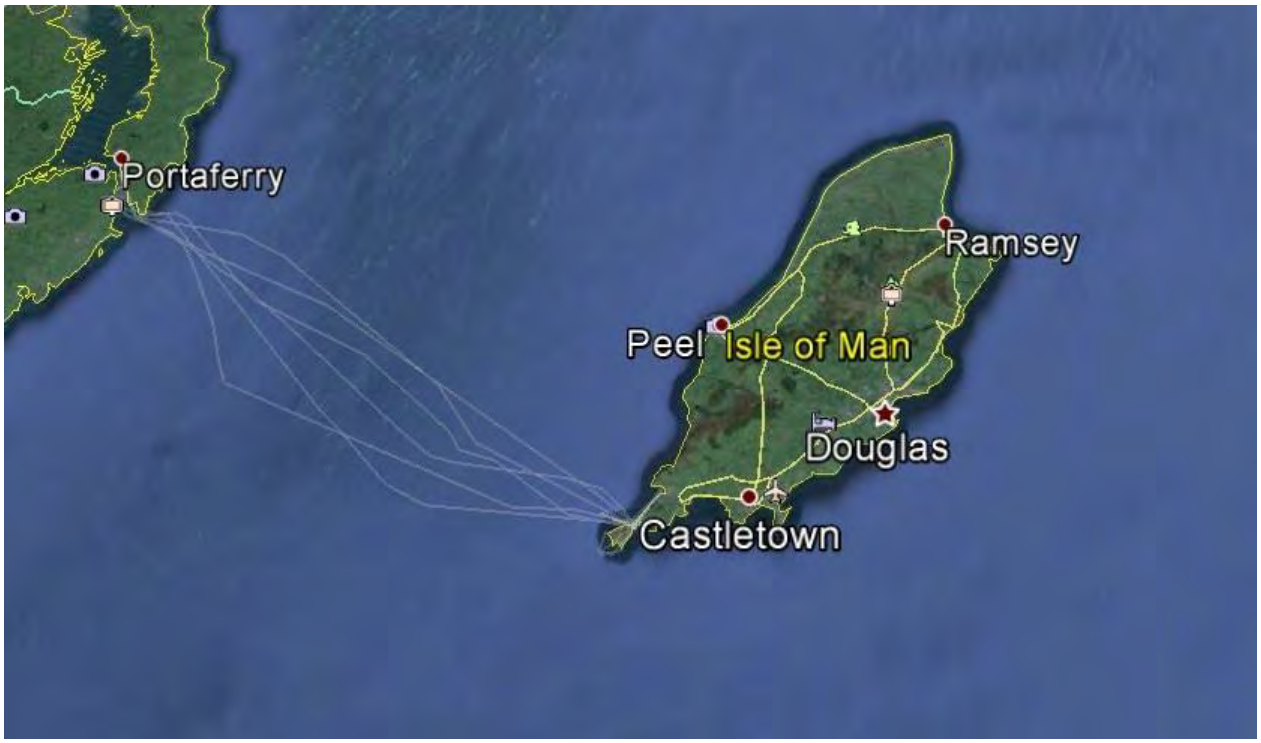
Further to what you will have extracted from our Manx reports I would also add that more recently the Point of Ayre (most northerly point of the Island) has become an important haul out site for predominantly grey seals. Numbers vary but over 100 are being seen fairly regularly. The highest count is around 160. What we don't know is if this site is over spill as the population is increasing or whether they have moved here from elsewhere. It is nevertheless an important site now and worth including in your report. In addition to that and not necessarily relevant but worth mentioning is the Manx Wildlife Trust back in 2000's did some work on highlighting important areas that have a high value for wildlife and although this was mainly focused on terrestrial features there are 6 sites highlighted as important sites for seals. They are the Calf of Man, Gob Garvain, Santon head, Maughold Head, Clay head and Contrary head. These sites are not legal recognised, such as SPAs or SACs, but any development within one is given consideration by the planners. So might be worth including them in the report for haul out sites, if not already mentioned. Below is a link to the government website where the sites can be viewed along with other marine designations.
https://manngis.maps.arcgis.com/apps/webappviewer/index.html?id=74e6bd8c85534835b80dea94a4180a11
For more information on what Wildlife Sites are please go to our website for details
https://www.mwt.im/terrestrial/wildlife-sites-are-places-are-high-wildlife-value

I hope this is useful and if you have any questions please ask. I'm on leave next week but will reply on my return.

Kind regards

[redacted]

[redacted]
Marine Officer
IOM Seasearch Co-ordinator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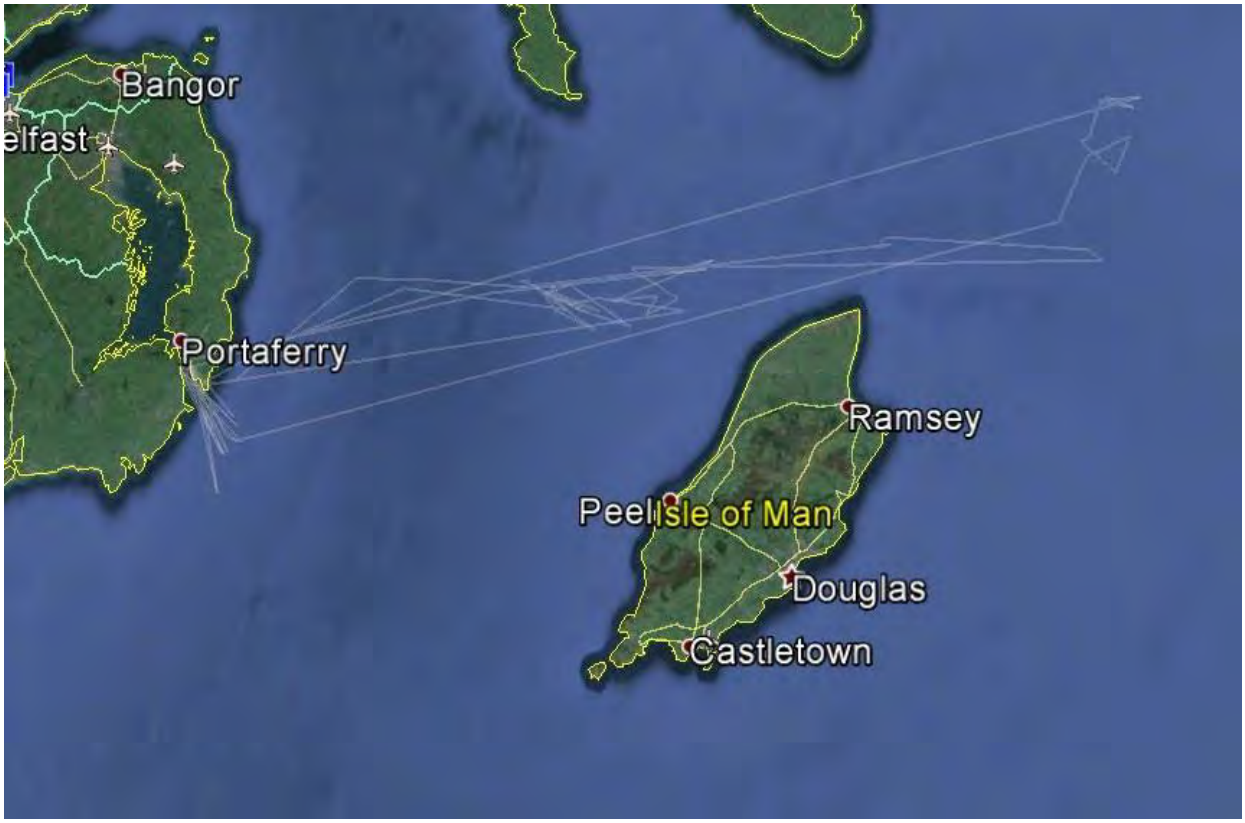
Ramsey
Peel
Isle of Man
Douglas
Castletown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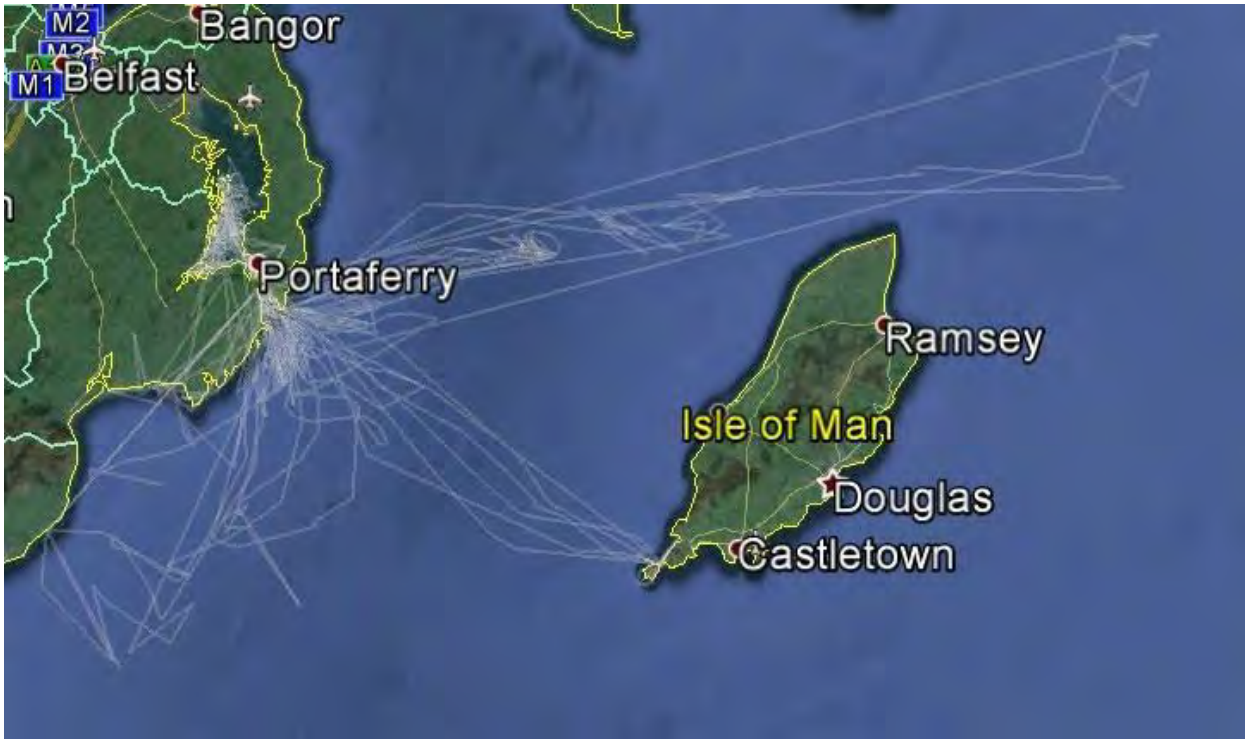
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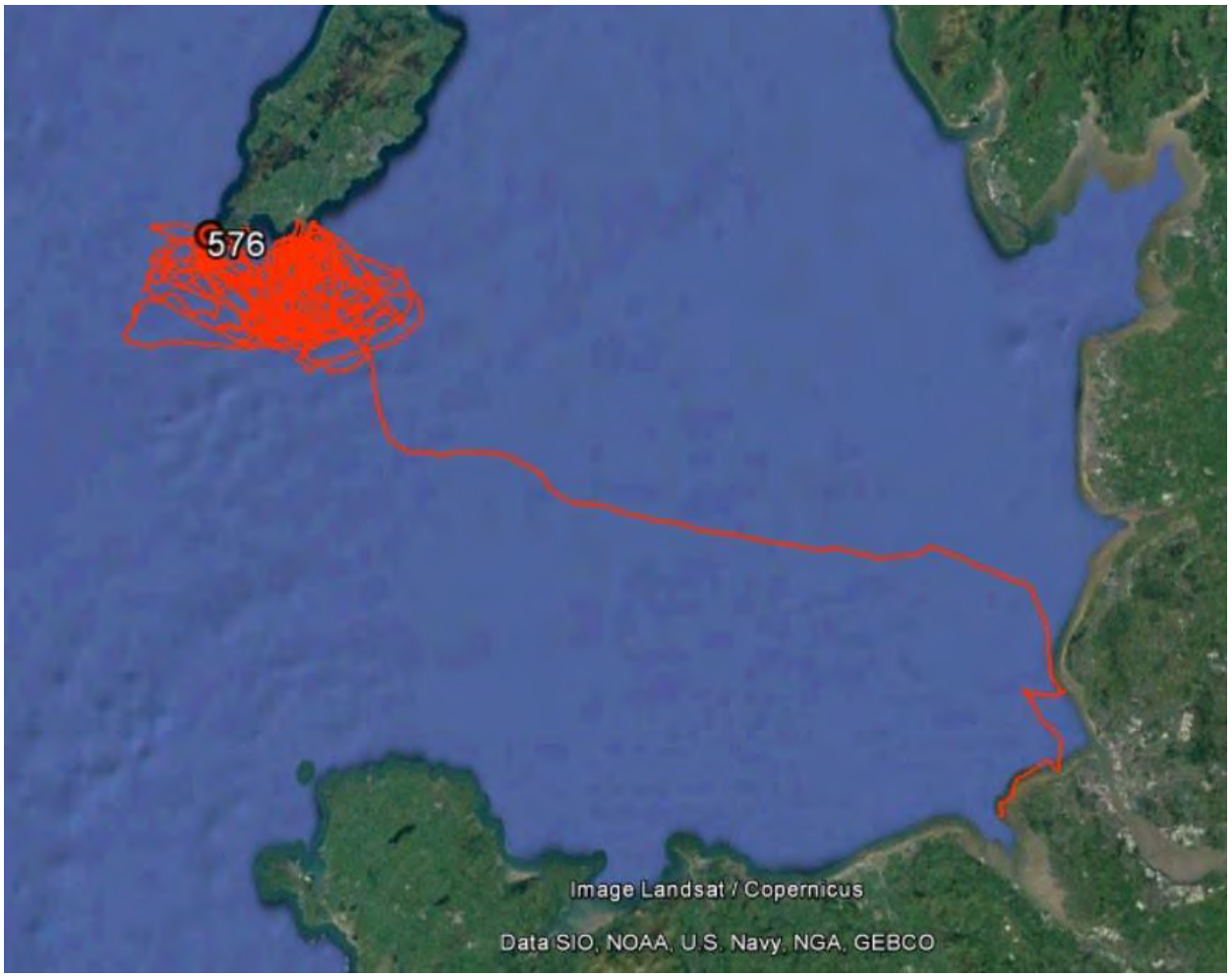
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Image Landsat / Copernicus
Data SIO, NOAA, U.S. Navy, NGA, GEBCO

C.6.9 Response from the MMO regarding the EWG Technical Note

MONA OFFSHORE WIND PROJECT AND MORGAN OFFSHORE WIND PROJECT: GENERATION ASSETS

Expert Working Group Technical Note

Document Reference: Expert Working Group Technical Note

September 2023

F01

Image of an offshore wind farm

1 Marine Mammals EWG Technical Note – Progress agreements

1.1.1.1 The aim of this technical note is to set out any outstanding agreements for the Mona Offshore Wind Project and Morgan Offshore Wind Project: Generation Assets (hereafter referred to as the 'Morgan Generation Assets') in the EWG and provide a summary of approach in the final Environmental Statement. Feedback is sought on the following topics:

- Design of aerial surveys with respect to marine mammals and use of an appropriate buffer around Mona and Morgan Array Areas.
- Regional Marine Mammal study area (MMSA) for use in the impact assessment and cumulative impacts assessment.
- Consideration of OSPAR Region III or maximum foraging range for Grey Seal CEA
- Agreement on noise modelling clarifications
- EDRs, dose response for HRA and EIA
- Densities and reference populations
- IPCoD modelling

1.2 Design of aerial surveys with respect to marine mammals and use of an appropriate buffer around Mona and Morgan Array Areas.

Table 1: Summary of agreements still outstanding – Digital Aerial Surveys.

Consultee	S42 / EWG Response
NRW	Responses from previous EWGs suggest NRW cannot confirm agreement on aerial survey design for Mona Offshore Wind Project and Morgan Generation Assets - suitability of Digital Aerial Survey (DAS) data for the marine mammal impact assessment cannot be conclusively determined based on the presented survey design alone. NRW recommended that all possible data sources (including those from DAS and the desktop study) are evaluated for quality and suitability and the most precautionary source with sufficient data quality to be used in impact assessments. It may be appropriate to present multiple data sources in the final assessments.
NE	Deferred to NRW for appropriate array area buffer size for the DAS but more generally in relation to aerial surveys broadly supportive of using digital aerial survey data to characterise the marine mammal baseline in the region and agreed that a range of density estimates from other sources must also be presented, for comparison to the site-specific surveys. Support concerns raised about the efficacy of digital aerial surveys in the Irish Sea. Would like to understand how the 10 km buffer coverage is quantifiably "better" and the implications for the marine mammal impact assessment. Natural England requests that the applicant considers providing a short description in the EIA on this topic, which could for example compare the outcomes of a 10 km buffer to the traditional 4km buffer.
JNCC	In S42 responses JNCC noted at least a qualitative review of the coverage over the entire area is required (i.e.is coverage even and are key areas of the Mona array areas covered by the surveys). JNCC do not agree with the approach of using

Consultee	S42 / EWG Response
	combined bird and mammal surveys, as these are not suitably designed for marine mammals and are unlikely to provide sufficient data. Agreed in EWG DAS should not be primary data source and happy to be supplemented with other sources.

1.2.1 Action for Final Environmental Statement in response to Table 1

1.2.1.1 The two years of aerial surveys have been completed and carried out according to the design in the PEIR and as presented at EWG meetings. Following EWG meetings and S42 responses, we will add in further detail about the consistency of coverage of surveys over the survey area (comprising the array area and buffer) during the monthly survey including discussion on a spatial coverage monthly and seasonally. Note, however, that the baseline characterisation does not rely upon aerial surveys alone and provides a comprehensive review of all desktop data sources and site-specific data which have subsequently been considered for quality, suitability, and robustness to carry forward to the impact assessment (as detailed in the marine mammal technical report). The Applicant has received all of the information and data sources suggested by the EWG and S42 responses, incorporating additional data sources for the Environmental Statement, and therefore are seeking for agreement on baseline characterisation as a whole (see Section 1.8 for presentation of densities and reference populations).

1.3 Regional Marine Mammal study area (MMSA) for use in the impact assessment and cumulative impacts assessment.

Table 2: Summary of agreements still outstanding - Marine Mammal Study Areas.

Consultee	Responses
NRW	In EWGs, NRW sought clarification on the purpose of the MMSA and use of MMMUs for impact assessment/screening. Agreement that the Celtic and Irish Sea (HP MMMU) is an appropriate study area for dolphin and minke whale for CEA, rather than full extent of their MUs. Recommend use of OSPAR Region III for screening (HRA) for grey seal. For EIA, NRW mentioned that when screening in projects if a smaller area is proposed (other than OSPAR III) for grey seal and justified, they would not anticipate ruling it out. While we would still advise the use of OSPAR III for screening, we are conscious that a large MU could be somewhat un-pragmatic. To this end, alternatives such as (1) the maximum foraging range of 448 km (Carter et al., 2022); (2) ICES divisions 7a,e,f,g,h; or (3) ICES divisions 7a,b,e,f,g,h,j would still be acceptable as screening distances.
NE	Recommended application of tiered approach but needed project alone comments addressed before agreeing CEA approach.
JNCC	In S42 responses agreed with use of MUs for MMSA. For screening, agreed with Irish and Celtic Seas MU. S42 responses focus on HRA screening.

1.3.1 Action for Final Environmental Statement for Mona and Morgan Generation Assets in response to Table 2: refinement of the approach to CEA based on projects within relevant species-specific MUs only.

1.3.1.1 **For EIA** in the PEIR (HRA is discussed later in section 1.3), the desktop review considered the marine mammal ecology, distribution and density/abundance within the Irish Sea and wider Celtic Sea, termed as the 'Regional Marine Mammal Study Area'. Marine mammals are highly mobile and may range over large distances and therefore this area was used to provide a wider context. Species-specific MUs were used in the impact assessment to aid quantifying population impacts. Going forward to Final Environmental Statement the species-specific approach, using relevant MUs to define reference populations will again be adopted.

1.3.1.2 In terms of the cumulative effect assessment (CEA) screening area for the PEIR and, as agreed with consultees during the EWG 02, screening initially focussed on projects within the extent of the harbour porpoise Celtic and Irish Seas MU, rather than the entire extent of the largest MU: the Celtic and Greater North Seas (CGNS) MU. This was to ensure a proportionate and pragmatic approach was taken, focussing on a region within which receptor-impact pathways are likely (since cumulative effects from the Mona Offshore Wind Project or Morgan Generation Assets within the Irish Sea were considered unlikely to occur with projects in the North Sea, for example).

1.3.1.3 Following EWG05 and S42 responses to the PEIR, the initial screening for the final Environmental Statement will again be focussed on projects within the harbour porpoise CIS MU, however, for the CEA assessment (for EIA) the following refinements are proposed following a more species-specific approach:

- Only projects within the Irish Sea MU will be used for CEA for bottlenose dolphin, as this MU largely represents the coastal bottlenose dolphin ecotype (of which there are only a few hundred), thus Project Erebus, which lies in the Offshore Channel and Southwest England MU (offshore ecotype), will not be considered. This was agreed by NRW and NE post EWG05.
- Only projects within the Grey Seal Reference Population (GSRP) will be used for the CEA for grey seal which includes the Wales MU, North West England MU, Northern Ireland SMU, South West Scotland MU, waters around the Isle of Man, East of Ireland region and South-East of Ireland region[1] (see Section 1.4 of this note).

[1]Note that whilst we acknowledge there is some disagreement about the appropriateness of the SMU boundaries for grey seal, we have not limited the assessment to the single MU in which the Mona Offshore Wind Project / Morgan Generation Assets lies and have instead used the sum of four SMUs (based upon grey seal counts per SMU in SCOS 2020 with the updated scalar of 25.15% from SCOS (2021)) plus an estimate from Isle of Man (Howe, 2018) plus East of Ireland and Southeast of Ireland estimates from Morris and Duck (2019) = 12,909 grey seal. This is based upon the telemetry study provided by SMRU

- Harbour seal was not included in the CEA for PEIR as this species was not identified as a key species for other cumulative projects screened in at the time of submission. For final Environmental Statement the CEA will consider any projects (in the updated CEA long list) which have screened in harbour seal with the appropriate reference population including the Wales MU, North West England MU, Northern Ireland SMU and waters around the Isle of Man.

1.3.1.4 No change will be made to the CEA for harbour porpoise, minke whale and Risso's dolphin which will continue to consider all projects within the CIS MU (harbour porpoise) for the cumulative assessment.

1.3.1.5 **For HRA** in the PEIR**,** species specific MUs were used for screening with additional information provided by telemetry studies (seals) to inform which sites to screen in for consideration of Likely Significant Effect (LSE). This approach was accepted through the EWG process, and therefore the same approach will be carried forward for the final HRA, as follows:

- For harbour porpoise all sites within the Celtic and Irish Seas MU will be considered,
- For bottlenose dolphin all sites within the Irish Sea MU will be considered.
- For grey seal all SACs in the Wales MU, North West England MU, Southwest Scotland and Northern Ireland MU will be screened for LSE. Additional information set out in Carter *et al.*, 2022 and telemetry data presented in the PEIR (Wright and Sinclair, 2022), indicates some potential connectivity with the Isles of Scilly Complex SAC, Lundy SAC, The Maidens SAC and Saltee Islands SAC and are therefore included.
- For harbour seal, the Wales and North West England MU was used, alongside consideration of connectivity presented in Carter *et al.* (2022) and telemetry data in the PEIR which screened in Strangford Lough SAC and Murlough SAC.
- There are no SACs within Isle of Man waters.

which shows high levels of connectivity with designated haul out sites in the Irish Sea and wider Celtic Sea, we feel this captures the wide-ranging mobile nature of the species but allows a proportionate and relevant population assessment.

1.4 Consideration of OSPAR Region III or maximum foraging range for Grey Seal CEA

Table 3: Summary of agreements still outstanding - Grey Seal CEA Screening.

Consultee	Response
NRW	Highlighted use of management units (MU's) as the appropriate screening distance was not always followed when screening in projects for the assessment of potential cumulative effects on marine mammals. As agreed in previous EWGs, using the Irish and Celtic sea area as a screening distance for other cetacean species is a proportionate measure. For grey seal, however, the OSPAR Region III interim MU should ideally be used to screen in projects that may potentially have cumulative effects on the grey seal population. If a smaller area (or other approach) is proposed for screening in projects for grey seal and justified, NRW (A) would not anticipate ruling it out.
NE	EWG 05 response: Natural England did not have objections on presenting OSPAR Region III alongside MUs for comparison but advise that then more precautionary one should be taken further to the assessment.
JNCC	S42: JNCC agree with the use of Management Units (MUs) for the regional marine mammal study area. We agree with previous EWG meeting outcome to screen in the Irish Sea extending to the Celtic Sea rather than the largest MU, based on likely receptor-pathways.

1.4.1 Action for Final Environmental Statement in response to Table 3: consideration of appropriate CEA screening area for grey seal and justification of approach.

1.4.1.1 Following recommendation from NRW during the EWG02, for the PEIR a quantitative impact assessment was presented (i.e., estimating the % of population potentially affected) for the respective project alone assessment (Mona Offshore Wind Project or Morgan Generation Assets) and cumulative assessment, against two reference population estimates:

- 1) the Grey Seal Reference Population (GSRP) (for combined SMUs/grey seal regions as described in Section 1.3 above)
- 2) the OSPAR Region III interim population (noting that the cumulative screening area for PEIR was the CIS MU (harbour porpoise) and not the OSPAR Region III).

1.4.1.2 Feedback via S42 response was to ideally use the OSPAR Region III as the appropriate CEA screening area unless an alternative can be justified (**Error! Reference source not found.**). In addition to the GSRP and OSPAR Region III a third option, based on the maximum foraging range of grey seal (448 km) as per Carter *et al* (2022), was also suggested by the EWG.

1.4.1.3 Notwithstanding the discussions as part of the EWG we propose using a species-specific MU approach to CEA screening. For grey seal this would equate to the GSRP, rather than OSPAR Region III or the 448 km radial distance, as the GSRP provides optimal coverage of the wide-

ranging nature of the species but allows for a pragmatic and proportionate approach to screening. Further justification of this approach is provided below.

- *OSPAR Region III*: The GSRP was defined based on a seal telemetry study (data provided by SMRU) which looked at movements of individuals within the Celtic and Irish Seas, showing connectivity between key haul-outs and the Mona/Morgan Projects. Whilst we acknowledge there is some disagreement about the appropriateness of the individual SMU boundaries, the GSRP as a whole falls within, and is comparable to, the cumulative screening area already agreed during the EWG02 (i.e. the Celtic and Irish Seas MU), and broadly aligns with ICES areas 7.a, g and f (NRW stated in their EWG05 responses that "alternatives such as…(2) ICES divisions 7a,e,f,g,h; or (3) ICES divisions 7a,b,e,f,g,h,j would still be acceptable as screening distances"). In addition, adopting this species-specific approach using relevant UK MUs is consistent with the S42 advice to use the IS MU for bottlenose dolphin. Whilst it is acknowledged that OSPAR Region III would cover a larger area (and therefore include projects further afield), we believe that in applying the GSRP, the cumulative assessment adopts a biogeographic region approach which is proportionate to the area within which a receptor-impact pathway is most likely to occur. It is for this same reason that the EWG agreed that it would not be proportionate to use the Celtic and Greater North Seas as a CEA screening area for Risso's dolphin, short-beaked common dolphin and minke whale. In addition, it is highlighted that by applying the smaller GSRP (13,563 animals) as a reference population, instead of the larger OSPAR Region III population (60,780 animals) the quantitative assessment of effects is not diluted.
- *Maximum foraging range*: The maximum foraging range of 448 km provided by Carter *et al*. (2022) was also suggested in relation to the CEA screening area. This range represents the maximum geodesic distance from any haul-out across all geographic areas reported for all tagged seals in the UK. This distance, however, is based on movements of an individual over many days (e.g. Cronin *et al*. (2013) found that the mean foraging trip duration was 1.7 days, longest being over 15 days), and does not therefore reflect typical movements of individuals from haul-outs. Carter *et al.* (2022) highlighted that distance to haul-out site was the primary driver of distribution and the habitat preference model developed for grey seal in the Irish Sea North (Region 7, Figure 1), within which the Mona Offshore Wind Project and Morgan Generation Assets is situated, suggested that there is a negative association with areas >80 km from haul outs in this region (Figure 2). Notably, the data presented showed a single observation at approximate 120 km suggesting that this may be more indicative as a maximum foraging range for this region. Therefore, use of the 448 km maximum foraging range was not considered to be appropriate in the context

of CEA screening for the Mona Offshore Wind Project and Morgan Generation Assets.

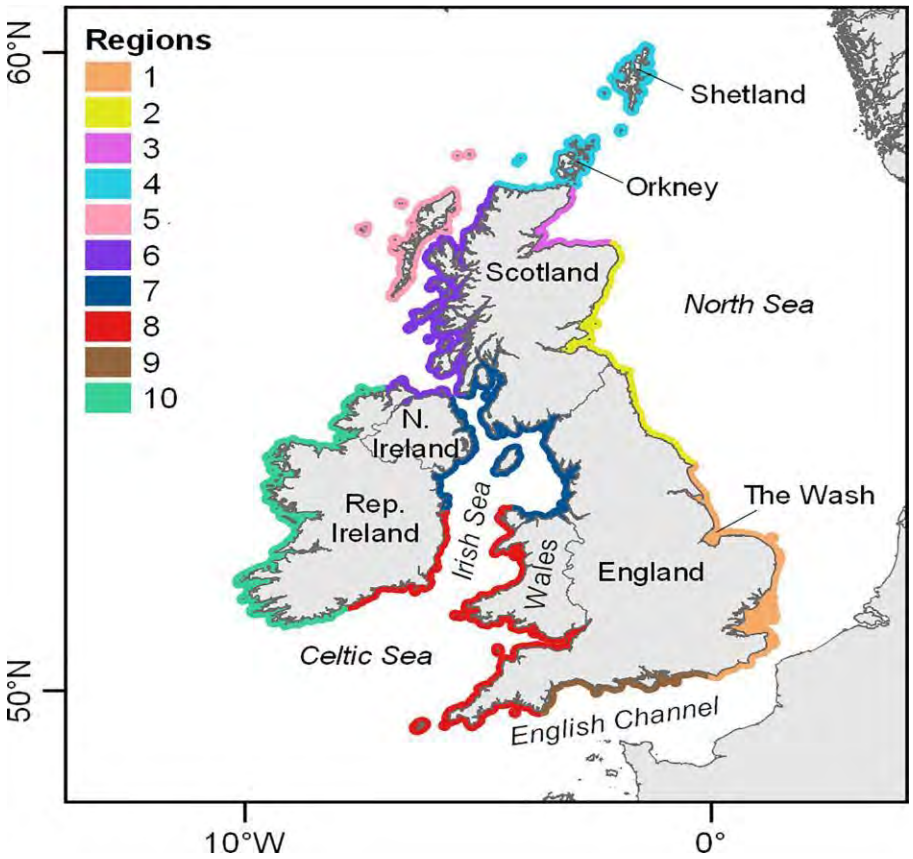

Figure 1: Map of the study area showing regional designations for habitat preference models. 1: Southeast England, 2: East Coast, 3: Moray Firth, 4: North Coast & Northern Isles, 5: Western Isles, 6: West Scotland & Ireland North, 7: Irish Sea North, 8: Celtic Sea & Irish Sea South, 9: English Channel. 10: West Ireland

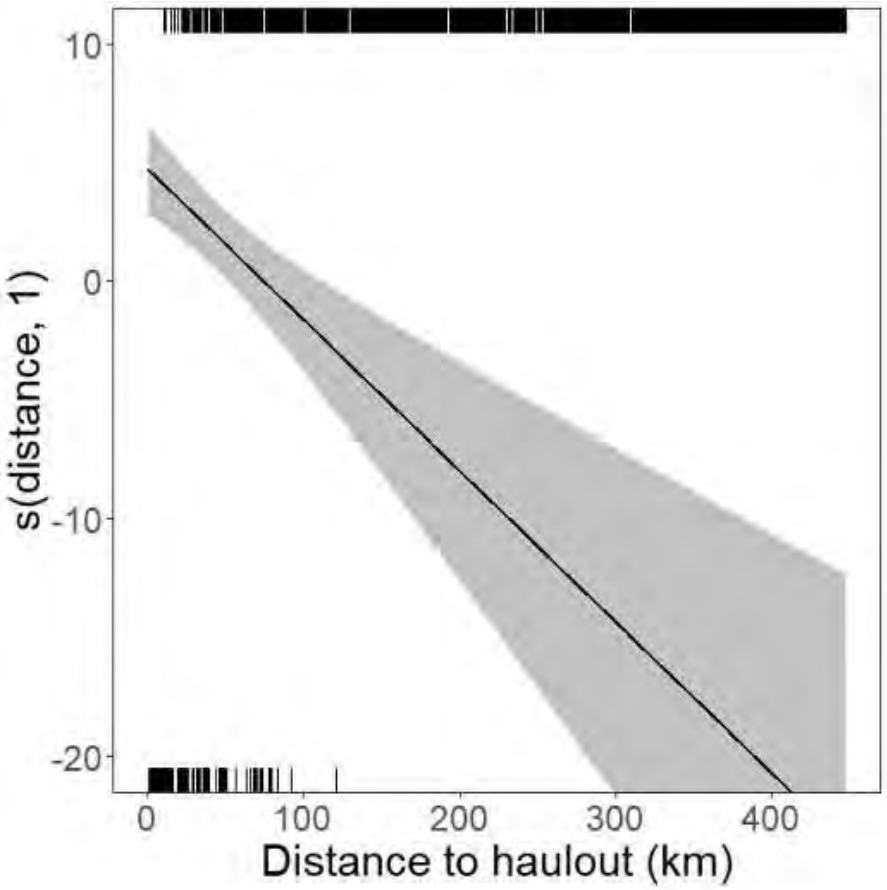

Figure 2: Habitat preference relationship in relation to distance from haul out for grey seal in the Irish Sea North (region 7).

1.4.1.4 Therefore, in light of the above, we propose to apply the GSRP as the CEA screening area, as the most appropriate reference population. As per PEIR, a quantitative assessment against the OSPAR Region III population will be presented, in parallel, for additional context but as this is less precautionary than the GSRP it will not be used to underpin the final conclusions in the impact assessment.

1.5 CEA - Site investigation (i.e. geophysical) surveys

Table 4: Summary of agreements still outstanding - CEA Screening, Geophysical Surveys.

Consultee	Response
NRW	Suggested screening based upon MUs not impact radius, and agreed use of CIS MU would be pragmatic for all cetacean species other than bottlenose dolphin.
NE	N/A
JNCC	N/A

1.5.1 Action for Final Environmental Statement in response to Table 4*Error! Reference source not found.*: revised approach to CEA screening area for site investigation surveys and use of a maximum number of SI surveys occurring concurrently.

1.5.1.1 Noting NRW's response to screening distances for site investigation surveys, we propose to screen using the species-specific CEA areas (rather than the maximum modelled impact ranges derived from the underwater noise modelling assessment used in PEIR). We propose to use a proportionate number to assume how many will be happening at the same. This is the approach adopted for previous OWF assessments, (e.g. Hornsea 4 assumed up to four site-investigation surveys to occur at the same time in North Sea whilst Awel y Mor assessed up to one in the Irish Sea). In alignment with other Round 4 projects in the Irish Sea (including Morgan Generation, Morecambe Generation, and Morgan-Morecambe Transmission Assets) we propose a conservative estimate of two site-investigation surveys could occur at a similar time.

1.5.1.2 Our estimate is based on the following:

- The CEA screening screened projects which could occur between 2024 and 2035. Projects where the licence expired two years before construction were excluded.
- There are potentially up to 14 site-investigations between this period, within the largest CEA study area (CIS MU).
- Surveys typically occur over short durations (typically up to 2 months).
- The construction period for Mona is four years.
- There are limitations on the number of survey vessels that could carry out such surveys at one time and therefore highly unlikely that all would overlap temporally.
- As a conservative approach we have assumed up to two surveys could overlap with the Mona site-investigation surveys. We are seeking agreement on this approach.

1.6 Agreement on noise modelling clarifications.

Table 5: Summary of agreements still outstanding - Noise Modelling Clarifications.

Consultee	Response
NRW	Agreed, NRW content with dual metric approach (SPL and SELcum) for impact assessment. Recommend modelling impact ranges without ADDs in parallel.
NE	In S42 responses, NE suggested they do not agree that 30 minute ADD should be included in the underwater noise modelling to predict impact ranges for the assessment and advises assessment should be based on the underwater noise modelling without ADDs and revise any assessments,

Consultee	Response
	including cumulative and HRA, that are based on the predicted ranges with 30min ADDs.
JNCC	No further comments from S42/EWG.

1.6.1 Action for Final Environmental Statement in response to Table 5: presentation of injury ranges with/without ADDs

1.6.1.1 **Dual metric approach:** Following EWG and S42 responses, we believe stakeholders are content with the dual metric approach for assessing injury (in the form of a permanent threshold shift (PTS)) to marine mammals. Thus both SPL and SELcum were presented in the impact assessment with the metric predicting the largest range of impact taken forward for the purposes of mitigation and considered in the adoption of appropriate measures to reduce injury to marine mammals.

1.6.1.2 **Acoustic Deterrent Devices (ADDs):** Most assessments model both with and without ADD to show the benefits of ADDs where this has been proposed as an integral part of the project designed-in mitigation measures to reduce the risk of injury to marine mammals. Therefore the assessment considers the implementation of an indicative 30 minute ADD deployment duration as well as the predicted ranges without the use of an ADD. ADDs are included as part of standard industry tertiary measures (as with passive acoustic monitoring/marine mammal observers) and therefore are accepted as part of best practice within marine mammal mitigation protocols (MMMPs). The detailed MMMP will be developed post-consent further to any project updates at this stage and a draft will be included with the application.

1.6.1.3 We are seeking agreement on our approach to present both with and without ADD and to base the conclusions of the assessment on the impacts which take into account any designed-in measures, including the use of ADDs.

1.7 EDRs, dose response for HRA and EIA

Table 6: S42 and EWG Responses – use of EDRs, dose response and thresholds.

Consultee	Response
NRW	For assessing area disturbed for harbour porpoise, NRW recommends that in addition / in parallel to EDRs, an unweighted noise threshold of 143 dB re 1µPa (or 103 dB re 1µPa VHF-weighted) single strike sound exposure level (Brandt et al.,2018; Heinis et al.,2019) should be used to represent the minimum fixed noise threshold at which significant disturbance would occur from impulsive noise sources.

Consultee	Response
NE/JNCC	Joint position statement gives SNCBs' advice on assessing the risk of significant disturbance as a result of noise and consequently managing noise disturbance within harbour porpoise sites to avoid a potential adverse effect on site integrity. Statement suggests use of EDRs for use in HRA assessments (JNCC, 2020).

1.7.1 Action for Final Environmental Statement in response to Table 6: use of the area-based approach for HRA based on EDR and 143 dB threshold.

1.7.1.1 **For HRA**, the approach to the assessment of disturbance resulting from piling use an unweighted noise threshold of 143 dB re 1µPa (or 103 dB re 1µPa VHF-weighted) will be used to represent the minimum fixed generalised response threshold (Tougaard, 2021) at which significant disturbance could occur for the final application in addition to the Effective Deterrence Range (EDR) approach. Dose-response will not be applied to the area-based assessment. The position statement (NRW, 2023b) will be reviewed and incorporated into the assessment as appropriate.

1.7.1.2 The use of an unweighted threshold of 143 dB re 1µPa relates to harbour porpoise only. For all other marine mammal species considered in HRA the NMFS level-B harassment threshold of 160 dB SPL_{rms} will be applied for piling alongside the relevant EDR (NMFS, 2005).

1.7.1.3 **For EIA,** the threshold 143 dB re 1µPa will be used alongside the dose-response approach. EDRs will not be used for the EIA assessment.

1.8 Densities and reference populations

Table 7: ES Densities and Reference Populations.

Consultee	S42 Response
NRW	Agreed except common dolphin
NE	Agreed except common dolphin
JNCC	Agreed.

1.8.1.1 Final densities to be taken forward to the assessment of impacts are presented in Error! Reference source not found. for Mona Offshore Wind Project and **Error! Reference source not found.** for Morgan Offshore Wind Project Generation Assets. We are seeking final agreement on all densities for both the Mona Offshore Wind Project and Morgan Offshore Wind Project Generation Assets.

1.8.2 Action for Final Environmental Statement in response to Table 7: update densities in assessment as per final agreed values with EWG.

1.8.2.1 NRW, NE and JNCC agreed with densities and reference populations for harbour porpoise, bottlenose dolphin, Risso's dolphin, minke whale, grey seal and harbour seal submitted via email following EWG05. Combined population estimates for the GSRP will be presented (as agreed with the EWG) and a population estimate for OSPAR Region III was also agreed for grey seal (provided for additional context as described in section 1.3 above). A single density for bottlenose dolphin will be applied, derived from the Welsh Marine Mammal Atlas (rather than two densities to represent coastal and offshore densities).

1.8.2.2 The Isle of Man government confirmed on 3rd August 2023 that they agreed with the grey seal population estimate of 400 for IoM waters (based on Howe, 2018).

1.8.2.3 During the EWG process, NRW (A) recommend the use of densities from the newest version of the Welsh Marine Mammal Atlas (Evans and Waggitt, 2023) instead of Waggitt *et al.* (2020). NE agreed with use of Welsh Marine Mammal Atlas unless new data reveals evidence of greater densities (e.g. SCANS IV; or site-specific surveys). Therefore, the proposed densities to take forward to assessment for short-beaked common dolphin, are also derived from the Welsh Marine Mammal Atlas (Evans and Waggitt, 2023) (see Table 9 for proposed densities for the Mona Offshore Wind Project and Table 10 for the Morgan Offshore Wind Project Generation Assets).

1.8.2.4 We are seeking final agreement on all densities for both the Mona Offshore Wind Project and Morgan Offshore Wind Project Generation Assets.

1.9 IPCoD modelling

Table 8: S42 Responses - IPCoD Modelling.

Consultee	S42 Response
NRW	NRW (A) recommend that when presenting results from IPCoD modelling to provide the ratio of the impacted versus unimpacted population over a set period of time (for example the first 6 years, based on the former Favourable Conservation Status (FCS) reporting period), and the full 25 year modelled period. Also suggested the modelled results from iPCoD are highly sensitive to whether or not the unit of population is appropriate, and therefore two populations of bottlenose dolphins (Irish Sea MU and Offshore Channel and Southwest England MU) will need to be assessed separately
NE	N/A
JNCC	For IPCoD modelling, MUs, by definition, should be considered separately and not combined unless strong justification to do so is provided.

1.9.1 Action for Final Environmental Statement in response to Table 8: present 6-year time step in iPCoD model, assess temporal maximum design scenario and add in additional cumulative projects

1.9.1.1 There is no change from the parameters presented in PEIR and no responses back on S42 on iPCoD parameters. Therefore, we are carrying these forward to the Environmental Statement.

1.9.1.2 We will, however, present the 6-year time step in the modelling period, which represents the former Favourable Conservation Status (FCS) reporting period, alongside 25 years.

1.9.1.3 We will add in additional projects that have since moved Tiers (scoping reports available, PEIR submitted, Environmental Statement available) e.g. Morecambe Generation, Transmission Assets.

1.9.1.4 We will also present iPCoD modelling for the temporal maximum design scenario as well as spatial maximum design scenario for Environmental Statement.

1.9.1.5 For bottlenose dolphin, as discussed in EWG05, only the Irish Sea MU will be used in IPCoD modelling. Therefore Project Erebus, which sits in the Offshore Channel and Southwest England MU rather than the Irish Sea MU will be scoped out for bottlenose dolphin.

1.9.1.6 We are seeking agreement on the above points related to iPCoD modelling.

Table 9: Marine mammal species densities and reference populations to be included in the final Environmental Statement for Mona Offshore Wind Project.

Species	Density (animals per km^2)	Source and justification for use	Reference population	Agreement following EWG05
Harbour porpoise	0.2773	Average density from the maximum composite shapefiles from the Welsh Marine Atlas (Evans and Waggitt, 2023) for the updated Mona array area.[2] For PEIR density was 0.097 baseline on site-specific aerial survey data. **Change from agreed approach in PEIR.**	Celtic and Irish Sea MU = 62,517 animals (IAMMWG, 2022; 2023)	Agreed by NRW / NE / JNCC.
Bottlenose dolphin	0.00171	Average density from the maximum composite shapefiles from the Welsh Marine Atlas (Evans and Waggitt, 2023) for the Mona marine mammal study area, as is higher than the estimate for the updated array area only. For PEIR, density was 0.035 animals per km^2 (Lohrengel *et al.,* 2018) **Change from agreed approach in PEIR.**	Irish Sea MU = 293 animals (IAMMWG, 2022; 2023)	Agreed by NRW / NE / JNCC.

[2] These values are slightly higher than NRW value provided (0.27357), but this is due to the updated array area, and are higher than the density estimate for the Mona marine mammal study area - the most precautionary chosen.

Species	Density (animals per km^2)	Source and justification for use	Reference population	Agreement following EWG05
Short-beaked common dolphin	0.0006	RPS note NRW and NE previous response for short-beaked common dolphin suggesting that Waggitt *et al* (2020) densities are not appropriate for this species and in line with their advice. The Applicant proposes instead to take forward the average density value from the Welsh Marine Mammal Atlas (Evans and Waggitt, 2023) for the Mona array area (0.0006 animals per km^2). For PEIR density was 0.018 animals per km^2 (SCANS II, Block O) (Hammond *et al.,* 2002) **Change from agreed approach in PEIR / EWG05.**	Celtic and Greater North Seas MU = 102,656 animals (IAMMWG, 2022; 2023)	**Approach proposed by NRW/NE. Seeking final agreement on density.**
Risso's dolphin	0.0313	This value from SCANS-III (Hammond *et al*., 2021) for adjacent Block E is the most precautionary estimate compared to the Welsh Marine Atlas (0.001 animals per km^2), and Waggitt *et al.* (2020) (0.001 animals per km^2) densities. Risso's not included in maps by Lacey *et al* (2022) **No change from agreed approach in PEIR.**	Celtic and Greater North Seas MU = 12,262 animals (IAMMWG, 2022; 2023)	Agreed by NRW / NE / JNCC.
Minke whale	0.0173	This value from SCANS-III (Hammond *et al*., 2021) for adjacent Block E is the most precautionary estimate compared to the Welsh Marine Atlas (0.006 animals per km^2), Waggitt *et al.* (2020) (0.007 animals per km^2) and is comparable to Lacey *et al*. (2022) density maps (0.018 animals per km^2). **No change from agreed approach in PEIR.**	Celtic and Greater North Seas MU = 20,118 animals (IAMMWG, 2022; 2023)	Agreed by NRW / NE / JNCC.
Grey seal	Offshore density 0.037	Density for the aerial survey area (updated Mona array area plus 7.06-15.68 km buffer) from Carter *et al.* (2022). For PEIR, density was also 0.037 animals per km^2. **No change from agreed approach in PEIR.**	Two reference populations included: 1) "Grey seal reference population":	Density agreed by NRW / NE / JNCC. **Seeking agreement on**

Species	Density (animals per km^2)	Source and justification for use	Reference population	Agreement following EWG05
	Inshore density 0.180	Density for the cable corridor area plus 10 km buffer from Carter *et al.* (2022). For PEIR, density was 0.196 animals per km^2. **<u>Change from agreed approach in PEIR.</u>**	**To note, these estimates have been updated using an updated scalar from SCOS (2021) since EWG05.** Sum of four SMUs (based upon counts per SMU presented in SCOS 2020 with updated scalar of 25.15 from SCOS 2021): 12 Wales = 3,579 13 NW England = 994 14 Northern Ireland = 2,008 SW Scotland = 2,056 Plus an Isle of Man estimate (Howe 2018) = *400* Plus, estimates based upon Morris and Duck (2019) with scalar from SCOS (2021). East of Ireland = 1,662 Southeast of Ireland = 2,211 = total of 12,909 grey seal. 2) OSPAR Region III	**<u>updated reference population.</u>**

Species	Density (animals per km^2)	Source and justification for use	Reference population	Agreement following EWG05
			estimate = 60,780 (n*min*) from OSPAR QSR report for 2023. Used as precautionary estimate rather than mean.	
Harbour seal	Offshore density 0.0002	Density for the aerial survey area (updated Mona array area plus 7.06-15.68 km buffer) from Carter *et al.* (2022). For PEIR, density was also 0.0002 animals per km^2. **No change from agreed approach in PEIR.**	Sum of the Wales (13), Northern Ireland (1,405) and Northwest England MU (6) latest population estimates per SMU in SCOS (2021) = *1,424 harbour seal.*	Agreed by NRW / NE / JNCC.
	Inshore density 0.001	Density for the cable corridor area plus 10 km buffer from Carter *et al.* (2022). For PEIR, density was also 0.001 animals per km^2. **No change from agreed approach in PEIR.**		

Table 10: Marine mammal species densities and reference populations to be included in the final Environmental Statement for Morgan Generation Offshore Wind Project.

Species	Density (animals per km^2)	Source and justification for use	Reference population	Agreement following EWG05
Harbour porpoise	0.262[3]	Average density from the maximum composite shapefiles from the Welsh Marine Atlas (Evans and Waggitt, 2023) for the Morgan marine mammal study area. This density is comparable to, but more precautionary than densities derived from two years of site-specific aerial survey data ('bio-season' design based absolute densities = 0.219 animals per km^2). For PEIR, the density derived from one year of site-specific aerial survey data ('bio-season' design based absolute densities) was 0.247 animals per km^2. **Change from agreed approach in PEIR.**	Celtic and Irish Sea MU = 62,517 animals (IAMMWG, 2022; 2023)	Approach agreed for Mona, awaiting final agreement on densities for Morgan Gen Final ES.
Bottlenose dolphin	0.0012	Average density from the maximum composite shapefiles from the Welsh Marine Atlas (Evans and Waggitt, 2023) for the Morgan marine mammal study area. For PEIR, density was 0.035 animals per km^2 (Lohrengel *et al.,* 2018) **Change from agreed approach in PEIR.**	Irish Sea MU = 293 animals (IAMMWG, 2022; 2023)	Approach agreed for Mona, awaiting final agreement on densities for Morgan Gen Final ES.
Short-beaked common dolphin	0.00029	RPS note NRW and NE response for short-beaked common dolphin suggesting that Waggitt *et al* (2020) densities are not appropriate for this species and in line with their advice. The Applicant proposes instead to take forward the average density value from the Welsh Marine Mammal Atlas (Evans and Waggitt, 2023) for the Morgan marine mammal study area. For PEIR, density was 0.018 animals per km^2 (Hammond *et al.,* 2002)	Celtic and Greater North Seas MU = 102,656 animals (IAMMWG, 2022; 2023)	Approach agreed for Mona, awaiting final agreement on densities for Morgan Gen Final ES.

[3] This value is slightly different to the NRW value provided but this is due to an updated array area. Densities were estimated for two areas; Morgan array area and Morgan marine mammal study area. The higher (more precautionary) density has been applied to take forward for assessment.

Species	Density (animals per km^2)	Source and justification for use	Reference population	Agreement following EWG05
		Change from agreed approach in PEIR.		
Risso's dolphin	0.0313	Density from SCANS-III (Hammond *et al.*, 2021) for adjacent Block E. This is the most precautionary estimate compared to the Welsh Marine Atlas (0.0009 animals per km^2), and Waggitt *et al.,* 2020 (0.001 animals per km^2) densities. Risso's not included in maps by Lacey *et al.* (2022). **No change from agreed approach in PEIR.**	Celtic and Greater North Seas MU = 12,262 animals (IAMMWG, 2022; 2023)	No change from approach agreed for PEIR, awaiting final agreement on densities for Morgan Gen Final ES.
Minke whale	0.0173	This value from SCANS-III (Hammond *et al.*, 2021) for adjacent Block E is the most precautionary estimate compared to the Welsh Marine Atlas (0.005 animals per km^2), Waggitt *et al.* (2020) (0.007 animals per km^2) and is comparable in order of magnitude to Lacey *et al.* (2022) density maps (0.025 animals per km^2). For PEIR, density was 0.0173 animals per km^2 (Hammond *et al.,* 2021). **No change from agreed approach in PEIR.**	Celtic and Greater North Seas MU = 20,118 animals (IAMMWG, 2022; 2023)	No change from approach agreed for PEIR, awaiting final agreement on densities for Morgan Gen Final ES.
Grey seal	0.0412	Density for the aerial survey area (updated Morgan array area plus buffer) from Carter *et al.* (2022). Density derived from two years of site-specific aerial survey data ('bio-season' design based absolute densities) was 0.130 animals per km^2. **No change from agreed approach in PEIR.**	Two reference populations included: **1) "Grey seal reference population":** Sum of four SMUs (based upon counts per SMU presented in SCOS 2020 with updated scalar of 25.15 from SCOS 2021): 12 Wales = 3,579 13 NW England = 994 14 Northern Ireland = 2,008	No change on approach agreed for PEIR, awaiting final agreement on densities for Morgan Gen Final ES .

Species	Density (animals per km^2)	Source and justification for use	Reference population	Agreement following EWG05
			SW Scotland = 2,056 Plus an Isle of Man estimate (Howe 2018) = *400* Plus, estimates based upon Morris and Duck (2019) with scalar from SCOS (2021). East of Ireland = 1,662 Southeast of Ireland = 2,211 = *total of 12,910 grey seal.* **2) OSPAR Region III estimate =** 60,780 (n*min*) from OSPAR QSR report for 2023. Used as precautionary estimate rather than n*mean*.	
Harbour seal	0.00005	Density for the aerial survey area (updated Morgan array area plus buffer) from Carter *et al.* (2022). No harbour seal were sighted during site-specific aerial surveys. **No change from agreed approach in PEIR.**	Sum of the Wales (13), Northern Ireland (1,405) and Northwest England MU (6) latest population estimates per SMU in SCOS (2021) = *1,424 harbour seal.*	No change on approach agreed for PEIR, awaiting final agreement on densities for Morgan Gen Final ES .

1.10 References

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C.6.10 Response from NRW regarding the EWG Technical Note

From: [redacted]
Sent: Monday, October 23, 2023 2:42 PM
To: [redacted]
Cc: [redacted]
Subject: RE: bp-EnBW Morgan and Mona OFW Monthly meeting with MMO

Hi [redacted]

Attached below is the response from Cefas following the marine mammal technical note. Apologies for the delay in getting this information back. Great to see you today and Adam and I will catch up regarding the other points.

"Please note that I largely defer to Natural England and to other relevant SNCBs for their comments on the following specific issues covered in the Technical Note (as these issues are outside my area of expertise):

- *Design of aerial surveys with respect to marine mammals and use of an appropriate buffer around Mona and Morgan Array Areas.*
- *Regional Marine Mammal study area (MMSA) for use in the impact assessment and cumulative impacts assessment.*

Consideration of OSPAR Region III or maximum foraging range for Grey Seal CEA

- *Densities and reference populations*
- *IPCoD modelling*

Agreement on noise modelling clarifications

1. *I can confirm that Cefas support the dual metric approach for assessing auditory injury in marine mammals. Both the peak sound pressure level (peak SPL) and the cumulative sound exposure level (SELcum) ranges should be presented.*
2. *I would add that for the assessment of UXO clearance, the peak SPL, as in the NOAA (NMFS, 2018) and Southall et al. (2019) guidance, is the correct metric to use for instantaneous PTS. This is because the risk of auditory damage depends on how high peak pressures get (and how rapidly they rise), which – out of the standard metrics available – is best reflected by the peak SPL. Because this PTS is physical damage to the inner ear, it is less dependent on the sensitivity of hearing across frequency, which is why it isn't weighted.*
3. *I am content for the assessment to present the benefits of using an ADD, as long as the worst-case ranges (i.e, no ADD) are clearly presented and considered.*

EDRs, dose response for HRA and EIA

4. *Section 1.7.1.2: The use of an unweighted threshold of 143 dB re 1µPa relates to harbour porpoise only. For all other marine mammal species considered in HRA the NMFS level-B harassment threshold of 160 dB SPLrms will be applied for piling alongside the relevant EDR (NMFS, 2005). Please note that thresholds based on the SPLrms are not appropriate for impulsive sources such as percussive pile driving – the appropriate metric is the SELss (single strike Sound Exposure Level)."*

Many thanks

[redacted] **BSc (Hons), MSc I Marine Licensing Case Officer I PCS London & South East Branch Representative | His Majesty's Government – Marine Management Organisation.**
Direct Line: [redacted] I Email: [redacted] I Lynx House, 1 Northern Road,

Website Twitter Facebook Linkedin Blog Instagram Flickr YouTube Google+ Pinterest

My pronouns are she/her

I'm a PCS Member. If you aren't a member you can join here https://www.pcs.org.uk/get-involved/why-join-pcs

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C.6.11 Response from JNCC regarding the EWG Technical Note

Projects Mona & Morgan Generation Marine Mammal Expert Working Group Technical Note (September 2023)

[redacted]
Senior Marine Advisor

25th September 2023

Introduction

This advice is provided in response to the Marine Mammal Expert Working (EWG) Group Technical Note received via email on 11th September 2023.

NRW advice in this document is provided (under a Discretionary Advice Service agreement) in respect of a proposal which will require an application for which Natural Resources Wales is a Statutory Consultee.

The customer acknowledges that the content of any advice or assistance provided by NRW is advisory only and that it shall not be deemed to bind or in any other way restrict NRW in performing its statutory functions.

The recipient acknowledges that:

- any advice given or materials or documentation provided by NRW do not constrain or bind NRW in respect of its statutory functions or its role as a statutory consultee or any decision NRW may make in relation to any application for a licence or permit;
- any advice given by NRW does not bind NRW in respect of any future representations it may make as statutory consultee or any decision NRW may make in relation to any application for a licence or permit;
- any views or opinions expressed by NRW are without prejudice to the consideration NRW may be required to give to any application or any future representations as statutory consultee or any decision NRW may make in relation to any application for a licence or permit;
- the final decision as to any representations made by NRW as statutory consultee will be based on all the relevant information available to NRW at the time it makes such representations;
- NRW cannot and does not give any guarantee as to the representations it may make as statutory consultee; and,
- any advice given by NRW may be overtaken by changes in available information, law, policy and guidance relevant to the subject matter of the advice.

Advisors Consulted:
Marine Mammals

Actions

Key Issues

- NRW Advisory (A) largely agree with the proposed progress agreements outlined in the Technical Note.

- NRW (A) note that use of the Grey Seal Reference Population (GSRP) for combined Seal Management Units (SMUs) / grey seal regions is being proposed for CEA screening, contrary to previous advice provided by NRW (A). However, we anticipate being able to agree with the proposed reference area / screening distance for grey seal, although we have some pending queries and comments regarding this – please see detailed comments below.

Detailed comments

- NRW (A) agree with the approach outlined in *Section 1.2.1.1*.

- NRW (A) disagree that the approach proposed in *Section 1.3.1.5* for grey seal was agreed through the EWG process. The additional detail qualifying our previous advice has not been fully captured in *Table 2* and *Table 3*. In view of our: (1) emailed comments following EWG05 (27th July 2023); (2) verbal comments during EWG03 (17th November 2022); and (3) our advice in the consultation on Marine Mammal Reference Populations & Densities (21st October 2022), the statement that *"If a smaller area (or other approach) is proposed for screening in projects for grey seal and justified, NRW (A) would not anticipate ruling it out"* should be interpreted with reference to the alternatives suggested, i.e. ICES divisions 7a,e,f,g,h; or ICES divisions 7a,b,e,f,g,h,j.

- Regarding *Table 3*, the question of which grey seal reference population to use has been raised at previous EWG's and written comment requests. NRW (A) note in *Paragraph 1.4.1.3* "*Nothwithstanding the discussions as part of the EWG*", use of the GSRP is being proposed for CEA screening, contrary to previous advice provided by NRW (A) and verbal agreement for a parallel approach reached with SNCBs. However, NRW (A) anticipate being able to agree to the use of the GSRP as the reference population / screening area used to underpin final conclusions in the impact assessment, with a quantitative assessment against the OSPAR region III (or any of the alternatives suggested by NRW (A)) presented in parallel. Justification for the use of the GSRP based on the greater sensitivity of a smaller modelled population to an impact (bearing in mind some modelling caveats discussed below), in addition to the telemetry evidence already presented (i.e. Wright and Sinclair, 2022; Carter et al 2022 etc.) may be sufficient. If NRW (A) has sufficient information to be able to independently conclude no impact / no adverse effect using the OSPAR III area (or any of the alternatives previously suggested by NRW (A)), then we would have no major concerns about the suggested approach. This would be contingent on a few clarifications / supplementary discussions noted below:

    1. Clarification is sought on what a *"quantitative assessment"* would entail. NRW (A) understand *"quantitative assessment"* to mean PCoD modelling of impacts of projects screened within the OSPAR III border on the OSPAR III population. We advise that applying projects screened in for the GSRP to the larger OSPAR III

population would effectively be diluting the impact - rendering the parallel modelling exercise less useful and less precautionary.

2. NRW (A) do not necessarily agree with the statement in *Paragraph 1.4.1.4 "as this is less precautionary"* due to various nuances that make such a conclusion difficult to make. Although a smaller population number may be more sensitive to modelled impacts, a larger screening area would include projects further afield. We should also be conscious of the uncertainty being introduced when selecting a smaller (pragmatic) population boundary that may not necessarily match the actual (likely larger) population boundary. With reference to our response to the consultation on Marine Mammal Reference Populations and Densities (21st October 2022) NRW are currently finalising a population modelling report which carried out sensitivity analyses for various models and recommends population parameters for harbour porpoise, bottlenose dolphin and grey seal. We draw attention to one of the major conclusions of this work: that all the models depended upon an appropriately defined population management unit. If the population boundaries assigned do not align with the true biological population (and there is movement of animals in or out), then this will affect whether the abundance estimate is appropriate and likewise the observed population trends when modelling demographic responses to human impacts. NRW (A) made a similar point verbally during EWG 03 when explaining the reasoning behind our preference for the OSPAR Region III interim management unit and / or the suggested alternatives based on ICES divisions.

3. NRW (A) note the justification that the GSRP is comparable in size to ICES areas 7a,g, and f, however, we do not agree with the suggestion that these are comparable to two of the alternatives (i.e. ICES divisions 7a,e,f,g,h / 7a,b,e,f,g,h,j) that were suggested by NRW (A) as potential smaller screening distances. The two suggested alternatives cover a wider area, and have been extensively sensitivity tested as part of our population modelling scope of work. As we have no such certainties for 7a,g,f, we do not agree with the justification provided.

4. NRW (A) note that the reasoning behind this decision is effectively the same as the decision to use the Celtic and Irish seas MU instead of the Celtic and Greater North Seas MU as a CEA screening area for Risso's dolphin, short-beaked common dolphin and minke whale. In EWG 02, following a suggestion by the applicant, NRW (A) agreed that the use of the Celtic and Irish sea MU would be a pragmatic screening distance for all cetacean species with large MUs such as Minke whale and dolphin species other than BND. For these species there is much more uncertainty over the exact population boundaries or little evidence of sub-structuring, therefore the advice was based on a combination of pragmatic judgement calls and available abundance data. This is not the case for grey seal where we have far more accurate population estimates, detailed knowledge of their foraging ranges, and good knowledge of population boundaries (albeit the precise location of these boundaries being a point of academic discussion). In addition, NRW (A) notes that a screening area / population boundary for grey seal equivalent to the CIS MU would be nearer in size to ICES divisions 7a,e,f,g,h or 7a,b,e,f,g,h,j. We recommend that advice and consent sought and given for some species should not be inferred for other species.

- NRW (A) acknowledge in *Section 1.5.1.2* that our response to the screening distances for site investigation surveys has been noted. We agree with the proposed approach of two

site investigation surveys occurring simultaneously, and the rationale on which the estimate is based on.

- With reference to *Section 1.6.1.3* / *Table 5 Presentation of injury ranges with/without ADDs,* NRW (A) agree with the proposed approach.

- NRW (A) acknowledge and agree with the proposed approach in *Section 1.7.1.1*, to use a 143 dB single strike unweighted Sound Exposure Level (SEL_{ss}) or a 103 dB VHF-weighted SEL_{ss} threshold in parallel with an EDR. We also acknowledge and welcome the statement that dose-response will not be applied to the area-based assessment.

- With reference to *Section 1.7.1.2,* NRW (A) agree with the proposed use of a 160 db SPL_{rms} threshold for other marine mammal species in the HRA, alongside the relevant EDR.

- With reference to *Section 1.7.1.3,* in line with NRW's position statement on assessing behavioural disturbance, NRW (A) recommend the use of the dose-response approach alone to assess behavioural disturbance from piling noise. This is because the 143 dB SEL_{ss} threshold is intended as a tool for area-assessment. Dose response approaches better reflect behavioural responses in the wild (which tend to be probabilistic) and should be used for EIA where these exist. Where dose response curves do not exist for a given noise source, NRW (A) recommend following the advice outlined in our position statement.

- With reference to *Section 1.8.2.4,* NRW (A) confirm that we agree with the proposed densities and population numbers outlined in *Tables 9* and *10*. We agree with the proposed use of common dolphin densities from Evans and Waggitt (2023), unless new data reveals evidence of greater densities. We also acknowledge and agree with the rationale provided for the choice of N_{min} for the grey seal OSPAR III population.

- With reference to *Section 1.9.1.2,* NRW (A) welcome the intent to present results at 6-year time step period alongside the full 25-year model run, and we agree on the points related to iPCoD modelling.

Response to specific Feedback Requests posed in Section 1.1.1.1

- *Design of aerial surveys with respect to marine mammals and use of an appropriate buffer around Mona and Morgan Array Areas* – NRW (A) agree with the approach outlined.

- *Regional Marine Mammal study area (MMSA) for use in the impact assessment and cumulative impacts assessment* – NRW (A) anticipate being able to agree with the approach outlined, however, we have some pending queries regarding the proposed approach for grey seal.

- *Consideration of OSPAR Region III or maximum foraging range for Grey Seal CEA* – NRW (A) anticipate agreeing to the use of the GSRP as the reference population / screening area used to underpin final conclusions in the impact assessment, with a quantitative assessment against the OSPAR region III presented in parallel. Clarification is being sought on the specifics of what the "quantitative assessment" would entail. Detailed comments have been provided above.

- *Agreement on noise modelling clarifications* – NRW (A) agree with the approach outlined.

- *EDRs, dose response for HRA and EIA* – NRW (A) agree overall with the approach outlined, although we have suggested some refinements in line with our position statement on assessing behavioural disturbance from underwater noise to harbour porpoise.

- *Densities and reference populations* – NRW (A) agree with the approach outlined.

- *IPCoD modelling* – NRW (A) agree with the approach outlined.

Additional comments

- With reference to the final minutes circulated following the Marine Mammal EWG05, we note the inclusion of "post-meeting" text. Although we recognise that this was done to include follow-up responses in relation to the post-meeting actions, agreement logs, and comments on the minutes, further responses have subsequently been provided by RPS to these comments.

  Whilst most of these responses and additional information appear to have been captured in the technical document reviewed here, this was not always done (e.g. NRW (A)'s response for Table 3). In some cases, the additional information provided by NRW (A) through comments on the minutes or in response to the post-meeting actions was summarised or paraphrased (e.g. NRW (A)'s feedback on the approach to the CEA for site investigation surveys; NRW (A)'s advice on assessing vessel disturbance; NRW (A)'s feedback on the approach to use of the OSPAR III region) and therefore does not capture the full nuances of the response supplied.

  NRW (A) recommend that where additional technical notes are provided following EWG's, that the responses to minutes and post-meeting actions should be recorded within the same technical document in full, without paraphrasing / summarising, in order to maintain a clear audit trail.

C.6.12 Response from Natural England regarding the EWG Technical Note

From: [redacted]
To:
Cc:
Subject: RE: Mona Morgan Generation marine mammal agreements technical note
Date: 25 September 2023 15:20:56
Attachments: [redacted]

Good afternoon, [redacted]

Please see comments below from JNCC marine mammal specialists in relation to the Expert Working Group Technical Note (dated Sept 2023) which was circulated on 11 September.

1. Design of aerial surveys with respect to marine mammals and use of an appropriate buffer around Mona and Morgan Array Areas

   We are content with the proposed additions to the ES and note that the baseline characterisation does not rely on the aerial surveys alone. Provided a clear audit of how all data used in the baseline has been evaluated is provided in the ES, we agree with the baseline characterisation process.
   We acknowledge that these surveys have now been completed and but we will continue to advise future developments that marine mammal surveys should be given due consideration when designing DAS, and not simply treated as an add-on and it assumed that specifications for birds will be appropriate for marine mammals.

2. Regional Marine Mammal study area (MMSA) for use in the impact assessment and cumulative impacts assessment

   We are content with the approach proposed for EIA and HRA.

3. Consideration of OSPAR Region III or maximum foraging range for Grey Seal CEA

   We defer to NRW for matters relating to grey seal.

4. CEA - Site investigation (i.e. geophysical) surveys

   We defer to NRW re this item.

5. Agreement on noise modelling clarifications

   We agree with the approach described.

6. EDRs, dose response for HRA and EIA

   JNCC are content for EDRs not to be used in the EIA assessment and for an unweighted noise threshold of 143 dB re 1µPa (or 103 dB re 1µPa VHF-weighted) to be used in addition to the EDR approach for the HRA.

7. Densities and reference populations

   We agree with the densities discussed following EWG05 and the proposal to update the common dolphin density to reflect those presented in Evans and Waggitt 2023.

8. IPCoD modelling

   JNCC agree with the proposed amendments to how the modelling will be presented and addition of projects which have moved tiers. We defer to NRW regarding modelling undertaken for bottlenose dolphin.

If you have any queries please let me know.

Kind regards,

[redacted]

[redacted] | **Senior Marine Industries Adviser | JNCC**
Pronouns: she/her
Inverdee House, Baxter Street, Aberdeen, AB11 9QA | Tel: [redacted]
Working pattern: Monday to Friday

Website **X/Twitter** **Facebook** **LinkedIn**

C.6.13 Response from TWT regarding the EWG Technical Note

Rachel Abbott

From: Ben Smith [redacted]
Sent: 24 October 2023 13:57
To: Samantha Tuddenham
Subject: RE: Mona Morgan Generation species densities

CAUTION: This email originated from outside of RPS.

Dear Sam,

The WTW agrees with the RPS justification for the use of the 2 species dependant approaches to determine MM densities.

Thank you for the inclusion and opportunity to review the proposed methodology.

Best Wishes,

Ben

Benjamin Smith
Swyddog Cynllunio Morol (Cymru) – Ynni Adnewyddadwy ar y Môr
Marine Planning Officer (Wales) – Offshore Renewable Energy

Wildlife Trust (Wales) / Ymddiriedolaeth Natur (Cymru)

From: Samantha Tuddenham [redacted]
Sent: 23 October 2023 11:52
To: [redacted]
Cc: [redacted]
Subject: Mona Morgan Generation species densities

Dear All,

Following EWG feedback on the Marine Mammal (MM) Technical Note (submitted 11th September 2023), final densities to be taken forward to assessments for Mona Offshore Wind Project and Morgan Offshore Wind: Generation Assets were agreed.
We note the responses from Natural England to the aforementioned Technical Note, stating: "*Please note that SCANS IV report has been published (SCANS-IV survey (tiho-hannover.de)) and it would be a valuable addition to the baseline characterisation given that it provides the newest data on distribution and abundance of cetaceans in the area*" And "*NE maintains the stand on the densities used in assessment i.e. to use Welsh Marine Mammal Atlas for*

agreed species unless new data reveals evidence of greater densities (SCANS IV and 2 years of site specific surveys).”

RPS has reviewed the methodology and relevant densities presented in the SCANS IV survey report and will include this data as a baseline characterisation source in technical reports for both projects. The densities that will be applied to the assessments for all cetacean species are those as agreed through EWG05 and/or the associated MM Technical Note (i.e. no changes from the MM Technical Note are proposed). Therefore, the Welsh Marine Mammal Atlas (for harbour porpoise, bottlenose dolphin and short-beaked commons dolphin) and SCANS III densities (Risso’s dolphin and minke whale) have been used for the assessment.

For harbour porpoise, bottlenose dolphin and short-beaked common dolphin the densities applied to the assessment are those derived from the Welsh Marine Mammal Atlas (WMMA) (Evans and Waggitt, 2023) as agreed through the MM Technical Note. WMMA uses 30 years of data from 1990 to 2020 from dedicated aerial and vessel surveys (including SCANS surveys) across Wales and the surrounding waters to produce modelled density distribution maps at a 2.5 km2 resolution. Crucially, the study is designed to quantify broad level habitat preferences and seasonality of species within regions of interest. This allows a robust representation of densities at a fine scale within the Irish Sea, rather than broad-scale densities derived from a single survey season conducted over a short timescale e.g. SCANS IV surveys. SCANS IV surveys were carried out between 28 June and 15 August 2022 (for those blocks in the Irish Sea), and densities are presented as blocks (e.g. Block CS-E has a surface area of 12,274 km2). As highlighted in Lacey et al. (2022) (which modelled density surfaces from SCANS III data) large scale line transect surveys (such as SCANS) are not designed to collect data at a sufficiently small spatial scale necessary to generate estimates of abundance for small coastal populations, such as the bottlenose dolphin ecotype found in the Irish Sea MU. The 2.5 km2 resolution modelled in the WMMA however, does allow for such fine-scale detail. Therefore, the Welsh Marine Mammal Atlas densities have been used for the assessment.

For Risso’s dolphin and minke whale, the densities applied to the assessment are those derived from SCANS III block E (in the absence of block F estimates), as agreed through EWG05 and the MM Technical Note. Whilst the SCANS IV survey is the latest of the SCANS surveys, the densities presented in SCANS IV are lower than equivalent densities from SCANS III and therefore to deviate from the agreed approach would result in the application of less conservative densities estimates. Therefore, we have taken the precautionary approach of using the SACNS III density data for these species.

In conclusion, after consideration of SCANS IV, the existing agreed densities as outlined in the MM Technical Note represents the most robust and appropriate approach, and therefore no change is required for the applications for consent.

Please can you confirm that this approach is the most appropriate for the Mona and Morgan projects by **6th November**?

Kind Regards, Sam

Samantha Tuddenham
Senior Marine Consultant
RPS | Energy
Goldvale House
27-41 Church Street West
Woking, Surrey GU21 6DH, United Kingdom
T [redacted]
D [redacted]
E [redacted]
Digital Business Card

C.6.14 Final Density Agreement Confirmation

From: [redacted]
Sent: 23 October 2023 11:52
To [redacted]
Subject: Mona Morgan Generation species densities

Dear All,

Following EWG feedback on the Marine Mammal (MM) Technical Note (submitted 11th September 2023), final densities to be taken forward to assessments for Mona Offshore Wind Project and Morgan Offshore Wind: Generation Assets were agreed.
We note the responses from Natural England to the aforementioned Technical Note, stating: “Please note that SCANS IV report has been published (SCANS-IV survey (tiho-hannover.de)) and it would be a valuable addition to the baseline characterisation given that it provides the newest data on distribution and abundance of cetaceans in the area” And “NE maintains the stand on the densities used in assessment i.e. to use Welsh Marine Mammal Atlas for agreed species unless new data reveals evidence of greater densities (SCANS IV and 2 years of site specific surveys).”
RPS has reviewed the methodology and relevant densities presented in the SCANS IV survey report and will include this data as a baseline characterisation source in technical reports for both projects. The densities that will be applied to the assessments for all cetacean species are those as agreed through EWG05 and/or the associated MM Technical Note (i.e. no changes from the MM Technical Note are proposed). Therefore, the Welsh Marine Mammal Atlas (for harbour porpoise, bottlenose dolphin and short-beaked commons dolphin) and SCANS III densities (Risso’s dolphin and minke whale) have been used for the assessment.

For harbour porpoise, bottlenose dolphin and short-beaked common dolphin the densities applied to the assessment are those derived from the Welsh Marine Mammal Atlas (WMMA) (Evans and Waggitt, 2023) as agreed through the MM Technical Note. WMMA uses 30 years of data from 1990 to 2020 from dedicated aerial and vessel surveys (including SCANS surveys) across Wales and the surrounding waters to produce modelled density distribution maps at a 2.5 km2 resolution. Crucially, the study is designed to quantify broad level habitat preferences and seasonality of species within regions of interest. This allows a robust representation of densities at a fine scale within the Irish Sea, rather than broad-scale densities derived from a single survey season conducted over a short timescale e.g. SCANS IV surveys. SCANS IV surveys were carried out between 28 June and 15 August 2022 (for those blocks in the Irish Sea), and densities are presented as blocks (e.g. Block CS-E has a surface area of 12,274 km2). As highlighted in Lacey et al. (2022) (which modelled density surfaces from SCANS III data) large scale line transect surveys (such as SCANS) are not designed to collect data at a sufficiently small spatial scale necessary to generate estimates of abundance for small coastal populations, such as the bottlenose dolphin ecotype found in the Irish Sea MU. The 2.5 km2 resolution modelled in the WMMA however, does allow for such fine-scale detail. Therefore, the Welsh Marine Mammal Atlas densities have been used for the assessment.

For Risso's dolphin and minke whale, the densities applied to the assessment are those derived from SCANS III block E (in the absence of block F estimates), as agreed through EWG05 and the MM Technical Note. Whilst the SCANS IV survey is the latest of the SCANS surveys, the densities presented in SCANS IV are lower than equivalent densities from SCANS III and therefore to deviate from the agreed approach would result in the application of less conservative densities estimates. Therefore, we have taken the precautionary approach of using the SACNS III density data for these species.

In conclusion, after consideration of SCANS IV, the existing agreed densities as outlined in the MM Technical Note represents the most robust and appropriate approach, and therefore no change is required for the applications for consent.

Please can you confirm that this approach is the most appropriate for the Mona and Morgan projects by **6th November**?

Kind Regards,

[redacted]
Senior Marine Consultant
RPS | Energy
Goldvale House
27-41 Church Street West
Woking, Surrey GU21 6DH, United Kingdom
[redacted]

C.6.15 JNCC response to Final Density Agreement Confirmation

From: [redacted]
Subject: RE: Mona Morgan Generation species densities
Date: 30 October 2023 16:25:18
Attachments: [redacted]

CAUTION: This email originated from outside of RPS.

Good afternoon [redacted]

Our marine mammal specialists have reviewed and are content with the approach laid out below. JNCC have no further comments to make at this time.

Kind regards,

[redacted]

[redacted]

Website X/Twitter Facebook LinkedIn

C.6.16 MMO response to Final Density Agreement Confirmation

From: [redacted]
Subject: RE: Mona Morgan Generation species densities
Date: 26 October 2023 14:59:44
Attachments: [redacted]

CAUTION: This email originated from outside of RPS.

Hi [redacted],

I attach the response from CEFAS UWN:

I have reviewed the email from RPS regarding the Mona and Morgan Generation species densities. However, this topic on species densities is outside my area of expertise and we usually defer to Natural England for their comments.

Therefore, I have no specific comments to make at this time.

Many thanks

[redacted]

Our MMO Values: Together we are **Accountable, Innovative**, **Engaging** and **Inclusive**

Enabling sustainable growth in our marine area

The MMO 'call for evidence - MMO assessment of fishing impacts in marine protected areas - Stage 2' is now open. To respond please go to Citizen Space: https://consult.defra.gov.uk/mmo/call-for-evidence-stage-2/

To receive information from the MMO's Marine Conservation Team regarding marine protected areas in England, please email "Contact me" to [redacted]

C.6.17 Natural England response to Final Density Agreement Confirmation

From: [redacted]
Subject: RE: Mona Morgan Generation species densities
Date: 27 October 2023 08:53:40
Attachments: image002.png

CAUTION: This email originated from outside of RPS.

Good Morning [redacted],

Thank you for providing reasoning for your approach to the Marine Mammal species densities.

Natural England agree to the proposed approach below.

Kind regards,
Elliott

[redacted]

Natural England

[redacted]

www.gov.uk/natural-england

C.6.18 NRW response to Final Density Agreement Confirmation

From: [redacted]

Subject: RE: Mona Morgan Generation species densities
Date: 26 October 2023 16:18:10

CAUTION: This email originated from outside of RPS.

Good afternoo [redacted]

Thank you for your email regarding Marine Mammal species densities for the Mona and Morgan Generation projects. NRW Advisory confirm we are content with the approach outlined in your email below dated 23/10/23.

Kind regards,

[redacted]

C.7. Marine mammals EWG meeting 6

C.7.1 Meeting minutes

MINUTES OF MEETING

Security Classification:
Project External

Partners in UK offshore wind

MOM Number	:	20231205_Morgan and Mona MM	**REV. No.**	:	F01
MOM Subject	:	Morgan and Mona Evidence Plan marine mammals meeting			

MINUTES OF MEETING

MEETING DATE	:	05/12/23
MEETING LOCATION	:	Microsoft Teams
RECORDED BY	:	
ISSUED BY	:	

PERSONS PRESENT:

- – bp (SR)
- – bp (MP)
- [redacted] bp (GV)
- [redacted] – bp (DH)
- – RPS (ST)
- [redacted] (BP)
- – RPS (LB)
- – NRW (SB)
- [redacted] – JNCC (AG)
- – NRW (NFM)
- [redacted]
- [redacted] – NRW (PB)
- – JNCC (JW)
- [redacted] NRW (PM)
- – Natural England (MNW)
- – NRW (NP)
- [redacted] Natural England (EW)
- [redacted]
- [redacted] (BS)

ITEM NO:	DISCUSSION ITEM:	Responsible party	Date
1.	**Project updates (presented by MP)** The Mona and Morgan Generation projects description for the Applications are now finalised and the assessments are almost complete. Mona is aiming to submit the application at the end of February 2024 and Morgan Generation is aiming to submit the applications after Easter 2024. Any further comments and completion of the agreement logs before the Christmas break would be appreciated as we are now at a critical time and are unable to include anything new at this stage. All previous stakeholder comments have been considered.		

	Following responses to the Mona and Morgan Generation Preliminary Environmental Information Report (PEIR), the project design envelope has been reviewed and updated. The Mona and Morgan Array Areas have been reduced in size, mainly in response to shipping and navigation and commercial fisheries consultation. The slide (slide 5) provides links to the offshore newsletters for Mona and Morgan Generation that were published in September 2023 and present key offshore updates. The minimum spacing between offshore infrastructure has been increased to 1,400 m both within and between rows. The maximum number of wind turbines has been reduced from 107 to 96 for both Mona and Morgan Generation. The rotor diameter of the largest wind turbine has increased from 280 m to 320 m for both Mona and Morgan Generation. Monopiles have been removed from the list of foundation options included in the project design envelopes. Gravity base foundations and jackets on suction buckets or pin piles (drilled or driven) are retained. No cable protection higher than 70 cm will be installed within in the Menai Strait and Conwy Bay SAC. The percentage of export cable requiring cable protection has been reduced to not exceed 10% of the total length within the SAC. Additionally, no more than a 5% reduction in water depth will occur at any point along the export cables without prior written approval from the Licensing Authority in consultation with the MCA. In addition, we can confirm that the Mona export cables will be installed under the intertidal area from below MLWS to above MHWS onshore via trenchless techniques. Open-cut trenching within the intertidal area has been removed for the project design envelope. This will remove any direct impact to the clay and piddock habitat in the intertidal area. The project has also made a significant reductions to the volume of seabed preparation material in the Mona and Morgan Generation Array Areas and the Mona Offshore Cable Corridor. NP- Does the project team anticipate any potential for slippage in the programme? This is useful to understand so that we can plan our resourcing for next year MP- At this stage we are not planning for potential programme slippage. NP- Does the EWG already have the up to date agreement logs? ST- Yes these were sent out with the slides ahead of the meeting.		
2.	**<u>Mona Assessment updates (presented by BP)</u>** Monopiles have been removed from the project design and the assessment now considers pin piling as the only form of piles. The maximum hammer energy has been reduced from 5,500kJ for monopiles presented in the Preliminary Environmental Information Report (PEIR) to 4,400kJ for pin piles. Most foundations will be piled up to a maximum of 3,000kJ but up to 16 foundations may be pile with a hammer energy up to 4,400kJ. The		

	projects have committed to no concurrent piling at the maximum hammer energy of 4,400kJ and with concurrent piling only occurring for the foundations installed with a maximum of 3,000 kJ. A maximum separation distance of 15 km will be used for concurrent piling. This will minimise the likelihood of disturbance to marine mammals by limiting the ensonified area as there is greater overlap in ensonified areas when piling occurs closer together. A minimum separation distance of 1.4 km will be used for concurrent piling. This will minimise the likelihood of injury to marine mammal and fish species in the immediate vicinity of piling operations by limiting the spatial overlap of areas of the highest ensonification during concurrent piling. Measures apply to both Mona and Morgan Generation. <u>Haul out connectivity</u> The densities and management units that form the regional marine mammal study area were agreed via the Final Agreements with MM EWG technical note sent to the EWG in September. Thank you for quick responses. In the second EWG meeting, it was advised that a qualitative assessment of grey seal haul-out sites should be presented. Further detail has been added on haul out connectivity for grey seals throughout the regional marine mammal study area. This approach is applicable for both Mona and Morgan Generation. We utilised the SMRU telemetry data provided for Mona and Morgan Generation, for the four SMUs covering the Irish Sea. So we digitised grey seal haul out sites, and then applied a 5 km buffer around each haul out site. A 5 km radius was used, as this was used in the Carter *et al.* 2022 maps and allows more tracks to be captured or tied to a haul out site than for example a 1 kilometre buffer. We then identified any adult or pups that crossed the marine mammal study area (so for Mona this comprises the Mona Array Area and the cable corridor plus a buffer) and crossed within the 5 km buffer region around any haul out site. Seals were shown to cross numerous haul out sites, with 3.9 being the average number of haul out sites visited per seal, but a maximum of nine visited by one seal. This has allowed us to provide some quantification of grey seal connectivity within the regional marine mammal study area and add context to our assessment of barrier effects. <u>CEA screening region for seals</u> The Mona and Morgan Generation impacts assessment used the combination of four seal management units as the Grey Seal Reference Population (GSRP) and this has been assessed alongside OSPAR Region III.		

	The GSRP consists of the 4 seal MUs (12 Wales, 13 Northwest England, 14 Northern Ireland and 1 SW Scotland) plus two Ireland regions plus the Isle of Man region. For Mona, iPCoD modelling for grey seal has been undertaken against both GSRP and OSPAR Region III for both the project alone and cumulative assessments. The approach to Morgan Generation will be discussed later in the meeting. Following S42 and EWG feedback, OSPAR Region III has been used as extended screening area for grey seal – for offshore wind projects only to allow a proportionate approach to assessment. For harbour seal, the Harbour Seal Reference Population (12 Wales, 13 NW England, 14 Northern Ireland) is used as the relevant screening area. The list of cumulative projects has been updated and the marine mammal assessments have been updated with any changes to information available. Some projects for example have gone to Tier 1 from Tier 2 or Tier 3 to Tier 2 since PEIR. White Cross has now submitted their application for consent so they are now included under tier 1 and the assessment and iPCoD modelling has been updated to account for this. For grey seal, White Cross sits approximately 7 km outside the GSRP but the reported underwater sound contours extend up to 12 km, so this project has been included for assessment against the GSRP as a precautionary approach. Whilst the majority of Tier 2 projects do not have numbers in the public domain, Tier 2 projects with quantitative information are included, as was in PEIR, and for the Mona Offshore Wind Project includes the Morgan Offshore Wind Project: Generation Assets, Morecambe Offshore Wind Project: Generation Assets, Morgan and Morecambe Transmission Assets. NP- Llyr 1 and Llyr 2 are the wrong way round in the CEA other projects/plans figure. BP- Thank you, we will update the figure. NP- To confirm, will you accept comments on the slides and today's discussion after the EWG? MP- Yes please provide any comments as soon as possible. <u>Results: Injury and disturbance from piling</u> For both Mona Offshore Wind Project and Morgan Offshore Wind Project: Generation Assets, the project alone assessment of injury and disturbance from elevated underwater sound during piling has no significant impact in Environmental Impact Assessment (EIA) terms. As for PEIR, the cumulative assessment concluded a potential significant impact for bottlenose dolphin in the context of the Irish Sea MU, against a background of a declining small population. The EIA therefore presents a precautionary significant impact for the project cumulatively with all other projects considered in the Irish Sea MU. In addition to primary and tertiary measures adopted, the project has committed to the development of an Underwater Sound Management Strategy (UWSMS) to reduce any significant impacts.	**Applicant to updated the CEA figure in the Environmental Statement**	For the Environmental Statement

	The primary aim is to reduce any residual significant impact after primary and tertiary measures have been implemented. Although no significant impacts for projects alone were concluded, the applicant acknowledges the contribution to the soundscape.		
3.	**<u>Underwater Sound Management Strategy (presented by ST)</u>** Site Integrity Plans have historically been applied to projects in the Southern North Sea (SNS), in particular those within or close to the Southern North Sea SAC, which is designated for harbour porpoise. In these SIP's there are defined thresholds for cumulative effects of piling – 10% in a particular season, or 20% on a particular day. Mona and Morgan Generation are not predicted to reach the 10% area threshold for the nearest harbour porpoise SAC (i.e. North of Anglesey Marine SAC), either alone or in-combination with other projects. As such, a SIP, similar to those used in the Southern North Sea SAC, is not considered appropriate to manage underwater sound impacts. At PEIR, outstanding concerns were raised with respect to: • Bottlenose dolphin populations, including those associated with Welsh SACs; • Cumulative concerns about potential impacts of piling on cod spawning; • Concerns about potential piling impacts on herring spawning. The Applicant is looking to agree a mechanism (similar to SIPs) that allow us to agree an approach to managing the potential underwater sound impacts post consent, when more details of the project construction for the individual projects, and more detail on cumulative projects in the region, is known. We are producing an Underwater Sound Management Strategy (UWSMS) to do this. The UWSMS would allow the projects to focus on underwater sound for multiple receptors (fish and marine mammals). The project will submit an outline of the UWSMS with the applications so the stakeholders and Secretary of State can have confidence that this will be effective and agreed post consent. The UWSMS would set out the detailed refined project design pre-construction (e.g. the number of foundations that will need piling may be reduced, hammer energies may be revised etc.) as the application collects more information on the ground conditions. The version developed post-consent will contain any further environmental information e.g. cod and herring stock or spawning grounds. These have previously been used post-consent in discussion on underwater sound impacts. The impact assessments within applications assume all the piling is occurring at the same time and therefore you end up with a large, conservative assessment. In reality, all cumulative projects may not be piling at the same time therefore the cumulative impacts will likely be reduced from what has been assumed in the final		

	applications. This has been the experience for SIPs where impacts have been reduced due to phasing of projects. The UWSMS will set out potential mitigation options which could be employed if there are residual concerns about the cumulative impacts of underwater noise following refined project design. These are often agreed in principle at the application stage with final agreement achieved post consent with the final project design. Slide 15 presents the working table of content for the UWSMS. This may still be subject to change. An outline of the UWSMS will be submitted with the application for consent along side the MMMP. The main advice the applicant is looking for is whether this approach would be acceptable. This approach was presented at the steering group and the project generally received positive feedback. We are trying to put forward a process where the projects can continue towards consent and the detail can be discussed post-consent when further information is available. Post Meeting note from NRW: *The proposed Underwater Sound Management Strategy appears acceptable in principle, although we would need to have sight of the detailed version before being able to confirm full agreement.*	**Stakeholders to confirm whether the UWSMS is an acceptable approach to manage underwater sound impacts**	Complete
4.	**<u>Injury and disturbance during UXO clearance (presented by BP)</u>** The assessment has considered a range of UXO sizes and the maximum design scenario is based on high order clearance of 907 kg UXO. This is a highlight precautionary approach as the most likely maximum is 130 kg UXO. The assessments assumed standard industry mitigation (Marine mammal observers, Passive Acoustic Monitoring) plus Acoustic Deterrent Devices and soft starts for piling. The assessment concluded no significant effect for bottlenose dolphin, short-beaked common dolphin, Risso's dolphin, minke whale, grey seal and harbour seal for Permanent Threshold Shift (PTS). When a maximum UXO size of 907 kg is considered, for harbour porpoise there is some residual effect (small number of animals potentially exposed to sound levels that could elicit PTS), which has led to the conclusion of moderate adverse significance. The most likely maximum is 130 kg which is mitigatable and discussed in the Marine Mammal Mitigation Protocol. There is no significant impact for behavioural disturbance (using Temporary Threshold Shift as proxy) for any species. Details will be agreed post-consent when further information on UXO parameters are available. The project has committed to a hierarchy approach to UXO clearance. • Avoid UXO • Clear UXO with low order techniques		

	• Clear UXO with high order techniques. Low order techniques or avoidance of confirmed UXO are not always possible and are dependent upon the individual situations surrounding each UXO. Given that it is possible that high order detonation may be used the MMMP also includes mitigation to reduce the risk of injury from UXO clearance. The UWSMS would consider both project alone and cumulative scenarios; reducing project alone effect would reduce contribution to CEA. RF-B- Have Effective Deterrent Ranges been considered (for disturbance) in addition to the TTS thresholds? BP- In the EIA, TTS has been applied as a proxy, for piling we do use EDRs. We will get back to you regarding UXO. *Post meeting note: we currently have used TTS ranges for assessing UXO in the HRA, however we are reviewing the use of EDRs for the application for consent.* *Post meeting note from NRW: NRW would have no issue with the use of both TTS and EDRs in the HRA.*		
5.	**<u>Morgan Generation updated assessment (Presented by LB)</u>** The majority of the Morgan assessment is aligned with Mona. The approach to the iPCoD modelling for cumulative impacts differs to Mona. The parameters for modelling will be the same as for Mona for harbour porpoise and minke whale. For bottlenose dolphin, the most precautionary fecundity rate of 0.22 (rather than 0.3) will be modelled. For Mona, both were modelled but due to the large number of cumulative scenarios for Morgan Generation, only one fecundity rate will be modelled. For grey seal, only the most pragmatic precautionary management units, which comprises the GSPR rather than OSPAR Region III will be modelled as this is a more precautionary approach. Morgan Generation won't model both due to the large number of cumulative scenarios for Morgan Generation. The project is looking for agreement on this approach. NP- From the explanation provided, this appears reasonable – however, this needs to be discussed with the technical advisors before NRW (A) can confirm acceptance or otherwise. As per Mona, a six year time step will be presented alongside the 25 year model run length. *Post meeting note from NRW: For bottlenose dolphin, NRW agrees that the approach to the iPCoD modelling is sensible and acceptable. For grey seal NRW would prefer the use of OSPAR III rather than GSPR. However, as Morgan is mostly in English waters*	**Stakeholders to confirm that the approach to iPCoD modelling for bottlenose dolphin and grey seal is acceptable.**	Complete

	NRW find it acceptable to defer to Natural England on the preferred method for IPCoD modelling of grey seals. *NRW welcomes the decision to present a six year time step alongside the 25 year model run length.*		
6.	**<u>Morgan Generation Section 42 comments (presented by LB)</u>** There is one specific Section 42 comments for Morgan Generation that we would like to highlight. Natural England responded to say "In order to establish what % of the reference population (Management Unit) classes as significant, appropriate thresholds should be defined. Define appropriate thresholds for % of reference population predicted to be impacted by an activity, to aid assessment of the appropriate level of magnitude". There is a lack of understanding on the trigger point at which population level effects occur and equally a lack of understanding of the trigger point for effects in terms of percentage of the population. There isn't any guidance available on which to base a threshold therefore the assessment has used expert judgment. MNW- Understand that there isn't any guidance on where to set the threshold however without a threshold at which the impact becomes significant then the conclusions will always be not significant. It is a natural question but potential not one to be answered now for these projects. SR- We have used expert judgment in the assessments but if there is guidance available that could be provided to the project, that would be welcome. DH- There are examples of where thresholds have been set, these are fairly arbitrary though. Sound like we are looking for an opinion on a threshold and then analysis of what the project results look like against that threshold. SR- Is anyone aware of if guidance on this is coming out through the Environmental Standards? BS- We are involved in the Morlais project, which is different technology and for collision risk but they have conducted some work to set thresholds on collision for marine mammals. If this is available, we will send it over. *Post meeting note from TWT: having conducted a quick review the material on appropriate thresholds and collision rate modelling (CRM) for Morlais is restricted. I appreciate a different technology but the work to determine disturbance and species thresholds is comparable. Once it is releasable I will ensure it is made available to you.*		
7.	**<u>Updates to the HRA (presented by LB)</u>** For harbour porpoise, screening has been undertaken using the Celtic and Irish Sea MUs. For bottlenose dolphin, screening has been undertaken using the Irish Sea MU. For grey seal, screening has been undertaken using the four seal MUs. Following NRWs S42 advice, OSPAR Region III been considered to identify any additional		

	sites with grey seal as a qualifying feature, which may have connectivity with the Mona Offshore Wind Project. Telemetry data used to screen out additional sites that did not show connectivity. For harbour seal, the screening was undertaken using the Harbour Seal Regional Population (HSRP), typical foraging range of species (50 km) and seal telemetry. The approach to the assessment of disturbance resulting from piling in the ISAA now presents both EDRs and area-based threshold approaches. Dose response assessment has been removed based on S42 feedback. The EDRs used are 15 km as they are for pin piles not monopiles. For harbour porpoise only, the unweighted threshold of 143 dB re 1µPa will be used to represent the minimum fixed generalised response threshold (Tougaard, 2021) at which significant disturbance could occur. For all other species, the NMFS level-B harassment threshold of 160 dB SPLrms will be applied for piling alongside the relevant EDR (NMFS, 2005). No Adverse Effect on Integrity (AEoI) has been predicted for harbour porpoise, grey seal or bottlenose SAC for the project alone and in-combination. *Post meeting note from NRW: It is unclear whether these updates refer to only the Morgan ISAA, or both Mona + Morgan ISAAs. If this section includes Mona, the approach to use OSPAR III to identify additional grey seal sites and screen out any additional sites that did not show connectivity is pragmatic given that all three Welsh SACs with GS as a feature will be screened in (Pembrokeshire Marine SAC being crucial given its importance as a major pupping site). Confirmation is being sought over whether the intent is to use an iterative assessment on the SACs that were screened in, in accordance with NRWs position statement on the use of management units in HRA?* *Applicant response: These updates refer to the Mona ISAA. In accordance with NRW's position statement and guidance, an iterative assessment has been used on the Welsh SACs screened in.*		
8.	**<u>Agreement logs (presented by ST)</u>** As discussed in previous EWG meetings we have made good progress on methodologies, and these have been logged in the agreement logs. The next aim is to map out progress towards conclusions and mitigation agreements as we move to application submission. The projects are looking to agree topics now based on the PEIR and project update and information provided in this presentation, and other EWG discussions. The projects are aware that there will be some items under discussion and so agreements will be made once these discussions take place and as the projects progress the advice received from the PEIR and EWGs. The agreement log includes a request for agreement that for the project alone there will not be any adverse effects on integrity of designated sites. This is based on the PEIR and updates shown today that there is no greater magnitude of impact than was presented at PEIR. The applicant understands the EWG will wish to		Ongoing

	see the full cumulative assessment ahead of providing agreements on impact levels, but we wanted to highlight that we are not in a position of significant/adverse effects or impacts for Mona or Morgan Gen. Some additional items in the agreement log and others have been flagged as under discussion, and some have been flagged as agreed. We would like to map a pathway to agreement and where we want to progress to, up to application. These logs will form framework for statements of common ground.	**Stakeholders to review and update the agreement log**	
9.	**<u>Next Steps (presented by ST)</u>** The meeting minutes and agreement logs will be circulated 2 weeks after the meeting. Thank you very much for all your input over the last few years to this Evidence Plan process.		

C.7.2 Response from NRW regarding meeting minutes

From: [redacted]

Subject: RE: Morgan Mona marine mammals EWG meeting 7
Date: 10 January 2024 17:09:00
Attachments: image002.png
image003.png
20231205_Morgan and Mona_MM EWG06 MoM F01 NRW Comments.docx
Morgan_Mona_MM_EWG_Agr Log F05.xlsx

Dear [redacted]

Thank you for providing the minutes for the Morgan/Mona Marine Mammals EWG 06 held on Tuesday December 5th. Please find our comments in the version attached.

We note that the Agreement Log provided with the minutes does not reflect any discussion points from the latest EWG. There are also several items within the log that are out of date, and it is unclear which items bp are currently seeking agreement on as progress on items have not been tracked with dates of comments/agreement except for the date of the EWG they were raised at. The agreement log provided has however been reviewed and updated with NRW (A)s understanding of the position / status of each issue. To aid the applicant's understanding of NRW (A)'s position on the items within the logs, an additional column has been provided which contains NRW's suggested status for each item and a colour coding system, including

Agreed (green)
Ongoing point under discussion (yellow)
Not agreed – but no material impact (orange)
Not agreed – material impact (red)

This status may help when considering how to transpose the agreement log into any Statement of Common Ground. Please can the applicant review these changes, ready for discussion at our meeting on January 18th

Regarding the actions on stakeholders contained within your email, please find our responses below.

Stakeholders to confirm whether the UWSMS is an acceptable approach to manage underwater sound impacts (10/01/24) - NRW Advisory state that the strategy could be an acceptable approach, however without sight of this strategy in detail and its subsequent iterations we are unable to confirm that it would be acceptable for the management of impacts from underwater sound.

Stakeholders to confirm that the approach to iPCoD modelling for bottlenose dolphin and grey seal is acceptable (10/01/24) - We confirm that the approach to iPCoD modelling is acceptable. We also welcome the decision to present a six-year time step alongside the full 25 year model run length. For bottlenose dolphin, we agree with the decision to use a fecundity rate of 0.22, given this was the recommended rate in our advice on population parameters from October 2022 (with alternative options of 0.3 and 0.16). For grey seal while NRW would prefer the use of OSPAR III as a management unit (in line with all prior comments explaining our reasoning), given that Morgan is mostly in English waters, NRW defers to Natural England on the preferred management unit.

If you have any questions please don't hesitate to get in touch.

Kind Regards,

[redacted]

[redacted]

Croesewir gohebiaeth yn Gymraeg a byddwn yn ymateb yn Gymraeg, heb i hynny arwain at oedi.

Correspondence in Welsh is welcomed, and we will respond in Welsh without it leading to a delay.

C.7.3 Response from JNCC regarding meeting minutes

From: [redacted] [redacted] marine mammals EWG meeting 7
Date: 10 January 2024 16:26:28
Attachments: image002.png
image003.png
Morgan_Mona_MM_EWG_Agr Log F05_Final.xlsx

Good afternoon [redacted]

Please find attached the updated Decision Log for marine mammals. There was some confusion around the meeting date within the Log, in particular 16th October 2023. We are not aware of a meeting occurring on that date.

Please also see below our responses to the Action Points (below in blue):

1. Applicant to update the CEA figure in the Environmental Statement (for the Environmental Statement) > AP for applicant; not applicable to JNCC
2. Stakeholders to confirm whether the UWSMS is an acceptable approach to manage underwater sound impacts (10/01/24) > JNCC are content with the approach and agree with the inclusion of noise abatement as a potential mitigation option for piling however we disagree with the inclusion of UXO clearance, as indicated on slide 15. As we advised on the PEIR, we do not recommend this activity is included as a licensable activity in the DCO/deemed ML and therefore it should not be included in this strategy at this time. Once it is determined UXO clearance is needed, appropriate mitigation measures can be discussed as part of that marine licence application and if appropriate, it can be added to this strategy. We would also expect agreement to this approach is secured as a condition of consent, and that JNCC are one of the stakeholders involved in development of the strategy post-consent.
3. Stakeholders to confirm that the approach to iPCoD modelling for bottlenose dolphin and grey seal is acceptable (10/01/24) > JNCC defer to the relevant SNCBs regarding this point
4. Stakeholders to review and update the agreement log (10/01/24) > Agreement log attached.

Please let me know if you have any questions.

Kind regards,

[redacted]

[redacted]

Website X/Twitter Facebook LinkedIn

C.7.4 Response from Cefas regarding meeting minutes

From: [redacted]

Subject: Review of meeting minutes for Morgan and Mona Evidence Plan marine mammals meeting which took place on the 5th December 2023.

Date: 08 January 2024 16:32:47

Attachments: [redacted]

[redacted]

Please see below the response from the Under Water Noise Team (CEFAS) re the Marine mammal EWG 07 – 5 Dec 2023

To the best of my knowledge, I can confirm that the meeting minutes are an accurate representation of the discussions held.
I think I asked the question whether Effective Deterrent Ranges have been considered as well as TTS (Temporary Threshold Shift) thresholds – this has the initial 'RB' against this comment in the minutes rather than RF.
We (Cefas) do not support the use of TTS thresholds being applied as a proxy for assessing disturbance, so we recommend that appropriate alternatives are proposed.

The actions from the meeting that are for Cefas/MMO are:

- Stakeholders to confirm whether the UWSMS is an acceptable approach to manage underwater sound impacts (10/01/24)

We (Cefas) would be interested to hear Natural England's views on this, specifically the applicant's view that a Site Integrity Plan (SIP) is not considered appropriate to manage noise impacts. If an Underwater Sound Management Strategy (UWSMS) is agreed as the preferred approach, then it would be helpful to set out in advance the conditions under which noise abatement, for example, will be required, so that there is a clear set of boundaries within which the developer will be working. This approach would still allow for the construction planning to evolve, but it would also give confidence that appropriate safeguards are in place at the stage of giving consent to the project, rather than leaving it to time-pressured discussions (which is too often the case) after consent has been granted.

- Stakeholders to confirm that the approach to iPCoD modelling for bottlenose dolphin and grey seal is acceptable (10/01/24)

I defer to Natural England and the other relevant SNCBs for their recommendations.

- Stakeholders to review and update the agreement log (10/01/24)

Please see updated agreement log attached with Cefas comments (comments are noted in blue font).

Many thanks

[redacted]

[redacted]

[redacted]

[redacted]

Our MMO Values: Together we are **Accountable, Innovative**, **Engaging** and **Inclusive**

Enabling sustainable growth in our marine area

To receive information from the MMO's Marine Conservation Team regarding marine protected areas in England, please email "Contact me" to [redacted]

C.8. Marine mammals agreement log

Item	Meeting Date	Issue on which agreement is sought	Consultee	Progress of agreement in the EWG	Agreement?	Notes
1	17/02/2022	Agreement on the Remit and Inputs to the EWG (as set out in Section 4.3 of the Evidence Plan Template).	NRW	NRW Advisory (A) agree in principle to the remit and inputs to the EWG, although, as stated previously, NRW (A) needs to be able to carefully consider, plan and manage our resources at all times and as such we can only commit to the Evidence Plan Process on a 'best-endeavours' basis. It should also be noted, that the Evidence Plan process falls under our Discretionary Advice Service – whilst we aim to meet demand for the service, there may be times when our capacity to do so is limited. In those instances, we reserve the right to not offer the service. NRW (A) would like to clarify in Section 3.1.1.3 Natural Resources Wales Advisory within the Evidence Plan Template that JNCC remain the statutory consultee for Welsh waters beyond 12 nm, but we will endeavour to align our advice where possible.	Agreed	NRW (A) will endeavour to 'agree' the points outlined in Section 4.3 where possible, but as acknowledged within the Evidence Plan process, it may not always be possible to reach full agreement between all parties. Where agreement is not reached, NRW (A) will advise according to our remit and clearly outline our reasoning. Similarly, in the second to last bullet point in Section 4.2.1, it may not be possible to 'ensure' the effects are reduced to an acceptable level. It should be noted that any advice that we provide is advisory only and will not be binding, or in any way restrict NRW in performing its statutory functions. All advice provided by NRW will be based on the information that has been made available to us, and policies that are in place at that time.
			TWT		Agreed	
			JNCC	JNCC agree in principle to the remit laid out in section 4.3 of the Evidence Plan Template.	Agreed	Any advice or assistance provided by JNCC via our Discretionary Advice Service is advisory only, and with reference to the General terms and conditions for DAS chargeable services, JNCC excludes any warranty that the advice provided by its officers represents JNCC's opinion or otherwise binds JNCC when acting as a Statutory Consultee.
			Natural England	Natural England provided comment on the draft Evidence Plan, via a comments log, on 4 November 2021. It was our view that the Evidence Plan set out the basic framework of the Evidence Plan. This was ahead of the 1st Evidence Plan meeting on 16 November 2021. We welcome the update of the Evidence Plan (version F02, provided 4 February 2022) which has incorporated our earlier comments. The remit of the Marine Mammal EWG as set out under 4.3 of the Evidence Plan (v F02) is appropriate and in line with Natural England's previous comments, we agree the remit as set out. The list of topics listed in 4.3.1 covers the majority of anticipated topics. Very minor point but in the last bullet point, we anticipate that the monitoring options will be discussed prior to the finalisation of the In Principle Monitoring Plan – the monitoring itself is typically finalised post-consent.	Agreed	None
			MMO/Cefas		No comments in the agreement log	
2	17/02/2022	Agreement on Ways of Working document, including timescales.	NRW	NRW (A) agree in principle to the Ways of Working document and the timescales for responding, although we reiterate that more time may be required for a response if there are large / multiple documents or due to unforeseen circumstances. Where deadlines cannot be reached, NRW (A) will notify RPS / bp / EnBW via the lead contacts as soon as possible. As above, NRW (A) can only commit to the Ways of Working on a 'best endeavours' basis and reserve the right to not offer our Discretionary Advice Service at times when our capacity to do so is limited. NRW (A) highlight the risk associated with the indicated publication of the PEIR in Q4 2022 potentially prior to the EWG agreeing the baseline characterisation in Q1 2023.	Agreed	None
			TWT		Agreed	
			JNCC	JNCC agree in principle to the Ways of Working document. JNCC would like to note that based on resources and workloads, longer response times may be needed for complex documents or issues. JNCC will notify RPS vis the lead contacts (Kevin Linnane and Samantha Tuddenham) if this situation arises. Please also note the timeline of PEIR incurs a risk or missing issues before publication (see note).	Agreed	The timeline provided in the presentation indicates that PEIR will be submitted prior to the EWG being presented with the baseline characterisation and outputs of impact assessment. This timeline incurs a risk that we cannot agree with information presented in the PEIR and misses an opportunity to resolve potential issues prior to publication of the PEIR.
			Natural England	We welcome the Evidence Plan Ways of working document (version F01, provided 4 February 2022) as a clear reference document. Natural England agrees with the Ways of Working document which aligns with previous comments in terms of timescales for review and comment provided as part of our comments on the draft Evidence Plan (4 November 2022). As noted in the document, it may be necessary for timescales to be amended to ensure sufficient time to review and comment (e.g. large documents or multiple documents), in which case we will communicate and agree an alternative deadline	Agreed	None
			MMO		No comments in the agreement log	
3	17/02/2022	Agreement on aerial surveys with respect to marine mammals; in particular use of an appropriate buffer around Mona Potential Array Area.	NRW	NRW (A) cannot confirm agreement to the aerial survey design.	Agreed with caveats	NRW (A) provided joint advice with JNCC and NE by email dated 28/04/21 regarding the suitability of the survey design for ornithology. It is not possible to determine whether the likely impacts on marine mammals from the development could extend beyond the survey area at this time. The suitability of Digital Aerial Survey (DAS) data for marine mammal impact assessment cannot be conclusively determined based on the presented survey design alone. We recommend all possible data sources, including those from DAS and the desktop study, are evaluated for quality and suitability and the most precautionary source with sufficient data quality be used in impact assessments. It may be appropriate to present multiple data sources in the final assessments.
			TWT	defer to remarks made by NRW and other SNCB's	n/a	

Item	Meeting Date	Issue on which agreement is sought	Consultee	Progress of agreement in the EWG	Agreement?	Notes
			JNCC	JNCC do not agree with the current aerial survey design. **agreed as per response to technical note sent after EWG05**	Agreed	Based on discussions in the initial meeting on the 17th February 2022 and information provided to RPS by JNCC, NE, and NRW dated April 2021, the suitability of survey design cannot be confirmed. The design of aerial surveys for marine mammals and ornithology are still not suitable, and recommendations have previously been made to use multiple data sources. Agreement on survey design for ornithology does not mean design is suitable for other receptors. If the data is to be used in environmental assessments, receptor-specific evidence should be provided to support the approach taken. Please refer to the previously provided joint advice dated 28/04/2021.
			Natural England	As the Mona site is located primarily in Welsh waters, Natural England defers to NRW as to the use of an appropriate buffer around Mona Potential Array Area. More generally in relation to aerial surveys: Natural England is broadly supportive of using digital aerial survey data to characterise the marine mammal baseline in the region. The potential limitations to this survey method raised by the developer and NRW are acknowledged and it is agreed that a range of density estimates from other sources must also be presented, for comparison to the site-specific surveys. Depending on the outcomes of the survey, it may be that density estimates available in the literature are the most appropriate to be used in the assessment for certain species (for example, species which have no or low number of sightings, or low confidence associated with the sightings, in the surveys). Natural England supports NRW in their concerns raised about the efficacy of digital aerial surveys in the Irish Sea, following from the recent outputs of the aerial surveys on the Awel y Mor OWF. These concerns are applicable to both Mona and Morgan. Natural England would also like sight of any example DAS images that are made available to NRW. Natural England at this stage has not formally agreed the appropriateness of the 10km buffer for marine mammals specifically, noting that this buffer was originally proposed for ornithological purposes. Natural England consider that a 10km buffer is unlikely to be less suitable for the marine mammal surveys than a 4km buffer, which is the industry standard. The applicant has stated that the 10km buffer “would provide better coverage for marine mammals.” Natural England would like to understand how the coverage is quantifiably “better” and the implications for the marine mammal impact assessment. Natural England requests that the applicant considers providing a short description in the EIA on this topic, which could for example compare the outcomes of a 10km buffer to the traditional 4km buffer.	n/a	None
			MMO/Cefas	Defer to Natural England and to other relevant SNCBs for their comments.	n/a	
4	17/02/2022	Agreement on extent of Regional Marine Mammal study area to be used for providing additional context and for the purposes of CEA screening. Species-specific MUs have been used in the impact assessment to aid quantifying population impacts and to define reference populations.	NRW	NRW (A) cannot agree to the use or extent of Regional Marine Mammal study areas at this time.	Agreed	Updated Agreement 09/01/2024. It is not clear for precisely what purpose Regional Marine Mammal study areas are defined, therefore NRW (A) are unable to agree to them at this stage. NRW (A)’s position on the use of Marine Mammal Management Units (MMMUs) for impact assessment or screening, and advice on applying these MUs during Appropriate Assessment has been provided in NRW (A)’s position statement which has been provided to the Applicant. 09/01/2024 - NRW (A) confirm that we disagree to the use of a Regional Marine Mammal study area. We do however recognise that the applicant has now changed the methodology to use management units instead, which we do agree with.
			TWT	Defer to comments made by NRW and other SNCB's	n/a	
			JNCC	JNCC do not agree with the use of Regional Marine Mammal study areas for this project.	Under discussion	JNCC require the use of Marine Mammal Management Units (MMMUs) for screening as noted by JNCC MU guidance: https://hub.jncc.gov.uk/assets/f07fe770-e9a3-418d-af2c-44002a3f2872.
			Natural England	Natural England requires a response from RPS on the purpose of the regional marine mammal study area before an agreement can be made on the extents proposed	Agreed	Natural England is in broad agreement to the approach to baseline characterisation, notwithstanding the aforementioned comment on the extent of the regional marine mammal study area to be characterised. We consider that the revised list of likely species that was presented in the meeting, including minke whale, is appropriate. With regards to the desktop data sources - consideration should be given to the inclusion of NGO/citizen observer data in the region. This would be particularly relevant for the more coastal areas, as these can provide local sightings information on areas of potential cable landfall. Natural England thanks and supports NRW in their detailed list of desktop data sources provided to the developer. Natural England asks that the applicant explicitly include the results of the MMO observations (i.e. list all sightings) onboard the site investigation surveys in their baseline characterisation.
			MMO/Cefas	Defer to Natural England and to other relevant SNCBs for their comments.	n/a	
5	19/07/2022	Agreement on approach to the baseline characterisation.	NRW		Agreed	NRW (A) await further discussion on the approach to baseline characterisation for Marine Mammals in future EWG meetings prior to formal agreement. 09/01/2024 - NRW (A) can confirm that we now agree with the approach to the baseline characterisaiton approach following discussions during EWGs.
			TWT		Agreed	

Item	Meeting Date	Issue on which agreement is sought	Consultee	Progress of agreement in the EWG	Agreement?	Notes
			JNCC	JNCC agree that DAS should not be the primary data source for marine mammal characterisation due to the issues associated with observing marine mammals at sea, and are happy for the baseline to be supplements with other data sources.	Agreed	Note, the interim baseline not presented due to lack of time
			MMO/Cefas	Cefas defer to Natural England and the other relevant SNCBs	n/a	
6	19/07/2022	Agreement on approach to noise modelling following clarifications provided in EWG.	NRW		Agreed	NRW (A) agree with the outlined approach to noise modelling following clarifications provided in the EWG and welcome the proposal to use a hybrid finite element / parabolic equation model to determine the source level of the newer, larger piles intended for use in this project.
			TWT		Agreed	
			JNCC	JNCC hold agreeing to the approach until after RPS have provided a log of the scenario's being considered with justification for the approach	Under discussion	JNCC appreciate the information provided and opportunity to discuss the subject in the meeting
			MMO/Cefas	Cefas support the dual metric approach for assessing auditory injury in marine mammals. Both the peak sound pressure level (peak SPL) and the cumulative sound exposure level (SELcum) ranges should be presented. For the assessment of UXO clearance, the peak SPL, as in the NOAA (NMFS, 2018) and Southall et al. (2019) guidance, is the correct metric to use for instantaneous PTS.	Agreed	
7	19/07/2022	Agreement on approach to LSE Screening for Marine Mammals.	NRW		Agreed	NRW (A) await further discussion on the approach to LSE Screening for Marine Mammals in future EWG meetings prior to formal agreement. NRW agree with the use of the harbour porpoise and bottlenose dolphin MUs for LSE screening, in line with our position statement. For grey seal we would recommend the use of either the OSPAR III interim MU, or the use of the Carter et al 2022 maximum foraging range of 448 km. 09/01/2024 - Following discussions at the most recent EWG NRW (A) can now confirm agreement to the approach for LSE Screening for Marine Mammals.
			TWT	defer to remarks made by NRW	n/a	
			JNCC	JNCC agree with the use of the harbour porpoise and bottlenose dolphin MUs for LSE screening; we will provide comment on the seal ranges once they've been considered again in the context of Carter et al	Agreed	Note, the approach was briefly presented in the meeting but no oppotunity for discussion due to time contraints.
			MMO/Cefas	Cefas defer to Natural England and the other relevant SNCBs	n/a	
8	19/07/2022	Agreement that White beaked dolphin can be scoped out fo the EIA and HRA.	NRW	Agreed during Marine Mammmal EWG02	Agreed	
			Natural England	Agreed during Marine Mammmal EWG02	Agreed	
					Agreed	
			JNCC	Agreed during Marine Mammmal EWG02	Agreed	
			MMO/Cefas	Cefas defer to Natural England and the other relevant SNCBs	n/a	
9	19/07/2022	Agreement that the Celtic and Irish Sea (HP MMMU) is an appropriate study area for dolphin and minke whale.	NRW	Agreed during Marine Mammmal EWG02	Agreed	NRW agree this could be a more pragmatic spatial scale for EIA and CEA than the very large Celtic and Greater North Sea MMMU with regards to dolphin species (ie all species except bottlenose, for which MMMUs have been well defined) and minke whale
			Natural England	The species of dolphin is not specified here. NE agree on the appropriateness of the proposed study area for minke whale.	Partially agreed	
			TWT		Agreed	
			JNCC		n/a	JNCC agree with NRW on this issue, and mirror the comments provided by NRW.
			MMO/Cefas	Cefas defer to Natural England and the other relevant SNCBs	n/a	
10	17/11/2022	Agreement on approach to densities and reference populations - harbour porpoise	Natural England	Proposed approach set out in EWG03, pre-meeting note and meeting minutes. Updated approach set out in EWG05 stated that the Marine Mammal Atlas will be used for harbour porpoises.	Agreed	Natural England is in agreement with the use of the Welsh Marine Mammal Atlast as this is the the latest and most relevant evidence related to harbour porpoise in the project area.
			NRW		Agreed	NRW would recommend the use of modelled density data from the latest version of the Marine Mammal and Bird atlas, and Harbour porpoise Celtic and Irish seas management unit.
			TWT	defer to remraks made by SNCB's	Agreed	
			JNCC		Agreed	JNCC note that the APEM Mona aerial survey density is notably smaller than the SCANS-III block E density. JNCC recommend using either the SCANS density or the Marine Mammal Atlas as recommended by NRW for a more conservative estimate. JNCC agree with the approach of using the MM Atlas densities for harbour porpoises.
			MMO/Cefas	Defer to Natural England and to other relevant SNCBs for their comments.	n/a	
11	17/11/2022	Agreement on approach to densities and reference populations - grey seal	Natural England	Carter et al. used for densities. Reference population to be discussed at the next EWG (Q1 2023).	Agreed	Natural England agree on the approach to densities and reference populations for Risso's dolphin, short beaked dolphin, minke whale, and also on the densities for grey seal.
			NRW		Agreed	NRW would recommend the use of the OSPAR Region III interim Management Unit as the appropriate scale for assessing population level impacts and as the reference population for IPCoD modelling. We agree with the use of Carter et al densities. 28/12/2023: NRW (A) can agree in principle with the approach proposed in EWG06, subject to this approach being adopted.
			TWT	defere toremarks made by NRW	Agreed with caveats	
			JNCC		Agreed	Grey seal sites are inshore so JNCC defer to NRW and NE on this but agree in principle.
			MMO/Cefas	Defer to Natural England and to other relevant SNCBs for their comments.	n/a	
12	17/11/2022	Agreement on approach to densities and	Natural England		Agreed	

Item	Meeting Date	Issue on which agreement is sought	Consultee	Progress of agreement in the EWG	Agreement?	Notes
		reference populations - bottlenose dolphin.	NRW		Agreed	NRW would recommend the use of modelled density data from the latest version of the Marine Mammal and Bird atlas. 09/01/2024 - NRW (A) can agree in principle with the approach proposed in the latest EWG06, subject to this approach being adopted.
			TWT	defere to remarks made by NRW	Agreed with caveats	
			JNCC		Agreed	
			MMO/Cefas	Defer to Natural England and to other relevant SNCBs for their comments.	n/a	
13	17/11/2022	Agreement on approach to densities and reference populations - Risso's dolphin, short beaked dolphin, minke whale	Natural England	Agreed with EWG via pre-EWG03 meeting note.	Agreed	Natural England agree on the approach to densities and reference populations for Risso's dolphin, short beaked dolphin, minke whale, and also on the densities for grey seal.
			NRW		Agreed	NRW (A) do not agree with the use of densities from Waggitt et al 2020 for short beaked common dolphin proposed during EWG05. NRW (A) do agree with the remaining species densities and reference populations outlined in Table 1 of the draft EWG05 Meeting Minutes received via email on 13th July 2023. 09/01/2024 - NRW (A) can agree in principle with the approach proposed in the latest EWG06, subject to this approach being adopted.
			TWT	defere to remarks made by NRW	Agreed	
			JNCC		Agreed	
			MMO/Cefas	Defer to Natural England and to other relevant SNCBs for their comments.	n/a	
14	16/10/2023	Other than UXO impacts, there will be no significant effects on marine mammal receptors in EIA terms for the project alone.	Natural England		No comments in the agreement log	Note to EWG: As presented in EWG06, the results for Mona do not differ considerably from those of the PEIR (with the exception of UXO). Therefore can we get agreement on this?
			JNCC		Agreed	Agreed on condition that relevant JNCC marine mammal mitigation guidelines are followed, and that full noise modelling is presented with PTS distances stated. JNCC reiterate our comment from the PIER and request that any UXO clearance is applied for in a separate marine licence application.
			TWT		No comments in the agreement log	
			NRW		Under discussion	09/01/2024 - NRW (A) are unable to confirm no significant effects on marine mammal receptors in EIA terms for the project alone without sight of the assessments. Despite anticipating that agreement is likely, we are unable to confirm this without the opportunity to review the assessments.
			MMO/Cefas	Unable to agree at this stage - full details of the updated noise modelling and proposed mitigation will need to be reviewed.	Under discussion	
15	16/10/2023	There will be no adverse effects on integrity on SACs with marine mammal features for the project alone.	Natural England		Agreed	
			JNCC		Agreed	Agreed, as the site is further than the 15km pinpiling EDR from the nearest harbour porpoise SAC (we defer to the relevant SNCB regarding inshore sites).
			TWT		No comments in the agreement log	
			NRW		Under discussion	09/01/2024 - NRW (A) are unable to confirm no AEOI on SACs with marine mammal features without sight of the assessments. Despite anticipating that agreement is likely, we are unable to confirm this without the opportunity to review the assessments.
			MMO/Cefas	Cefas defer to Natural England and the other relevant SNCBs	n/a	
16	16/10/2023	Other than piling and UXO impacts, there will be no significant effects on marine mammal receptors in EIA terms for the project cumulatively.	Natural England		No comments in the agreement log	
			JNCC		No comments in the agreement log	
			TWT		No comments in the agreement log	
			NRW		Under discussion	09/01/2024 - NRW (A) are unable to confirm no significant effects on marine mammal receptors in EIA terms cumulatively without sight of the assessments. Despite anticipating that agreement is likely, we are unable to confirm this without the opportunity to review the assessments.
			MMO/Cefas	Cefas defer to MMO, Natural England and the other relevant SNCBs	n/a	
17	16/10/2023	Other than piling impacts, there will be no adverse effects on integrity on SACs with marine mammal features for the project in-combination with other plans and projects.	Natural England		No comments in the agreement log	
			JNCC		No comments in the agreement log	
			TWT		No comments in the agreement log	

Item	Meeting Date	Issue on which agreement is sought	Consultee	Progress of agreement in the EWG	Agreement?	Notes
			NRW		Under discussion	09/01/2024 - NRW (A) are unable to confirm no AEOI on SACs wth marine mammal features in combination with other plans and projects without sight of the assessments. Despite anticipating that agreement is likely, we are unable to confirm this without the opportunity to review the assessments.
			MMO/Cefas	Cefas defer to Natural England and the other relevant SNCBs	Under discussion	
18	16/10/2023	For UXO impacts, although a significant effect (injury) on harbour porpoise is predicted any such effects will be managed and avoided through measures set out in the MMMP, which will be agreed with stakeholders post consent.	Natural England		No comments in the agreement log	
			JNCC		Under discussion	As previously advised, we do not agree with the inclusion of UXO clearance as a licensable activity in the DCO. If required, this activity should be applied for under a separate licence, at which time mitigation requirements can be discussed and agreed. There is too little information at this stage to confidently conclude that mitigation can be provided that will reduce the potential significant impacts predicted.
			TWT		No comments in the agreement log	
			NRW		Under discussion	09/01/2024 - It is not possible for NRW (A) to confirm whether effects to harbour porpoise *could* be managed and avoided (note: not *will* be managed) through measures set out in the MMMP without the opportunity to review the latest version of this document and subsequent iterations.
			MMO/Cefas	Full details of the updated / finalised noise modelling and proposed mitigation will need to be reviewed.	Under discussion	
19	16/10/2023	For piling impacts, although a significant cumulative effect (in EIA terms) / in-combination AEOI (in HRA terms) is predicted on bottlenose dolphin, any such effects will be managed and avoided through measures set out in the Underwater Sound Management Strategy (Piling Strategy), which will be agreed with stakeholders post consent.	Natural England		No comments in the agreement log	
			JNCC		No comments in the agreement log	
			TWT		No comments in the agreement log	
			NRW		Under discussion	09/01/2024 - It is not possible for NRW (A) to confirm whether effects to bottlenose dolphin *could* be managed and avoided (note: not *will* be managed) through measures set out in the UWSMS without the opportunity to review the latest version of this document and subsequent iterations.
			MMO/Cefas	Cefas defer to Natural England and the other relevant SNCBs	n/a	
20	16/10/2023	The mitigation and management measures are appropriate to ensure all other significant effects and AEOI are avoided for marine mammal receptors, including the the Measures to Minimise Impacts to Marine Mammals and Rafting Birds.	Natural England		No comments in the agreement log	
			JNCC		No comments in the agreement log	
			TWT		No comments in the agreement log	
			NRW		Under discussion	09/01/2024 - It is not possible for NRW (A) to confirm whether mitigation and management measures will be sufficient to rule out all other Significant Effects and AEOI for marine mammal receptors without sight of the latest version of the MMMP and subsequent iterations. We are unable to comment on rafting birds in the Marine Mammal Agreement Log.
			MMO/Cefas	Cefas defer to Natural England and the other relevant SNCBs	n/a	
21	16/10/2023	Agreement on the CEA screening area for site investigation surveys and use of a maximum number of site investigation surveys occurring concurrently.	Natural England		Agreed	
			JNCC	We defer to NRW re this item.	n/a	
			TWT	defer to comments made by NRW	n/a	
			NRW	NRW (A) acknowledge in Section 1.5.1.2 that our response to the screening distances for site investigation surveys has been noted. We agree with the proposed approach of two site investigation surveys occurring simultaneously, and the rationale on which the estimate is based on.	Agreed	Update 09/01/2024 - NRW (A) can confirm that this issue has been closed out following our comments on EWG05 in September 2023
			MMO/Cefas	Cefas defer to Natural England and the other relevant SNCBs	n/a	
	16/10/2023	Agreement on the use of the area-based approach for HRA based on Effective Deterrent Range (EDR) and 143 dB	Natural England	NE agree with the proposed approach regarding the EDRs and dose response for HRA and EIA.	Agreed	

Item	Meeting Date	Issue on which agreement is sought	Consultee	Progress of agreement in the EWG	Agreement?	Notes
		threshold	JNCC	JNCC are content for EDRs not to be used in the EIA assessment and for an unweighted noise threshold of 143 dB re 1µPa (or 103 dB re 1µPa VHF-weighted) to be used in addition to the EDR approach for the HRA	Agreed	
			TWT	defer to comments made by NRW	Agreed	
			NRW	NRW (A) acknowledge and agree with the proposed approach in Section 1.7.1.1, to use a 143 dB single strike unweighted Sound Exposure Level (SELss) or a 103 dB VHF-weighted SELss threshold in parallel with an EDR. We also acknowledge and welcome the statement that dose-response will not be applied to the area-based assessment. With reference to Section 1.7.1.2, NRW (A) agree with the proposed use of a 160 db SPLrms threshold for other marine mammal species in the HRA, alongside the relevant EDR. With reference to Section 1.7.1.3, in line with NRW's position statement on assessing behavioural disturbance, NRW (A) recommend the use of the dose-response approach alone to assess behavioural disturbance from piling noise. This is because the 143 dB SELss threshold is intended as a tool for area-assessment. Dose response approaches better reflect behavioural responses in the wild (which tend to be probabilistic) and should be used for EIA where these exist. Where dose response curves do not exist for a given noise source, NRW (A) recommend following the advice outlined in our position statement.	Agreed	Update 09/01/2024 - Can confirm NRW (A) are content with this proposed approach for the HRA and confirm agreement.
22			MMO/Cefas	The use of an unweighted threshold of 143 dB re 1µPa relates to harbour porpoise only. For all other marine mammal species considered in HRA the NMFS level-B harassment threshold of 160 dB SPLrms will be applied for piling alongside the relevant EDR (NMFS, 2005). Please note that thresholds based on the SPLrms are not appropriate for impulsive sources such as percussive pile driving – the appropriate metric is the SELss (single strike Sound Exposure Level)."	Agreed	
	16/10/2023	Agreement on presenting a 6-year time step in the iPCoD model, assessing temporal maximum design scenario and to add in additional cumulative projects.	Natural England	NE agrees with the proposed approach in regards to iPCod modelling.	Agreed	
			JNCC	JNCC agree with the proposed amendments to how the modelling will be presented and addition of projects which have moved tiers. We defer to NRW regarding modelling undertaken for bottlenose dolphin.	Agreed	
			NRW	NRW (A) agree with the approach outlined.	Agreed	Agreement confirmed 28/12/2023
			TWT		Agreed	
23			MMO/Cefas	Cefas defer to Natural England and the other relevant SNCBs	n/a	
	16/10/2023	Approach to present both with and without ADD and to base the conclusions of the assessment on the impacts which take into account any designed-in measures, including the use of ADDs	Natural England	NE stands with our previous advice that the assessment should be based on the underwater noise modelling without ADDs. Modelling with an indicative 30min ADD duration can be used to showcase the benefits of such devices as a potential mitigation tool in a separate chapter but not for the purpose of the assessment.	Not agreed	
			NRW	NRW (A) agree with the proposed approach.	Agreed, with caveat	09/01/2024 - We agree with the proposed approach in principle, however would recommend this is presented bearing in mind the most recent evidence [Elmegaard et al 2023] (https://www.nature.com/articles/s41598-023-43453-8) The approach proposed should consider: (a) Length of ADD exposure based on need, i.e. the impact range from PTS. Otherwise, if exposure length is indicative we would advise making that clear. (b) In line with MMO advice, the worst case ranges with no ADD need to be presented clearly and considered in depth (c) The risk that in an effort to reduce injury, the impact pathway may be shifted to disturbance. With respect to point (c), recent work by Siri Elmegaard from Peter Madsen's group at the Uni of Aarhus has shown that porpoise in particular are extremely sensitive to acoustic harassment devices, even at low received levels. Thus, our advice would be that if overall conclusions are to be based on designed-in measures, all aspects of the designed-in measures including potential disturbance from ADDs should be considered and included.
			TWT		Agreed	
			JNCC	JNCC agree with the proposed approach.	Agreed	
24			MMO/Cefas	Content for the assessment to present the benefits of using an ADD, as long as the worst-case ranges (i.e, no ADD) are clearly presented and considered.	Agreed	

Appendix D: Evidence Plan Offshore Ornithology EWG

D.1. Offshore ornithology EWG overview

Table D.4: Overview of offshore ornithology EWG consultation materials.

Date	Meeting	Information provided
18 February 2022	Offshore ornithology EWG meeting 1	Meeting minutes (D.2.1) Response from the MMO regarding the meeting minutes (D.2.2) Response from Natural England regarding the meeting minutes (D.2.3) Response from JNCC regarding the meeting minutes (D.2.4)
13 July 2022	Offshore ornithology EWG meeting 2	Meeting minutes (D.3.1) Response from JNCC regarding the meeting minutes (D.3.2) Response from Natural England regarding the meeting minutes (D.3.3) Response from NRW regarding the meeting minutes (D.3.4) Offshore Ornithology Baseline Characterisation Technical Note for the Evidence Plan Offshore Ornithology Expert Working Group (D.3.5) Response from NRW regarding the Offshore Ornithology Baseline Characterisation Technical Note (D.3.6) Response from JNCC regarding the Offshore Ornithology Baseline Characterisation Technical Note (D.3.7) Response from The Wildlife Trust regarding the Offshore Ornithology Baseline Characterisation Technical Note (D.3.8) Offshore Ornithology Displacement Assessment Technical Note for the Evidence Plan Offshore Ornithology Expert Working Group (D.3.9) Response from NRW regarding the Offshore Ornithology Displacement Assessment Technical Note (D.3.10) Offshore Ornithology Collision Risk Assessment Technical Note for the Evidence Plan Offshore Ornithology Expert Working Group (D.3.11) Response from Natural England regarding the Offshore Ornithology Collision Risk Assessment Technical Note (D.3.12) Response from Natural England regarding the Offshore Ornithology Collision Risk Assessment and Offshore Ornithology Displacement Assessment Technical Note (D.3.13) Response from JNCC regarding the Offshore Ornithology Collision Risk Assessment Technical Note and the Offshore Ornithology Displacement Assessment Technical Note (D.3.14) Response from MMO regarding the Offshore Ornithology Technical Notes (D.3.15) Advice note from Natural England regarding the HPAI and impact assessment (D.3.16)

Date	Meeting	Information provided
30 November 2022	Offshore ornithology EWG meeting 3	Meeting minutes (D.4.1) Response from Natural England regarding the meeting minutes (D.4.2) Response from NRW regarding the meeting minutes (D.4.3) Response from JNCC regarding the meeting minutes (D.4.4)
23 February 2023	Offshore ornithology EWG meeting 4	Meeting minutes (D.5.1) Response from Natural England regarding the meeting minutes (D.5.2) Response from NRW regarding the meeting minutes (D.5.3) Response from JNCC regarding the meeting minutes (D.5.4) HRA Methodology update for Mona/Morgan Generation (D.5.5)
30 June 2023	Offshore ornithology EWG meeting 5	Meeting minutes (D.6.1) Response from JNCC regarding the meeting minutes (D.6.2) Response from Natural England regarding additional actions (D.6.3) Response from Natural England regarding the meeting minutes (D.6.4) Advice to Mona/Morgan regarding EIA scale reference populations for assessment (D.6.5) Response from NRW regarding updated HRA methodology (D.6.6) Response from NRW regarding updated HRA methodology (D.6.7) Provision of Auk ID paper (D.6.8) Response from APEM regarding the Auk ID rate paper (D.6.9) Mona and Morgan Generation Power Analysis report (D.6.10) Response from NRW regarding the Mona and Morgan Generation Power Analysis (D.6.11) Response from Natural England regarding the Mona and Morgan Generation Power Analysis report (D.6.12) Natural England proposed methodology for ‘gap-filling’ the Irish Sea R4 cumulative and in-combination assessments (D.6.13)
19 October 2023	Offshore ornithology EWG meeting 6	Meeting minutes (D.7.1) Response from NRW regarding the meeting minutes (D.7.2) Response from JNCC regarding the meeting minutes (D.7.3)
08 December 2023	Offshore ornithology EWG meeting 7	Meeting minutes (D.8.1) Response from NRW regarding the meeting minutes (D.8.2) Provision of Avoidance Rates Technical Note (D.8.3) Provision of Regional Breeding Populations Technical Note (D.8.4) Provision of CEA Historical Projects Application Approach Technical Note (D.8.5)
-	Offshore ornithology EWG agreement log	Agreement log (D.9)

D.2. Offshore ornithology EWG meeting 1

D.2.1 Meeting minutes

MINUTES OF MEETING

Security Classification: Project Internal

Partners in UK offshore wind

MOM Number	:	20220217_Morgan and Mona Ornithology EWG01	**REV. No.** :	F02
MOM Subject	:	Morgan and Mona Evidence Plan Ornithology expert working group meeting 1.		

MINUTES OF MEETING

MEETING DATE	:	18/02/2022
MEETING LOCATION	:	Microsoft Teams
RECORDED BY	:	[redacted] (RPS)
ISSUED BY	:	[redacted] (RPS)

PERSONS PRESENT:

- [redacted] – bp (GV)
- [redacted] – bp (MP)
- [redacted] – bp (WD)
- [redacted] – RPS (KL)
- [redacted] - RPS (ST)
- [redacted] – RPS (MA)
- [redacted] – RPS (LM)
- [redacted] – Natural England (AuB)
- [redacted]
- [redacted] – Natural England (RB)
- [redacted]
- [redacted] – MMO (SJ)
- [redacted]
- [redacted] -JNCC (JB)
- [redacted] – TWT (GdJC)
- [redacted]
- [redacted] – RSPB (AM)

APOLOGIES:

- [redacted] (NRW)
- [redacted] (NRW).

ITEM NO:	DISCUSSION ITEM:	Responsible party	Date
1.	**Introduction** (Presented by KL) This meeting is the first expert working group for offshore ornithology for Morgan and Mona. So far, we've held two Evidence Plan (EP) Steering Group (SG) meetings for the projects in November and December as well as the first Benthic (BE), Fish and Shell Fish (FSF) and Physical Processes (PP)		

	EWG and Marine Mammals EWG yesterday to introduce the project and get the EP up and running. The first few slides we have provide an intro to the project, and we will run through how we envisage the EWG working. The RPS topic specialist will then run through the current surveys and any feedback we have already received on the current surveys.		
2.	**Overview of the Projects** (Presented by WD) bp are working with EnBW in a 50/50 partnership (the Applicants) to develop the Morgan and Mona offshore wind farms which are being progressed as two separate projects. These sites were awarded as part of The Crown Estate's Round 4 offshore wind leasing round and are currently at 'preferred bidder' status, subject to completion of the plan level Habitats Regulations Assessment (HRA). The intention is for both projects to be developed as fixed bottom offshore wind farms. Morgan is the northern project located in in English waters, and Mona is the southern project located mostly in Welsh waters. Together, they will have a combined capacity of 3GW. Morgan and Mona will be developed on similar but slightly staggered timescales and will be under separate consent applications. The Mona project is aiming to be operational in 2028 and the Morgan project is aiming to be operational in 2029. **Key dates** Both projects are currently at pre-scoping stage. The Applicants are working on the basis that The Crown Estate (TCE) will conclude the plan-level HRA in spring 2022. The Applicants will then be in a position to sign the agreement for lease for seabed rights. Due to the size and nature of both projects, Morgan and Mona are both considered Nationally Significant Infrastructure Projects (NSIPs). The Applicants are looking to submit seperate Development Consent Order (DCO) applications for Morgan and Mona. Mona will also require a Welsh marine licence and the Applicants area in discussion with NRW Marine Licensing Team on the remit of this marine licence. Currently the Applicants are targeting the 2025 Contract for Difference (CfD) round, noting the recent announcement on annual CfD rounds. The scoping reports for both projects are planned to be submitted April 2022. The intent is to have each project submission offset by a week as per the Planning Inspectorate's preference. The Applicants are currently undertaking pre-scoping engagement including local authority engagement. Throughout 2022 the Applicants will progress with pre-application activities including both offshore and onshore surveys. Local authority engagement and fisheries engagement have begun. The applicant has also established a maritime navigation engagement forum. The Applicants aim to publish the Preliminary Environmental Information Report (PEIR) towards the end of 2022 with formal		

	consultation scheduled for early 2023. The Mona DCO application is currently planned to be submitted in Q4 2023 and the Morgan DCO planned for Q1 2024. **Indicative export cable corridor** The Applicants anticipate that there will be two Points of Interconnection (POIs), one for Morgan on the northwest coast of England and one for Mona on the north Wales coast. At the moment the Applicants are considering a number of POI options. The decision on the location of the POI for each Project is determined by National Grid and at this time we do not know where the POI will be. Once the Applicants have clarity around this, they will present this information to the steering group (SG). The Applicants have received feedback from TCE that scoping must be carried out on the full preferred bidder areas. This is to ensure consistency between the TCE plan-level HRA and the round 4 scoping reports. The Applicants have refined down the preferred bidding area for Mona and are not currently looking to develop the northern section (the so called 'dinosaur's head'). The figure on the slides shows the area currently considered as the Mona Potential Array Area, however scoping will be undertaken on the larger Mona preferred bidder area (including the 'dinosaur head'). **Evidence Plan process** (presented by KL) The Evidence Plan (EP) process has been developed following the Planning Inspectorate and Defra guidance. The Applicants have also considered draft guidelines provided by Natural England [1]. The EP process is a mechanism for the Applicants to agree with the stakeholders what is needed to be included with the consent application and to discuss any issues or concerns. The aim is to agree as much as possible during the pre-application phase so only key issues are left for examination. The EP has historically been HRA focused however in line with recent best practice, the Applicants propose to extend this to include the EIA process for ecology topics, including designated sites such as SSSIs and MCZs. The Applicants are proposing to carry out a single EP process for both projects. The projects will have separate agreement logs to account for the differences between the projects ahead of the DCO applications. Meeting minutes will also note any differences between the projects.		
	EWG (presented by KL) The aim of the EWGs will be to discuss and where possible, agree key topics for the EIA and HRA so we are only left with key issues at examination. . The EP Template was issued to the SG early in 2021 and has been updated following receipt of comments. If there are any other comments, please let us know in writing after the meeting. The Applicants are seeking to agree the remit of the EWG. The indicative		

[1] Natural England (2021) Expectations for pre-application engagement and best practice guidance for the evidence plan process.

	timeline of the EWG meetings is subject to change (particularly the latter meetings) but this gives stakeholders an indication of the number of meetings and expected timings to inform their resourcing over this time. Broad approach to EWGs as set out in the Ways of Working (WoW) document circulated prior to the meeting: • Information circulated to EWG minimum 2 weeks ahead of meeting. • Meeting is held with attendees prepared to comment on materials provided. • Full meeting minutes will be taken, and agreement logs will be compiled where matters are agreed, and after each meeting the minutes and agreement log will be circulated. • Minutes and agreement logs to be returned/agreed within 2 weeks following receipt, alongside written comments on documents submitted. The agreement log and meeting minutes will be ultimately be appended to the DCO application.		
3.	**Offshore ornithology** (presented by MA) The APEM aerial surveys were designed with a 10km buffer around a previous indicative array area for Mona which did not include the northern section (referred to as the 'head of the dinosaur'). As we have had feedback from TCE that we must scope on the full Mona bidding area (including the 'head of the dinosaur') the aerial surveys do not achieve a full 10km buffer. A full 10km buffer is reached to the east, west and south of Mona. The buffer for the Morgan aerial survey reaches 10km all the way round, including to the south and this overlaps with Mona therefore data can be amalgamted if necessary. This is not considered to be necessary at this stage. The justification for the 10km buffer was due to red-throated diver (RTD) (a feature of the Liverpool Bay SPA). Preliminary results over the first year of surveys for Mona recorded only three RTD, therefore it is becoming clear that due to the low numbers of RTDs recorded the Mona Potential Array Area should not be an issue for this species (noting that we have only analysed one full year's data so far). AM- Do you know what heights the APEM planes were flying at during the aerial surveys? MA- We can check this and feed back (Subsequent input from MP to say that the planefly at a 396m altitude and a speed of circa 120 knots. The images are captured at 1.5 cm ground survey distance, with a minimum coverage of 12% of the sea surface analysed). AM- Did the surveys record any RTD in the Morgan survey area? MA- We don't have the full winter data set for Morgan yet therefore we don't know number of RTD at this point. <u>Survey feedback</u>		

	Previous feedback on the survey methodology has included suggesting the use of a 10km buffer around the Morgan and Mona sites due to the proximity to the Liverpool Bay SPA which includes RTD as a qualifying feature, a species known to be sensitive to displacement from offshore wind farms. Previous consultation requested feedback on the use of LiDAR surveys to capture site-specific flight height data. However, due to lack of sufficient research, Natural England did not endorse the use of LiDAR as a method for collecting flight height data to parameterise collision risk models; as such it has not been progressed by the Applicants and flight heights will be assumed using existing literature. GV- The Morgan and Mona array boundaries put forward during TCE Round 4 process were specifically designed to be 10km from the Liverpool Bay SPAs. This was done on the basis of the MacArthur Green advice to TCE during the tendering process to reduce the development risk in the east Irish Sea. This is therefore important project specific mitigation, considered as part of the site selection process, to avoid impacts on these sensitive receptors. <u>Preliminary results</u> Based on the first 12 months of data from the Mona aerial surveys, the presentation slides present information on the key species recorded (kittiwake, guillemot, manx shearwater, and gannet). The density estimates have been calculated using the APEM design based abundance approach i.e. by averaging values from the grid cells. <u>Desk top sources</u> The presentation shows a non-exhaustive list of desk top data sources that will be used alongside the site-specific data to characterise the baseline. AM- There is a lot of available tracking data that has been done for the SPAs in the area. Oxford University has done some tracking data around Skomer and Skokholm. Swansea University have done some tracking of guillemot. Also tracking data available on gannets from Ailsa Craig and Grassholm. It is worth looking at site-specific tracking data to give context to general desktop data sources. JB – agreed that tracking datasets would be a useful dataset. MA- Yes, we will look at these. And we will consider site specific foraging ranges in the literature as well as compiled generic data. KL- If there are any more specific tracking studies please let us know. Send the reference in writing after the meeting and we will follow it up. RB- Are you looking to produce design based estimates or model based estimates to be used? MA- We are exploring the modelling option using MRSea. This option makes data easy to manipulate and use for assessments.	**AM and JB to provide a link to the specific tracking studies referenced**	15/03/2022

	RB-Are the density surfaces presented in this presentation KDE (Kernel Density Estimates)? MA-Yes, they are. RB- Have the Applicants looked at the data from the old R3 Irish Sea zone? The distribution of Manx shearwater on that project was higher than has been recorded in these site-specific surveys. Possibly the hotspots were more associated with the Irish Sea Front so may be further west. There were hot spots across multiple species also recorded in the R3 Irish Sea Zone surveys. MA- Not yet but it will be considered. KL- The Rhiannon offshore wind farm boundaries were a bit further to the west towards the Irish sea front. GV- Was involved in that project and recalled that the Manx shearwater were further west than the Morgan and Mona projects, associated with the Irish Sea Front. RB- I think this is correct, further west of these projects. JB- Will there be any consideration of impact on bird prey resources? This may extend beyond the boundary of the Morgan and Mona wind projects themselves. Particularly relevant in relation to the SPAs in the area. KL- Yes, the fish and shellfish data for the area will be analysed and detailed baseline characterisation will be undertaken. The impact assessment for the fish and shellfish topic will consider the impact of all phases of the project on fish and shellfish receptors, including those that may be bird prey resources (particularly herring and sandeels). This will feed into the ornithology assessment which will consider the impact on bird prey resource. The initial benthic site-specific surveys are indicating that neither the Morgan or Mona areas have a high suitability for sandeel habitat or herring spawning habitat, the main bird prey resources. However, these are initial results only, will full detail to be provided in the fish and shellfish technical report. JB- There are a few internal JNCC projects which might help understand the baseline e.g. diet requirement for Manx shearwater. Let us know when you start to have results from the fish and shellfish technical report. JNCC will point the Applicants towards what they have done at that point.		
4.	**Intertidal ornithology (Presented by LM)** The Applicants have commenced surveys at a number of landfalls close to potential Points of Interconnection. The Surveys commenced in Sept/Oct 2021. Comprising preliminary landfall areas, extending minimum 500 m in each direction along the coast (buffer zone). The intertidal surveys will look at birds up to 1.5km offshore from Mean High Water Spring (MHWS). Recording sectors are segregated in 500m zones in which we count birds and map the locations of individual birds as well as recording bird behaviour.		

	The frequency of 'through the tide count' over the tidal cycle varies between landfall sites, and counts go down to one every 2 hours for low usage areas. Early stakeholder comments on the methodology also request that level of baseline disturbance are accounted for. The surveys will also record the perceived effect of disturbance on bird abundance and distribution for each count. The aim of the nocturnal surveys is to determine the difference between counts in the day and night. Early indications are a similar assemblage is being recorded with a lower abundance during the night. The optical equipment for surveying during the night is limited to 400m. The Applicants are currently reviewing the data and considering the rationale for extending the survey to the end of April for sites that are within SPAs. Preliminary findings can be presented at the next EWG meeting. KL-The Applicants are currently looking at a number of landfall options in the area, although only one will be chosen for each project. In the absence of a decision by National Grid on the POI, this is , therefore, potentially redundant work, but required to maintain the programme. Once National Grid identify the POIs, the landfalls will be subject to further consultation. At this time we can't present where the potential landfall locations are. AD- Would it be possible to share the locations of the survey to check on additional sensitivities in the area from local knowledge? When will you hear from National Grid? That may be a more suitable time to discuss this. KL- The Applicants are likely to hear from National Gird in March/April. We will then know where the export cable corridor will connect, if the projects are granted a radial connection. The scoping report is planned to be submitted in April, and this will present which POI the projects will be using and a broad search area for the export cable corridor. Over the next couple of months the Applicants will be looking to refine the export cable corridor so after scoping will be the best time to discuss. AD/AB- There are also undesignated inland areas that may support birds associated with SPAs local knowledge may be useful when this information is known. KL- We are also planning to have an onshore ecology EWG, which will be arranged once the POIs for each project is known.		
5.	**Questions** MA- Worth discussing the offshore export cable corridor and the approach to characterisation of this part of the project areas. Our intention is to rely on available desktop data for the export cable corridor. There is a lot of data in the area and this approach is standard for offshore wind farm transmission assets. KL- This is an area of the Irish Sea that is well studied and there is a lot of desktop data available for baseline characterisation.		

	LB- Using the desktop study to start the assessment on export cable corridor is fine. It would be useful to know what opportunities there will be for gathering new survey data even if it is just to verify the desktop data. MA- Due to the compressed timescales, there will be limited opportunities for new surveys once the results of the OTNR and National Grid POI decision are announced. KL- Given the amount of data available and relative low risk from cable laying operation the proportionality of additional survey data would need to be considered. We can look at this once the desktop data has been fully reviewed and we know the specific data that covers the landfall and export cable corridor once these are known. LB- This sound like a sensible approach. Thinking in terms of consistency around advice in other areas and the data requirements for other projects. There will need to be an element of a risk assessment of just relying on the desktop data. MA- Up to 10km of the export cable corridor closest to the array will have been covered by the aerial seabird surveys, and the sea up to 1.5km from the coast will have been covered by the intertidal waterbird surveys. We can take the opportunity to compare our aerial and coastal survey results with the desk study data. AD- RSPB request more detail than presented in the outline in these slides to be able to provide agreement on approaches. The RSPB would not be able to agree the survey methodology without further detail, the RSPB has not been party to the discussion that have gone on previously on the survey methodology. KL- Comment from RSPB is noted, we can look at that internally. If further information is not provided after this meeting, it will be within the scoping report. AD- That's fine we can look at it at scoping.		
6.	**Next steps** (Presented by KL) Confirmation on POIs from National Grid. Scoping scheduled for April 2022. The Applicants would look for agreement on the following points following the meeting: • Agreement on the Remit and Inputs to the EWG (as set out in Section 4.4 of the Evidence Plan Template); • Agreement on Ways of Working Documents, including timescales; • Agreement on broad approach to aerial surveys; • Agreement on broad approach to landfall surveys; and • Agreement on board approach to characterisation of the export cable corridor for ornithology.	**All- to fill in agreement log to provide progress of agreement for each of the points listed.**	15/03/2022

7.	**Close of meeting**		

D.2.2 Response from the MMO regarding the meeting minutes

Marine Management Organisation

Marine Licensing
Lancaster House
Hampshire Court
Newcastle upon Tyne
NE4 7YH

T [redacted]
F
www.gov.uk/mmo

[redacted]
Environmental Advisor
bp Alternative Energy Investments Ltd
(By email only)

Our reference:
ENQ/2021/00033

06 April 2022

Dear [redacted]

Morgan and Mona Offshore Windfarm – Expert Topic Group Meetings

The Marine Management Organisation (MMO) received the above document and accompanying comments for consideration on 04 February 2022. The MMO has reviewed the document alongside our advisors at Cefas and our comments are below:

Comments

Shellfisheries

1. Desktop data sources include the Northern Irish Sea Fish Trawl Surveys. Please note that this is unlikely to inform of shellfish abundances. At best, trawls (except for Nephrops if using an otter trawl) will provide presence/absence information at best. Shellfish (lobster, crab, whelks, cuttlefish) are typically targeted using specialised pots. The MMO would suggest interrogating MMO landings data to determine the extent of shellfish landings.

Underwater Noise

2. Timescales for Feedback (document F02 Ways of working document): Please note that although Cefas advisors can endeavour to provide comments and review minutes and contents of agreement logs within 2 weeks, the exact timeframes will ultimately depend on the deadlines specified by the MMO.

Benthic Ecology

3. The MMO requests confirmation that the benthic grab samples collected in relation to the developments will be processed to the recommend national processing guidelines (Worsfold and Hall, 2010) and that the resultant data will be made available as soon as possible.

4. The MMO note that there were several areas relevant to benthic ecology that were not discussed at the meeting (e.g., cumulative impacts, non-native invasive species, survey design and benthic analyses, electromagnetic fields, suitability of baseline

datasets, data processing and availability). The MMO is aware this is only the first group meeting but will expect these topics to be covered in the future.

Fisheries and Fish Biology

5. In the absence of confirmed export cable routes and cable landfall locations for the projects, the MMO are currently unable to comment, consider or advise on any potentially vulnerable fish receptors which may be affected by the construction activities associated with the construction and operational phases of the wind farms. The MMO will review this in more detail once landfall locations are confirmed.

6. During the expert topic meeting reference was made to the Cefas Pelagic ecosystem survey in the Western Channel and Celtic Sea (PELTIC) surveys and their potential use as a source of information/data to inform the baseline for fisheries. The MMO would advise that in the Irish sea the survey stations only go as far north as Llŷn Peninsula in North Wales, which is significantly further south of the proposed locations for Morgan and Mona. The day may be useful to provide broadscale information and data on pelagic species in the Irish Sea but may not be as useful for providing site-specific fisheries data for the windfarm study areas. See Annex1 for map of PELTIC survey stations.

Coastal Processes and Physical

7. No comments at this stage.

General- Benthic Scope of Works and the Intertidal Outline Scope Reports

8. The MMO note that Samantha Tuddenham sent an email on 01 April 2022 requesting comments on the benthic scope of works report revision 2 with a deadline of 19 April 2022. The MMO has advised previously that consultation with our advisors requires 4 weeks and there will be time either side for quality checks. Further discussions are required around the timescales the projects are proposing as the MMO do not currently find them appropriate.

Conclusion

The MMO notes there are no major concerns at this stage of the projects and has provided advice to ensure all aspects of the topics raised above are adequately covered. The MMO is still concerned however by the time the project expects the MMO to provide comments within and would encourage further discussion on this topic at the next catch-up meeting with the MMO.

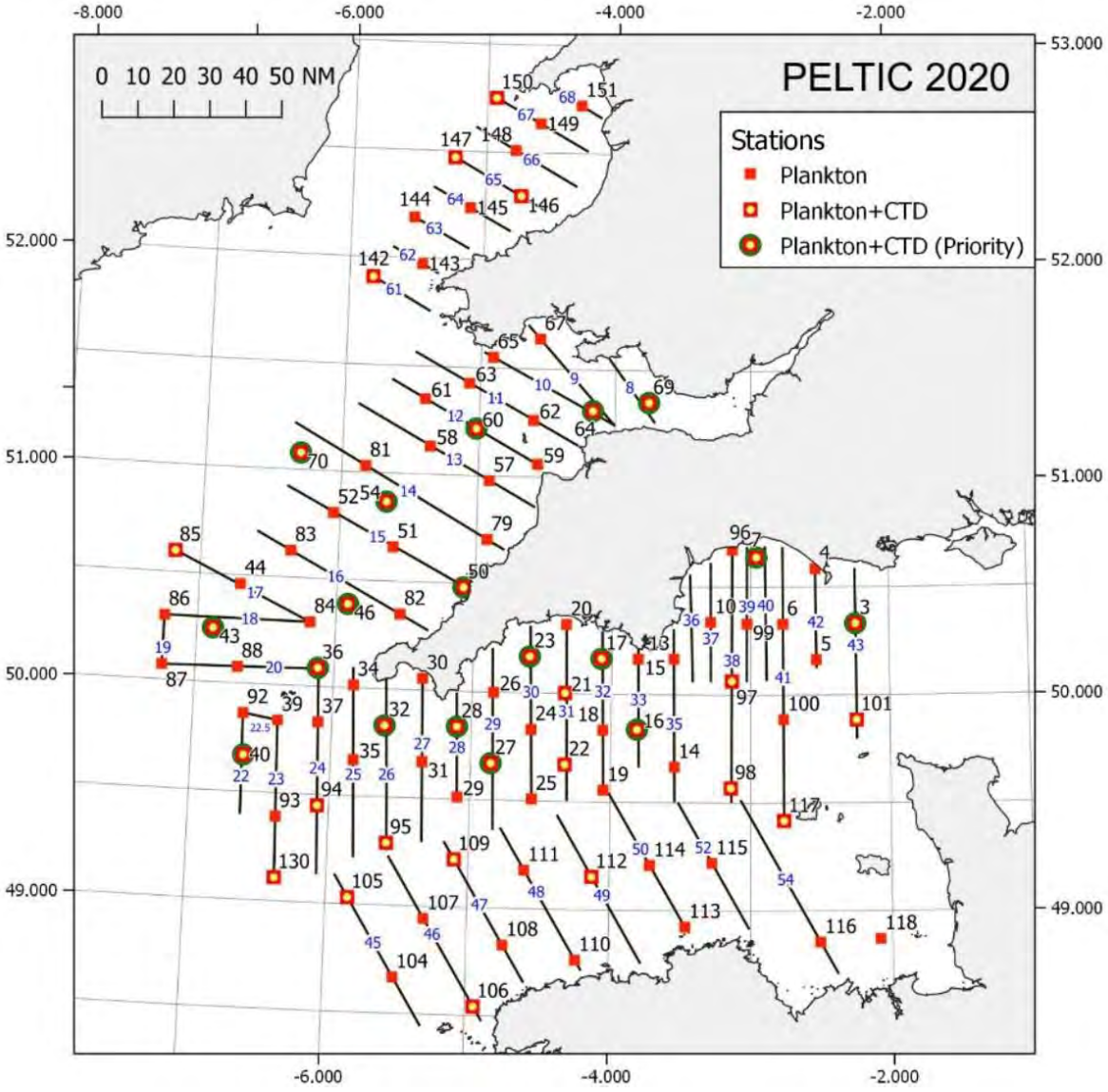
If you wish to discuss any of the points further, please don’t hesitate to contact me.

Yours sincerely,

[redacted]
Marine Licensing Case Officer

[redacted]

Annex 1 – Map of Survey Stations for the PELTIC survey



D.2.3 Response from Natural England regarding the meeting minutes

Date: 10 March 2022
Our ref: DAS/UDS A000566 / 381738
Your ref: Ornithology EWG01

Customer Services
Hornbeam House
Crewe Business Park
Electra Way
Crewe
Cheshire
CW1 6GJ

[redacted]ents Limited

c/c [redacted]
RP

BY EMAIL ONLY

Dear [redacted]

Discretionary Advice Service (Charged Advice) - UDS A000566
Contract Reference: BP EnBW Morgan and Mona Offshore Wind Farm
Consultation: Ornithology EWG01

This advice is being provided as part of Natural England's Discretionary Advice Service in accordance with the Quotation and Agreement dated 17 May 2021 to BP Alternative Energy Investments Limited.

The following advice is based upon the information presented in the Ornithology Expert Working Group (EWG) Meeting 1 (attended on 18 February 2022) and subsequent meeting notes provided on the 1st March 2022 by [redacted]

Natural England were asked to provide advice upon:

1. Agreement on the remit of the EWG;
2. Agreement on Ways of Working document;
3. Agreement on the approach to the aerial and landfall surveys;
4. Agreement on the broad approach to baseline characterisation.

1. Agreement on the remit of the EWG

Natural England provided comment on the draft Evidence Plan, via a comments log, on 4 November 2021. It was our view that the Evidence Plan set out the basic framework of the Evidence Plan. This was ahead of the 1st Evidence Plan meeting on 16 November 2021. We welcome the update of the Evidence Plan (version F02, provided 4 February 2022) which has incorporated our earlier comments.

The remit of the Offshore Ornithology as set out under 4.4 of the Evidence Plan (v F02) is appropriate and in line with Natural England's previous comments, we agree the remit as set out. We welcome the outlined timetable of future meetings as presented in Table 4.6 to enable resource planning.

We would advise that consistency is used in reference to the name of this EWG; it has been referred to as Offshore, Offshore and Coastal and simply Ornithology EWG. We recommend that Ornithology EWG would be most appropriate if discussions which include the intertidal, and potentially inland along cable corridors, ornithology aspects are to be discussed going forward.

2. Agreement on Ways of Working document

We welcome the Evidence Plan Ways of working document (version F01, provided 4 February 2022) as a clear reference document.

Natural England agrees with the Ways of Working document which aligns with previous comments in terms of timescales for review and comment provided as part of our comments on the draft Evidence

Plan (4 November 2022). As noted in the document, it may be necessary for timescales to be amended to ensure sufficient time to review and comment (e.g. large documents or multiple documents), in which case we will communicate and agree an alternative deadline.

3. Agreement on the approach to the aerial and landfall surveys

We agree with the survey method set out for the aerial surveys, as set out for the area covered and frequency of coverage, as well as the grid based design and a 12% surface analysis coverage.

Natural England agree with the survey method presented for the intertidal and nearshore waterbird surveys, which align with our previous advice (our reference 362549 and 374171, provided 25 August 2021 and 12 November 2021 respectively). As previously stated, we would welcome further discussion regarding the potential continuation of these surveys to cover May to July inclusive so as to cover any passage waders. Once there has been further refinement on the Points of Interconnection for the cables, we would welcome further discussion or update on any changes to the locations for these surveys.

As raised in the meeting, we would highlight the risk assessment based on the desk based study where surveys have not been planned, i.e. along the cable route between the array Zone of Influence and the intertidal survey areas. This risk assessment should be considered on the age of the data used. Natural England have commissioned a report using existing data to analyse the abundance and distribution of bird features of Liverpool Bay SPA, this report has not yet been published. Once it is finalised we will be able to provide a copy, this may be useful towards your desk based study although may still be limited due to age of data.

We recognise the aim to publish the Preliminary Environmental Information Report (PEIR) for formal consultation in early 2023. This would only allow for one full year of overwintering intertidal bird survey data (surveys starting in winter 2021) to be presented, and for the Morgan sites it is unlikely that the full 24 month survey effort will be completed or data analysed. Natural England highlight the risk that the additional data collection could have potential to change the conclusions, which could cause potential delays to the project. Natural England have previously advised (Natural England reference: DAS/UDS A000566 / 374171, dated 12 November 2021) that two years of survey effort is the minimum expected evidence standard for bird data, and seeks confirmation that the timetable set out for DCO submission allows for this evidence standard.

4. Agreement on the broad approach to baseline characterisation

The approach to the baseline characterisation, using site-specific data and contextualisation from wider reports and evidence, as set out in the Ornithology EWG meeting is supported. We welcome the data sources listed and again refer to the currently unpublished report, which may be of use to be incorporated to contextualise the primary data collection.

Natural England have set up a SharePoint Online (SPOL) site to share Natural England's advice on the environmental considerations and use of data and evidence to support offshore wind and cable projects in English waters. Advice provided on this site includes Natural England and Joint Nature Conservation Committee (JNCC)'s shared advice on 'Nature conservation considerations and environmental best practice for subsea cables in English inshore and UK offshore waters.'

The outputs of Natural England's project 'Offshore Wind Marine Environmental Assessments: Best Practice Advice for Evidence and Data Standards' are also provided. This project, produced in collaboration with DEFRA, the following reports are currently available;

- Phase I: Expectations for pre-application baseline data for designated nature conservation and landscape receptors to support offshore wind applications.
- Phase II: Expectations for pre-application engagement and best practice guidance for the evidence plan process.
- Phase III: Expectations for data analysis and presentation at examination for offshore wind applications.

You can access the new SPOL site from the following links:
Environmental considerations for offshore wind and cable projects - Home (sharepoint.com) or
https://defra.sharepoint.com/sites/WorkDelivery2512/SitePages/Home.aspx

Due to how SharePoint Online works, people outside of Defra will need to request access to the site before being able to view the advice documents, so there could be a slight delay for external stakeholders to access the site.

Additional comment

During the meeting there was a request for additional data sources, although not necessarily relevant for current work, Natural England have recently published a report regarding functionally linked habitat for Special Protection Area (SPA) waterbirds in the North West of England[1] which may be of use in future aspects of the project.

For clarification of any points in this letter, please contact me using the details provided below.

Yours sincerely

[redacted]
Strategic Coastal Lead Adviser
Coast and Marine Team
Cheshire, Greater Manchester, Merseyside & Lancashire Area Team
[redacted]

☐ The advice provided in this letter has been through Natural England's Quality Assurance process.

The advice provided within the Discretionary Advice Service is the professional advice of the Natural England adviser named below. It is the best advice that can be given based on the information provided so far. Its quality and detail is dependent upon the quality and depth of the information which has been provided. It does not constitute a statutory response or decision, which will be made by Natural England acting corporately in its role as statutory consultee to the competent authority after an application has been submitted. The advice given is therefore not binding in any way and is provided without prejudice to the consideration of any statutory consultation response or decision which may be made by Natural England in due course. The final judgement on any proposals by Natural England is reserved until an application is made and will be made on the information then available, including any modifications to the proposal made after receipt of discretionary advice. All pre-application advice is subject to review and revision in the light of changes in relevant considerations, including changes in relation to the facts, scientific knowledge/evidence, policy, guidance or law. Natural England will not accept any liability for the accuracy, adequacy or completeness of, nor will any express or implied warranty be given for, the advice. This exclusion does not extend to any fraudulent misrepresentation made by or on behalf of Natural England.

Cc [redacted]

[1] Bowland Ecology 2021. Identification of Functionally Linked Land supporting SPA waterbirds in the North West of England. NERC361. Natural England

D.2.4 Response from JNCC regarding the meeting minutes

From: [redacted]
To:
Cc:
Subject: RE: Morgan Mona Ornithology 1st EWG Meeting
Date: 15 March 2022 17:12:00
Attachments: [redacted]

CAUTION: This email originated from outside of RPS.

Good afternoon [redacted]

Please find attached the Mona and Morgan logs complete with JNCC comments.

As mentioned in our benthic response JNCC's role in relation to offshore renewables in English waters has been delegated to Natural England. Natural England is now authorised to exercise the JNCC's functions as a statutory consultee in respect of certain applications for offshore renewable energy installations in inshore and offshore waters (0-200nm) adjacent to England. Therefore, JNCC would not look to provide comment on the Morgan project unless we anticipate an impact on a jointly managed site (i.e a site jointly managed by ourselves and Natural England). As such JNCC have completed both the Mona and Morgan projects with respect to ornithological issues.

One of the actions on from the EWG was for JNCC to provide a link to the specific tracking studies referenced during the meeting (15/03/2022). Please see below:

Tracking studies

A summary of tracking studies carried out which may be relevant are listed below, with the lead researcher to whom correspondence should be sent in order to source tracking data.

Gannets at Grassholm have been tracked during chick-rearing for 11 years (2006 and 2010–19) using GPS tags by the University of Exeter, with research led by Dr Stephen Votier.

Manx shearwater at Skomer have been tracked during incubation and chick-rearing between 2006 and 2019 using GPS tags by the University of Oxford, with research led by Professor Tim Guilford.

Common guillemot at Skomer have been tracked as juveniles and adults form 50 years using leg rings by the University of Sheffield, with research led by Professor Tim Birkhead.

Kind regards,

[redacted]

[redacted]
Offshore Industries Adviser
Marine Management Team
JNCC, Inverdee House, Baxter Street, Aberdeen, AB11 9QA

[redacted]

JNCC have been monitoring the outbreak of COVID-19 closely and developed a response plan. As a result, the vast majority of our staff are working from home and adhering to the government's advice on social distancing and travel restrictions. Whilst we are taking these actions we are available for business as usual. We will respond to enquiries as promptly as possible. However, there may be some delays due to the current constraints and we ask for your understanding and patience.

jncc.gov.uk

D.3. Offshore ornithology EWG meeting 2

D.3.1 Meeting minutes

MINUTES OF MEETING

Security Classification: Project Internal

Partners in UK offshore wind

MOM Number	:	20220713_Morgan and Mona Ornithology EWG02	**REV. No.** :	F01
MOM Subject	:	Morgan and Mona Evidence Plan Ornithology expert working group meeting 2.		

MINUTES OF MEETING

MEETING DATE	:	13/07/2022
MEETING LOCATION	:	Microsoft Teams
RECORDED BY	:	[redacted](RPS)
ISSUED BY	:	[redacted](RPS)

PERSONS PRESENT:

- [redacted]– bp (GV)
- [redacted]– bp (MP)
- [redacted]– bp (WD)
- [redacted]– RPS (KL)
- [redacted]
- [redacted]– RPS (MA)
- [redacted]– Natural England (AuB)
- [redacted]– Natural England (RB)
- [redacted]
- [redacted] JNCC (JW)
- [redacted]– RSPB (AM)
- [redacted](NRW)
- [redacted](MMO)
- [redacted]JNCC (RH)
- [redacted]– NE (LB)
- [redacted]-NRW (ES)

APOLOGIES:

- [redacted]

ITEM NO:	DISCUSSION ITEM:	Action & Responsible party	Date
1.	AM- Apologies RSPB haven't been able to provide a written response to the technical papers provided to the EWG last month, although they have been reviewed.		
2.	**Project update (presented by WD)** bp are working with EnBW in a 50/50 partnership (the Applicants) to develop the Morgan and Mona Offshore Wind Projects which are being progressed as two separate projects.		

	Morgan is the northern project located in in English waters, and Mona is the southern project located mostly in Welsh waters. Together, they will have a combined capacity of 3GW. Morgan and Mona will be developed on similar but slightly staggered timescales and will be under separate consent applications. The Mona project is aiming to be operational in 2028 and the Morgan project is aiming to be operational in 2029. The Morgan and Mona Offshore Wind Projects are being developed as separate DCOs with separate landfalls. The Applicant is looking to sign The Crown Estate (TCE) Agreement for Lease this year. We now have final clarity from the National Grid regarding the results of the Pathway to 2030 Holistic network Design which has provided the onshore grid connection points for the Morgan and Mona Offshore Wind Projects. Mona will have a grid connection at the existing Bodelwyddan National Grid substation. Morgan will have a shared grid connection at the existing Penwortham National Grid substation with the Morecambe Offshore Wind Project which is bring progressed jointly by Cobra and Floatation Energy. Both Morgan and Morecambe will share an onshore and offshore cable corridor however the projects will remain electrically separate. This means we have had to separate the Morgan generation and transmission assets applications. The Morgan generation assets scoping report has been submitted to the Planning Inspectorate and the Applicant is working with Morecambe to deliver a joint DCO for the transmission assets. The Morgan (generation assets only) and Mona (generation and transmission assets) PEIR submission will be at the end of Q1 2023. The Morgan generation assets PEIR has been aligned with the Mona PEIR to allow the Applicant to properly consider the cumulative effects between the projects. This alignment is expected to continue to application.		
	Baseline characterisation (presented by MA) KL- We had a comment from JNCC in the offshore ornithology EWG01 regarding disturbance of birds from the aerial surveys. We have response from APEM (the aerial survey contractor) on this and we will send around their response after the EWG. MA- The Mona digital aerial surveys have now completed 24 months of data collection. Morgan digital aerial surveys will continue until March 2023. The surveys have been carried out by APEM. AM- On Hornsea there has been a lot of discussion on MRSea, how it is carried out and how it is presented. It is worth reflecting on the lessons learned from that project, for example the importance of being clear on how auto correlation has been tested for. NatureScot has done a review of aerial surveys and has put together some recommendations on how the results are presented, although this is not published at the moment. Worth looking out for when published. These recommendations may also contain information on how bird disturbance from aerial surveys should be considered in the reporting.	**RPS to share APEM response to JNCC query on disturbance of birds from the aerial surveys**	**Completed**

	MA- RPS have caried out the MRSea for this project so it may not be connected to what was carried out for Hornsea. We have followed the presentation that is set out in the latest Natural England guidance. MRSea has been carried out on the most abundance species (kittiwake, gannet, guillemot, razorbill, Manx shearwater). We have found that the spatial data itself is the only thing that described the spatial abundance of species, other variables e.g. water depth did not explain the spatial abundance. Apportioning of unidentified species was carried out and then availability bias was carried out, in that order. The MRSea analysis uses data from the whole Mona Array Area and the Mona survey area, then data are extracted from the relevant areas (array, array plus buffer) for the collision risk and displacement analysis. The survey captured 30% of the sea surface in the survey area and undertook at least 12% image analysis of the survey area. There was a request for power analysis to be carried out to detect the appropriateness of the 12%. We are asking for more clarification in this EWG on what the EWG members are looking for from this power analysis. We have used the MRSeaPower package before for the ability to detect changes as power analysis is usually used to define the ability to detect future changes rather than characterise a baseline. KL- The purpose of these surveys is to characterise the baseline; they are not pre-construction monitoring surveys. The power to detect changes is not what the Applicant is seeking to do with these surveys. LR- This is something that NRW raised, however without specialists present, LR will take this away. RH- It is something that JNCC would consider worth doing as it can inform if the current survey design has enough power to be used for the pre-construction surveys. Does it detect the level of displacements that we would expect to see for the species that may be impacted? MA- What level of change would be consider acceptable to detect? Previously we have looked for 30% and 50% change. RH- It would depend on the species. It's harder to detect a lower change but we would want to detect a 30% change (if it occurs) for those species that are less sensitive to displacements, but we would also want to detect 50% (if it occurs) so we don't miss any larger displacements. AM- Request for a comparison between the two camera and four camera system with a couple of months of data to ensure that the variability at the site is being captured. This has been done a few times and has always shown that there is sufficient coverage, but distribution is site specific. MA- That is the HiDef approach, APEM have carried out this analysis and they use a selection of images rather than the 2 or 4 camera approaches. This would therefore just involve additional image analysis. The project will discuss the possibility of this internally. In the responses to the technical papers there was a recommendation to carry out hot/cold spot analysis to identify higher and lower use	**RPS to provide post-meeting clarification of the form of the MRSea model** **LR to discuss clarity around request for power analysis with NRW specialists.** **RPS and the Applicant to discuss additional analysis of**	**Completed** **10/08/22**

	areas. This was done on an interim data set as an illustration tool for the Project Design Envelope. The Mona PEIR will be based on the wind turbines occupying the whole Mona Array Area with no siting design within it; that may possibly be done to inform future design. The parameters to use for availability bias were presented in the technical papers and this was agreed in the responses. Abundance and density estimates in the Mona Array Area and buffers will be presented in the PEIR technical report.	**survey images to ensure site variability is being captured.**	**10/08/22**
3.	**Displacement (presented by MA)** The displacement technical paper follows the SNCB guidance approach, and there was general agreement on this in the responses. The Applicant would like recommendation of the approach to displacement and the mortality rates for species to be used. Would the EWG recommend using the same displacement and mortality rates for Manx Shearwater and for Kittiwake as for Auk species? RB- This is the approach we have recommended for other projects. Natural England recommend displacement is modelled for Manx Shearwater but not for Kittiwake. LR- NRW will take this away for comments from specialists. MA- There are several ranges suggested for displacement and mortality; there are several levels within these which are needed to incorporate for uncertainty. We can present the upper and lower limits and mean. If we presented all the permutations of the model output, then this would present a lot of values. Which values need to be presented, which would the EWG like to see the assessment based on? RB- Hornsea becomes a case study for this as the most recent project that has undergone examination, and this is currently being discussed for Hornsea. Worth looking out for what is agreed in examination for this. KL-Can NE flag to the Applicant when an agreement is reached on Hornsea. RB- NE will be looking to split out project specific advice from general NE advice. When NE has reached a general position, this will be shared with the Applicant. GV- If this best practice isn't developed or isn't reached soon, for the purpose of the PEIR we will continue to present the highest, lowest, and mean outputs and then NE can respond to the PEIR if they disagree with the approach. We would appreciate any early flags from NE on their preferred approach. LR- NRW to take this away for comments from specialist. RB- NRW and JNCC are already in possession of the updated CRM parameters that were provided to the Applicant.	**NRW to provide recommendation on the displacement and mortality rates to be used for Manx Shearwater and Kittiwake.** **RB to share NE advice on values to be presented as soon as available. To be circulated to entire EWG.** **NRW to provide comment on preferred displacement and**	**Completed** **TBC**

	KL- If and when NE are in a position to share their recommendations on displacement and mortality model outputs would they be ok for them to be shared with the EWG? RB- Once it has been sent to the Applicant then it will ok to share with the EWG. AM- For Hornsea they haven't presented the outer confidence limits for MRSea. They have presented their approach and NE preferred approach which includes a range of values. This is a reasonable approach. It is key there is clarity on how this information is derived and the extent of uncertainty. LR- There are other pathways and forums outside this EWG where SNCBs can discuss and agree these parameters. MA-We will include the main 5 species recorded in the displacement assessment and including Kittiwake and Manx Shearwater. It is usually recommended to use abundance estimates for all behaviours, is this also applicable to Manx Shearwater? RH- We would be hesitant to say yes there won't be any red throated divers for Morgan as there is only 12 months of data, we would want to wait until there is 24 months of data before we agreed to them being scoped out. MA-Noted. For Morgan, the PEIR will be based on 12 months of data so we accept that there will be some flexibility for change once we have the full data set.	**mortality model outputs to be presented and assessment based on.** **EWG to provide recommendation for abundance estimates for all behaviours for Manx Shearwater**	**Completed** **Completed**
4.	Collision Risk Modelling (presented by MA) KL- RB, noting that this section reflects the updated CRM parameters provided by yourself, can we share these updated parameters with the EWG? MA- We are proposing to use the stochastic model with the updated avoidance rates. AM- Will this be using the stochastic interface deterministically or stochastically? MA- Full stochastic will be used. RB- Avoidance rates are informed by the JNCC work and have been selected for individual species but there is a move away from species specific rates to species group compared to the 2014 advice. They do not fully reflect the gannet work yet but the report on this will be available soon. AM- for the record, RSPB consider jury still out on application of macro-avoidance for gannet on top of the within-wind farm rate. Avoidance behaviour may be different in breeding and non-breeding season (most avoidance may be shown by non-breeders). It incorporates the within-wind farm rate for gulls, but gannet may not be as manoueverable so it may not be appropriate.	**RB to share the updated CRM parameters with the EWG.**	**10/08/22**

	MA- The intention is that we will use the stochastic model for PEIR, using the parameters provided by NE. Is there any progress on collision risk for Manx Shearwater accounting for behaviours that are not picked up from surveys e.g. Nocturnal behaviours? AM- The RSPB don't have a solution for this at this time. Suggest reviewing tagging data to see what pattern of activity is like in the area. MA- Would also like to ask if the parameters for other marine species that are provided in the CRM technical report are appropriate? Physical parameters for Fulmar and Manx Shearwater wer presented in the collision risk technical note; does EWG agree these are appropriate for those species? Collision risk and displacement are additional for species where both are assessed and this will be considered within the assessment. 70% macro avoidance is recommended by Natural England for Gannet. What are the appropriate macro-avoidance rates to apply for this for other species, e.g. Kittiwake? RB- NE don't recommend displacement for kittiwake. For Manx Shearwaters it is more appropriate to work around displacement than collision. LH-It was JNCC that requested that kittiwake was assessed for displacement. JNCC will take this question away to discuss internally.	**EWG to approve or recommend alternative parameter values for Fulmar and Manx Shearwater** **JNCC to provide advice on what macro avoidance rates should be used for Kittiwake**	**10/08/22** **10/08/22**
5.	**Scoping opinion (presented by KL**) We are working through the scoping opinion and will be providing responses to comments where requried. We will be incorporating the scoping opinion in the PEIR where appropriate. The applicant has nothing specific to bring up but would like to offer the EWG the chance to raise anything. RH- Assessment of displacement during construction and decommissioning should include for 50% of the displacement during operation. This should be applied to the same area as should be applied for operation. MA- we have presented these values in our displacement analyses.		
6.	**Approach to LSE screening (presented by KL)** The approach to LSE screening is presented where there is potential for effects on offshore birds. We are still early in the process, and this is the methodology to identify the sites and features, it doesn't include a full list of sites to be considered. We will progress this further once we have more information on the baseline surveys and initial outputs of the displacement and CRM outputs. SPAs and Ramsar sites with offshore and onshore waterbird qualifying features. We are broadly considering sites within 50km of the cable landfall, but this is not final, we will consider wider sites if appropriate. The next step is to consider the site-specific information.		

	LR- Is feedback on the LSE screening methodology going via the steering group or EWG? KL- For those in the steering group and EWG please provide one response via the steering group. For those just in the EWG, please provide a response on the specific LSE methodology for ornithology via the EWG.		
7.	**Discussion and next steps (presented by KL)** Outlined next steps for meeting minutes and agreement logs (attached). Seeking agreement on the approach papers presented and points raised during the meeting. MA- The breeding season apportioning would be carried out using the SNH guidance, is this appropriate. We do not propose to issue a technical note on the apportioning approach. RH- This is the reference tool we would recommend.		
8.	**Close of meeting** **Post meeting clarifications** <u>Further information on the MRSea tool</u> RPS analysts have been consulting with Lindsay Scott-Hayward from CREEM to ensure we use the model appropriately. She gave useful tips on implementing MRSea and explaining the internal workings of the model, but no flaws were identified in the implementation of MRSea by RPS. To clarify the previous point, the spatial terms are generally by far the most important in describing species distributions. The environmental covariates like “water depth” and “distance to coast” provide some additional explanatory power, but this is generally very limited compared to the spatial terms in the model. We also discussed Hornsea, and the major take-away from this was that it is important to be transparent and justify why certain choices made (most notably for Hornsea was that no interaction term was included, without justification). The model used for baseline characterisation in the PEIR is the best model as selected by MRSea. We used what is considered the gold standard (tenfold cross validation, a method adopted from machine learning) to consider which covariates should and should not be included in the model. This will lead to robust estimates of bird distributions and abundances. To double check MRSea abundances and densities in each month, we compared them to design-based estimates. In all cases, the MRSea estimates were very similar to design-based estimates. <u>Query regarding plane flight heights</u> The standard altitude flown by APEM is on average 400 m this offers 1.5 cm Ground sampling distance (GSD) on average across the image footprint (i.e. the pixels at nadir (directly beneath the aircraft) will be even better than 1.5cm – typically 1.4cm GSD). This increases our image resolution and therefore our species identification. APEM recommends		

	that survey flights take place at a height of at least ca. 400 m to avoid disturbance to birds and marine megafauna and optimise ground resolution and footprint, and data quality. We can fly at higher altitudes and still achieve an image resolution of 1.4 cm GSD directly beneath the aircraft and will do so for post-construction monitoring where necessary for safety, however flying at an altitude of 1,350ft also allows comparatively more weather windows than flying at higher altitudes. If APEM were to fly at a higher altitude it would mean fewer weather windows due to low cloud base and we are confident that flying at this altitude does not cause disturbance. APEM's camera systems are mounted vertically and can see through the water column, and therefore can detect individuals below the sea surface. We can categorise any individuals that have dived below the surface, which may not be the same for other providers with obliquely mounted camera systems. We can also demonstrate mathematically that birds towards the centre 80% of an image do not have the time to get out of shot if their reaction distance is between 1,312 ft and 1,476 ft. If disturbance was a genuine factor APEM would have many thousands of images of birds taking off, which is known not to be the case. Furthermore, Komenda-Zehnder et al. (2003) observed that the behaviour of waterbirds was not significantly influenced if aeroplanes flew at 984 ft above ground level. Therefore, there is a considerable body of evidence that flying at altitudes significantly below 450 m does not cause disturbance to birds. APEM have viewed thousands of images collected at an altitude of c. 400 m and have not seen any evidence of flushing, such as aggregations of birds diving or taking off due to the presence of an aircraft. APEM have also undertaken numerous surveys in the Outer Thames Estuary over many years through the baseline, construction, and operation of the London Array Windfarm and for Natural England. A large number of these surveys were conducted at heights of 984 ft (300 m) and showed no disturbance to red-throated divers or other species detected within the surveys. Within the data collected from these surveys, the majority of the divers were sitting on the sea surface, showing no evidence of flushing due to aircraft altitude. APEM carried out numerous surveys over many years that show no evidence of disturbance to species at varying altitudes. Compared to visual surveys (boat/low flying aerial) for instance, proportionally more individuals are seen sitting on the sea surface than flying. Furthermore, APEM has undertaken surveys for Natural England in The Wash SPA which provided data on both wading birds and seabirds during which there were also ground based observers surveying at the same time as the aerial survey. This survey required a GSD of 1 cm flown at an altitude of 1,575ft (480m), and the ground observers confirmed they saw no evidence of disturbance. Furthermore, APEM have been commissioned by SNCBs, including Marine Scotland, Natural England and Natural Resources Wales, to undertake surveys of SPAs and other nationally important sites where a flight altitude of c. 400 m has been agreed for use. One example is the common scoter census projects for JNCC in Carmarthen Bay. These surveys showed no disturbance to common scoter with a flight altitude of (1,100ft) 335 m. In these surveys, the vast majority of the birds are		

	sitting on the water with no signs of disturbance, either flushing or diving. In summary, APEM are confident our survey methodology does not lead to disturbance of birds or marine mammals and is acceptable to SNCB. If there is another concern, such as safety, APEM can amend our flight plan to a higher aircraft altitude with minimal impact to the GSD, however this runs the risk of fewer weather windows.		

D.3.2 Response from JNCC regarding the meeting minutes

Mona Morgan EWG meeting 13th July

JNCC actions

Provide recommendation on the displacement and mortality rates to be used for Manx Shearwater and Kittiwake.

For both kittiwake and Manx shearwater we advise that whole displacement matrices are presented, and then the applicant can work back to establish what levels of displacement and mortality will have an effect. A range of mortality rates from 1-10% are advised.

EWG to provide recommendation for abundance estimates for all behaviours for Manx Shearwater

We advise that a combined estimate of the number of birds on the water (corrected for survey coverage) and of the number of birds in flight (corrected for survey coverage) are used for an assessment of Manx shearwater displacement.

EWG to approve or recommend alternative parameter values for Fulmar and Manx Shearwater

We are in agreement with the suggested parameters for fulmar and Manx shearwater.

JNCC to provide advice on what macro avoidance rates should be used for Kittiwake

JNCC advise that no macro-avoidance density reduction is applied to black-legged kittiwake for inputting into the CRM.

EWG to provide LSE screening comments

Comments provided separately to steering group.

D.3.3 Response from Natural England regarding the meeting minutes

Date: 19 August 2022
Our ref: DAS/UDS A000566 / 400331
Your ref: Morgan and Mona Offshore Ornithology Expert Working Group 02

[redacted]
BP Alternative Energy Investments Limited

c/c [redacted]
RPS/ Energy

Hornbeam House
Crewe Business Park
Electra Way
Crewe
Cheshire CW1 6GJ

T [redacted]

BY EMAIL ONLY

Dear [redacted]

Discretionary Advice Service (Charged Advice) - UDS A000566
Contract Reference: BP EnBW Morgan and Mona Offshore Wind Farm
Consultation: Morgan and Mona Offshore Windfarm Offshore Ornithology EWG02

This advice is being provided as part of Natural England's Discretionary Advice Service in accordance with the Quotation and Agreement dated 17 May 2021 to BP Alternative Energy Investments Limited.

The following advice is based upon the information presented in the Offshore Ornithology Expert Working Group (EWG) Meeting 2 (attended on 13 July 2022).

Natural England were asked to provide advice upon:

1. Agreement on the approach to baseline characterisation as set out in the Morgan and Mona baseline characterisation technical paper;
2. Agreement on the approach to displacement as set out in the Morgan and Mona Displacement technical paper, taking into account clarifications to be provided by SNCBs;
3. Agreement to the approach to stochastic Collision Risk Modelling (sCRM) as discussed in the EWG02 meeting, which superseded the Morgan and Mona Collision Risk Modelling (CRM) technical paper following the NE advice;
4. Agreement that on the basis of low abundance of red-throated diver across the Mona array and survey buffer, does the EWG agree this species can be scoped out for the array impacts assessment (noting this will be included for the export cable route);
5. Agreement on the approach to identification of sites and features in the LSE Screening as set out in the slide pack for the EWG02.

Our advice within this letter builds on that provided on the Baseline Characterisation technical paper (our reference: 393974), Displacement technical paper (our reference: 394421) and Collision Risk Modelling technical paper (our reference: 394425) provided by RPS.

1. Agreement on the approach to baseline characterisation as set out in the Morgan and Mona baseline characterisation technical paper

Natural England have no further comments to those set out in our advice letter (our reference: 393974) on the Baseline Characterisation technical paper (dated 7 June 2022) provided by RPS. We note from discussions at the Offshore Ornithology EWG Meeting 2 (EWG02) that the designs to be presented at

the Preliminary Environmental Information Report (PEIR) will not be a sited design and therefore some aspects raised in our advice will be considered at a future stage in the project (e.g. cold spotting/ hot spotting).

We note that there was an action from the EWG02 for RPS and the applicant to discuss the possibility of additional analysis of survey images to ensure variability is being captured across the survey area. We await further information regarding the outcomes of these conversations in regard to our recommendation of power analysis to demonstrate that survey coverage is appropriate.

2. Agreement on the approach to displacement as set out in the Morgan and Mona Displacement technical paper, taking into account clarifications to be provided by SNCBs

Natural England has previously provided a response to the Morgan and Mona Displacement technical paper (dated 24 June 2022, our ref: 394421). Following on from the discussions in the EWG02, Natural England additionally do not recommend that displacement is assessed for kittiwake as we currently consider the evidence base to be insufficient and suggestive of inconsistent responses to Offshore Wind Farms (OWFs). If the project chooses to assess kittiwake for displacement effects we advise that it is not acceptable to reduce the densities considered in collision risk modelling.

At this stage in the assessment Natural England recommend that full displacement matrices are presented, for all species excluding kittiwake. An investigation into the range of levels of displacement and mortality rate that would lead to an adverse effect would then enable discussion around the likelihood of impacts occurring. Natural England considers that the formulation of appropriate mortality rates to be used in defining the estimated impact should be guided by site-specific sensitivity for each species.

Natural England advise that a combined estimate of birds on the water and in flight is used to assess displacement of Manx shearwater.

3. Agreement to the approach to sCRM as discussed in the EWG02 meeting, which superseded the Morgan and Mona CRM technical paper following the NE advice

The parameters presented in the email from Andie Nicholls, RPS (email dated 26 July 2022, with references provided by email 10 August 2022) appear to be suitable for the species covered. Natural England reiterate that we believe it is of limited value to model CRM for these species. Johnston *et al.* (2014)[1] flight curves for these species indicate a very low risk of collision. If new evidence (e.g. from tagging studies) on flight height can be presented and considered that would significantly alter the expected outputs, Natural England would encourage investigation of this. If CRM is to be undertaken a novel approach may be more appropriate considering these species might be most at risk of collision with the turbine bases, although we note again that very low levels of collision would be expected.

Natural England are not currently able to share the draft CRM parameters which were provided in draft to support RPS's progression of work on the project with the wider EWG members and therefore request that the information we shared with the project team (email dated 7 July 2022, sent by Richard Berridge) is treated as not for further dissemination. Our draft guidance has been provided to the Marine Industry Group for Ornithology for review. Once approval has been received other interested parties may have access to the final guidance, as required. We note that Natural Resources Wales and the Joint Nature Conservation Committee have received this information as members of the Marine Industry Group for Ornithology. We advise that the project proceed with presenting the rates and reference as draft Natural England guidance until the guidance has formally been published. We will provide an update when the guidance has been published.

[1] Johnston, A., Cook, A.S.C.P., Wright, L.J., Humphreys, E.M., Burton, N.H.K., 2014. Modelling flight heights of marine birds to more accurately assess collision risk with offshore wind turbines. Journal of Applied Ecology 51, 31-41. https://doi.org/10.1111/1365-2664.12191

4. **Agreement that on the basis of low abundance of red-throated diver across the Mona array and survey buffer, does the EWG agree this species can be scoped out for the array impacts assessment (nothing this will be included for the export cable route)**

Natural England agree that red-throated diver displacement arising from the Mona project array is likely to be insignificant based on the data from the 24 months digital aerial surveys for this project presented in the EWG02. However, we consider that some further justification for scoping the species out of a displacement assessment is required. Although very low numbers are detected in the baseline survey data it will be necessary to understand the density and distribution of red-throated divers across the survey area. This is of particular importance in light of our previous advice that an adverse effect on site integrity on this species due to displacement could not be ruled out at Burbo Bank Extension Offshore Wind Farm. A comparison of the predicted density and distribution of the species in relation to the historic and contemporary boundary of the Liverpool Bay Special Protection Area (SPA) may be useful, noting that the historic boundary is a more realistic representation of the area within the SPA where higher diver densities are encountered.

5. **Agreement on the approach to identification of sites and features in the LSE Screening as set out in the slide pack for the EWG02.**

As set out in the Evidence Plan Steering Group Meeting 3 (held on 20 July 2022) the ornithology approach is only broadly described, and will be reviewed at a future date once work has been carried out on the baseline characterisation, CRM and displacement modelling. At present Natural England does not have any further comment to make, and will provide further comment at a future date once further detail is available.

For clarification of any points in this letter, please contact me using the details provided below.

Yours sincerely

[redacted]
Strategic Coastal Lead Adviser
Coast and Marine Team
Cheshire, Greater Manchester, Merseyside & Lancashire Area Team
[redacted]

☒ The advice provided in this letter has been through Natural England's Quality Assurance process.

The advice provided within the Discretionary Advice Service is the professional advice of the Natural England adviser named below. It is the best advice that can be given based on the information provided so far. Its quality and detail is dependent upon the quality and depth of the information which has been provided. It does not constitute a statutory response or decision, which will be made by Natural England acting corporately in its role as statutory consultee to the competent authority after an application has been submitted. The advice given is therefore not binding in any way and is provided without prejudice to the consideration of any statutory consultation response or decision which may be made by Natural England in due course. The final judgement on any proposals by Natural England is reserved until an application is made and will be made on the information then available, including any modifications to the proposal made after receipt of discretionary advice. All pre-application advice is subject to review and revision in the light of changes in relevant considerations, including changes in relation to the facts, scientific knowledge/evidence, policy, guidance or law. Natural England will not accept any liability for the accuracy, adequacy or completeness of, nor will any express or implied warranty be given for, the advice. This exclusion does not extend to any fraudulent misrepresentation made by or on behalf of Natural England.

Cc [redacted]

D.3.4 Response from NRW regarding the meeting minutes

From: [redacted]
To:
Cc:
Subject: RE: Morgan Mona Offshore Ornithology EWG02
Date: 16 August 2022 17:33:24
Attachments: [redacted]

CAUTION: This email originated from outside of RPS.

Hi [redacted]

Thank you for your email and apologies for the delayed response following the Second Morgan and Mona Offshore Ornithology Expert Working Group that took place on 13th July 2022, as you are aware, I have only just returned from leave. Please find below NRW Advisory (A) responses to the relevant action points from the meeting:

- **LR to discuss clarity around request for power analysis with NRW specialists.**

  The NRW Scoping Response stated that *"The level of coverage required to be sufficient for baseline characterisation will depend on the nature of the area being surveyed and the abundance and distribution of receptors across the area. A power analysis should be undertaken to inform survey design and ensure that such designs maximise the probability of detecting changes in abundance and distribution through future comparison with data that may be collected post-consent."* The applicant proposes to collect data from approximately 30% of the sea surface and analyse 12%. It is unclear where the justification for the 12% analysed comes from and how it relates to these survey data, hence advising the applicant to make this clearer.

  Typically, NRW (A) would recommend a power analysis to ensure that there is sufficient statistical power to detect changes in abundance and distribution through future comparison with data that may be collected at a later stage, demonstrating that the applicant has considered whether the current survey design has enough power to be used for the pre-construction surveys. It is important that analyses have the power to detect trends in abundance or distribution and the level of displacements for the species that may be impacted.

- **NRW to provide recommendation on the displacement and mortality rates to be used for Manx Shearwater and Kittiwake.**

For Manx Shearwater and Kittiwake, NRW (A) advise that whole displacement matrices are presented. At a later stage, the applicant can work back to establish what levels of displacement and mortality are likely to have an effect. NRW (A) advise using a range of mortality rates from 1-10%.

- **EWG to provide recommendation for abundance estimates for all behaviours for Manx Shearwater**

The SNCBs advise that a combined estimate of the number of birds on the water (corrected for survey coverage) and of the number of birds in flight (corrected for survey coverage) are used for an assessment of Manx shearwater displacement.

- **EWG to approve or recommend alternative parameter values for Fulmar and Manx Shearwater**

  NRW (A) agrees with the suggested parameters for Fulmar and Manx shearwater.

Unfortunately Elwyn is currently away from his desk due to unforeseen circumstances, so I am not able to finalise the Agreement Log, but will do so as soon as possible on his return. We have no amendments / comments to make on the minutes from the meeting.

I will be in touch shortly re. actions following the Steering Group meeting and Marine Mammal EWG.

Kind regards,

[redacted]

[redacted]

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Cyfoeth Naturiol Cymru / Natural Resources Wales
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Trefynwy / Monmouth

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Croesewir gohebiaeth yn Gymraeg a byddwn yn ymateb yn Gymraeg, heb i hynny arwain at oedi.

Correspondence in Welsh is welcomed, and we will respond in Welsh without it leading to a delay.

D.3.5 Offshore Ornithology Baseline Characterisation Technical Note for the Evidence Plan Offshore Ornithology Expert Working Group

Partners in UK offshore wind

MORGAN AND MONA OFFSHORE WIND PROJECTS

Offshore ornithology baseline characterisation technical note for the Evidence Plan Offshore Ornithology Expert Working Group.

24 May 2022
F01

Document status

Version	Purpose of document	Authored by	Reviewed by	Approved by	Review date
F01	Final for EWG	LM/MA	KL	KL	24/05/2022

Approval for issue

[Name]	[Signature]	[Date]

Prepared by:	Prepared for:
RPS	**Morgan/Mona Offshore Wind Ltd.**

1 OFFSHORE ORNITHOLOGY BASELINE CHARACTERISATION TECHNICAL NOTE

1.1 Background and aims

1.1.1.1 This technical note outlines the approach proposed to characterise the baseline conditions in the offshore environment for the Mona and Morgan Offshore Wind Projects. It is intended to provide the Ornithology Expert Working Group (EWG) with additional details supplementary to the Scoping reports and the Ornithology EWG consultation meeting held on 18 February 2022. Specifically, it describes the methods proposed to characterise the abundance and distribution of seabirds in the offshore ornithology study area using existing data sources and site-specific surveys. The focus is on the characterisation of the Morgan and Mona Array Areas and appropriate buffer zones around them, using desk study and site-specific aerial digital surveys.

1.1.1.2 Characterisation of the full length of the offshore cable corridors (i.e. in the intertidal areas as well as seaward of Mean Low Water Springs) is not specifically covered in this technical note, but we note the EWG advice regarding a risk assessment approach to the use of desk-based information to characterise the baseline within the offshore cable corridors and assess the potential impacts of the Morgan and Mona Offshore Wind Projects' offshore export cables. Baseline data for the intertidal areas potentially impacted by the cable landfall up to 1.5km seaward of Mean High Water Springs will be provided by bespoke coastal waterbird surveys, the method for which was agreed by Natural England following the Ornithology EWG Meeting 1, subject to consideration of extension of the surveys into the May to July period. We also highlighted that the aerial digital surveys provide data covering the 10km length of the cable corridor closest to the Morgan and Mona Array Areas, facilitating some cross-validation with desk-based data sources.

1.1.1.3 For the purpose of this technical note, the overarching term 'seabird' is used to refer to species that depend on the marine environment for survival at some point in their life cycle. Therefore, in addition to the true seabirds, seaducks and divers and grebes are also included because of their additional reliance on marine areas, especially in the non-breeding season.

1.2 Review of existing data sources

1.2.1.1 Evidence sources and existing datasets will be reviewed to define the seabird baseline conditions and support the findings of the site-specific surveys. Both scientific and grey literature will be reviewed, together with information gathered from relevant seabird tracking campaigns. A full list of the data sources reviewed and their inclusion in the baseline species accounts will be provided in the Preliminary Environmental Information Report (PEIR) and Environmental Statement. Natural England have indicated their support of the data sources listed during the Ornithology EWG Meeting 1 consultation (which will also be listed in the Scoping report) and have highlighted the forthcoming availability of a commissioned report using existing data to analyse the abundance and distribution of bird features of Liverpool bay SPA, which may be useful for the desk study and to contextualise the site-specific survey data. JNCC have also provided links to three relevant tracking studies (gannets at Grassholm; Manx shearwater at Skomer; common guillemot at Skomer) which will be included in the desk-based review, providing useful context regarding the likely connectivity between seabirds and the Morgan and Mona Offshore Wind Projects.

1.2.1.2 In addition to summarising findings from desk-based studies, we will be using the supplementary spatial data from Waggitt *et al*. (2020) and Bradbury *et al*. (2014) to produce a series of species maps showing the spatial variation in densities across seasons (breeding and non-breeding) in the Mona and Morgan offshore ornithology study areas. As the spatial coverage of both datasets overlapped with the two Morgan and Mona Offshore Wind Projects, the findings provide context and validate findings from the site-specific surveys. Using data from Waggitt *et al*. (2020) and Bradbury *et al.* (2014), average density per season will be mapped and abundance estimates produced for the Mona and Morgan Array Areas (together with associated impact buffer zones: +2km and +4km) for comparison with the site-specific aerial digital survey data (discussed below).

1.3 Site-specific surveys analysis

1.3.1.1 Aerial digital surveys for seabirds have been undertaken by APEM in each of the Morgan and Mona Offshore Wind Project's offshore ornithology study areas, which include the Morgan and Mona Array Areas plus buffer zones of up to 10km (Figure 1). A full 10km buffer has been achieved around the Morgan Array Area. There have been changes in the proposed Mona Array Area since the design of the aerial survey (it was based on the Mona Core Survey Area shown in Figure 1) therefore the buffer only extends to 4km to the north of the Mona Array Area. The surveys for each of the Morgan and Mona Offshore Wind Projects will comprise a suite of 24 monthly surveys spanning two years. Surveys for the Mona Offshore Wind Project have been completed monthly between March 2020 and February 2022. Monthly surveys for the Morgan Offshore Wind Project commenced in April 2021 and will complete in March 2023. The grid-based survey method collects data over 30% of the sea surface with analysis of images across 12% of the offshore ornithology study area (the survey area), conforming with current industry best-practice. Subsequent to the Ornithology EWG Meeting 1, Natural England and JNCC have provided agreement to the survey methods and coverage that were described during the consultation. JNCC have requested further rationale regarding the flight altitude of 396m with evidence to demonstrate that sensitive species are not disturbed by the survey aircraft; this information has been requested from the aerial survey contractor, APEM, which will be provided in subsequent consultation.

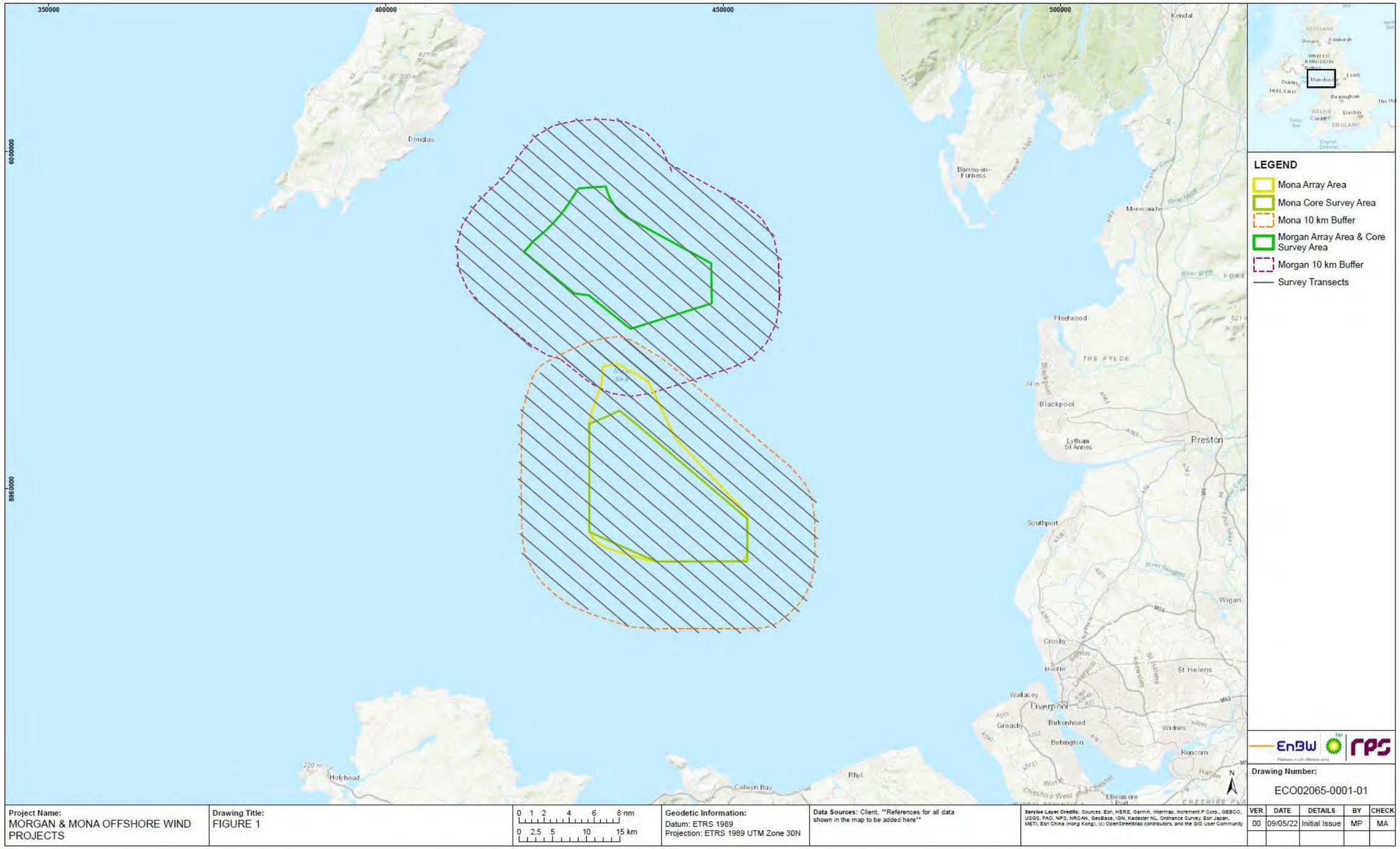

Figure 1: Aerial digital survey areas for Mona and Morgan Offshore Wind Projects

1.3.1.2 The aerial digital survey data will be analysed to provide seabird abundance estimates and densities within the appropriate areas relative to the Morgan and Mona Array Areas. Model-based and design-based estimates will be produced for seabirds with sufficient sightings to derive robust estimates. All bird behaviours (flying and sitting) will be included in this analysis.

1.4 Model based estimates of abundance and densities

1.4.1.1 We propose to use the MRSea package to predict spatial density and abundance of the five most abundant seabird species (black-legged kittiwake, northern gannet, common guillemot, razorbill and Manx shearwater) across the offshore ornithology study areas or relevant impact areas (e.g. array area only, array area+2km) alongside 95% confidence intervals to provide a measure of uncertainty in the estimates. The model is not appropriate for species with low abundance, for which design-based estimates will be provided (see below).

1.4.1.2 MRSea is a modelling package executable in the R environment (R Core Team, 2021) based on the generalised additive model framework (GAM), fitting splines through 1- and 2-dimensional data (staged approach). The basic model to explain bird abundance has the following form: Species Count ~ Month + offset(log(area)), family=quasipoisson. In the first (1-dimensional) stage, the basic model will be expanded to include water depth, bathymetric slope, bathymetric aspect, and water flow direction as both linear and smoothed explanatory variables. In the second (2-dimensional) stage, the x-y coordinates will be fitted to the best model from stage 1 using SALSA, and with month as an interaction term, allowing for different density surfaces to be estimated for different months. The best models will be selected in a model selection framework using the quasi-Bayesian information criterion (QBIC). The final model for each species will be used to predict the numbers and densities of birds across an environmental grid within the offshore ornithology study area. To calculate the absolute estimate from the relative estimate, a correction factor will be applied to account for availability bias for species that spend time diving underwater. Furthermore, in the case of 'unidentified' birds recorded during the surveys, those unidentified birds will be apportioned to the individual species that make up that group by applying correction factors.

1.5 Design based estimates of abundance and densities

1.5.1.1 Design based estimates for seabird numbers and densities in each month within the relevant impact areas will be generated for all other focal species. For the five more abundant focal species, they will be compared with the MRSea estimates to provide comparison with the MRSea outputs. Design-based estimates and confidence intervals will be produced using a non-parametric bootstrapping procedure with 1,000 iterations in the R environment (R Core Team, 2021). A variance for each of the population estimates will be derived from the 1,000 iterations of the non-parametric bootstrap. Upper and lower estimates of the 95% confidence intervals will be calculated from the variability in the 1,000 values generated.

1.6 Apportioning of unidentified species

1.6.1.1 The proportion of birds that are recorded, but not identified to species level, will be apportioned to the individual species that make up that group. For example, in the case of unidentified common guillemot/razorbill (i.e. 'large auk'), they should be apportioned to common guillemot and razorbill recorded during the surveys. In accordance with best practice (Natural England, 2021a), apportioning will be based on the proportion of birds identified to species level within the same survey. The known (relative) species estimates for each survey month are increased by proportionally assigning the numbers of the unknown species groups to each of the relevant known species.

1.7 Correction factors to account for availability bias

1.7.1.1 To account for birds that may be missed during the digital aerial surveys when they are foraging beneath the water surface, the numbers of birds observed in the surveys will be divided by the proportion of time that a bird is expected to be visible at the surface. As such, it is proposed to adjust the relative numbers of birds for availability bias in the baseline characterisation report. Availability bias correction factors will only be applied to estimates of abundance of birds sitting on the sea surface and not applied to birds in flight (Natural England, 2021a). Correction factors applied to sitting common guillemots and razorbill will be based on JNCC (2013), which assumes that approximately 24% of common guillemot and 17% of razorbill are underwater when aerial imagery is captured.

1.7.1.2 The availability bias correction and apportioning of unidentified species to species converts the relative abundance/density estimates to absolute estimates for each area described.

1.8 Data presentation and interpretation

1.8.1.1 In line with the Offshore Wind Marine Environmental Assessments: Best Practice Advice for Evidence and Data Standards (Natural England, 2021b), monthly abundance estimates and densities will be presented in tabulated format for each behaviour and area (Project array area, plus 2km, 4km and 10km buffer zones or whole survey area). The abundance estimates will be discussed in the context of findings from the other existing data sources reviewed.

1.9 References

Bradbury, G., Trinder, M., Furness, B., Banks, A.N., Caldow, R.W. and Hume, D. (2014) Mapping seabird sensitivity to offshore wind farms. PloS one, 9(9), p.e106366.

Joint Nature Conservation Committee (2013) JNCC Expert Statement on Ornithological Issues for Written Representations in Respect of East Anglia ONE Offshore Windfarm by Dr Sophy Allen. Joint Nature Conservation Committee, Aberdeen.

Natural England (2021a) Offshore Wind Marine Environmental Assessments: Best Practice Advice for Evidence and Data Standards. Phase III: Expectations for data analysis and presentation at examination for offshore wind applications.

Natural England (2021b) Offshore Wind Marine Environmental Assessments: Best Practice Advice for Evidence and Data Standards. Phase I: Expectations for pre-application baseline data

for designated nature conservation and landscape receptors to support offshore wind applications.

R Core Team (2021) R: A language and environment for statistical computing. R Foundation for Statistical Computing, Vienna, Austria. URL https://www.R-project.org/.

Waggitt, J.J., Evans, P.G., Andrade, J., Banks, A.N., Boisseau, O., Bolton, M., Bradbury, G., Brereton, T., Camphuysen, C.J., Durinck, J. and Felce, T. (2020) Distribution maps of cetacean and seabird populations in the North-East Atlantic. Journal of Applied Ecology, 57(2), pp.253-269.

D.3.6 Response from NRW regarding the Offshore Ornithology Baseline Characterisation Technical Note

Morgan & Mona Offshore Wind Projects: Ornithology Expert Working Group

[redacted]
Senior Marine Advisor

8th June 2022

Introduction

This advice is provided in response to the **Offshore Ornithology Baseline Characterisation Technical Note** received via email on **24th May 2022**, for the Evidence Plan Offshore Ornithology Expert Working Group.

NRW advice in this document is provided (under a Discretionary Advice Service agreement) in respect of a proposal which will require an application for which Natural Resources Wales is a Statutory Consultee.

The customer acknowledges that the content of any advice or assistance provided by NRW is advisory only and that it shall not be deemed to bind or in any other way restrict NRW in performing its statutory functions.

The recipient acknowledges that:

- any advice given or materials or documentation provided by NRW do not constrain or bind NRW in respect of its statutory functions or its role as a statutory consultee or any decision NRW may make in relation to any application for a licence or permit;
- any advice given by NRW does not bind NRW in respect of any future representations it may make as statutory consultee or any decision NRW may make in relation to any application for a licence or permit;
- any views or opinions expressed by NRW are without prejudice to the consideration NRW may be required to give to any application or any future representations as statutory consultee or any decision NRW may make in relation to any application for a licence or permit;
- the final decision as to any representations made by NRW as statutory consultee will be based on all the relevant information available to NRW at the time it makes such representations;
- NRW cannot and does not give any guarantee as to the representations it may make as statutory consultee; and,
- any advice given by NRW may be overtaken by changes in available information, law, policy and guidance relevant to the subject matter of the advice.

Advisors Consulted:
Marine Ornithology

Advice

Key Issues

- NRW Advisory (A) advise that further information on how the survey design has been arrived at is needed, including results of a power analysis to detect the sample size required for the analysis of aerial survey data.

- Please note that revised guidance is available for Red-Throated Diver displacement – please refer to the Joint SNCB Interim Advice On The Treatment Of Displacement For Red-Throated Diver (2022). Figure 1 of the Baseline Characterisation Technical Note appears to show a 10 km buffer around the whole site, as such, the reasons for not including survey data from a full 10 km buffer around the site(s) is unclear.

Detailed comments

Section 1.2 Review of existing data sources

NRW (A) agree that the sources described will provide useful supplementary data for the baseline characterisation. Additional supplementary data (e.g. tracking data) and information may be found in a number of other sources including:

- The outputs of the Marine Ecosystems Research Programme (https://www.marine-ecosystems.org.uk/Research_outcomes/Top_predators)
- FAME (Future of the Atlantic Marine Environment project and STAR (Seabird Tracking and Research) (https://marine.gov.scot/information/fame-star-seabird-kittiwakes-guillemots-razorbills-and-shags-tracking-projects).
- Review of Seabird Demographic Rates and Density Dependence: (https://data.jncc.gov.uk/data/897c2037-56d0-42c8-b828-02c0c9c12d13/JNCC-Report-552-REVISED-WEB.pdf)
- Wetland Bird Survey https://www.bto.org/our-science/projects/wetland-bird-survey
- Non-Estuarine Waterbird Survey https://www.bto.org/our-science/publications/research-reports/results-third-non-estuarine-waterbird-survey-including

A literature search of published research papers and reports may also provide supplementary information to the applicant.

NRW (A) advise that although the supplementary spatial data presented in Bradbury *et al*., (2014) is useful, care should be taken as it does not cover all Welsh sites.

NRW (A) advise that data collected for this project (e.g. digital aerial surveys) should be the primary data source used for the analysis, with other data used for supplementary purposes.

Section 1.3 Site-specific survey analysis

Please note that there is revised guidance available for Red-Throated Diver displacement in the Joint SNCB Interim Advice On The Treatment Of Displacement For Red-Throated Diver (2022). *Figure 1: Aerial digital survey areas for Mona and Morgan Offshore Wind Projects* appears to show a 10 km buffer around the whole site, as such, the reasons for not including survey data from a full 10 km buffer around the site(s) is unclear.

NRW (A) advise that further information on how the survey design has been arrived at is needed, including more detail on the justification for the analysis of images across 12% of the offshore ornithology study area. To determine whether survey coverage and design provide an adequate baseline characterisation, NRW (A) advise that evidence from a power analysis is used. The level of coverage required to be sufficient for baseline characterisation will depend on the nature of the area being surveyed and the abundance and distribution of receptors across the area. A power analysis should be undertaken to inform survey design and ensure that such designs maximise the probability of detecting changes in abundance and distribution through future comparison with data that may be collected post-consent. Webb *et al.,* (2014) provide some examples of power analyses applied to sampling of focal bird species within a marine Special Protection Area (SPA).

Section 1.7 Correction factors to account for availability bias

NRW (A) advise the use of the following correction factors as outlined in JNCC (2013):

- Guillemot: 1.311
- Razorbill: 1.211
- Puffin: 1.165

Section 1.8 Data presentation and interpretation

NRW (A) advise that the applicant also provides records of all species detected from aerial surveys.

References

Bradbury, G., Trinder, M., Furness, B., Banks, A.N., Caldow, R.W. and Hume, D. (2014) Mapping seabird sensitivity to offshore wind farms. PloS one, 9(9), p.e106366.

Johnston, A., Cook, A.S.C.P., Wright, L.J., Humphreys, E.M. & Burton, N.H.K. (2014) Modelling flight heights of marine birds to more accurately assess collision risk with offshore wind turbines. *Journal of Applied Ecology*, **51**: 3141.

Joint Nature Conservation Committee (2013) JNCC Expert Statement on Ornithological Issues for Written Representations in Respect of East Anglia ONE Offshore Windfarm by Dr Sophy Allen. Joint Nature Conservation Committee, Aberdeen.

Joint SNCB Interim Advice On The Treatment Of Displacement For Red-Throated Diver (2022). https://data.jncc.gov.uk/data/9aecb87c-80c5-4cfb-9102-39f0228dcc9a/interim-sncb-advice-rtd-displacement-buffer.pdf

Webb, A., Bradbury, G., Burt, L. & Hexter, R. (2014). Digital aerial surveillance of inshore waterbirds in Liverpool Bay Special Protection Area. JNCC, Peterborough.

Woodward, I., Thaxter, C.B., Owen, E. & Cook, A.S.C.P. (2019) Desk-based revision of seabird foraging ranges used for HRA screening. Report by BTO for Niras and TCE. BTO Research Report No. 724. BTO, Thetford.

D.3.7 Response from JNCC regarding the Offshore Ornithology Baseline Characterisation Technical Note

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RPS | Energy
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GU21 6DH

JNCC Reference: OIA-08762
Date: 7 June 2022

Dear [redacted]

Morgan and Mona Offshore Wind Projects, Offshore Ornithology Baseline Characterisation Technical Note: Version F01

Thank you for consulting JNCC on the Morgan and Mona Offshore Wind Projects, Offshore Ornithology Baseline Characterisation Technical Note (Version F01), dated 24 May 2022, which we received on 24 May 2022.

The JNCC advice contained within this minute is provided (under a Discretionary Advice Service agreement) as part of our advisory role relating to nature conservation in UK offshore waters (beyond territorial limit). We have subsequently concentrated our comments on aspects of the documents that we believe relate to offshore waters.

Any advice or assistance provided by JNCC via our Discretionary Advice Service is advisory only, and with reference to the General terms and conditions for DAS chargeable services, JNCC excludes any warranty that the advice provided by its officers represents JNCC's opinion or otherwise binds JNCC when acting as a Statutory Consultee.

Ornithology Comments

1.2.1.2 Note that density data contained within Bradbury et al 2014 includes red-throated diver. When generating maps and abundance estimates for red-throated diver using the Bradbury et al 2014 data, we advise that this covers the Mona and Morgan Array Areas plus a 10km buffer zone to complement the spatial coverage of both the aerial surveys and the joint SNCB advice regarding red-throated diver displacement analysis.

1.4.1.1 We advise that MRSea is used to predict spatial density and abundance for the array area plus 10km buffer for each of the most abundant species (black-legged kittiwake, northern gannet, common guillemot, razorbill and Manx shearwater). There is emerging evidence that

displacement can have an effect beyond 2km to species such as guillemot, kittiwake, and gannet (Peschko et al 2020; Peschko et al 2021). In the event that sufficient robust evidence comes to light to suggest that a displacement assessment is carried out beyond 2km for some species, it would be useful to already have spatial density and abundance estimates generated.

1.4.1.2 & 1.7.1.2 Note that the apportioning of unidentified species and availability bias correction should be carried out the order of apportioning then availability correction to ensure that all unidentified species (once apportioned) are corrected for availability bias.

1.7.11 We agree with the proposed correction factors to apply to guillemot and razorbill due to availability bias. Note that an availability bias should also be applied to puffin, based on the proportion of time that puffins available at the surface as 0.8584 (Spencer 2012).

References

Peschko, V., Mendel, B., Müller, S. Markones, N., Mercker, M. & Garthe, S. (2020) Effects of offshore windfarms on seabird abundance: Strong effects in spring and in the breeding season, *Marine Environmental Research*, vol. 162, article 105157. https://doi.org/10.1016/j.marenvres.2020.105157

Peschko, V., Mendel, B., Mercker, M., Dierschke, J. & Garthe, S. (2021) Northern gannets (Morus bassanus) are strongly affected by operating offshore wind farms during the breeding season, *Journal of Environmental Management*, vol. 279, article 111509. https://doi.org/10.1016/j.jenvman.2020.111509

Spencer SM. (2012) Diving behavior and identification of sex of breeding Atlantic puffins

(Fratercula arctica), and nest-site characteristics of alcids on Petit Manan Island, Maine, M.Sc. thesis, University of Massachusetts, Amherst. 75 p.

Please contact me with any questions regarding the above comments.

Yours sincerely,

[redacted]

Offshore Industries Adviser

Email: [redacted]

Telephone: [redacted]

D.3.8 Response from The Wildlife Trust regarding the Offshore Ornithology Baseline Characterisation Technical Note

From: [redacted]
To:
Cc: [redacted]
Subject: RE: Morgan and Mona Offshore Wind Projects offshore ornithology technical papers
Date: 09 June 2022 10:29:13
Attachments: image002.png

CAUTION: This email originated from outside of RPS.

Hi [redacted],

I can confirm that I we have no comments on the Ornithology Baseline Characterisation Technical Note

Kind regards,
[redacted]

From: [redacted]
Sent: 08 June 2022 15:29
To: [redacted]
Cc: [redacted]
Subject: FW: Morgan and Mona Offshore Wind Projects offshore ornithology technical papers

CAUTION: This email originated from outside the organisation. Do not click links or open attachments unless you recognise the sender and know the content is safe, if unsure please contact IT

Hi [redacted]

Please can you send me any comments The Wildlife Trust has on the ornithology Baseline Characterisation Technical Note for the Morgan and Mona projects or confirm if you do not have any comments.

Kind Regards,
[redacted]

D.3.9 Offshore Ornithology Displacement Assessment Technical Note for the Evidence Plan Offshore Ornithology Expert Working Group

Partners in UK offshore wind

MORGAN AND MONA OFFSHORE WIND PROJECTS

Offshore ornithology displacement assessment technical note for the Evidence Plan Offshore Ornithology Expert Working Group.

27 May 2022
F01

Document status

Version	Purpose of document	Authored by	Reviewed by	Approved by	Review date
F01	Final for EWG	LM/MA	KL	GV	26/05/22

Approval for issue

[Name]	[Signature]	[Date]

Prepared by:	Prepared for:
RPS	**Morgan/Mona Offshore Wind Ltd.**

1 OFFSHORE ORNITHOLOGY DISPLACEMENT TECHNICAL NOTE

1.1 Background and aims

1.1.1.1 This technical note outlines the approach proposed to assess the potential impacts of displacement of seabirds for the Mona and Morgan Offshore Wind Projects. It is intended to provide the Ornithology Expert Working Group (EWG) with additional details supplementary to the Mona Offshore Wind Project Scoping Report[1] and the Mona/Morgan Ornithology EWG consultation meeting held on 18 February 2022. Specifically, it describes the methods proposed to quantify the potential impact of the displacement of seabirds from the Mona and Morgan Array Areas and appropriate buffer zones around them, using baseline data from the aerial digital surveys described in the Offshore ornithology baseline characterisation technical note (Document name: Morgan Mona_Ornithology_EWG02_Baseline Charcterisation_F01).

1.1.1.2 Displacement effects occurring along the offshore cable corridors (seaward of Mean Low Water Springs) are not specifically covered in this technical note, but we note the EWG advice regarding a risk assessment approach to the use of desk-based information to characterise the baseline within the offshore cable corridors and assess the impacts of the Projects' offshore export cables.

1.1.1.3 Disturbance as the result of activities during the construction, operational and maintenance and decommissioning phases of a wind farm has the potential to displace birds from an area of sea in which the activity is occurring. For the purpose of this assessment, displacement is defined as the reduced density of birds occurring near wind turbines, due to long-term disturbance leading to functional habitat loss (Marques *et al.* 2021). Species differ greatly in their susceptibility to disturbance. Species sensitivity to disturbance in response to offshore windfarms has been quantified by, for example, Garthe and Hüppop (2004), Furness *et al*. (2013), Bradbury *et al*. (2014) and Wade *et al.* (2016).

1.1.1.4 The Statutory Nature Conservation bodies (SNCB) have produced guidelines to assess seabird displacement associated with offshore wind farms (SNCB, 2017). The guidelines promote the use of a displacement matrix approach (i.e. representing proportions of birds potentially displaced/dying as a result of offshore wind farm development). Using the above approach, we proposed to assess the displacement effect associated with the Mona and Morgan Array Areas.

1.2 Outline of proposed approach

1.2.1.1 As sensitivity to displacement differs considerably between seabird species, we will screen and progress species for matrix stage using 'Disturbance Sensitivity' and 'Habitat Specialisation' scores from Bradbury *et al*. (2014) (expanded from Furness *et al*. 2013) as recommended by the Joint SNCB Interim Displacement Advice Note (SNCB, 2017). The assessment will be based on the overall mean seasonal peak number of birds (average of the highest seasonal vales in each year of survey) in the Mona and Morgan Array Areas with the appropriate buffer zone. Finally, we will populate displacement matrix tables based on the displacement and mortality values recommended by the SNCB (2017) and assess the displaced population against relevant population during the breeding and non-breeding season.

1.3 Screening species for displacement assessment

1.3.1.1 Seabird species that qualify under the sensitivity assessment will be progressed to the matrix table stage. We will consider the more abundant species within the Mona and Morgan offshore ornithology study areas for which there are sufficient sightings to produce robust model and/or design-based abundance estimates and have potential to contribute materially to cumulative effects. These are likely to comprise common guillemot, razorbill, northern gannet and possibly Atlantic puffin (to be confirmed; this species has been relatively scarce in the baseline surveys).

1.3.1.2 Red-throated diver and sea ducks are priority species for displacement assessment given their high sensitivity to disturbance from offshore wind farms. As part of the site selection process, a 10km buffer was applied to the Liverpool Bay Special Protection Area (SPA) to minimise impacts on offshore ornithology receptors. As a result, these species have been extremely rarely recorded in the Mona and Morgan offshore ornithology study areas and they are therefore unlikely to be subject to detailed assessment in relation to displacement from the Mona and Morgan Array Areas. These species will, however, be given consideration in relation to the installation of the offshore export cables, which coincides with part of the Liverpool Bay SPA.

1.3.1.3 Using the 'Disturbance Sensitivity' and 'Habitat Specialisation' scores from Bradbury *et al*. (2014) (expanded from Furness *et al*. (2013)), SNCB (2017) recommends that species considered more sensitive to displacement (species with scores of 3 or higher in either 'Disturbance Sensitivity' and 'Habitat Specialisation' category) should be selected in the matrix table stage. SNCB (2017) also recommends that northern gannet are taken forward to the matrix table stage (albeit with a score of 2) given that there are empirical studies demonstrating that the species is sensitive to displacement and barrier effects (Krijgsveld *et al*., 2011; Vanermen *et al*., 2013). A more recent study has also shown that northern gannet strongly avoided wind farms (Peschko *et al*., 2021).

1.4 Abundance estimates

1.4.1.1 Abundance estimates will be generated from the data collected through the programme of aerial digital surveys carried out in the Mona and Morgan offshore study areas, which extend up to 10km around the Mona and Morgan Array Areas. The full methodology is presented in the Offshore ornithology baseline characterisation technical note submitted to the Ornithology EWG as part of the Evidence Plan (Document name: Morgan Mona_Ornithology_EWG02_Baseline Charcterisation_F01).

1.4.1.2 Mean seasonal peak population estimates of each species will be calculated to provide the number of birds at risk of displacement impacts, including upper and lower 95% confidence intervals. Seasons will be defined according to the breeding, non-

[1] https://infrastructure.planninginspectorate.gov.uk/projects/wales/mona-offshore-wind-farm/

breeding and migratory periods using seasonal divisions proposed for Biologically Defined Minimum Population Scales (BDMPS) by Furness (2015) (Table 1.1). The seasonal divisions will be adjusted as necessary to reflect local colony-specific information where it may be available.

Table 1.1: Seasonal definitions, from Furness (2015).

Species	Pre-Breeding Season/spring migration	Breeding season	Migration-free breeding season	Post Breeding Season/autumn migration	Non-breeding/winter season
Common guillemot	n/a	March – July	March – June	n/a	August – February
Razorbill	January – March	April – July	April – June	August – October	November – December
Atlantic puffin	n/a	April – early August	May-June	n/a	Mid-August – March
Northern gannet	December – March	March – September	April – August	September – November	n/a

1.4.1.3 As an example of the mean seasonal peak population calculation, for common guillemot which breeds from March to July, we will average the peak count for the breeding season in Year 1 of baseline surveys (which occurred in March) and the peak count in the breeding season of Year 2 (which occurred in April). In accordance with SNCB (2017), we will estimate displacement as affecting birds present both in flight and sitting on the water (whether foraging or loafing), having accounted for availability bias (birds that may be underwater at the time of the survey). Therefore, abundance estimates of birds recorded in flight and sitting will be combined to derive the mean seasonal peak population at risk of displacement. Where possible, data relating to age classes of each species will also be reported, although the values used in the matrices will relate to all birds.

1.4.1.4 For each of the species considered above, displacement impacts will be quantified for the population derived within each of the Mona and Morgan Array Areas plus 2km buffer. SNCBs recommend for most species a standard displacement buffer of 2km with the exception of the species groups of divers and sea ducks as they can be affected at distances over 4km (Natural England, 2021). As noted above, those species have very rarely been recorded in the offshore ornithology study area during the baseline surveys and will be screened out of detailed assessment of displacement from the Mona and Morgan Array Areas. They will be considered in relation to the installation of the offshore export cables.

1.5 Displacement and mortality rates in the matrix

1.5.1.1 Mean seasonal peak values for each relevant season will be entered into the displacement matrix. The matrix presents a range of potential displacement (each 10% interval between 10-100%) and mortality rates (1, 2, 5 and then each 10% interval up to 100%), with the potential displacement levels and mortality scenario cells then highlighted to provide appropriate values for assessment. These values require agreement with the SNCBs through the Ornithology EWG.

1.5.1.2 The likely displacement and mortality rates we propose to use for the assessment of impacts on the key species are shown in Table 1.2. These ranges are derived from the Joint SNCB Interim Displacement Advice Note (SNCB, 2017) or considering precedents from other recent offshore wind farm applications (e.g. Norfolk Vanguard, East Anglia ONE North and Hornsea Four).

Table 1.2: Displacement and mortality rates for use in the assessment.

Species	Displacement rates	Mortality rates	Source
Common guillemot	30 – 70%	1-10% (with lower end of range preferred for assessment)	SNCB (2017)
Razorbill	30 – 70%	1-10% (with lower end of range preferred for assessment)	SNCB (2017)
Atlantic puffin	30 – 70%	1-10% (with lower end of range preferred for assessment)	SNCB (2017)
Northern gannet	60 – 80%	1%	East Anglia ONE North, Hornsea 4 and Norfolk Vanguard; based on reference to Cook *et al.* (2018), Skov *et al.* (2018), Leopold *et al.* (2011) and Furness & Wade (2012)

1.6 Assessing impacts against appropriate populations

1.6.1.1 The values derived from the matrices are then related to reference population scales to determine if the level of potential additional mortality is likely to lead to population level consequences. We will follow SNCB (2017) to assess the displacement effect against the appropriate population scale.

1.6.1.2 For the breeding season, the assessment will be done against an appropriate regional population scale (covering the total colony counts within mean-maximum foraging range plus one standard deviation). Foraging ranges will be initially identified from Woodward *et al.* (2019), although colony specific information will be reviewed and used to derive appropriate foraging ranges if it is available. Species-specific mean-max (+1S.D.) foraging ranges compiled by Woodward *et al*. (2019) will be used to select the relevant colonies (SPA and non-SPA) and calculate appropriate breeding population sizes. The location of the breeding sites will be sourced from data.gov.uk (Seabird Nesting Counts (British Isles)). The latest colony counts will be sourced from the Seabird Monitoring Programme (SMP) online database (https://app.bto.org/seabirds/public/index.jsp).

1.6.1.3 Similarly, the assessment will be done against an appropriate population scale during the non-breeding season using biological populations (BDMPS) defined by Furness (2015), in accordance with SNCB guidance (2017).

1.6.1.4 The additional mortality predicted as a result of displacement will be highlighted in the context of baseline mortality in the population; baseline mortality rates will be derived

from Horswill and Robinson (2015) and consideration will be given to age classes within the populations.

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D.3.10 Response from NRW regarding the Offshore Ornithology Displacement Assessment Technical Note

Morgan & Mona Offshore Wind Projects: Marine Ornithology Displacement and Collision Risk Modelling

[redacted]
Senior Marine Advisor

7th July 2022

Introduction

This advice is provided in response to the Projects Morgan and Mona Displacement and Collision Risk Modelling (CRM) Technical Notes provided via email by RPS on 27/05/22.

NRW advice in this document is provided (under a Discretionary Advice Service agreement) in respect of a proposal which will require an application for which Natural Resources Wales is a Statutory Consultee.

The customer acknowledges that the content of any advice or assistance provided by NRW is advisory only and that it shall not be deemed to bind or in any other way restrict NRW in performing its statutory functions.

The recipient acknowledges that:

- any advice given or materials or documentation provided by NRW do not constrain or bind NRW in respect of its statutory functions or its role as a statutory consultee or any decision NRW may make in relation to any application for a licence or permit;
- any advice given by NRW does not bind NRW in respect of any future representations it may make as statutory consultee or any decision NRW may make in relation to any application for a licence or permit;
- any views or opinions expressed by NRW are without prejudice to the consideration NRW may be required to give to any application or any future representations as statutory consultee or any decision NRW may make in relation to any application for a licence or permit;
- the final decision as to any representations made by NRW as statutory consultee will be based on all the relevant information available to NRW at the time it makes such representations;
- NRW cannot and does not give any guarantee as to the representations it may make as statutory consultee; and,
- any advice given by NRW may be overtaken by changes in available information, law, policy and guidance relevant to the subject matter of the advice.

Advisors Consulted:
Marine Ornithology

Advice

Key Issues

- NRW Advisory (A) would like to have sight of the survey data and/or results of modelling before we are able to conclude if further assessment is needed for displacement of any species, including Red Throated Diver and sea duck species.

- NRW (A) advise that displacement and mortality rates for all species assessed should present a full range of variability for displacement and mortality rates, following the precautionary approach.

- NRW (A) welcome further discussion between the applicant and the other SNCBs to agree the appropriate assessment methods for Manx Shearwater collision risk, and other species with activity patterns that do not align well with survey methods.

- NRW (A) note that the applicant has proposed alternative input parameters for gannet collision risk modelling. We advise that further discussion is needed between the applicant and the other SNCBs to agree appropriate assessment methods for gannet collision risk, and to account for Nocturnal Activity Factors (NAFs).

- For species which may be impacted by both collision and displacement (e.g. gannet), the impacts from both should also be considered cumulatively. The SNCBs regard the two impacts (collision and displacement) as additive and advise that they should be summed. Further information on this is available in the Joint SNCB Interim Displacement Advice Note (2022).

Detailed comments

Displacement:

- The Joint SNCB Interim Displacement Advice Note, originally published in 2017, was updated January 2022 to include reference to the Joint SNCB Interim Advice on the Treatment of Displacement for Red-Throated Diver. The 2022 version can be downloaded from https://data.jncc.gov.uk/data/9aecb87c-80c5-4cfb-9102-39f0228dcc9a/joint-sncb-interim-displacement-advice-note-2022.pdf.

- Table 1.2 in the displacement assessment technical note submitted by the applicant appears to suggest presenting only a 1% mortality rate for Northern Gannet. NRW (A) advise that displacement and mortality rates for all species assessed should present a full range of variability for displacement and mortality rates, following the precautionary approach. NRW (A) agree with the production of matrix approach tables, i.e. representing proportions of birds potentially displaced/dying as a result of the development. However, displacement assessments need to present data and predicted impacts in a way that allows the full range of uncertainty (e.g. around input data, analysis, methodology) to be understood and evaluated. There will be uncertainty around the predicted impacts in the assessments: some of this comes from natural variability and uncertainty in the input data (e.g. densities of birds at a site) and some of which is due to imperfect understanding of how systems work (e.g. effects of displacement on mortality of birds). In order to be able to

make an assessment of the significance of potential impacts on populations it is necessary to understand and, where possible, take account of this uncertainty. To account for this, NRW (A) advise that assessments of displacement should use the information on uncertainty and variability in the input parameters (e.g. bird densities, mortality and displacement rates) to allow consideration of the range of values predicted impacts may fall within, and to allow an assessment of confidence in the conclusions made regarding adverse effects on site integrity and significance of impacts for populations. NRW (A) advise that displacement matrices are presented for the mean peak bird population estimates and the upper and lower confidence limits of these. Assessments should also be conducted on range of predictions based on considering a range of mortality and displacement rates. Further advice on the ranges of displacement and mortality rates can be found in the Joint SNCB Interim Displacement Advice Note (2022). Matrices should be presented separately for the different biological periods for sensitive species, depending on when birds are present at the development site and its buffer. The overall assessment should sum the seasonal impacts to give an annual impact prediction.

- NRW (A) note that the applicant suggests that they do not need to do a detailed Red-Throated Diver assessment as the site is outside the 10 km buffer from Liverpool Bay SPA and because the species has been recorded infrequently in surveys. NRW (A) would like to have sight of the survey data and/or results of modelling before we are able to conclude if further assessment is needed for displacement of any species, including Red Throated Diver and sea duck species.

- Displacement should be assessed for construction, operation and decommissioning. NRW (A) advise that displacement during construction is assessed as 50% of the displacement during operation.

Collision

- NRW (A) agree with the use of Johnston *et al*., (2014) flight height data, as other methods of flight height collection have not been proven.

- NRW (A) note that the applicant has highlighted that baseline surveys may not provide an accurate representation of activity for species such as Manx Shearwater, which may be more active during the night, dusk and dawn. NRW (A) welcome further discussion between the applicant and the other SNCBs to agree the appropriate assessment methods for collision risk for Manx Shearwater and other species which may be affected by this issue.

- NRW (A) note that the applicant has proposed alternative input parameters for gannet collision risk modelling. NRW (A) advise that further discussion is needed between the applicant and the other SNCBs to agree appropriate assessment methods for gannet collision risk, and to account for Nocturnal Activity Factors (NAFs).

- Nature Scot (2014) describes the main parameters that should be used for collision risk assessments. Due to uncertainty NRW (A) recommend the use of a wide variety of parameters. NRW (A) advise that collision risk assessments need to present data and predicted impacts in a way that allows the full range of uncertainty (e.g. around input data, analysis, methodology) to be understood and evaluated. Assessments should use the information on uncertainty and variability in the input parameters (e.g. bird densities, flight

heights, avoidance rates, nocturnal activity) to allow consideration of the range of values predicted impacts may fall within, and to allow an assessment of confidence in the conclusions made regarding adverse effects on site integrity and significance of impacts for populations. However, the current Band (2012) model cannot incorporate combined uncertainty/variation across all of these input parameters. Therefore NRW (A) advise that multiple outputs from the Band model are obtained by running it for each individual variation in bird density, or flight height, or nocturnal activity etc. and presenting these outputs. Information on the Band model (including the Excel file required to run the model) can be found under the SOSS-02 project information at: http://www.bto.org/science/wetland-and-marine/soss/projects

- NRW (A) agrees with the use of SOSSMAT (or Micropath) for collision risk modelling of non-seabird species, such as estuarine SPA features. As the applicant suggests, for migrant seabird species such as skuas or terns, which do not migrate following straight lines between a point of origin and a destination, alternative approaches are required. These can include: (1) Estimating the number of a species of bird migrating through a wind farm footprint area based on an apportionment of migrant bird numbers across a broad migratory front. This approach is largely consistent with WWT Consulting & MacArthur Green Ltd. (2014). (2) Factoring flux in by using the mean peak monthly densities from the site-specific surveys to calculate the number of passages of each species and assuming the density in any month was constantly maintained both by day and night. Whichever approach is taken, the value calculated for the number of birds potentially passing through the site should then be inputted into the CRM spreadsheet and a CRM assessment carried out for each relevant species, with the predicted mortality assessed against the baseline mortality for the relevant population.

Collision and displacement

- NRW (A) note that proposed methods for collision risk and displacement have been described in separate documents. However, NRW (A) advise that for species which may be impacted by both collision and displacement (e.g. gannet), the impacts from both should also be considered cumulatively. The SNCBs regard the two impacts (collision and displacement) as additive and advise that they should be summed. Further information on this is available in the Joint SNCB Interim Displacement Advice Note (2022).

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D.3.11 Offshore Ornithology Collision Risk Assessment Technical Note for the Evidence Plan Offshore Ornithology Expert Working Group

Partners in UK offshore wind

MORGAN AND MONA OFFSHORE WIND PROJECTS

Offshore ornithology collision risk assessment technical note for the Evidence Plan Offshore Ornithology Expert Working Group.

Image of an offshore wind farm

27 May 2022
F01

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Approval for issue

[Name]	[Signature]	[Date]

Prepared by:	Prepared for:
RPS	**Morgan/Mona Offshore Wind Ltd.**

1 OFFSHORE ORNITHOLOGY COLLISION RISK MODELLING TECHNICAL NOTE

1.1 Background and aims

1.1.1.1 This technical note outlines the approach proposed to assess the potential impacts of collision risk to seabirds for the Mona and Morgan Offshore Wind Projects. It is intended to provide the Ornithology Expert Working Group (EWG) with additional details supplementary to the Mona Offshore Wind Project Scoping Report[1] and the Mona/Morgan Ornithology EWG consultation meeting held on 18 February 2022. Specifically, it describes the methods and modelling parameters proposed to quantify the potential collision risk to seabirds from the Mona and Morgan Offshore turbine arrays using baseline data from the aerial digital surveys described in the Offshore ornithology baseline characterisation technical note (Document name: Morgan Mona_Ornithology_EWG02_Baseline Charcterisation_F01).

1.1.1.2 During the operational phase of the Mona and Morgan Offshore Wind Projects, the turning rotors may present a risk of collision for seabirds that fly within close proximity to the turbines. Stationary structures, such as the tower, nacelle or when rotors are not operating, are not expected to result in a material risk of collision. When a collision occurs between the turning rotor blade and the bird, it is assumed to result in direct mortality of the bird, which potentially could result in population level impacts. Species differ in their susceptibility to collision risk, depending on their flight behaviour and avoidance responses, and the vulnerability of their populations (Garthe and Hüppop, 2004; Furness and Wade, 2012; Wade *et al.*, 2016). The structure and operation of the turbines can also affect the risk to birds, with factors such as rotor speed, blade size, pitch angle and height above the sea surface all influencing the magnitude of risk. Artificial lighting may also change the risk for some species (e.g. shearwaters and petrels), although there is little available evidence to quantify that risk.

1.1.1.3 Advice on the approach to the assessment of collision risk has been presented by Natural England (Natural England, 2021), which recommends the application of the deterministic Band Collision Risk Model (CRM; Band, 2012) to quantify the risk and estimate mortality. Details of how to apply the CRM are set out under the SOSS-02 project information[2]. We follow the established best practice approach in assessing collision risk for the Mona and Morgan Offshore Wind Projects but seek to allow for flexibility where emerging evidence becomes available that might influence the assessment. The stochastic Collison Risk Model (sCRM) (McGregor *et al.*, 2018) is not currently recommended; however, it provides a user-friendly ShinyApp interface which can be run deterministically and provides a useful audit trail of input parameters and outputs. This enables reviewers to easily assess and reproduce the results of any modelling scenario.

1.2 Outline of proposed approach

1.2.1.1 Collision risk will be quantified using the deterministic Band model approach (Band, 2012), although model runs will be carried out accounting for variation in physical parameters, avoidance rates and upper and lower confidence limits in the population estimates to provide upper and lower collision risk estimates. The collision risk models will incorporate currently recommended avoidance rates and nocturnal activity factors (Cook *et al.*, 2014; SNCB, 2014), although these will be presented alongside estimates based on other rates, if emerging evidence from monitoring studies indicates any likely updates to the previously published rates. Other physical modelling parameters, including bird size, flight speed, flight type etc, will follow best practice and consistency with other recent offshore wind farm applications, such as East Anglia ONE North, Norfolk Vanguard/Boreas and Hornsea Thee/Four. The proposed parameters are set out in Table 1.1 and Table 1.2.

1.3 Screening species for collision risk assessment

1.3.1.1 A precautionary approach will be taken to include technical CRM for most species that are recorded with more than negligible frequency in the Mona and Morgan Array Areas. The suite of species recorded during the baseline surveys will be screened in or out of detailed assessment based on the species' frequency of occurrence in flight (translating to density) in the Mona and Morgan Array Areas and their reported vulnerability to collision (Garthe and Hüppop, 2004; Furness and Wade, 2012; Wade *et al.*, 2016). We expect these to comprise: black-legged kittiwake, great black-backed gull, European herring gull, lesser black-backed gull, northern fulmar, Manx shearwater and northern gannet. Auk species are not considered to be vulnerable to collision risk impacts and will be excluded from the collision risk assessment.

1.4 Density estimates

1.4.1.1 Monthly density estimates of seabirds in flight within the Mona and Morgan Array Areas (the footprint with no buffers), including upper and lower 95% confidence limits, will be generated from the data collected through the programme of aerial digital surveys carried out in the Mona and Morgan offshore study areas, which extend up to 10km around the Mona and Morgan Array Areas. The full methodology is presented in the Offshore ornithology baseline characterisation technical note submitted to the Ornithology EWG as part of the Evidence Plan (Document name: Morgan Mona_Ornithology_EWG02_Baseline Charcterisation_F01).

1.4.1.2 There will be two density estimates for each calendar month as the baseline survey programme spans 24 monthly samples across two years. The input parameter for the CRM for each month will be the mean of the two corresponding months.

1.5 Flight heights and CRM option

1.5.1.1 Flight heights for CRM may take the form of simple species-specific proportions at rotor swept height, or of species-specific flight height distributions. Either can be derived from site-specific data collected during the baseline survey programme, or from 'generic' flight height distributions in published literature. We propose to use the generic flight height distributions published by Johnston *et al.* (2014a, 2014b) for CRM for the Mona and Morgan Offshore Wind Projects. The application of site-specific flight height data collected by LiDAR survey was considered at the outset of the survey

[1] https://infrastructure.planninginspectorate.gov.uk/projects/wales/mona-offshore-wind-farm/

[2] https://www.bto.org/our-science/wetland-and-marine/soss/projects

programme, but was not proceeded following consultation with Natural England. At the time of consultation, Natural England did not endorse the use of LiDAR as a method for collecting flight height data to parameterise CRMs due to the lack of an established body of scientific evidence. Other methods to collect site-specific flight height data (e.g. derived from aerial imagery) were not currently considered to be sufficiently robust or precise in their estimates and have associated issues with the application of appropriate avoidance rates.

1.5.1.2 In the absence of site-specific flight height data, the collision risk will be estimated using the Band model option 2 with the generic species-specific flight height distributions published by Johnston *et al.* (2014b). To account for levels of uncertainty in flight heights, the estimated mortality will be presented for the median values and the upper and lower confidence intervals limits of the flight height distributions. No other model options will be used.

1.5.1.3 For bird species on passage, the baseline characterisation may not provide an accurate representation of the potential level of activity through the Mona and Morgan Array Areas. Natural England (2021) recommend two different methods for seabirds and non-seabird species. For non-seabird species, we propose to use the SOSS Migration Tool (SOSS-MAT) described in the SOSS-05 project information[2]. For seabird species, the method uses either an estimate of the number of birds passing through the array area based on the proportion of birds migrating across a broader migratory front, or using flux values gained from mean-peak monthly densities derived from the baseline aerial digital surveys. The methods to apply for Mona and Morgan Offshore Wind Projects require discussion with the Ornithology EWG regarding the scope of species to include and appropriate estimation of flux.

1.5.1.4 For other species, such as Manx shearwater, the baseline surveys may not provide an accurate representation of their activity due to the diurnal timing of the surveys, while shearwaters may be more active during the dawn, dusk and nocturnal periods. There is also potential attraction to light and this needs consideration in the assessment. There is no currently available guidance for this approach, therefore we welcome further discussion with the Ornithology EWG on this topic. We will present the collision risk outputs for Manx shearwater following the standard approach as for other species as described in this technical note; however, we will also qualitatively assess the potential additional risk in relation to lighting.

1.6 Modelling parameters

1.6.1.1 The Band model incorporates a number of parameters relating to the birds and their behaviour, as well as physical parameters relating to the turbines, to provide the mechanistic prediction of collision risk. It is necessary to incorporate degrees of uncertainty in some of those parameters to ensure that the risk is not underestimated. At the same time, it is widely acknowledged that additive layers of precaution in all parameters may lead to overestimation of risk and therefore alternative values may also be presented where emerging evidence indicates it is appropriate to do so. This is particularly the case in relation to avoidance rates and nocturnal activity factors, which have some of the biggest influences on the predicted magnitude of risk.

1.6.1.2 In compliance with Natural England advice (Natural England, 2021), the CRM will incorporate the mean total avoidance rates presented in the 2014 SNCB note, which was based on a review of Cook *et al.* (2014). With use of Band model option 2, these will include a range incorporating variability or uncertainty (±2S.D.) (Table 1.1). Outputs incorporating avoidance rates derived from current studies will also be considered, e.g. ORJIP Thanet Bird Collision Avoidance study (Skov *et al.*, 2018) and Vattenfall Aberdeen seabird flight behaviour study by RPS and DHI.

1.6.1.3 Nocturnal Activity Factors (NAFs) also have a large influence on the CRM outputs. They are applied to account for a level of flight activity at night when it is not possible to sample bird flight density in the survey area. Nocturnal activity is generally considered to be lower than during the day, therefore a percentage uplift is applied to the diurnal densities derived from the baseline aerial digital surveys. Natural England (2021) states that NAFs are currently under review and in the meantime recommend the NAFs shown in Table 1.1. We consider that these may values may overestimate the risk for gannet and therefore will present alternative values based on other published evidence (Furness *et al.*, 2018) alongside those recommended by Natural England (2021).

1.6.1.4 Various other biometric parameters of each bird species are needed for species-specific CRM, including bird length, wing-span, flight speed and flight type. The proposed parameters are shown in Table 1.1, complying with recommendations in Natural England (2021). For the purpose of CRM, all species are assumed to use 'flapping' flight and have 50% proportions of flights upwind/downwind.

1.6.1.5 In addition, the wind farm parameters that represent the Maximum Design Scenario (MDS) in relation to collision risk will be incorporated into the CRM. The wind turbine parameters representing the MDS for the Mona and Morgan Offshore Wind Projects are shown in Table 1.2.

Table 1.1: Species biometrics and input parameters for CRM.

[a] Body length and wing-span values from BTO Bird Facts (Robinson, 2005).

[b] Flight speeds for black-legged kittiwake, great black-backed gull, European herring gull, lesser black-backed gull and northern gannet are as specified in Natural England (2021), derived from Pennycuick (1987, 1997) and Alerstam et al. (2007). Fulmar flight speed from Pennycuick (1997). Manx shearwater flight speed is the mean ground speed reported by Gibb et al. (2017) for flapping flight.

[c] Specific avoidance rates are not provided in advice documents for northern fulmar and Manx shearwater, therefore we propose to use the default 98% avoidance rate (SNCB, 2014).

[d] evidence based NAF for gannet based on 8% nocturnal flight activity during the breeding season and 4% during the non-breeding season (Furness *et al.*, 2018). Standard NAF derived from Natural England (2021) and King *et al.* (2009).

Species	Body length (m)[a]	Wing-span (m)[a]	Flight speed (m/s)[b]	Nocturnal Activity Factor	Avoidance rate (%)
Black-legged kittiwake	0.39	1.08	13.1	2-3 (25-50%)	0.989 (±0.002)
Great black-backed gull	0.71	1.58	13.7	2-3 (25-50%)	0.995 (±0.001)
European herring gull	0.60	1.44	12.8	2-3 (25-50%)	0.995 (±0.001)
Lesser black-backed gull	0.58	1.42	13.1	2-3 (25-50%)	0.995 (±0.001)
Northern fulmar	0.48	1.07	13.0	4 (75%)	0.98 (±0. 2)[c]

Species	Body length (m)[a]	Wing-span (m)[a]	Flight speed (m/s)[b]	Nocturnal Activity Factor	Avoidance rate (%)
Manx shearwater	0.34	0.82	11.46	5 (100%)	0.98 (±0.2)[c]
Northern gannet	0.94	1.72	14.9	1-2 (0-25%) (and 4-8%)[d]	0.989 (±0.002)

Table 1.2: Wind turbine parameters in the MDS for CRM.

[a] Maximum parameter values presented are specific to the 15MW wind turbine model.

Parameter[a]	Parameter value	Source/Reference
Max. number of turbines	107	Project Design Envelope
Number of rotor blades per turbine	3	Project Design Envelope
Max. blade width (m)	6.8	Project Design Envelope
Average blade pitch (degrees)	3	Project Design Envelope
Max. rotor radius (m)	125	Project Design Envelope
Average rotation speed (rpm)	6.4	Project Design Envelope
Wind turbine model	15MW	Risk magnitude has been analysed for a range of turbine capacity models based on an interaction between the maximum number of wind turbines of that model and the maximum values of key CRM parameters; the 15MW model yielded the worst-case risk and it is expected that risk for all other models considered would be less.
Minimum air gap (LAT, MSL) (m)	34, 30	Project Design Envelope, air gap relative to Lowest Astronomical Tide (LAT and Mean Sea Level (MSL) allowing for 4m tidal offset between LAT and MSL.

1.7 Seasonality

1.7.1.1 As described for the displacement assessment, collision risk will be reported for each season. Seasons will be defined according to the breeding, non-breeding and migratory periods using seasonal divisions proposed for Biologically Defined Minimum Population Scales (BDMPS) by Furness (2015) (Table 1.3). The seasonal divisions will be adjusted as necessary to reflect local colony-specific information where it may be available.

Table 1.3: Seasonal definitions, from Furness (2015).

Species	Pre-Breeding Season/spring migration	Breeding season	Migration-free breeding season	Post Breeding Season/autumn migration	Non-breeding/winter season
Black-legged kittiwake	January – April	March – August	May – July	August – December	n/a
Great black-backed gull	n/a	Late March – August	n/a	n/a	September – March
European herring gull	n/a	March – August	n/a	n/a	September – February
Lesser black-backed gull	March – April	April – August	May – July	August – October	November – February
Northern fulmar	December – March	January – August	April – August	September – October	November
Manx shearwater	Late March – May	April – August	June – July	August – early October	n/a
Northern gannet	December – March	March – September	April – August	September – November	n/a

1.8 Assessing impacts against appropriate populations

1.8.1.1 The estimated collision risks will be presented on a monthly basis with no apportioning to colonies, i.e. the total predicted collision rates, as well as apportioned to relevant colonies. The approach to apportioning and population assessment will be provided in a separate technical note for consultation with the Ornithology EWG.

1.8.1.2 The values derived from the CRMs will be presented in full, including all variations that incorporate variability and uncertainty in input parameters as described above for bird densities, flight heights, nocturnal activity factors and avoidance rates.

1.8.1.3 For the breeding season, the assessment will be undertaken against an appropriate regional population scale (covering the total colony counts within mean-maximum foraging range plus one standard deviation). Foraging ranges will be initially identified from Woodward *et al.* (2019), although colony specific information will be reviewed and used to derive appropriate foraging ranges if it is available. Species-specific mean-max (+1S.D.) foraging ranges compiled by Woodward *et al*. (2019) will be used to select the relevant colonies (SPA and non-SPA) and calculate appropriate breeding population sizes. The location of the breeding sites will be sourced from data.gov.uk (Seabird Nesting Counts (British Isles)). The latest colony counts will be sourced from the Seabird Monitoring Programme (SMP) online database (https://app.bto.org/seabirds/public/index.jsp).

1.8.1.4 Similarly, the assessment will be done against an appropriate population scale during the non-breeding season using biological populations (BDMPS) defined by Furness (2015), in accordance with SNCB guidance (2017).

1.8.1.5 The magnitude of the collision risks to each species will be assessed initially against a threshold of 1% increase in the rate of baseline mortality, derived from Horswill and

Robinson (2015). Where this threshold is exceeded, the impact will be subject to further consideration such as population modelling. Where the 1% threshold is not exceeded, it will be considered that the impact of the project alone is not significant, but will be examined in the context of the assessment of cumulative or in-combination impacts.

1.9 References

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D.3.12 Response from Natural England regarding the Offshore Ornithology Collision Risk Assessment Technical Note

Date: 07 June 2022
Our ref: DAS/UDS A000566 / 393974
Your ref: Ornithology Baseline Characterisation Technical Note

Hornbeam House
Crewe Business Park
Electra Way
Crewe
Cheshire CW1 6GJ

T [redacted]

[redacted]
BP Alternative Energy Investments Limited

BY EMAIL ONLY

Dear [redacted]

Discretionary Advice Service (Charged Advice) - UDS A000566
Development proposal: BP EnBW Morgan and Mona Offshore Wind Farm
Consultation: Ornithology Baseline Characterisation Technical Note

This advice is being provided as part of Natural England's Discretionary Advice Service in accordance with the Quotation and Agreement dated 17 May 2021 to BP Alternative Energy Investments Limited.

Thank you for your consultation on the above dated and received on 24 May 2022.

The following advice is based upon the information within;

- Morgan and Mona Offshore Wind Projects: Offshore ornithology baseline characterisation technical note for the Evidence Plan Offshore Ornithology Expert Working Group. RPS (dated 24 May 2022).

Overarching comments

Natural England welcomes the opportunity to provide comment on the additional detail presented in this technical note, which supplements the Environmental Impact Assessment (EIA) Scoping Reports for the Morgan and Mona projects.

Overall, Natural England is content with the detail set out within the technical note. We provide some detailed comments and advice below.

Detailed comments

1.3 Site-specific surveys analysis

Although analysis of 12% of the sea surface is likely to be sufficient, best practice would be to conduct a power analysis to determine the level and distribution of survey coverage to analyse. We recommend that a power analysis is undertaken to demonstrate that survey coverage is appropriate.

1.4 Model based estimates of abundance and densities

Natural England support and encourage the use of the MRSea package to predict spatial density and abundance of seabirds where appropriate.

- We advise that design-based estimates should be presented for all species, including those estimated by MRSea.

- We suggest ongoing consultation throughout the modelling process to allow Statutory Nature Conservation Bodies to agree or advise on modelling approach, parametrisation, trial runs, etc..

- Month and year should be considered to output density surfaces for each survey. This allows for the use of model outputs in the displacement assessment process.

- We advise that consideration of hot spot/cold spot analysis should be undertaken, this is to aid potential mitigation through siting of array.

- It may be prudent to seek independent advice on the use of MRSea to ensure it is used appropriately. Natural England may seek independent advice to aid our review if necessary.

For clarification of any points in this letter, please contact me using the details provided below.

Yours sincerely

[redacted]

Strategic Coastal Lead Adviser
Coast and Marine Team
Cheshire, Greater Manchester, Merseyside & Lancashire Area Team
[redacted]

☒ The advice provided in this letter has been through Natural England's Quality Assurance process.

The advice provided within the Discretionary Advice Service is the professional advice of the Natural England adviser named below. It is the best advice that can be given based on the information provided so far. Its quality and detail is dependent upon the quality and depth of the information which has been provided. It does not constitute a statutory response or decision, which will be made by Natural England acting corporately in its role as statutory consultee to the competent authority after an application has been submitted. The advice given is therefore not binding in any way and is provided without prejudice to the consideration of any statutory consultation response or decision which may be made by Natural England in due course. The final judgement on any proposals by Natural England is reserved until an application is made and will be made on the information then available, including any modifications to the proposal made after receipt of discretionary advice. All pre-application advice is subject to review and revision in the light of changes in relevant considerations, including changes in relation to the facts, scientific knowledge/evidence, policy, guidance or law. Natural England will not accept any liability for the accuracy, adequacy or completeness of, nor will any express or implied warranty be given for, the advice. This exclusion does not extend to any fraudulent misrepresentation made by or on behalf of Natural England.

Cc [redacted]

D.3.13 Response from Natural England regarding the Offshore Ornithology Collision Risk Assessment and Offshore Ornithology Displacement Assessment Technical Note

Date: 24 June 2022
Our ref: DAS/UDS A000566 / 394421 & 394425
Your ref: Displacement & Collision Risk Modelling Technical Notes

Hornbeam House
Crewe Business Park
Electra Way
Crewe
Cheshire CW1 6GJ

T [redacted]

[redacted]
BP Alternative Energy Investments Limited

BY EMAIL ONLY

Dear [redacted]

Discretionary Advice Service (Charged Advice) - UDS A000566
Development proposal: BP EnBW Morgan and Mona Offshore Wind Farm
Consultation: Displacement & Collision Risk Modelling Technical Notes

This advice is being provided as part of Natural England's Discretionary Advice Service in accordance with the Quotation and Agreement dated 17 May 2021 to BP Alternative Energy Investments Limited.

Thank you for your consultation on the above dated and received on 27 May 2022.

The following advice is based upon the information within;

- Morgan and Mona Offshore Wind Projects: Offshore ornithology displacement assessment technical note for the Evidence Plan Offshore Ornithology Expert Working Group. RPS (dated 27 May 2022); and
- Morgan and Mona Offshore Wind Projects: Offshore ornithology collision risk assessment technical note for the Evidence Plan Offshore Ornithology Expert Working Group. RPS (dated 27 May 2022).

Overarching comments

Natural England welcomes the opportunity to provide comment on the additional detail presented in these technical notes, which supplements the Environmental Impact Assessment (EIA) Scoping Reports for the Morgan and Mona projects.

We provide detailed comments and advice below.

Detailed comments

Displacement assessment

Natural England agrees with the general approach to displacement assessment as detailed within the technical note provided. We note that further discussion is expected with the Statutory Nature Conservation Bodies (SNCBs) to agree displacement and mortality rates.

In addition to the species detailed, Natural England advise that Manx shearwater (*Puffinus puffinus*) should also be considered. It has previously been advised that the displacement and mortality rates applied to auks are used for Manx shearwater, and it is suggested that this is discussed further via the Evidence Plan process at an Offshore Ornithology Expert Working Group meeting.

Collision risk assessment

The SNCBs are currently in the final stages of drafting new guidance on Collision Risk Modelling (CRM) in light of recent work (Cook, 2021)[1] and a subsequent audit / re-analysis of that work undertaken by Exeter University commissioned by the Joint Nature Conservation Committee (Ozsanlav-Harris *et al.*, in press)[2]. Further, Natural England have commissioned a project, "Consideration of avoidance behaviour of Northern gannet (*Morus bassanus*) in collision risk modelling for offshore wind farm impact assessments" which will inform the treatment of Northern gannet in CRM.

Within the upcoming CRM guidance there will be a clear recommendation to use the stochastic CRM (sCRM), following work to resolve previously identified issues.

Although we do not anticipate that the guidance note and supporting evidence will be published in the near future, we are very close to being able to supply individual projects with all necessary parameters to undertake CRM in line with that forthcoming guidance. Natural England advise that CRM is not undertaken according to the existing guidance as detailed in the supplied technical note. We expect to be in receipt of the data in early July 2022 and will provide the avoidance rates and updated parameters to inform the approach to sCRM as soon as we are able.

For clarification of any points in this letter, please contact me using the details provided below.

Yours sincerely

[redacted]

Strategic Coastal Lead Adviser
Coast and Marine Team
Cheshire, Greater Manchester, Merseyside & Lancashire Area Team
[redacted]

☒ The advice provided in this letter has been through Natural England's Quality Assurance process.

The advice provided within the Discretionary Advice Service is the professional advice of the Natural England adviser named below. It is the best advice that can be given based on the information provided so far. Its quality and detail is dependent upon the quality and depth of the information which has been provided. It does not constitute a statutory response or decision, which will be made by Natural England acting corporately in its role as statutory consultee to the competent authority after an application has been submitted. The advice given is therefore not binding in any way and is provided without prejudice to the consideration of any statutory consultation response or decision which may be made by Natural England in due course. The final judgement on any proposals by Natural England is reserved until an application is made and will be made on the information then available, including any modifications to the proposal made after receipt of discretionary advice. All pre-application advice is subject to review and revision in the light of changes in relevant considerations, including changes in relation to the facts, scientific knowledge/evidence, policy, guidance or law. Natural England will not accept any liability for the accuracy, adequacy or completeness of, nor will any express or implied warranty be given for, the advice. This exclusion does not extend to any fraudulent misrepresentation made by or on behalf of Natural England.

Cc [redacted]

[1] Cook, A.S.C.,P., (2021). Additional analysis to inform SNCB recommendations regarding collision risk modelling. BTO Research Report 739, BTO, Thetford, UK
[2] Ozsanlav-Harris, L., Inger, R., and Sherley, R., (in press). Review of data used to calculate avoidance rates for collision risk modelling of seabirds. *JNCC Report*

From: [redacted]
To:
Cc:
Subject: (draft) CRM parameters for Morgan & Mona OWF
Date: 07 July 2022 16:38:28
Attachments: [redacted]

CAUTION: This email originated from outside of RPS.

Hi [redacted]

As noted in our response to the Morgan & Mona CRM technical note, there is a forthcoming update to the joint SNCB CRM guidance note. This new guidance is still in draft, and unlikely to be agreed, adopted and published for some time. However, we are fairly confident that the parameters that will be recommended are now unlikely to change. So, please find attached those parameters to enable you to undertake CRM. Note also that we now recommend using the stochastic model.

I must caveat the attached as not representing joint SNCB guidance, and therefore the parameters supplied remain subject to change. However, the attached currently represent Natural England's preferred parameters to undertake your CRM with. Presumably you are looking to run CRM for the PEIR, in which case it may be that in case of any further changes to parameters (hopefully unlikely) these could just be reflected in your ES.

Feel free to get in touch if you have any questions, otherwise, see you at the next ETG.

All the best,

[redacted]

Senior Specialist - Marine Ornithology
Birds and Net Gain Team - Specialist Services and Programmes
Natural England - Chief Scientist Directorate

Mobile: [redacted]

www.gov.uk/natural-england

Draft Avoidance rates and other CRM parameters

Users to be aware that the updated SNCB guidance note has not yet been finalised, so these values may still be subject to change.

Please note:
-NE no longer accept the used of the extended Band model (options 3 & 4)
- the suggested approach to gannet modelling is a novel methodology, involving the reduction of the density of birds in flight by an agreed macro-avoidance rate.

Table 1: Recommended Avoidance Rates (AR) for Collision Risk Modelling taken from Ozsanlev-Harris et al (in prep)

Species	**Basic Band (2012) Model AR**	**Basic sCRM AR**
Northern gannet* **(All gulls rate)**	0.992	0.993 (±0.0003)
Black-legged Kittiwake **(All gulls rate)**	0.992	0.993 (±0.0003)
Lesser Black-backed Gull **(Large Gulls rate)**	0.994	0.994 (±0.0004)
Herring gull **(Large Gulls rate)**	0.994	0.994 (±0.0004)
Great Black-backed Gull **(Large Gulls rate)**	0.994	0.994 (±0.0004)
Sandwich tern (and other tern species) **All gulls and terns rate**	0.990	0.991 (±0.0004)
Other marine species **All gulls and terns rate**	0.990	0.991 (±0.0004)

*Macro-avoidance to be accounted for by a reduction of density of birds in flight based on the level of macro-avoidance displayed by this species. A project has been commissioned by NE to inform this rate using best available evidence, in the interim NE advise the use of a macro avoidance rate of 70%

Table 2 – SNCB recommended parameters for the Basic Band model – Option 1 or 2 (Band 2012)

Species	**AR**	**Flight Speed** [1]	**NAF**[2]	**Body length** [3]	**Wingspan**[4]	**Flight Type**	**% of flights upwind**
Northern gannet* **(All gulls rate)**	0.992	14.9	8 % 1.32	0.94	1.72	Flapping	50
Black-legged Kittiwake **(All gulls rate)**	0.992	13.1	25-50% 2-3	0.39	1.08	Flapping	50
Lesser Black-backed Gull **(Large Gulls rate)**	0.994	13.1	25-50% 2-3	0.58	1.42	Flapping	50
Herring gull **(Large Gulls rate)**	0.994	12.8	25-50% 2-3	0.6)	1.44	Flapping	50
Great Black-backed Gull **(Large Gulls rate)**	0.994	13.7	25-50% 2-3	0.71	1.58	Flapping	50
Sandwich tern (and other tern species) **All gulls and terns rate**	0.990	10.3	Defer to Garthe and Hüppop (2004) or where empirical data is available consult SNCB	0.38	1	Flapping	50
Other marine species **All gulls and terns rate**	0.990	Consult SNCB		Consult SNCB	Consult SNCB	Consult SNCB	Consult SNCB

[1] All flight speeds from Alerstam (1997) except for Gannet from Pennycuick (1987) and Sandwich Tern from Fijn and Gyimesi (2018)

[2]All based on Garthe & Hüppop (2004) other than Gannet which is from Furness et al (2018)

[3] All named species from Snow & Perrins (1987)

[4] All named species from Snow & Perrins (1987)

Table 3 – SNCB recommended summary data for the stochastic CRM model (McGregor et al 2018)

Species	**AR**	**Flight Speed** [5]	**NAF**[6]	**Body length** [7]	**Wingspan**[8]	**Flight Type**	**% of flights upwind**
Northern gannet* **(All gulls rate)**	0.993 (±0.0003)	14.9 (0)	0.08 +-0.10	0.94 (0.0325)	1.72 (0.0375)	Flapping	50
Black-legged Kittiwake **(All gulls rate)**	0.993 (±0.0003)	13.1 (0.40)	Use central value 0.375 and SD of (0.0637) that results in 0.25 and 0.5 being captured in the 95% CI	0.39 (0.005)	1.08 (0.0625)	Flapping	50
Lesser Black-backed Gull **(Large Gulls rate)**	0.994 (±0.0004)	13.1 (1.90)		0.58 (0.03)	1.42 (0.0375)	Flapping	50
Herring gull **(Large Gulls rate)**	0.994 (±0.0004)	12.8 (1.80)		0.6 (0.0225)	1.44 (0.03)	Flapping	50
Great Black-backed Gull **(Large Gulls rate)**	0.994 (±0.0004)	13.7 (1.20)		0.71 (0.035)	1.58 (0.0375)	Flapping	50
Sandwich tern **All gulls and terns rate**	0.991 (±0.0004)	10.3 (3.4)	Defer to Garthe and Hüppop (2004) or where empirical data is available consult SNCB	0.38 (0.005)	1 (0.04)	Flapping	50
Other marine species **All gulls and terns rate**	0.991 (±0.0004)	Consult SNCB		Consult SNCB	Consult SNCB	Consult SNCB	Consult SNCB

[5] All flight speeds from Alerstam (1997) except for Gannet from Pennycuick (1987) and Sandwich Tern from Fijn and Gyimesi (2018)

[6]All based on Garthe & Hüppop (2004) other than Gannet which is from Furness et al (2018)

[7] All named species from Snow & Perrins (1987)

[8] All named species from Snow & Perrins (1987)

References:

Alerstam T, Rosen M, Backman J, Ericson PGP, Hellgren O. 2007. Flight speeds among bird species: Allometric and phylogenetic effects. PLoS Biol 5(8): e197. doi:10.1371/journal.pbio.0050197

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Ozsanlav-Harris, L, Inger, R & Sherley R[1]. (in prep). Review of data used to calculate avoidance rates for collision risk modelling of seabirds. *JNCC Report No. X (Research & review report)*, JNCC, Peterborough, ISSN 0963-8091.

Pennycuick, C.J. 1997. Actual and optimum flight speeds: field data reassessed. The Journal of Experimental Biology 200, 2355–2361

D.3.14 Response from JNCC regarding the Offshore Ornithology Collision Risk Assessment Technical Note and the Offshore Ornithology Displacement Assessment Technical Note

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Senior Marine Consultant
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JNCC Reference: OIA-08777
Date: 24/06/22

Dear [redacted]

Morgan and Mona Offshore Wind Projects, Offshore Ornithology Collision Risk Assessment Technical Note: Version F01 & Offshore Ornithology Displacement Assessment Technical Note: Version F01

Thank you for consulting JNCC on the Morgan and Mona Offshore Wind Projects, Offshore Ornithology Collision Risk Assessment and Displacement Assessment Technical Notes (both Version F01), both dated 26 May 2022, which we received on 27 May 2022.

The JNCC advice contained within this minute is provided (under a Discretionary Advice Service agreement) as part of our advisory role relating to nature conservation in UK offshore waters (beyond territorial limit). We have subsequently concentrated our comments on aspects of the documents that we believe relate to offshore waters.

Any advice or assistance provided by JNCC via our Discretionary Advice Service is advisory only, and with reference to the General terms and conditions for DAS chargeable services, JNCC excludes any warranty that the advice provided by its officers represents JNCC's opinion or otherwise binds JNCC when acting as a Statutory Consultee.

Offshore Ornithology Collision Risk Assessment Technical Note: Version F01

1.1.1.3. Natural England (2021) recommend use of the sCRM for the basic Band model (ie Options 1 and 2). JNCC prefer use of sCRM over the deterministic Band CRM (Band 2012) for Options 1 and 2. Given that in section 1.5.1.2. it states that Band model Option 2 will be used to estimate collision risk, and no other model options will be used, we would recommend use of the sCRM (McGregor *et al.*, 2018).

1.2.1.1. and Table 1.1. Please be aware that the SNCBs are in the process of updating advice on input parameters for use within CRM (and this would include the sCRM). Please seek

advice from JNCC for any updates and to seek latest recommendations re specific input parameters.

1.3.1.1. It is not clear what ‘more than negligible frequency’ means. Whilst we agree with the list of species provided as being expected to require a collision-risk assessment, we cannot rule out other species at this stage until we have seen density estimates across species for the array plus buffer, based on baseline survey data collection.

1.5.1.2. Whilst we fully support use of generic flight heights from Johnston et al (2014a and 2014b) for use within CRM, we propose that a review of existing available tracking data might provide a source of site-specific flight height information for some species/colonies of relevance. Whilst that would not replace use of Band Option 2 with generic flight heights, it would add additional information for consideration, for example for breeding individuals from known colony of origin, and/or as a comparison of potential collision risk during specific seasons for which the data applies.

Table 1.3 For most species, we would not usually advise use of a migration-free breeding season. For example, for northern gannet we advise the use of three seasons as per Furness 2015: breeding season (March - September), post-breeding migration (September - November), and pre-breeding migration (December - March).

1.6.1.2. Whilst we welcome consideration of emerging evidence, please note that we would not usually recommend use of parameters from a single location (unless that location is site-specific to the windfarm in question) and current (and imminent updates to) SNCB advice on avoidance rates and other input parameters are therefore based on evidence across multiple locations/sources. As noted above, please seek advice from JNCC for any updates and to seek latest recommendations re specific input parameters which includes avoidance rate.

Offshore Ornithology Displacement Assessment Technical Note: Version F01

Note that in addition to a displacement assessment for the operational phase of the Mona and Morgan Offshore Wind Projects, we advise that a displacement assessment is also carried out for the construction and decommissioning phases. This should assume that 50% of the annual displacement impact resulting from the operational phase will occur during construction, and decommissioning, phases.

1.3.1.1 Once species have been screened for sensitivity to displacement, all species where a robust model- and/or design-based abundance estimate can be generated should be subject to a displacement assessment, not only those that have potential to contribute to cumulative effects. Indeed to understand whether or not an impact will contribute to cumulative effects, an individual assessment needs to be made.

1.3.1.1 We advise that Manx shearwater is screened into the displacement assessment. Manx shearwater has a ‘disturbance susceptibility’ score of 1 according to Bradbury et al. (2014), meaning they are displaced at low levels or less likely to be displaced than other species. We therefore we recommend that a displacement assessment is conducted for Manx shearwater.

1.3.1.1 We advise that black-legged kittiwake is screened into the displacement assessment as recent evidence suggests that they can be sensitive to displacement from offshore wind

farms (Peschko et al 2020; Vanermen et al 2016; Leopold et al 2013). We therefore recommend that a displacement assessment is conducted for black-legged kittiwake.

1.3.1.2 Without an understanding of the numbers of red-throated diver and seaducks observed in the study areas or seeing the results of model- or design-based estimates of abundance and density, we cannot agree that a displacement assessment is not carried out for red-throated diver and seaducks.

1.4.1.2 Table 1.1 For common guillemot we advise the use of two seasons as per Furness 2015: breeding season (March - July) and non-breeding season (August - February).

1.4.1.2 Table 1.1 For razorbill we advise the use of three seasons as per Furness 2015: breeding season (April - July), migration season (August - October and January - March) and winter season (November - December).

1.4.1.2 Table 1.1 For Atlantic puffin we advise the use of two seasons as per Furness 2015: breeding season (April - early August) and non-breeding season (mid-August - March).

1.4.1.2 Table 1.1 For northern gannet we advise the use of three seasons as per Furness 2015: breeding season (March - September), post-breeding migration (September - November), and pre-breeding migration (December - March).

1.4.1.4 Note that for re-throated diver, joint SNCB advice is to assess displacement within the wind farm area plus a 10km buffer (SNCBs, 2022).

1.4.1.4 As previously stated, without an understanding of the numbers of red-throated diver and seaducks observed in the study areas or seeing the results of model- or design-based estimates of abundance and density, we cannot agree that a displacement assessment is not carried out for divers and seaducks.

1.5.1.2 Table 1.2 We advise that a range of mortality rates is presented for all species included in a displacement assessment. This includes northern gannet, for which mortality rates of 1-10% should be used and presented.

1.5.1.2 Table 1.2 Manx shearwater has a ‘disturbance susceptibility’ score of 1 according to Bradbury et al. (2014), meaning they are displaced at low levels or less likely to be displaced than other species. We therefore we recommend that a displacement assessment is conducted for Manx shearwater with displacement rates of 1-10% and mortality rates of 1-10%, noting the requirement to also produce full displacement matrices.

1.5.1.2 Table 1.2 We advise that black-legged kittiwake is screened into the displacement assessment as recent evidence suggests that they can be sensitive to displacement from offshore wind farms (Peschko et al 2020; Vanermen et al 2016; Leopold et al 2013). We therefore recommend that a displacement assessment is conducted for black-legged kittiwake with displacement rates of 30-70% and mortality rates of 1-10%, noting the requirement to also produce full displacement matrices.

1.6.1.2 Note that in the context of HRA, the best estimate of the seasonal population size of the relevant SPA should be used when assessing impacts against the population during the relevant season.

1.6.1.4 It is not clear what "… consideration will be given to age classes within the populations" means in practice?

References

Leopold, M.F., van Bemmelen, R.S.A. & Zuur A.F. (2013) Responses of Local Birds to the Offshore Wind Farms PAWP and OWEZ off the Dutch Mainland Coast. Report number C151/12

Peschko, V., Mendel, B., Müller, S. Markones, N., Mercker, M. & Garthe, S. (2020) Effects of offshore windfarms on seabird abundance: Strong effects in spring and in the breeding season, *Marine Environmental Research*, vol. 162, article 105157, https://doi.org/10.1016/j.marenvres.2020.105157

SNCBs (2022) Joint SNCB Interim Advice On The Treatment Of Displacement

For Red-Throated Diver Available at: https://hub.jncc.gov.uk/assets/9aecb87c-80c5-4cfb-9102-39f0228dcc9a#:~:text=The%20Joint%20SNCB%20Interim%20Displacement,England%20and%20JNCC%20in%202012.

Vanermen, N., Courtens, W., Van de walle, M., Verstraete, H. & Stienen, E.W.M. (2016) Seabird monitoring at offshore wind farms in the Belgian part of the North Sea. Updated results for the Bligh Bank & first results for the Thorntonbank

Please contact me with any questions regarding the above comments.

Yours sincerely,

[redacted]

Senior Marine Ornithologist

Email: [redacted]

Telephone: [redacted]

D.3.15 Response from MMO regarding the Offshore Ornithology Technical Notes

From: [redacted]
To:
Cc: [redacted]
Subject: RE: Morgan and Mona Offshore Wind Projects offshore ornithology technical papers
Date: 29 June 2022 09:39:13
Attachments: [redacted]

CAUTION: This email originated from outside of RPS.

Hello [redacted]

I can confirm that the MMO has no comments to make on the ornithology technical papers at this time.

Kind Regards

[redacted]

[redacted] BSc (Hons) MSc | Marine Licensing Case Officer | Marine Management Organisation
Lancaster House | Hampshire Court | Newcastle upon Tyne NE4 7YH
8[redacted]

Our MMO Values: Together we are **Accountable, Innovative**, **Engaging** and **Inclusive**

From: [redacted]
Sent: 28 June 2022 15:45
To: [redacted]
Cc: [redacted]
Subject: FW: Morgan and Mona Offshore Wind Projects offshore ornithology technical papers

Hi [redacted]

Please can you send me any comments the MMO has on the Displacement and Collision Risk Modelling (CRM) Technical Notes for the Morgan and Mona projects or confirm if you do not have any comments.

Kind Regards, [redacted]

[redacted]

From: [redacted]
Sent: 27 May 2022 09:27
To: [redacted]

D.3.16 Advice note from Natural England regarding the HPAI and impact assessment

Highly Pathogenic Avian Influenza (HPAI) outbreak in seabirds and Natural England advice on impact assessment (specifically relating to offshore wind)

September 2022

1. We are currently unclear what the short, medium and long-term effects of the 2022 HPAI outbreak will be on seabird colony abundance and vital rates (productivity and survival), though impacts at some English colonies in 2022 were likely substantial (e.g. emerging indications of estimates include adult mortality in ~50% of the UK's only roseate tern colony at Coquet Island SPA, and ~10% of Sandwich terns at the North Norfolk Coast SPA). We do not know the extent of population resilience – for instance, how many non-breeding birds might replace adults dying from HPAI in 2022 in future breeding seasons.

2. We expect HPAI to remain a threat to UK breeding seabirds (and terrestrial species of birds, especially perhaps wintering waterbirds) for the foreseeable future. It will take several years for data to be gathered on abundance, mortality and productivity, so we will need to work with imperfect knowledge in the interim.

3. The species understood to be of greatest relevance for imminent impact assessment of offshore wind farms in England are black-legged kittiwake, Sandwich tern, northern gannet, great black-backed gull, common guillemot and razorbill.

4. We expect seabird data collected prior to summer 2022 (approx. June) to remain a valid representation of 'typical' seabird distribution and density, as this was before mass mortality events began to take place. (At this point, we assume affected colonies will recover in the short or long term, depending on available recruits to colonies, scale of further outbreak, and other factors). Data collected at sea from summer 2022 onwards will need discussion with Natural England, to understand how the species and colonies of concern, and their density at sea at certain times, may have been affected by HPAI. We welcome engagement with developers actively engaged in data collection through the Evidence Plan process.

5. Implications for data collection planned for projects beyond Round 4 will largely be site- and species-specific, and we recommend careful interpretation of results in consultation with Natural England. As the duration and severity of the epidemic is unknown and evidence will continue to accumulate over time, an iterative approach seems likely to be required.

6. Broadly, we expect any changes in abundance at colonies to be reflected proportionately in the at sea data. That is, it is reasonable to assume distribution patterns will remain broadly similar, but densities to change accordingly.

7. This assumption means that the scale of impact is likely to remain in proportion to the size of the colony. For instance, if a population were reduced by 10% then we would expect 10% fewer collisions. However, where a population has been significantly depleted, it should be considered whether an equivalent level of impact would have greater implications for the newly reduced population.

8. This would also reflect the likely need to ensure that the sea areas that support SPA (Special Protection Area) seabird colonies provide suitable conditions to restore populations where HPAI impacts have reduced population sizes, rather than simply maintain them. Natural England will aim to provide conservation advice that reflects any such changes.

9. Given the significant uncertainties about the health and resilience of seabird colonies introduced by HPAI, Natural England is likely to further emphasise the need to continue with a risk-based approach to its advice on additional impacts from development, particularly where

populations have been significantly impacted. This is to ensure that the impacts of HPAI are not compounded by those from development.

9. This approach is also likely to be taken to compensation discussions. We are likely to recommend that the nature, scope and scale of compensatory measures reflect the uncertainties around population trends, recovery and resilience introduced by HPAI.

10. We need much more data, and urgently need all concerned with seabird conservation and related developments to fund monitoring of key variables at important colonies, so that collectively we can make best decisions about impact and its effects in the face of the threat from HPAI.

11. Natural England will shortly publish its advice to Defra underpinning an English Seabird Conservation and Recovery Plan, which includes direct recommendations for seabird recovery, some relating to disease as well as seabird monitoring.

12. We must work collectively to ensure that seabird populations are made more resilie nt to the type of catastrophic event caused by HPAI. This includes delivering the actions relating to feeding, breeding and survival as outlined in Natural England's recommendations to Defra in the England Seabird Conservation and Recovery Plan.

D.4. Offshore ornithology EWG meeting 3

D.4.1 Meeting minutes

MINUTES OF MEETING

Security Classification: Project Internal

Partners in UK offshore wind

MOM Number	:	20221130_Morgan gen Mona OO EWG03 MoM	**REV. No.** :	F02

MOM Subject : Morgan generation assets and Mona Offshore Ornithology Expert Working Group meeting 3

MINUTES OF MEETING

MEETING DATE : 30 November 2022

MEETING LOCATION : MS Teams

RECORDED BY : [redacted] (RPS)

ISSUED BY : [redacted] (RPS)

PERSONS PRESENT:

- [redacted] - RPS (KL)
- [redacted] - RPS (ST)
- [redacted] - RPS (JS)
- [redacted] - RPS (LM)
- [redacted] - RPS (AN)
- [redacted] - bp (MP)
- [redacted] -bp (WD)
- [redacted] - bp (GV)
- [redacted] - JNCC (JW)
- [redacted] - JNCC (RH)
- [redacted] - JNCC (JB)
- [redacted] - Natural England (ABR)
- [redacted] - Natural England (RB)
- [redacted] - Natural England (LB)
- [redacted] - NRW (LR)
- [redacted] - NRW (HR)
- [redacted] - TWT (GJC)
- [redacted] - Natural England (JH)
- [redacted] - IoM (RS)
- [redacted] - MMO (AP)
- [redacted] - MMO (RG)

APOLOGIES

- [redacted] RSPB (AM)
- [redacted] RSPB (AD)

ITEM NO:	DISCUSSION ITEM:	Responsible party	Date
1.	**Project update (presented by WD)** bp are working with EnBW in a 50/50 partnership (the Applicants) to develop the Morgan Offshore Wind Project Generation Assets ('Morgan (Generation Assets)') and the Mona Offshore Wind Projects ('Mona'), which are being progressed as two separate projects. Morgan (Generation Assets) is the northern project located in English waters, and Mona is the southern project located mostly in Welsh waters. Together, they will have a combined capacity of 3GW. The Morgan Offshore Wind Project and the Morecambe Offshore Windfarm (developed by Cobra Instalaciones Servicios, S.A. and Flotation Energy plc) have been scoped into the Pathways to 2030 workstream under the Offshore Transmission Network Review (OTNR). Under the OTNR, the National Grid Electricity System Operator is responsible for conducting a Holistic Network Design Review to assess options to improve the coordination of offshore wind generation connections and transmission networks. The output of this process concluded that the Morgan Offshore Wind Project and the Morecambe Offshore Windfarm should share a transmission assets route corridor to a shared grid connection location at Penwortham in Lancashire. Both projects support the Holistic Network Design Review conclusions and intend to collaborate on a shared route corridor. The Morgan and Morecambe Transmission Assets project will be subject to a separate DCO. This consenting approach will provide a formal structure for the projects to collaborate, allows for integrated consideration of cumulative effects and streamlining the process with a single consent which should be simpler for stakeholders. The Applicants therefore intend to set up a separate Evidence Plan Process (EPP) to cover the Morgan and Morecambe Transmission Assets. The Mona and Morgan (Generation Assets) EPP will progress as planned and be separate from the Morgan and Morecambe Transmission Assets EPP. Mona is being taken forward as a separate DCO including both the generation and transmission assets. The individual Morgan (Generation Assets) and Mona PEIR submissions will be at the end of Q1 2023. The two PEIR submissions have been aligned to allow the Applicant to properly consider the cumulative effects between the projects. The Morgan and Morecambe Transmission Assets PEIR is likely to be submitted in Q3 2023.		
2.	**Baseline characterisation (Presented by JS)** For the Mona Offshore Wind Project a buffer of 4-10km has been used as the Array Area was refined after the digital aerial surveys		

	were commissioned. For Mona, 24 months of data are available to be included in PEIR. For Morgan generation, only 12 months of data are available to be included in PEIR. All species in the digital aerial surveys were identified by APEM and those raw counts were used in the spatial distribution modelling. RB- Have the unidentified auk species been apportioned to particular species? There is a high percentage of unidentified auks so you need to be careful of identification bias. Apportioning such a large proportion of unidentified auks based on the proportions of identified species may not be appropriate. It would be useful to understand how this varied seasonally. JS- The spatial modelling doesn't include the unidentified auks. After the spatial modelling, the unidentified auks are apportioned and included in the resulting densities. The spatial model was only completed on the most common species as the model doesn't run for a low number of data points. The model uses spatial and environmental variables to aid predictions of the spatial distribution. For the months and species where there was sufficientnt data for modelling, non-parametric bootstrapping was used instead to predict densities and spatial distribution. HR- Where you have provided MRSea estimates, will design-based estimates also be provided? JS- Yes, we have calculated both for all species where MRSea was undertaken. We also consider the availability bias e.g. for auks species that are underwater. For example if puffins are underwater for 16% of the time, then we would increase the densities by 16%. We then attributed the unknown species after the modelling was undertaken. There are high levels of variation in the densities between the Mona and Morgan surveys across the same month. As well as high levels of variation between the same months across different years. KL- The densities presented do take into account the unidentified species. JS- The density maps presented include the apportioned unidentified auk species. KL- We can take this away and look at why the number of unidentified auk species is so high. RB- Yes this may be helpful regarding the question of how many birds need to be identified to have confidence in the spatial modelling. *Post meeting note from Natural England:* *In relation to the discussion about the possibility of investigating the impact of the unidentified portion of the auk data on the spatial mapping & density surfaces, which followed on from Natural England raising concerns about apportioning from low ID rates with no real understanding of bias.*	**The Applicant to investigate why the number of unidentified auks are high.** **Also to look at seasonal variation.**	In progress

	The issues here are around ID bias, but this includes the possibility that some of that bias may be driven (directly or indirectly) by environmental covariates. *Essentially, it would be useful/informative to ascertain if it is really appropriate to inflate the densities, and if spatial modelling of a species with such a low ID rate is likely to be representative.*		
3.	**<u>Collision risk modelling (presented by JS)</u>** Collision risk modelling (CRM) was undertaken using the Shiny app online. It is a stochastic collision risk model. It is built from the basic band model. It allows you to include the confidence limits for parameters and the model will sample from a range and provide outputs on that range. The densities that fed into the model were either derived from MRSea where available, or from non-parametric bootstrapping where MRSea was unavailable. KL- The EWG was provided with methodology papers for CRM, displacement and baseline characterisation ahead of the last EWG meeting. We had broad agreement on the methodology. The parameters that fed into the model e.g. avoidance rates were agreed as part of the last EWG meeting. For black-legged kittiwake, most of the predicted collisions occurred outside the breeding season. Collision increased the baseline mortality by 0.023-0.055%. HR- What definitions of seasonality are you using? JS- They are based of the biological defined seasons from Furness 2015[1]. HR- Kittiwake has three seasons, breeding, non-breeding and migratory. JS- This has been considered for the technical reports, it has only been presented as breeding and non-breeding in the graphs in the presentation for simplicity; but the three seasons have been accounted for in the technical reports. Great black-backed gulls showed high variability with low collisions due to low predicted densities. Collision increased the background mortality by 0.18-0.87%. For lesser black-backed gulls, collisions were very low due to low predicted densities. Collisions increased the background mortality by 0.003-0.022%. Herring gulls were more common, collisions were roughly equal between the breeding and non-breeding seasons. Collision increased the background mortality by 0.002-0.016%.		

[1] Furness, Robert. (2015) Non-breeding season populations of seabirds in UK waters: Population sizes for Biologically Defined Minimum Population Scales (BDMPS). Natural England Commissioned Report. 164.

	For northern gannet, the breeding season had higher densities and therefore there were higher predicted collisions. Based on advice we received these densities were decreased by 70% to account for the macro-avoidance rates. Gannets were the only species for which we were asked to apply this. Collision increased the background mortality by 0.0005%-0.0043% Northern fulmar were recorded mostly in the non-breeding season. They mostly do not fly at heights associated with collision risk . Collision increased the background mortality by up to 0.001%. Manx shearwater had 0 collisions as they don't fly at collision risk height. All species apart from great black-backed gulls had less than 0.1% increase in baseline mortality. With great black-backed gulls having less than 1% increase in baseline mortality. It has therefore been concluded that collision risk for the project alone is unlikely to affect populations. Cumulative effects will also be considered, and results will be presented in the EWG meeting in Q1 2023.		
4.	**<u>Migratory CRM (presented by JS)</u>** The SOSSMAT tool has been used for migratory CRM. If you divide the number of survey flight lines that cross the Mona array area by the total number of flight lines, you get a proportion of the total bird population expected to cross the array area. This proportion is then multiplied by the total bird population from census studies to get the total number of birds at risk of collision (with no avoidance) when crossing the array area. HR- What flight heights have been used? JS- We have used those recommended in the SOSSMAT guidelines. HR- Have the full range of flight heights in the SOSSMAT guidelines been used. LM- We have used the percentage of birds potentially at turbine height from the SOSSMAT tool which is based on a range of values. HR- Have seabird migrations been considered? LM- No, the modelling is not really appropriate to undertake assessment on migratory seabirds. HR- NRW would suggest a slightly different approach for migratory seabirds such as terns and skuas. As they don't migrate in straight lines as the model assumes, they need to be considered in the contact of the migratory front and where the offshore wind farm sits within that. Suggested taking an approach similar to that undertaken by WWT and McArthur Green for Marine Scotland project on strategic assessment of collision risk of OWFs to migrating birds.	**NRW to provide the reference to how McArthur Green have considered migratory seabirds -** information and link provided in separate NRW response	Complete

5.	**Displacement assessment (presented by JS)** We have used the matrix displacement approach, as agreed in previous EWG meetings. We have used a range of displacement and mortality rates as advised by the EWG in the last meeting. For construction and decommissioning we have implemented half of the displacement rate used for operation, as advised by the EWG in the last meeting. We have used regional populations based on Furness 2015. For each species in each bio-season we have used peak numbers. Mona has two estimates, one for each survey year so an average of those peaks across the two years has been used. For Morgan generation, only one year of data is available for PEIR so we have one peak. The full two years of data will be included in the Morgan generation assets environmental statement. HR- For Manx Shearwater, NRW would advise that the displacement rates for auks are used. JS – We have used the displacement rates included in the displacement note circulated to the EWG on 05 May 2022 before the last EWG meeting. RB- NE advised after the last EWG that Manx Shearwater should have the same displacement rates as auk species. KL- We will take this away and update the assessment if required. *Post meeting note* *In Natural England's response to the displacement technical note provided by RPS on 27 May 2022. They state 'Natural England advise that Manx shearwater (Puffinus puffinus) should also be considered. It has previously been advised that the displacement and mortality rates applied to auks are used for Manx shearwater, and it is suggested that this is discussed further via the Evidence Plan process at an Offshore Ornithology Expert Working Group meeting.'* *JNCC responded to the displacement technical note with 'We therefore we recommend that a displacement assessment is conducted for Manx shearwater with displacement rates of 1-10%'* *NRW responded to the action from the last EWG meeting 'NRW to provide recommendation on the displacement and mortality rates to be used for Manx Shearwater and Kittiwake.' with 'For Manx shearwater and kittiwake, NRW (A) advise the whole displacement matrices are presented. At a later stage, the applicant can work back to establish what levels of displacement and mortality are likely to have an effect. NRW (A) advise using a range of mortality rates from 1-10%.'* *JNCC responded to the same action with 'A range of mortality rates from 1-10% are advised.'* *NRW and JNCC have not provided clear steer to the Applicant on displacements rates to be used for Manx Shearwater. However, the full matrices are to be presented in the PEIR, as requested by NRW*	**NRW and JNCC to provide guidance on the displacement rates to be used in the Environmental Statement assessment – see separate NRW response.**	Complete

	and other stakeholders. The assessment for the PEIR has been undertaken using 1-10% displacements rates for Manx Shearwater. If further advice cannot be provided at this time, this can be further discussed with the EWG upon review of the full matrices in the PEIR.		
6.	**<u>Apportioning assessment (presented by JS)</u>** We have undertaken apportioning based on the NatureScot method. We take the centroid of the offshore wind farm and use the mean-max foraging range plus one standard deviation. The mortalities form collisions and displacement are then apportioned to each colony. Apportioning is undertaken based on the proximity of a colony to the offshore wind farm, which is then assigned a weighting factor. We have used the standard age composition from Furness 2015 which provided the number of expected immature individuals in the population for each adult. RB- Natural England do not advise separating out sabbatical birds rates for apportioning. HR- NRW would also not recommend separating out sabbatical birds for apportioning. RB- You said that you have used the mean max foraging rates plus one standard deviation. As well as looking at the mean max, Natural England would recommend that the max from each species from each colony is looked at. This is detailed in the Natural England best practice guidelines. We don't want to dilute the impact by including additional colonies unnecessarily but using this method, an important SPA colony may be included. HR- This apportioning approach is appropriate for the breeding season. How has apportioning been done for the non-breeding season? JS- We have only been able to do it for the breeding season. We have used the Furness 2015 data which provides a breakdown of different colonies. HR- for the non-breeding season, NRW advice would be to use the tables in appendix A of Furness 2015 - by using the proportion of the relevant colony figure against the total BDMPS population during the respective season (further detail in separate NRW response). AN- we have used the tables in appendix A for non-breeding season. RS- The Isle of Man has protected colonies of birds. Are they included for apportioning. JS- The main focus has been the SPAs. KL- Non-SPA colonies have been considered within the EIA and these will include the Isle of Man Marine Nature Reserve colonies.	**RPS to consider updating apportioning assessment to include sabbaticals in adult mortalities.** **RPS to check NE best practice guidance.**	In progress Complete

7.	**LSE screening (presented by KL)** We have undertaken a more detailed review for Mona now that we have the apportioning and CRM results for offshore ornithology. We have considered these results in the LSE screening to ensure it is proportionate. Where mortalities were >1 individual, these sites were screened in for 'in combination'. Where mortality was <1 these sites were screened out. This is based on the worst-case scenario where the layers of conservatism in the displacement and CRM analysis as well as the maximum design parameters used (e.g. for displacement the maximum mortalities associated with the greatest displacement, up to 70%, and the greatest mortality rates, up to 10%) should ensure a precautionary approach. When the project is considered alone, all species were below the 1% threshold, even for the worst case scenarios. HR- NRW doesn't agree that sites can be screened out based on less than 1% increase in baseline mortality. LSE should be a coarse screening filter, so where a feature of a site is present on the OWF site and there is connectivity and a potential impact pathway we would expect the site to be screened in and taken through to the appropriate assessment phase. The results of the apportioning of impacts (collision/displacement etc) and assessments of impacts against baseline mortality should be included in the appropriate assessment. KL- We understand that this is the typical approach adopted historically, but the aim of our approach is to provide a more proportionate Appropriate Assessment. We are trying to manage the size of the Information to Support Appropriate Assessment (ISAA) and focus it on those SPAs and features of SPAs where there is potential for LSE. We feel this is important as it ensures the ISAA is focussed on the key SPAs, rather than screening in a very large number of SPAs where we have clear evidence that the risk to these SPAs is minimal (even in highly conservative worst case scenarios). This will help all parties to manage workloads during the pre-application process and into examination. Particularly when we have the evidence (i.e. through site specific modelling and assessments) to support this approach. HR- NRW will take this away and consider this approach. RB- Natural England would take the same stance. We understand the approach to reduce the documentation burden. We will also take this away and respond on how we would like it presented. We also don't consider the use of de minimis to be appropriate for in combination effects.	**NRW and Natural England to consider the proposed approach to LSE screening– see separate NRW response**	Complete
8.	**Avian Flu (presented by KL)** We understand that the Highly Pathogenic Avian Influenza (HPAI) is a very live issue and we have seen the Natural England guidance on it published in September 2022 and provided to the Sheringham and Dudgeon extension consent application. For the		

	Mona Offshore Wind Project, we have 24months of data which is all pre- HPAI. The Natural England advice is that data collection pre-June 2022 remains valid. For Morgan generation, we have 12-month pre and 12 months post June 2022. We will continue to look at the data as it comes in but at the moment we can't see anything beyond natural variation that has been seen in the Mona data. It is unclear how HPAI will affect the Irish Sea populations, most studies so far have focused on the Scottish populations. We would expect that if the Irish Sea populations are reduced then the collision risk and displacement would also proportionally decrease. Does the EWG have and advice or comments on the HPAI? RD- It has come through late on the IoM, from mid-July. Effects have been widespread since then. RB- It is a live issue and Natural England have no further advice from what has already been published. RS- Has hen harrier been considered within the assessment. We have a large population on the IoM and there may be a flight line between the IoM and Wales/England. JS- We have considered hen harriers in the technical reports.		
9.	**<u>Next steps (presented by KL)</u>** • Meeting minutes to be circulated 2 weeks following the EWG. • Agreement logs to be circulated following EWG. • Agreement on approach to LSE Screening using apportioning. • Meeting Q1 2023 to discuss results for Morgan generation. LB- Is there consideration for barrier effects for migratory birds. KL- We will take this away to consider the potential for barrier effects and disruption of the normal migratory path.	**RPS to consider the potential impact of barrier effects and disruption of the normal migratory path.**	In progress

D.4.2 Response from Natural England regarding the meeting minutes

Date: 11 January 2023
Our ref: DAS/UDS A000566 412777
Your ref: Benthic ecology, fish and shellfish, and physical processes EWG02

[redacted]
BP Alternative Energy Investments Limited

c/c [redacted]
RPS/ Energy

Hornbeam House
Crewe Business Park
Electra Way
Crewe
Cheshire
CW1 6GJ

[redacted]

BY EMAIL ONLY

Dear [redacted]

Discretionary Advice Service (Charged Advice) – UDS A000566
Development proposal: BP EnBW Morgan and Mona Offshore Wind Farm
Consultation: Ornithology EWG03

This advice is being provided as part of Natural England's Discretionary Advice Service in accordance with the Quotation and Agreement dated 17 May 2021 to BP Alternative Energy Investments Limited.

The following advice is based upon the information within the Ornithology Expert Working Group (EWG) Meeting 3 (attended on 30th November 2022) and subsequent meeting notes provided 12th December 2022 by [redacted].

Natural England was asked to provide advice upon:

1) Agreement on approach to LSE screening using apportioning
2) Investigation of the implications of low ID rate for Auks on the spatial modelling and density surfaces
3) Manx shearwater displacement rates

Detailed comments

1) Agreement on approach to LSE Screening using apportioning

LSE Screening

The LSE Screening stage of the HRA process details whether those constituent elements of the plan or project which are (a) not directly connected with or necessary to the management of the European Site(s) features and (b) could conceivably adversely affect a European site, would have a **likely significant effect,** either alone or in combination with other plans and projects, upon the European sites and which could undermine the achievement of those conservation objectives.

In accordance with case law, this HRA has considered an effect to be 'likely' if there is a risk or a possibility of it that '*cannot be excluded on the basis of objective information'* and to be 'significant' if it *'undermines the conservation objectives'* (Case C127-02 *Waddenzee* (paras 45 & 47*).*

This assessment of risk therefore takes into account the precautionary principle (where there is scientific doubt) and **excludes**, at this stage, any measures proposed and outlined in the submitted details of the plan/project that are specifically intended to avoid or reduce harmful effects on a

European site(s).

Natural England advise that LSE should be treated as a coarse screening filter to identify all instances of qualifying features with potential protected site connectivity and an impact pathway. If significant (possible) effects cannot be excluded on the basis of objective information without extensive investigation, further assessment should be presented in an Appropriate Assessment.

Natural England appreciate the desire to reduce the burden of documentation, but consider that the overall information supplied essentially remains unchanged. Natural England does not agree that it is appropriate to screen species/sites out of LSE based on a <1% increase in baseline mortality. It should also be noted that Natural England also does not consider the use of de minimis to be appropriate for screening impacts out of consideration for in-combination assessments.

Apportionment

Natural England advise that where site-specific information on age classes is not available a precautionary approach should be adopted, and all adult-type birds should be treated as adults. The use of stable age structures is not appropriate over the spatial scale of an OWF survey area. Further, we reiterate that Natural England advise that sabbatical rates should not be considered for apportioning.

2) **Investigation of the implications of low ID rate for Auks on the spatial modelling and density surfaces**

Natural England has concerns regarding the apportioning of auks from low ID rates, with no real understanding of bias. Species-specific ID bias cannot be accounted for. Further, there is the possibility that additional ID bias may be driven (directly or indirectly) by environmental covariates. It would be useful to ascertain if;

1) it is appropriate to inflate the densities by apportioning of unidentified birds
2) spatial modelling of identified birds for species with such a low ID rate is representative of the population in the study area.

(i.e., in both cases, what percentage should be identified to have confidence in this approach)

Natural England would recommend asking the Digital Aerial Survey provider why the auk ID rate is so low as it would be useful to understand if there are options to improve this through, e.g. increased interrogation of raw data.

3) **Manx shearwater displacement rates**

Natural England highlight the paucity of evidence around Manx shearwater displacement and acknowledge that the whole displacement matrix will be presented in the PEIR. This will allow evaluation of the likely levels (if any) at which a significant effect may be expected.

For clarification of any points in this letter, please contact me using the details provided below.

Yours sincerely,

[redacted]
Marine and Coastal Lead Adviser
Coast and Marine Team
Cheshire to Lancashire Area Team
[redacted]

☒ The advice provided in this letter has been through Natural England's Quality Assurance process

The advice provided within the Discretionary Advice Service is the professional advice of the Natural England adviser named below. It is the best advice that can be given based on the information provided so far. Its quality and detail is dependent upon the quality and depth of the information which has been provided. It does not constitute a statutory response or decision, which will be made by Natural England acting corporately in its role as statutory consultee to the competent authority after an application has been submitted. The advice given is therefore not binding in any way and is provided without prejudice to the consideration of any statutory consultation response or decision which may be made by Natural England in due course. The final judgement on any proposals by Natural England is reserved until an application is made and will be made on the information then available, including any modifications to the proposal made after receipt of discretionary advice. All pre-application advice is subject to review and revision in the light of changes in relevant considerations, including changes in relation to the facts, scientific knowledge/evidence, policy, guidance or law. Natural England will not accept any liability for the accuracy, adequacy or completeness of, nor will any express or implied warranty be given for, the advice. This exclusion does not extend to any fraudulent misrepresentation made by or on behalf of Natural England.

Cc [redacted]

Annex 1
European Protected Species

A licence is required in order to carry out any works that involve certain activities such as capturing the animals, disturbance, or damaging or destroying their resting or breeding places. Note that damage or destruction of a breeding site or resting place is an absolute offence and unless the offences can be avoided (e.g. by timing the works appropriately), it should be licensed. In the first instance it is for the developer to decide whether a species licence will be needed. The developer may need to engage specialist advice in making this decision. A licence may be needed to carry out mitigation work as well as for impacts directly connected with a development. Further information can be found in Natural England's 'How to get a licence' publication.

If the application requires planning permission, it is for the local planning authority to consider whether the permission would offend against Article 12(1) of the Habitats Directive, and if so, whether the application would be likely to receive a licence. This should be based on the advice Natural England provides at formal consultation on the likely impacts on favourable conservation status and Natural England's guidance on how the three tests (no alternative solutions, imperative reasons of overriding public interest and maintenance of favourable conservation status) are applied when considering licence applications.

Natural England's pre-submission Screening Service can screen application drafts prior to formal submission, whether or not the relevant planning permission is already in place. Screening will help applicants by making an assessment of whether the draft application is likely to meet licensing requirements, and, if necessary, provide specific guidance on how to address any shortfalls. The advice should help developers and ecological consultants to better manage the risks or costs they may face in having to wait until the formal submission stage after planning permission is secured, or in responding to requests for further information following an initial formal application.

The service will be available for new applications, resubmissions or modifications – depending on customer requirements. More information can be found on Natural England's website.

D.4.3 Response from NRW regarding the meeting minutes

Project Mona & Morgan (Generation) Offshore Ornithology EWG03: NRW Actions

[redacted]
Senior Marine Advisor

5th January 2023

Introduction

This advice is provided in response to the **Meeting Actions from the Offshore Ornithology Expert Working Group (EWG) meeting 03 which took place on 30th November 2022.**

NRW advice in this document is provided (under a Discretionary Advice Service agreement) in respect of a proposal which will require an application for which Natural Resources Wales is a Statutory Consultee.

The customer acknowledges that the content of any advice or assistance provided by NRW is advisory only and that it shall not be deemed to bind or in any other way restrict NRW in performing its statutory functions.

The recipient acknowledges that:

- any advice given or materials or documentation provided by NRW do not constrain or bind NRW in respect of its statutory functions or its role as a statutory consultee or any decision NRW may make in relation to any application for a licence or permit;
- any advice given by NRW does not bind NRW in respect of any future representations it may make as statutory consultee or any decision NRW may make in relation to any application for a licence or permit;
- any views or opinions expressed by NRW are without prejudice to the consideration NRW may be required to give to any application or any future representations as statutory consultee or any decision NRW may make in relation to any application for a licence or permit;
- the final decision as to any representations made by NRW as statutory consultee will be based on all the relevant information available to NRW at the time it makes such representations;
- NRW cannot and does not give any guarantee as to the representations it may make as statutory consultee; and,
- any advice given by NRW may be overtaken by changes in available information, law, policy and guidance relevant to the subject matter of the advice.

Advisors Consulted:
Marine Ornithology

Actions

NRW to provide the reference to how McArthur Green have considered migratory seabirds

NRW Advisory (A) agree with the use of SOSSMAT for migratory non seabirds. However, consideration should also be given to migratory seabird species such as skuas and terns that may not get picked up in large numbers on aerial surveys due to the snapshot nature of the surveys, for collision risk for Mona and Morgan. As noted during the Offshore Ornithology EWG03 meeting, it would not be appropriate to use SOSSMAT for these species as they often migrate following coastlines at a distance offshore, rather than straight lines between point of origin and destination, which is an assumption of SOSSMAT. Therefore, alternative approaches are required, such as estimating the abundance of a species of bird migrating through a wind farm footprint area based on an apportionment of migrant bird numbers across a broad migratory front. As an example, for a species that might pass through the Irish Sea as part of a longer migratory route (such as great skua), the risks that the population is exposed to relate to the proportion of the broad migratory front that passes across the proposed wind farm area. For a species that migrates exclusively over the sea, the broad migratory front could be defined as the width of the Irish Sea. Consideration should also be given to the distribution of birds within the broad migratory front: birds could be distributed evenly, or they might have a skewed distribution. For example, if the species tends to avoid the coast on migration through the Irish Sea, then distribution could be biased towards the centre of the Irish Sea.

This approach is broadly consistent with the approach taken in the report for the Marine Scotland project on strategic assessment of collision risk of OWFs to migrating birds (WWT Consulting Ltd, 2014) http://www.gov.scot/Resource/0046/00461026.pdf

NRW to provide guidance on the displacement rates to be used in the Environmental Statement Assessment

NRW (A) agree with the displacement rates presented of 30-70% for auks and 60-80% for gannet.

Regarding Manx shearwater, there is currently no evidence for any particular range of displacement rates (1-10%, 30-70% or any other) for this species from offshore wind farms. Therefore, NRW (A) welcome that the whole matrices will be presented in the PEIR and agree that this can be further discussed with the EWG upon review of the full matrices in the PEIR.

NRW to consider the proposed approach to LSE screening

NRW (A) do not agree with the approach set out during the Offshore Ornithology EWG to LSE screening. This is because LSE is a coarse screening filter, should be simple, and if further evidence is brought in, then effectively this should be part of the Appropriate Assessment (AA). This provides a transparent approach that can be followed through the Report to Inform Appropriate Assessment (RIAA). As such, NRW (A) would expect all sites where a qualifying feature has been recorded on the development site and where there is

potential connectivity (e.g. within foraging range) and a potential impact pathway (e.g. displacement or collision) and hence the potential to undermine the conservation objectives for the feature, to be carried through to the AA phase. Any additional work looking at e.g. apportioning impacts and assessments of predicted impacts against baseline mortality etc. should be included in the AA.

Additional NRW Comments following the Offshore Ornithology EWG03 meeting

Age classes, sabbaticals and apportionment of impacts

Apportionment of age classes:
NRW (A) do not agree with the use of the PVA stable age structures, as it is very difficult to state that this is what it is at the specific offshore site in a specific season. NRW (A) currently advise that proportions of adults and immatures are based on age-class information from site-specific surveys. NRW (A) note the difficulties associated with ageing some species from digital aerial data and currently recommend that in the absence of site-specific information on age classes, a precautionary approach assuming all adult-type birds are adults, is adopted.

Sabbaticals:
As noted during the EWG meeting, NRW (A) currently advise that sabbaticals are not included/taken into consideration, therefore, sabbaticals should not be removed from impact assessments.

Apportionment to colonies:
Impacts should be apportioned to colonies (both SPA/Ramsar for HRA and SSSIs for EIA). NRW (A) welcome the use of the NatureScot method for apportionment of impacts in the breeding season.

For apportionment of impacts to relevant colonies during the non-breeding season(s), NRW (A) advise the use of the data presented in the tables in Appendix A of the BDMPS report (Furness 2015 - Non-breeding season populations of seabirds in UK waters: Population sizes for Biologically Defined Minimum Population Scales (BDMPS) - NECR164 (naturalengland.org.uk)). Appendix A provides the BDMPS for seabirds during each season, such as during migration or winter (Furness, 2015). Please note that a separate BDMPS may need to be defined for the migration seasons as well as for the 'winter' period between migration seasons. It is possible to apportion seabird species to a specific SPA population by using the proportion of the relevant colony figure against the total BDMPS population during the season. Whether the colony figure in the BDMPS tables used is the adult figure or that for all ages depends on the approach to impact assessment (e.g. if a PVA model is being employed and impacts within the model are specified as changes to adult survival, then calculating the proportion of adults within the relevant BDMPS would be the appropriate approach). NRW (A) note that SSSIs are not listed in the Appendix A Furness (2015) report tables, so for these, there will be a need to find an appropriate proxy site to use.

D.4.4 Response from JNCC regarding the meeting minutes

From: [redacted]
To:
Cc:
Subject: RE: Morgan Mona offshore ornithology EWG03 meeting
Date: 22 December 2022 11:59:40
Attachments: [redacted]

CAUTION: This email originated from outside of RPS.

Good afternoon [redacted]

Please see JNCC's response to the EWG actions below. I have also attached the updated agreement log.

We are content with the minutes and have no comments to make.

NRW and JNCC to provide guidance on the displacement rates to be used in the Environmental Statement assessment
For Manx shearwater displacement we advise that whole displacement matrices are presented. At a later stage, the applicant can work back to establish what levels of displacement and mortality are likely to have an effect.

NRW and Natural England to consider the proposed approach to LSE screening. Agreement on approach to LSE Screening using outputs for collision risk modelling, displacement assessment and associated apportioning paper.
LSE is a coarse screening filter, should be simple and if further evidence is bought in, then effectively this should be part of the appropriate assessment. This provides a transparent approach that can be followed through the RIAA. Therefore, we would expect all sites where a qualifying feature has been recorded on the development site and where there is potential connectivity (e.g. within foraging range) and a potential impact pathway (e.g. displacement or collision) and hence the potential to undermine the conservation objectives for the feature to be carried through to the AA phase. Any additional work looking at e.g. apportioning impacts and assessments of predicted impacts against baseline mortality etc. should be included in the AA.

Apportionment of age classes (slides 37-39 - Apportioning)
We do not agree with the use of the PVA stable age structures, as it is very difficult to say that this is what it is at the specific offshore site in a specific season. We currently advise that proportions of adults and immatures are based on age-class information from site-specific surveys. We note the difficulties associated with ageing some species from digital aerial data and currently recommend that in the absence of site-specific information on age classes, a precautionary approach assuming all adult-type birds are adults is adopted.

Kind regards,

[redacted] BSc(Hons)
Offshore Industries Adviser

Marine Management Team
JNCC, Inverdee House, Baxter Street, Aberdeen, AB11 9QA
[redacted]

JNCC have been monitoring the outbreak of COVID-19 closely and developed a response plan. As a result, the vast majority of our staff are working from home and adhering to the government's advice on social distancing and travel restrictions. Whilst we are taking these actions we are available for business as usual. We will respond to enquiries as promptly as possible. However, there may be some delays due to the current constraints and we ask for your understanding and patience.


jncc.gov.uk

D.5. Offshore ornithology EWG meeting 4

D.5.1 Meeting minutes

MINUTES OF MEETING

Security Classification: Project External

Partners in UK offshore wind

MOM Number	:	20230223_Morgan gen Mona OO EWG04 MoM	**REV. No.**	: F02
MOM Subject	:	Morgan generation assets and Mona Offshore Ornithology Expert Working Group meeting 4		

MINUTES OF MEETING

MEETING DATE	:	23 February 2023
MEETING LOCATION	:	MS Teams
RECORDED BY	:	Kevin Linnane (RPS)
ISSUED BY	:	Samantha Tuddenham (RPS)

PERSONS PRESENT:

- [redacted] - RPS (KL)
- [redacted] - RPS (ST)
- [redacted] - RPS (JS)
- [redacted] - RPS (LM)
- [redacted] - RPS (AN)
- [redacted] - bp (MP)
- [redacted] - bp (SR)
- [redacted] - Niras (MH)
- [redacted] - JNCC (JW)
- [redacted] - JNCC (RH)
- [redacted] - Natural England (RB)
- [redacted] - Natural England (EW)
- [redacted] - Natural England (LB)
- [redacted] - Natural England (AR)
- [redacted] - Natural England
- [redacted] - NRW (HR)
- [redacted] - IoM (RS)
- [redacted] MMO (AP)
- [redacted] - RSPB (AM)
- [redacted] - TWT (BS)

APOLOGIES

- [redacted] - RSPB (AD)
- [redacted] - NRW (LR)
- [redacted] - MMO (RG)
- [redacted] - TWT (GJC)
- [redacted] - JNCC (JB)
- [redacted] - Natural England (ABR)

ITEM NO:	DISCUSSION ITEM:	Responsible party	Date
1.	**Project update (presented by MP)** The Applicant is expecting to publish the Mona and Morgan Generation Preliminary Environmental Information Reports (PEIR) end of March/ April 2023. Statutory consultation will then take place in April and May 2023. We have increased the duration of statutory consultation to 47 days taking into account the Easter holidays so we hope this will give the stakeholders time to read and respond to the PEIRs. Only the first year of data from the digital aerial surveys was available to feed into the Morgan Gen PEIR. The surveys end in March 2023 and the full two years of data will be incorporated into the Environmental Statement to accompany the DCO application. The Applicant will consult with the Expert Working Group (EWG) in summer 2023 to provide an update on the site-specific data and to confirm if there are any changes to the assessment as a result of the second year of data.		
2.	**Feedback and actions from EWG03 (presented by JS)** In EWG03, there was a query on why some auk ID rates were lower in some months than expected. We queried this with APEM and APEM have now updated their Auk ID rates. These updates will be taken into account in the Environmental Statement. KL noted that this lower ID rate primarily related to a few months, winter season, in particular in winter 2020/21. In EWG03 it was suggested that the displacement rates that should be used for Manx Shearwater are 70% displacement and 10% mortality. The numbers in this presentation present the recommended rates and they will be used for the Environmental Statement. KL- JNCC also requested that the full displacement matrices were presented. There are in PEIR so while we have not taken forward 70% displacement and 10% mortality these are included in the tables. JS- There was also a request for sabbaticals to be included as adult birds. The numbers in this presentation address this and this will be included in the Environmental Statement, however, it was not possible to update the PIER. KL- Sabbaticals are presented in the PEIR, they are included as a separate column rather than added to the adults. AM- Have collision risk impacts on Manx Shearwater been scoped out? What did you use for flight heights.		

	JS- We have carried out collision risk modelling for Manx Shearwater, we use generic flight heights from Johnston *et al*.[1] AM- There is some evidence that Manx Shearwater fly at wind turbine height. There is a general assumption from generic flight heights that they do not fly this high. However, there is evidence that is not in the public domain that they do fly that high. It would be good to see that acknowledged as an uncertainty.		
3.	**<u>HPAI survey update (presented by JS)</u>** The second summer of Morgan digital aerial surveys has recorded only six deceased birds, five of which were gannets and one unidentified. They make up a low proportion of total birds recorded however noting that it is one snapshot in time so this is more an overview of what has been recorded rather than a quantitative assessment of the impact of HPAI. There were also slightly lower numbers of birds recorded in the second year of surveys compared to the first however it is not possible to conclude whether the lower numbers in the second year are attributable to HPAI or other random fluctuations. It is normal for bird numbers to vary substantially between years even under baseline conditions and the abundances were broadly at a similar level as the first year of aerial surveys. AM- It is great that dead birds are also being recorded and presented. Are these records being passed on to any organisation? The SNCBs have jointly agreed how any data would be centralised but it would be good if it could be collated e.g. by NRW. HR- If the information can be shared within someone in NRW then I would suggest Matty Murphy. AM- The potential challenge is the assessment on populations and whether populations are still robust to the additional mortality from projects. There needs to be some consideration of this in the interpretation of the PVA results and in the HRA on the SPA populations against which impacts are assessed. There are also sources of natural variation from tidal cycles, it would be interesting to look at whether tidal cycles account of the difference in data between the first and second year of the survey. JS- In the MRSea models, we already incorporate environmental variations so we can look at tidal cycles in more detail. RS- It is welcome that the project is looking into HPAI. For the surveys results, should we set aside the averages and just use the higher numbers as one year of data is before the outbreak and one year is after. JS- If the affected colonies get new colony counts then the information will be comparative as the numbers affected will be compared against the updated population numbers.	**RPS to look at tidal cycles influence on survey result variability** **NRW to provide a list**	On going

[1] Johnston, A., Cook, A.S.C.P., Wright, L.J., Humphreys, E.M. and Burton, N.H.K. (2014), Modelling flight heights of marine birds to more accurately assess collision risk with offshore wind turbines. J Appl Ecol, 51: 31-41. https://doi.org/10.1111/1365-2664.12191

	KL- Could one of the SNCBs provide a list of the HPAI related data from the digital aerial surveys that would be useful for them to have and who we should provide this data to. The project will discuss what information can be made available. HR- Yes NRW will come back to you on this. *Post meeting note: NRW have requested that survey data records of dead birds are reported to Defra at [redacted] as well as being sent to NRW through their avain flu reporting email ffliwadarcnc@cyfoethnaturiolcymru.gov.uk.*	**of HPAI survey data that would be useful and a contact to send this data to.**	Complete
4.	**<u>Mona Offshore Cable Corridor (presented by JS)</u>** Impacts on the Mona Offshore Cable Corridor have been assessed qualitatively and quantitatively in the PEIR. The Mona Offshore Cable Corridor overlaps with the Liverpool Bay SPA. Conservative assumption is that the maximum displacement zone (from installation vessel) at any given time will be along a 4km stretch of the cable corridor (noting displacement will more likely be encircling the cable installation vessel). Red throated diver and common scoter were assessed quantitatively in the PEIR. BS- Is the project not looking to co-locate its cable corridor with the other wind farms in the area? KL- Not for Mona, for Morgan the cable will be in a co-located cable corridor with the Morecambe offshore wind project. The Mona project team looked at whether this would be viable (e.g. with Awel Y Mor), but this was not possible. BS- If the route is entirely different from the others on the north coast then the resistance that has occurred on Awel Y Mor may come up on Mona. KL- bpEnBW ran through the cable routing process and approach with the steering group so this has been presented to stakeholders. It will be fully detailed within the PEIR site selection chapter. MP- The Applicant has carried out a detailed site selection process and the offshore cable corridor avoids a high number of constraints; the cable corridor presented in the PEIR is the most viable option. HR- Is the worst case one installation vessel at one time, or could it be more? KL- Assumption is for one installation vessel at one time. HR- Would suggest that timing restrictions be considered for Red throated diver and common scoter so that the cable is not laid during key times for these species. RB and AM echoed this recommendation. KL- This could be examined but based on the numbers affected that will be presented, we don't think that this measure is	**The Applicant to review red throated diver and common scoter seasonality in Liverpool Bay SPA area in relation to**	On going

	required. The Applicant is looking to use vessel management practices to reduce disturbance where possible. RB- The mortality estimates may be very small however for the Liverpool Bay SPA there is concerns over availability of supporting habitats for red throated diver due to displacement effects. Natural England already consider there to be adverse effects on red throated diver in the Liverpool Bay SPA.	**cable installation**	
5.	**<u>Overview of the new conservation advice package for Liverpool Bay SPA (presented by EW)</u>** The new conservation advice package published by NRW, JNCC and Natural England. The package has been updated to make the attributes and features more clear for each feature. Species distribution, disturbance, supporting habitat and food availability attributes have been updated. For most attributes, the conservation objective is to maintain, with the exception of those associated with supporting habitat within the SPA, where there is a restore objective for extent of supporting habitats. Specifically, this relates to disturbance which projects should look to minimise. Red-throated diver have restore objectives for the distribution and extent of supporting habitats for non-breeding population attributes. There is also an update to the seasonality of each of the features.		
6.	**<u>Morgan Gen CRM analysis (presented by JS)</u>** The approach is the same as for Mona but based on the first 12 months of survey data. It will be updated with the full 24 months of survey data for the application. Collision risk modelling (CRM) was undertaken using the Shiny app online. It is a stochastic collision risk model. It is built from the basic band model. It allows you to include the confidence limits for parameters and the model will sample from a range and provide outputs on that range. The densities that fed into the model were either derived from MRSea where available, or from non-parametric bootstrapping where MRSea was unavailable. RS- The Isle of Man has a significant great black backed gull population. The Applicant should look at the seabird counts for the colonies. AN- the Isle of Man colonies are included the PEIR, with all colonies including isle of man included within each species foraging range: this includes GBBG and isle of man colonies		
7.	**<u>Migratory collision risk modelling (presented by JS)</u>** The SOSSMAT tool has been used for migratory CRM. RS- Have whooper swan and hen harrier been checked as migrants?		

	LM- Yes they have been included, all migratory water birds have been included. The table in the slides just presents a summary of some of the key species.		
8.	**<u>Apportioning assessment (presented by JS)</u>** We have undertaken apportioning based on the NatureScot method. We take the centroid of the offshore wind farm and use the mean-max foraging range plus one standard deviation. The mortalities form collisions and displacement are then apportioned to each colony. Apportioning is undertaken based on the proximity of a colony to the offshore wind farm, which is then assigned a weighting factor. We have used the standard age composition from Furness 2015 which provided the number of expected immature individuals in the population for each adult. HR- Last EWG we discussed that the age structures from the BPMPS was being used for age-class apportioning. Advice was that data from the survey images should be used to inform this. JS- We have not done this in the PEIR as the site survey data did not have this information. We will go back to APEM about this. RB-Survey for gannet should be able to come up with an age structure. JS- Yes, we can go back to APEM on this.	**Applicant to check with APEM on whether age structure can be provided for survey impacts**	Ongoing
9.	**<u>Cumulative Effects Assessment (presented by JS)</u>** The cumulative effects assessment (CEA) was carried out for • Common guillemot • Razorbill • Atlantic puffin • Northern gannet • Black-legged kittiwake. The CEA was based on a 500km range which is based on the maximum foraging range of a species included in the assessment. Publicly available data on projects was included. If further data becomes available before the application then this will be incorporated into the Environmental Statement where possible. HR- The cumulative assessment should be based on all projects within the relevant BDMPS population area for each species (as defined in Furness 2015) rather than use of a 500km range. RB- Agree with HR suggestions. Noted an example whereby during the non-breeding season, birds from North Sea colonies could move into the Irish Sea. KL- The Applicant can consider this request for the application. Concern that you would end up with a very large list of projects, so not proportionate.	**The Applicant to review whether all projects within the relevant BDMPS should be included in the cumulative assessment for the Environmental Statement**	Ongoing

	JS- A tiered approach has been adopted based on the certainty that a project will be developed and the reliability of information available in the public domain. RS- There is the Orsted Isle of Man wind farm, this could be considered although understand it is not at the application stage yet. KL- There is no public information about the Isle of Man wind farm therefore there is no information on which to undertake a quantitative assessment. We cannot make any assumptions on what other projects may do. It is included in the project CEA long list and the Applicant is aware of it but we have not been able to include it in the PEIR assessment due to lack of specific information. LB- On the discussion regarding the range over which cumulative projects are considered. It would be relevant to include some of the North Sea and Scottish Projects as populations with birds that overwinter in the Irish Sea may also travel to the North Sea. AN- Is this based on marine pathway ranges? LB- Yes.		
10.	**<u>Population Viability Analysis (presented by JS)</u>** HR- We would advise that a burn in should be used and it should be 5 years. Impacts should commence when the offshore wind farm starts operating. AN- We used the Natural England tool and this specified that the burn in is for future works. We can include it for the application but that is why we did not use it in the first instance. AM- The tool has been updated but not the associated guidance. RB- The tool has been updated but not the guidance and recommend a 5 year burn in. SR- When will the guidance be updated? RB- will take that away and confirm. RH- In the CEA, when you are accounting for impacts from Erebus on guillemot, where have you taken the numbers for the impact assessment? We did disagree with some of the rates in the original ES. There are several addendums to the ES that use different rates. JS-We used the displacements to run our own analysis. AN- With regards to burn in period, that assumes we are using relatively up to date colony counts, what shall we do if colony counts were last counted a long time ago? If we do a burn in period for that, the model may run for more than the specified burn in period. Can we have your thoughts on that? HR- Need to give it some consideration and will get back to you on that .	**Natural England to confirm when the PVA model guidance will be updated.** **NRW to respond to RPS query around burn in time to be used in PVA modelling for**	Complete Complete

	RS- Where are the growth rate for the populations from? AN- We use the productive and demographic rates form Horswill and Robinson 2015. This is then put into the model. RS- some populations we known are declining on Isle of Man. AN- we have used the recommended source of Horswill and Robinson 2015. We acknowledge this may be outdated and so can we request that JNCC provide the data they used to present their productivity graphs on their seabird population reports (e.g. as presented here https://jncc.gov.uk/our-work/black-legged-kittiwake-rissa-tridactyla/)? This will then allow us to consider more updated productivity and survival scores for PVA. JW- we will take this away and see what can be done. RS- supports this recommendation.	**older colony counts** **JNCC to look into providing access to the data they used to produce their productivity score graphs for UK countries and for each species. JNCC confirmed that the BTO should be contacted.**	Ongoing
11.	**<u>LSE Screening methodology (Presented by KL)</u>** We discussed the approach to LSE screening with the steering group in July 2022. We described the slightly different approach that has been taken for the Mona and Morgan Gen PEIRs. Following this, we have had clear feedback from stakeholders on the approach to LSE Screening and therefore would like to discuss a compromise approach for the final application. Approach taken in the PEIR is that apportioning assessment has been used to identify the SPAs and qualifying features where a risk of LSE could not be excluded. Where mortalities were <1 individual they were screened out from the assessment as LSE could be ruled out alone and in-combination. Where mortalities identified from apportioning were >1 individual, these sites were screened in, with a particular focus on 'in combination' effects. Where mortality was <1 these sites were screened out. This is based on the worst-case scenario where the layers of conservatism in the displacement and CRM analysis as well as the maximum design parameters used (e.g. for displacement the maximum mortalities associated with the greatest displacement, up to 70% displacement, and the greatest mortality rates, up to 10%) should ensure a precautionary approach. If more realistic/less conservative assumptions are made (e.g. lower displacement and mortality rates), the numbers of birds affected are reduced considerably. For those sites that have been taken forward to the appropriate assessment i.e. where there is the potential for more than one bird to be affected, only very small numbers have been identified both in absolute numbers and as a proportion of the background mortality for the relevant SPAs (see slide showing mortalities for guillemot at Lambay Island and Ireland's Eye SPAs). These are against background mortalities of hundreds or thousands of individuals per annum (i.e. therefore the in-combination impacts		

	are well within background variation). If all sites with potential connectivity with the Mona and Morgan Generation Offshore Wind Projects were screened in, the Information to Support Appropriate Assessment (ISAA) would be exceptionally long with a large number of tables presenting very small mortality numbers for Mona and Morgan Generation. In the approach adopted for PEIR, the Applicant is looking to develop a proportionate HRA, responding to well known and acknowledged criticisms of the HRA process and making the assessment more accessible for stakeholders. As flagged by the offshore ornithology EWG, in terms of an audit trail, the apportioning numbers that have been used to screen out SPAs are all set out in the HRA Stage 1 screening document. As such, future projects can undertake a full in-combination assessment that includes mortality estimates from the Mona and Morgan Generation Offshore Wind Projects. We have had feedback from stakeholders in the last offshore ornithology EWG that this approach to LSE screening is not what has been applied to other wind farms historically. The Applicant is therefore suggesting a compromise solution, noting that the approach for PEIR will be as previously set out. For the HRA Stage 1 screening and ISAA to be submitted with the application for consent, the Applicant will look to take a more traditional approach to the HRA Stage 1 screening while trying to control the level of detail in the ISAA. We would look to screen on the basis of the foraging ranges from SPAs with breeding colonies (as is typically undertaken for UK offshore wind farms). We would also look to screen SPAs and qualifying features out, where it can be demonstrated that there will be 0 mortalities of breeding birds (i.e. through CRM, displacement or apportioning e.g. fulmer and Manx shearwater and collision risk modelling, see slides). The Applicant is proposing to undertake a 'two step' integrity test. The first step would be to undertake a high level initial assessment within the ISAA, using the apportioning paper to present where there is no risk of adverse effects on integrity on an SPA and not including a very detailed assessment against the conservation objectives for each low risk SPA (e.g. using a brief, tabulated approach to concluding no adverse effects on integrity). The Mona and Morgan Generation Offshore Wind Projects are well sited offshore wind farms in regard to ornithological aspects for the HRA and numbers across the sites area generally low therefore we are expecting a good number of SPAs to fall into this low risk category, that is, most if not all of the SPAs and features which were screened out at LSE in the PEIR. In the second step, a more detailed assessment would then be undertaken on the SPAs where there is a greater risk of adverse effects on integrity (likely to be focussed on in-combination effects). Requested Feedback:	**EWG to provide feedback on whether a compromise solution to the assessment included in the ISAA would be acceptable in**	Completed

	• Please can the EWG provide feedback to these meeting minutes to indicate if a compromise solution would be acceptable in principle – this would allow us to work on restructuring the LSE Screening and ISAA for the ES. • While reviewing the PEIR could stakeholders provide feedback on which SPAs would be worth taking forward to the detailed assessment within the ISAA (i.e. second step integrity test).	**principle (see post meeting note below).**	
12.	**<u>Next steps (presented by KL)</u>** • Meeting minutes to be circulated 2 weeks following the EWG. • Agreement logs to be circulated following EWG. • Agreement on approach to LSE Screening using apportioning. The EWG05 will be organised in summer 2023 to discuss the section 42 response and updates for the Environmental Statement.		
13.	**Close of meeting.**		
14.	**Post Meeting Note:** Following the EWG meeting, a follow up meeting was held on 8 March 2023 with NRW (HR and LR) to re-present the LSE Screening methodology (Item 11 above) as HR was unable to attend the end of the EWG meeting on 23 February 2023. During the meeting, the LSE screening thresholds proposed for the DCO application (i.e. 0 adults individuals from SPAs) was queried by HR. HR asked whether this would include "rounding down" apportioned features/SPAs and therefore would this mean <0.5 adult individuals as a threshold for screening out sites/features? KL noted that if this threshold of <0.5 adult individuals (or another numerical threshold as advised by SNCBs) was acceptable to all SNCBs, then that would help ensure the ISAA is proportionate. HR not certain that this would be acceptable to SNCBs. KL queried whether this could be discussed with other SNCBs and feed back to the project in the meeting minutes. Action HR and LR. HR questioned whether this threshold would assume the highest mortalities for both Displacement and Collision Risk. KL confirmed this was the approach for the LSE Screening; the full range of mortalities is presented in the apportioning paper, but for LSE Screening the project would use the highest, most conservative number. Coming onto the compromise approach outlined for the ISAA (i.e. step 1 to undertake a "high level" integrity test), HR suggested that 1% of baseline mortalities from the SPA could be used as a threshold for those sites included in a "high level" assessment in the ISAA. HR suggested this could include a presentation (e.g. in tabular format) of the SPA, qualifying feature, apportioned mortalities, total population (and year), baseline mortalities and project mortalities as a % of the baseline mortalities. Those over	**HR and LR (NRW) to liaise with SNCBs on:** **(a) whether there is a numerical threshold which could be used for LSE Screening.** **(b) whether the 1% baseline mortality threshold could be used for the "Step 1" integrity**	Completed

	the 1% threshold would require more detailed consideration in the ISAA. KL queried whether this could be discussed with other SNCBs and feed back to the project in the meeting minutes. Action: HR and LR.	**test in the ISAA.**	

D.5.2 Response from Natural England regarding the meeting minutes

Date: 27 March 2023
Our ref: DAS/UDS A000566 426713
Your ref: Morgan & Mona Ornithology EWG04 23.02.23

[redacted]
BP Alternative Energy Investments Limited

c/c [redacted]
RPS/ Energy

Hornbeam House
Crewe Business Park
Electra Way
Crewe
Cheshire
CW1 6GJ

[redacted]

BY EMAIL ONLY

Dear [redacted]

Discretionary Advice Service (Charged Advice) – UDS A000566
Development proposal: BP EnBW Morgan and Mona Offshore Wind Farm
Consultation: Morgan & Mona Ornithology EWG04 23.02.23

This advice is being provided as part of Natural England's Discretionary Advice Service in accordance with the Quotation and Agreement dated 17 May 2021 to BP Alternative Energy Investments Limited.

The following advice is based upon the information within the 4th Ornithology Environmental Working Group for Morgan generation and Mona offshore wind projects (attended on 23rd February 2023) and subsequent meeting notes provided 13th March 2023 by [redacted]

Natural England was asked to provide feedback on:

1) Compromise solution: ISAA Assessment
2) Cable route: Red-throated diver and Common scoter at Liverpool Bay SPA
3) Cumulative effects assessment
4) PVA guidance

Detailed comments

1) Compromise solution: ISAA assessment

Natural England considers that a fully detailed methodology should be presented in writing to support the proposed approach to LSE & the ISAA assessment. In principle, Natural England is supportive of the two-stage approach to the appropriate assessment. Natural England considers the approach suggested by NRW to be acceptable, using <1% of baseline mortality to rule out AEOI in stage one, and further detailed assessment of any site/feature combinations where predicted mortality exceeds 1% of baseline, e.g., through PVA and consideration of impacts against conservation objectives.

Natural England retains some concerns with the approach to LSE screening. Natural England reiterates that LSE should represent a coarse initial filter. Natural England does not agree that mortalities of <1 individual should be screened out from the assessment, as Natural England does not agree that LSE can necessarily be ruled out on this basis, especially in-combination. With regards to what can be treated as 0 mortality (rounded if <0.5 or =0 only), Natural England advises that actual 0 only should be used to screen out LSE.

Natural England re-iterates that a clear audit trail to enable in-combination assessments is vital. It is essential that all predicted impacts on each SPA are clearly presented in an accessible document so that future projects can draw on it.

The method as detailed does not consider impacts to non-breeding birds. Non-breeding season populations of seabirds in UK waters: Population sizes for Biologically Defined Minimum Population Scales (BDMPS) - NECR164 (naturalengland.org.uk) should be used to identify potential connectivity in the non-breeding season. Relevant sites should then be considered in the appropriate assessment, most likely (but not necessarily) at the 'light touch' phase.

Finally, Natural England believe that this 'compromise' approach may be appropriate for this specific project scenario, where there is potential connectivity to a very large number of sites but the likelihood of substantial impacts is generally low. However, it should be acknowledged that this approach will not necessarily be appropriate for all cases.

2) **Cable route - Red-throated diver and Common Scoter at Liverpool Bay SPA**

The proposed cable route passes through a relatively important area for common scoter and red-throated diver in the Liverpool Bay SPA. The mortality estimates may be very small, however, at the Liverpool Bay SPA there is concern over the reduced availability of supporting habitats for red-throated diver due to displacement (i.e., the 'distribution' & 'disturbance' conservation objectives rather than 'abundance'). Natural England already considers there to be adverse effects on red throated diver in the Liverpool Bay SPA. Therefore, Natural England would strongly advise that all works on the cable corridor are undertaken in the period May-September, avoiding the red-throated diver non-breeding season as defined in the conservation advice package, Liverpool Bay/Bae Lerpwl SPA - UK9020294A (naturalengland.org.uk).

3) **Cumulative effects assessment**

Please refer to Natural England's published guidance on screening and apportioning in the breeding and non-breeding seasons and cumulative and in-combination assessments in 'Offshore Wind Marine Environmental Assessments: Best Practice Advice for Evidence and Data Standards. Phase III: Expectations for data analysis and presentation at examination for offshore wind applications'. Natural England advise that the proposed use of an arbitrary 500km range is not appropriate for screening in projects for a cumulative effects assessment. The relevant spatial scale will be species-specific and should be based on the relevant BDMPS (Furness, 2015).

4) **PVA guidance**

Please refer to Natural England's published guidance on PVA in 'Offshore Wind Marine Environmental Assessments: Best Practice Advice for Evidence and Data Standards. Phase III: Expectations for data analysis and presentation at examination for offshore wind applications' (see section 5.3.1.1 Population modelling). With respect to use of a burn-in period, note that this guidance states *"PVAs should estimate the impacted and unimpacted populations over the lifetime of the project and include a 'burn-in' period (5 years) to allow the model to reach stability prior to the projection period beginning."*

For clarification of any points in this letter, please contact me using the details provided below.

Yours sincerely,
Elliott Waltho
Marine and Coastal Lead Adviser
Coast and Marine Team
Cheshire to Lancashire Area Team
[redacted]@naturalengland.org.uk

☒ The advice provided in this letter has been through Natural England's Quality Assurance process

The advice provided within the Discretionary Advice Service is the professional advice of the Natural England adviser named below. It is the best advice that can be given based on the information provided so far. Its quality and detail is dependent upon the quality and depth of the information which has been provided. It does not constitute a statutory response or decision, which will be made by Natural England acting corporately in its role as statutory consultee to the competent authority after an application has been submitted. The advice given is therefore not binding in any way and is provided without prejudice to the consideration of any statutory consultation response or decision which may be made by Natural England in due course. The final judgement on any proposals by Natural England is reserved until an application is made and will be made on the information then available, including any modifications to the proposal made after receipt of discretionary advice. All pre-application advice is subject to review and revision in the light of changes in relevant considerations, including changes in relation to the facts, scientific knowledge/evidence, policy, guidance or law. Natural England will not accept any liability for the accuracy, adequacy or completeness of, nor will any express or implied warranty be given for, the advice. This exclusion does not extend to any fraudulent misrepresentation made by or on behalf of Natural England.

Co[redacted]

Annex 1
European Protected Species

A licence is required in order to carry out any works that involve certain activities such as capturing the animals, disturbance, or damaging or destroying their resting or breeding places. Note that damage or destruction of a breeding site or resting place is an absolute offence and unless the offences can be avoided (e.g. by timing the works appropriately), it should be licensed. In the first instance it is for the developer to decide whether a species licence will be needed. The developer may need to engage specialist advice in making this decision. A licence may be needed to carry out mitigation work as well as for impacts directly connected with a development. Further information can be found in Natural England's 'How to get a licence' publication.

If the application requires planning permission, it is for the local planning authority to consider whether the permission would offend against Article 12(1) of the Habitats Directive, and if so, whether the application would be likely to receive a licence. This should be based on the advice Natural England provides at formal consultation on the likely impacts on favourable conservation status and Natural England's guidance on how the three tests (no alternative solutions, imperative reasons of overriding public interest and maintenance of favourable conservation status) are applied when considering licence applications.

Natural England's pre-submission Screening Service can screen application drafts prior to formal submission, whether or not the relevant planning permission is already in place. Screening will help applicants by making an assessment of whether the draft application is likely to meet licensing requirements, and, if necessary, provide specific guidance on how to address any shortfalls. The advice should help developers and ecological consultants to better manage the risks or costs they may face in having to wait until the formal submission stage after planning permission is secured, or in responding to requests for further information following an initial formal application.

The service will be available for new applications, resubmissions or modifications – depending on customer requirements. More information can be found on Natural England's website.

D.5.3 Response from NRW regarding the meeting minutes

Project Mona & Morgan Offshore Ornithology EWG04 NRW Actions

[redacted]
Senior Marine Advisor

27th March 2023

Introduction

This advice is provided in response to the Meeting Actions from the Mona and Morgan generation Offshore Ornithology EWG04 which took place on 23rd February 2023.

NRW advice in this document is provided (under a Discretionary Advice Service agreement) in respect of a proposal which will require an application for which Natural Resources Wales is a Statutory Consultee.

The customer acknowledges that the content of any advice or assistance provided by NRW is advisory only and that it shall not be deemed to bind or in any other way restrict NRW in performing its statutory functions.

The recipient acknowledges that:

- any advice given or materials or documentation provided by NRW do not constrain or bind NRW in respect of its statutory functions or its role as a statutory consultee or any decision NRW may make in relation to any application for a licence or permit;
- any advice given by NRW does not bind NRW in respect of any future representations it may make as statutory consultee or any decision NRW may make in relation to any application for a licence or permit;
- any views or opinions expressed by NRW are without prejudice to the consideration NRW may be required to give to any application or any future representations as statutory consultee or any decision NRW may make in relation to any application for a licence or permit;
- the final decision as to any representations made by NRW as statutory consultee will be based on all the relevant information available to NRW at the time it makes such representations;
- NRW cannot and does not give any guarantee as to the representations it may make as statutory consultee; and,
- any advice given by NRW may be overtaken by changes in available information, law, policy and guidance relevant to the subject matter of the advice.

Advisors Consulted:
Marine Ornithology

Actions

Action: NRW to respond to RPS query around burn in time to be used in PVA modelling for older colony counts

NRW Advisory (A)'s understanding is that the burn-in is done as a separate component and is done before the main PVA runs are done - the burn-in involves running baseline PVA simulations for n burn-in years and outputting the age structures that are obtained at the end of this period. This age structure is then used as the initial age structure within the main PVA runs. The burn-in run, and main PVA run are identical except in the way that the initial age structure is specified. So, NRW (A) advise that the PVAs are parameterised using a 5-year burn-in period, with the impacts set to commence when the project is anticipated to start operating and to run for the lifetime of the project, and with the starting population being the latest count for the site in question.

Action: EWG to provide feedback on whether a compromise solution to the assessment included in the ISAA would be acceptable in principle (see post meeting note in meeting minutes)

In principle, NRW (A) are supportive of the two-stage approach to the appropriate assessment. We advise use of <1% of baseline mortality to rule out AEOI from the project alone or in-combination in stage 1 of ISAA integrity assessment, with further detailed assessment of any site/feature combinations where predicted mortality exceeds 1% of baseline mortality e.g. through PVA and consideration of impacts against conservation objectives in stage 2. NRW (A) consider that a fully detailed methodology should be presented in writing to support the proposed approach to LSE and the ISAA assessment. We also understand that the approach to LSE and ISAA taken in the PEIR will be the original approach rather than any updated/amended one. We therefore recommend that detail is provided in the PEIR of the proposed revised approach that will be taken in the submission.

NRW (A) retain some concerns with the approach to LSE screening. We reiterate that LSE should represent a coarse initial filter. We do not agree that mortalities of <1 individual should be screened out from the assessment, as we do not agree that LSE can necessarily be ruled out on this basis, especially in-combination. With regards to what can be treated as 0 mortality (rounded if <0.5 or =0 only), NRW advises that actual 0 only should be used to screen out LSE.

NRW (A) again advise that a clear audit trail to enable in-combination assessments is vital. It is essential that all predicted impacts on each SPA are clearly presented in an accessible document so that future projects can draw on it.

The method as described appears to focus on impacts to breeding birds with no consideration to non-breeding birds. NRW (A) advise Furness (2015) is used to identify potential connectivity in the non-breeding season. Relevant sites should then be considered in the ISAA, which would most likely be at the stage 1 / 'light touch' phase.

Whilst NRW (A) consider that this 'compromise' approach may be appropriate for this specific project, where there is potential connectivity to a very large number of sites but the likelihood of substantial impacts is generally low, it should be acknowledged that this approach will not necessarily be appropriate for all cases.

Action: NRW to liaise with SNCBs on: (a) whether there is a numerical threshold which could be used for LSE Screening. (b) whether the 1% baseline mortality threshold could be used for the "Step 1" integrity test in the ISAA

A meeting was held between NRW, NE and JNCC on 20/03/23 to discuss these issues and the 'compromise' solution to the assessment to be included in the ISAA in the submission. As a result, please see our response above to the Action regarding compromise solution to assessment included in the ISAA.

Additional NRW Comments following Offshore Ornithology EWG04

Cable route – Liverpool Bay SPA
The proposed cable route passes through a relatively important area for common scoter and red-throated diver in the Liverpool Bay SPA. As noted during the OO EWG, NRW (A) advise that works on the cable corridor are undertaken outside of the key times for these species – i.e. avoiding works between October-April – see Liverpool Bay SPA conservation advice package.

Cumulative Effects Assessment
As noted during the OO EWG, NRW (A) do not consider that the proposed use of an arbitrary 500 km range is appropriate for screening in projects for a cumulative effects assessment. The relevant spatial scale will be species-specific and should be based on the relevant BDMPS as defined in Furness (2015).

REFERENCES

Furness, R.W. (2015) Non-breeding season populations of seabirds in UK waters: Population sizes for Biologically Defined Minimum Population Scales (BDMPS). Natural England Commissioned Reports, Number 164. Available from: http://publications.naturalengland.org.uk/file/5734162034065408

D.5.4 Response from JNCC regarding the meeting minutes

From: [redacted]
To:
Cc:
Subject: RE: Morgan generation and Mona offshore wind project Offshore ornithology EWG04
Date: 27 March 2023 16:37:11
Attachments: [redacted]

CAUTION: This email originated from outside of RPS.

Good afternoon, [redacted]

With regard to the latest Orni Expert Working Group (EWG 04), JNCC have no comments to make on the minutes from 23/02/2023 (email 13/03/2023).

There were two actions on JNCC in response to this meeting. I know Rebecca responded directly to you on the first of these (copy of the email attached for completeness). With regard to the second action; EWG to provide feedback on whether a compromise solution to the assessment included in the ISAA would be acceptable in principle (see post meeting note in meeting minutes), please see our response below.

JNCC response:
We advise that a fully detailed methodology should be presented in writing to support the proposed approach to LSE & the AA.
We agree in principle that mortalities of zero individuals can be screened out at the LSE screening stage. We advise that actual 0 only should be used at the LSE screening stage (meaning no value other than 0.0 individuals).
We agree in principle that 1% baseline mortality can be used within Stage 1 of the Two step Integrity Test within the AA for the alone assessment.
We advise that 1% baseline mortality is also used in the in-combination assessment, and where mortality from Mona or Morgan in-combination with the other identified projects results in an increase in 1% or greater of baseline mortality, that will be taken to Stage 2.
These thresholds are key to ensuring relevant impacts are taken through to the in-combination assessment and that all predicted impacts on each SPA are clearly presented in an accessible document so that future projects can draw on it.

With regards to the Agreement Log, we have added an update to cell H36 in blue. For clarity, the text in cell H36 reads:

> "27/03/2023 Update: We advise that a fully detailed methodology should be presented in writing to support the proposed approach to LSE & the AA prior to seeking agreement on the approach."

If you have any questions, please let me know.

Kind regards,

[redacted]

[redacted] BSc(Hons)

Offshore Industries Adviser
Marine Management Team
JNCC, Inverdee House, Baxter Street, Aberdeen, AB11 9QA
[redacted]

JNCC have been monitoring the outbreak of COVID-19 closely and developed a response plan. As a result, the vast majority of our staff are working from home and adhering to the government's advice on social distancing and travel restrictions. Whilst we are taking these actions we are available for business as usual. We will respond to enquiries as promptly as possible. However, there may be some delays due to the current constraints and we ask for your understanding and patience.


jncc.gov.uk

D.5.5 HRA Methodology update for Mona/Morgan Generation

Partners in UK offshore wind

MORGAN GENERATION AND MONA OFFSHORE WIND PROJECTS

HRA Methodology Update

Image of an offshore wind farm

05 May 2023
F01

Document status					
Version	**Purpose of document**	**Authored by**	**Reviewed by**	**Approved by**	**Review date**
F01	Issue to stakeholders	RPS	bpEnBW	bpEnBW	05/05/2023

Prepared by:	Prepared for:
RPS	**Morgan and Mona Offshore Wind Ltd.**

Contents

Acronyms

Acronym	Description
AEOI	Adverse Effect on Integrity
HRA	Habitats Regulations Assessment
ISAA	Information to support and Appropriate Assessment
LSE	Likely Significant Effect
PEIR	Preliminary Environmental Impact Assessment
SPA	Special Protection Area

Units

Unit	Description
%	Percentage

1 HRA METHODOLOGY UPDATE

1.1 Introduction

1.1.1.1 The benefits of a proportionate Habitats Regulations Assessment (HRA) for all parties are well understood. The approach undertaken for ornithology Stage 1 HRA Screening in the Preliminary Environmental Information Report (PEIR), set out the Applicant's aim to develop a proportionate Habitats Regulations Assessment (HRA), in response to the well-known and acknowledged criticisms of the HRA process whilst making the assessment more accessible for stakeholders. However, the feedback from stakeholders in the offshore ornithology Expert Working Group (EWG) was that this methodology is not what has been applied to other wind farms historically. The Applicant is therefore proposing a compromise solution for the Stage 1 HRA Screening and Stage 2 (Information to Support Appropriate Assessment (ISAA)) to be submitted with the application for development consent.

1.1.1.2 This technical note provides a summary of the proposed ornithology HRA methodology for both the Mona and Morgan Generation Offshore Wind Projects. The purpose of this note is to outline the process that will be undertaken within the HRA Stage 1 Screening and the Stage 2 ISAA and seek approval for this method with the Evidence Plan Steering Group prior to drafting the HRA to be submitted with the application for consent. This note is for the offshore ornithology EWG members to consider and to also use to update the offshore ornithology EWG agreement logs as appropriate, while reviewing this technical note alongside the PEIR for the Morgan Generation and Mona Offshore Wind Projects.

1.1.1.3 It should be noted that this technical note does not list the sites considered, a full list of European sites will be presented separately in the fully updated Stage 1 HRA Screening reports for the Morgan and Mona Offshore Wind Projects.

1.2 Stage 1 HRA Screening

1.2.1.1 For the Stage 1 HRA Screening, the Applicant will look to take a more traditional approach whilst aiming to manage the level of detail included in the Stage 2 ISAA. The Applicant will undertake a preliminary screening based on the foraging ranges from Special Protection Areas (SPAs) with breeding colonies (as is typically undertaken for UK offshore wind farms), with an LSE Screening matrix presented for each SPA within the relevant foraging range. However, in order to ensure a proportionate Stage 2 ISAA which focusses on the key SPAs and associated features of importance; where it can be demonstrated that there will be zero mortalities (i.e. zero mortalities will be considered as 0.0, a 0.2 figure will not be rounded down to 0) of breeding birds (i.e. through collision risk modelling and/or displacement assessments and subsequent apportioning to individual SPAs) the associated qualifying feature will be screened out of further assessment.

1.2.1.2 All sites and features where mortalities associated with collision or displacement are predicted to be more than zero (>0) will be screened in for further assessment in the ISAA. The evidence to support these conclusions (i.e. numbers of bird mortalities apportioned to individual SPAs) will be set out in the individual LSE Screening matrices (as per the approach in PEIR).

1.3 Stage 2 ISAA

1.3.1.1 For the HRA Stage 2 ISAA, the Applicant is proposing to undertake a 'two step' integrity test as discussed with the Evidence Plan Steering Group and the offshore ornithology EWG. This will involve a high level initial step 1 assessment to determine those SPAs with low risk (further information on 'step 1 for 'low risk' SPAs is provided below in paragraph 1.3.2.1) of Adverse Effect on Integrity (AEOI), and a more detailed step 2 assessment for those SPAs where there is greater risk of an AEOI.

1.3.2 Integrity test: step 1

1.3.2.1 Step 1 will involve a high level initial assessment using the apportioning assessment to present where there is low risk of AEOI of an SPA. If the predicted magnitude for the project alone is <1% of the baseline mortality of the reference population for a qualifying feature, then a high level assessment will be presented and a conclusion of no AEOI can be made. For those deemed 'low risk' SPAs, a high-level assessment will be provided against the conservation objectives (e.g. a brief, tabulated approach to concluding no AEOI). As discussed with the EWG (to be agreed via this note), this level of detail is deemed sufficient if the predicted magnitude is <1% of the baseline mortality of the reference population. In these cases, it will be concluded that the predicted magnitude will not affect the achievement of the conservation objectives for the SPA and as a result will not have an adverse effect on the integrity of the SPA.

1.3.2.2 Based on information presented within the PEIRs, impacts from the Mona and Morgan Generation Offshore Wind Projects on SPAs and associated ornithological features from displacement and collision are generally low and therefore the Applicant is anticipating that a large number of SPAs will fall into this low risk category, that is, most if not all of the SPAs and features which were screened out at the Stage 1 HRA Screening Stage in the PEIRs.

1.3.2.3 If the predicted magnitude is >1% of the baseline mortality of the reference population for a qualifying feature, then further consideration will be given to the magnitude of the likely effect, including the contribution of impacts from other plans and projects, in-combination. In this case an AEOI cannot be ruled out and the SPA and associated qualifying features will be progressed to the Integrity test: step 2, outlined in paragraph 1.3.3.1 below. This approach broadly follows the same approach as that followed for other DCO applications (e.g. Hornsea Four), although as set out above, the Applicant would look to streamline this process (e.g. by tabulating information for ease of review).

1.3.3 Integrity test: step 2

1.3.3.1 In the second step, a more detailed assessment will be undertaken on the SPAs where there is a greater risk of AEOI (likely to be focussed on in-combination effects). As outlined above in paragraph 1.3.2.3 these will be for European sites where the predicted magnitude is >1% of the baseline mortality of the SPA reference population for a qualifying feature. Step 2 will then follow a similar process to that undertaken to the Stage 2 ISAA submitted with the PEIR, and will use further detailed information from collision risk modelling assessments, displacement assessments and Population Viability Analysis (where required for particular species/sites) to examine against each conservation objective for the relevant SPAs in order to make a conclusion with regard to adverse effects on integrity.

D.6. Offshore ornithology EWG meeting 5

D.6.1 Meeting minutes

MINUTES OF MEETING

Security Classification: Project External

Partners in UK offshore wind

MOM Number	:	20230629_Morgan and Mona Offshore Ornithology	**REV. No.** :	F02
MOM Subject	:	Morgan and Mona Evidence Plan Offshore Ornithology meeting 5		

MINUTES OF MEETING

MEETING DATE	:	30/06/2023
MEETING LOCATION	:	Microsoft Teams
RECORDED BY	:	[redacted] (RPS)
ISSUED BY	:	[redacted] (RPS)

PERSONS PRESENT:

- [redacted] – bp (GV)
- [redacted] – bp (SR)
- [redacted] – RPS (KL)
- [redacted] - RPS (ST)
- [redacted] – RPS (LM)
- [redacted] – Niras (MH)
- [redacted] – Niras (WG)
- [redacted] JNCC (JW)
- [redacted] JNCC (RH)
- [redacted] – Natural England (KB)
- [redacted] – Natural England (RB)
- [redacted] – Natural England (AR)
- [redacted] – NRW (LR)
- [redacted] – NRW (HR)
- [redacted] – NRW (EL)
- [redacted] – IoM (RS)
- [redacted] – MMO (AP)
- [redacted] -MMO (MS)
- [redacted] – NRW (RN)

APOLOGIES:

- [redacted] -RSPB
- [redacted] -RSPB

ITEM NO:	DISCUSSION ITEM:	Responsible party	Date
	<u>Project updates (presented by GV)</u> Statutory consultation on the Mona and Morgan Generation PEIRs ended on 4th June. The Applicant appreciates all the feedback; we are currently reviewing all the responses and how they can be addressed. From the statutory consultation feedback and parallel activities, the Applicant has been considering a number of project		

	updates. There are several updates to the project description envelope that are expected to be included in the application. The Applicant is looking to reduce the Mona Array Area and the Morgan Generation Array Area. They are expected to be reduced from what was presented in PEIR and lie wholly within the array areas presented in the PEIR. The Mona Array Area is anticipated to be reduced by approximately 33% and lie wholly within Welsh offshore waters. The Morgan Array Area is anticipated to be reduced by approximately 10%. The primary driver for these reductions is shipping and navigation, specifically ensure safety of navigation. The need for changes for the project design envelope has been highlighted through engagement with a number of the ferry companies in the Irish Sea. The reductions have also been driven through consultation with aviation and other sea users receptors. The layout principles for both Mona and Morgan Generation are expected to be updated to increase the spacing requirements between offshore structures, the specific updates will be communicated in due course. These updates are to address concerns from commercial fisheries. The Applicant is anticipating that monopile foundations will be removed from the project design envelope. The foundations options remaining will be gravity base or jackets (which may be pin piled or suction bucket foundations). This is being driven by the ground conditions. The Applicant expect there to be a mixed foundation solution taken forward to the application, likely to be a mix of jacket and gravity base foundations. The smallest wind turbine option is being removed from the project design envelope due to feedback from the supply chain that this turbine option won't be available at the time of construction. The rotor diameter will therefore also increase from 280m to 320m and this is also based on feedback from the supply chain on the parameters for the wind turbines that will be available at the time of construction. *Post meeting note: The rotor diameter will increase from 280m to 320m not 340m, as set out in the slide pack. The slide pack has been updated and is circulated alongside these meeting minutes.* The Applicant is also reviewing the parameters for the design envelope following the Section 42 statutory consultation responses. Any updated parameters will be fully explained and justified within the application. RH- Will there be a reduction in the number of turbines? GV- Yes, the PEIR presented a maximum of up to 107 wind turbines and the application will be for less than that. HR- Are there plans to update the abundance estimates for the new array areas and subsequently update the CRM assessments. LM- Yes we will update all the assessments to account for the project design changes.		

	<u>Section 42 responses - overarching (presented by KL)</u> The Applicant and RPS have been working through all the S42 responses, looking to the project design envelope and the environmental assessment. There were a couple of key responses that we wanted to raise to the steering group; these will also be discussed with the EWGs. There were several requests for the project to undertake assessments for historic projects where quantitative information required to include them in the cumulative and in-combination assessments is not available. The cumulative and in-combination assessment can only be undertaken on publicly available data and it may not be appropriate to undertake analysis for other projects. There is also no precedent for that type of analysis. The IoM offshore windfarm is in the early stage of the planning process and we expect the scoping report to be published in the autumn. We will incorporate the information in the public domain into the cumulative and in-combination assessment for Mona and Morgan Generation, in line with the Tiered approach. There were a few comments on the site-specific data available to be included in the PEIR. The benthic data for the Mona Offshore Cable Corridor and the zone of influence for the Mona and Morgan Array Areas will be presented in the July EWG. For marine mammals and offshore ornithology, the 24 months of survey data for Morgan Generation will be presented and discussed in the October EWG meetings for those topics. Natural England provided comments on the Morgan Generation and the Morgan and Morecambe Offshore Wind Farms: Transmission Assets (Transmission Assets) applications to ensure that a whole project assessment is undertaken. Are there specific topics or receptors that are of particular concern for the cumulative assessment for Morgan Generation and the Transmission Assets together? The Applicant is considering how human topic cumulative impacts are addressed and we have strategies for those impacts. We can only base the CEA on information in the public domain. These projects are subject to separate consent applications so there will always be difficulty regarding what information is available at the time of application. However, that is why the tier approach to CEA was developed and adopted and we feel the approach set out in the slides adequately addresses the concerns raised. We will circulate the slides after the meeting so you can review the approach to CEA in full. Please can the stakeholders provide their feedback in writing with the meeting minutes. LR- As the projects are being developed by the same applicant, you will have more information than is the public domain e.g. for Morgan Generation, the PEIR is based on 12 months of data. Will the Mona Cumulative Effects Assessment (CEA) be able to present	**Stakeholders to provide their feedback on the approach to the CEA for Morgan Generation**	Complete

	updated information for Morgan Generation using the full 24 months of data. KL- The Mona DCO application will be submitted first in Q1 2024. We don't know the exact gap between the Mona and Morgan Generation applications. The information included in the Mona CEA needs to be already in the public domain, it would be legally very difficult to include new information for Morgan Generation in the Mona application before the Morgan Generation application is published. In addition, there is a risk that if we include information for Morgan Generation that hasn't been finalised, the information may change and then this would pose a risk to the Mona DCO application. HR- Is there a chance that Mona and Morgan Generation will be in examination at the same time with CEAs based on different numbers. Will there be a need to change the CEA for Mona during examination? KL- We don't expect them to be on the exact same timeline, but we are anticipating that there will be an overlap in the examination. It is not unusual for CEAs to be updated in examinations so one of the first actions once the Morgan Generation application was published would be to submit a note to the Examining Authority for the Mona DCO at the earliest opportunity to outline the implications to the Mona CEA. For these types of developments, it is inevitable that one must go first, but as they are being developed by the same applicant and have the same EIA consultants, we will be able to move quickly to update stakeholders on any implications for the applications.		
	<u>Section 42 response- Offshore ornithology (Presented by LM and MH)</u> **<u>Auk ID rates:</u>** There were some responses regarding the low Auk species ID rates from the site-specific surveys. Statutory Consultation responses recommended to carry out some scenario testing to investigate the potential impact of low species ID rates and determine if spatial modelling and apportioning is appropriate. This was specifically in relation to the Mona data. RPS have gone back to APEM on this and they have re-analysed the data and provided updated Auk species ID rates. Before, there were several winter months with ID rates of common guillemot and razorbill below 25%, and now there are only 2 months below 50%. Overall, all monthly ID rates of common guillemot and razorbill have been improved and we are proposing to use the updated ID rates in the application. Please can the EWG clarify if scenario testing is still suggested considering the updated ID rates? HR- Do you know what APEM have changed in this re-analysis in order to get the higher ID rates? LM- They have gone back over the data however we don't know specifically what they have done. KL- It is possible that they have used a more experienced member of staff who is able to ID birds in more images.	**EWG to clarify if scenario testing is still suggested considering the updated Auk species ID rates** **The Applicant to provide further detail on methodology for raising the**	Complete Complete

	HR- It would be good to see something in writing from APEM regarding what changes have been made that have resulted in the increased Auk species ID rates. . RB- I would like to agree with HR, we would want to know how these ID rates have been updated. Providing new ID rates seems strange and we would like to see the methodology for this. *Post meeting note: NRW need to see the detail on what exactly Apem have done that has resulted in these revised species ID rates first and then can consider scenario testing in light of further understanding of what Apem are doing.* **Migratory Seabirds:** The Applicant agrees with the Statutory Consultation response that SOSSMAT might not be appropriate for scoping of migratory seabird species. As recommended, an alternative approach is considered for the Environmental Statement which is based on the Marine Scotland project on strategic assessment of collision risk of OWFs to migrating birds. Can the EWG provide feedback on whether this approach would be acceptable. HR- This approach sounds fine and it in line with what NRW have suggested. What species will be considered? LM- Gull species, skua species, shearwater species, storm petrels and Leach's petrel, tern species, gannet and kittiwake HR- Seabird species such as gannet, kittiwake and auks are more likely to be adequately represented in the monthly digital aerial surveys and so do not require assessments of passage populations. However, species like terns, skuas and little gull which may pass though the site on passage may not be adequately captured by baseline characterisation surveys, which represent a snapshot of conditions at the particular time of the survey and hence assessments should account for the flux of such birds on passage through the site. *NRW post meeting note: As confirmed during the EWG, NRW Advisory are content with the approach set out during the EWG and slides, which is in line with the approach we outlined in our previous advice.* **Liverpool Bay SPA (KL presented):** The RPS and Niras ornithologists have reviewed the HiDef report that supported the updated Liverpool Bay SPA conservation advice package. This report confirmed that aggregations of common scoter and red-throated divers broadly coincided with inshore areas of the Mona offshore export cable which are previously known to support large aggregations of this species during the winter. The Applicant is looking at what can be done to reduce the impact of the projects on birds. For the Mona export cable installation, ideally schedule works to avoid the most sensitive period, but where it is not possible to avoid cable installation from 1st November to 31st March, measures will be set out in the consent plan 'Measures to minimise disturbance to marine mammals and rafting birds' to be submitted with the application. Measures will include not over revving vessel engines and sticking to defined transit routes. These	**Auk species ID rates** **EWG to provide feedback on the proposed methodology for scoping of migratory seabirds**	Complete

	are standard measures for reducing disturbance to birds from SPAs. Noting the impact of cable installation will be very short term and intermittent, and to reiterate, works would be scheduled to avoid this period wherever possible. RB- Natural England would highlight that there isn't much that can be done to minimise disturbance to red throated diver due to cable installation works; the measures to minimise disturbance were more related to activities such as Crew Transfer Vessel movements, rather than cable installation works. The only effective measure is to not be present in the area. KL While the Project will schedule works to avoid the most sensitive period where possible, the project is not including Horizontal Directional Drilling (HDD) operations at the landfall in the works for which scheduling will be undertaken to avoid the wintering period within the SPA. The HDD operations will be undertaken in the intertidal area or very nearshore. As red throated diver and common scoter are generally not present or present in very low numbers in the very nearshore area, the impact will be very small. It is therefore not proportionate to apply the restrictions to the HDD operations. RB- This sounds ok for red throated diver, but it would be worth taking a close look at common scoter who may be found closer to shore. HR- NRW provisionally agree with Natural England, as long as all qualifying features (so including the wintering waterbird assemblage) are considered and a justification provided. *Post meeting note: The Mona intertidal bird surveys recorded red-throated diver at a peak of 65 birds in January 2022 at the Mona landfall area, although they were usually found at lower densities but present during all the wintering months in which surveys took place (December 2021 to March 2022). Red throated diver were recorded at densities between <0.1-1 average birds per hectare in the nearshore area (1.5km from shore). None were recorded within the intertidal area and to roughly 150m off the shore. Common scoter were recorded at a peak of 2,150 in January 2023 with <0.1 average birds per hectare recorded within one hectare in the intertidal area and at densities between <0.1-5 average birds per hectare within 150 m of shore (Mona Offshore Wind Ltd, 2023[1]).* **<u>Cumulative/in-combination assessments (presented by MH)</u>** Statutory consultation highlighted that the cumulative and in-combination assessments do not factor in impacts from a number of other projects due to a lack of data. Impacts specified as 'unknown' have been treated as zero which will inevitably underestimate impacts, potentially significantly. Statutory consultation responses consider this approach to be unacceptable, and hence consider it inappropriate to comment on the potential	**Natural England to update the Applicant with progress**	Ongoing

[1] Mona Offshore Wind Ltd, 2023, Mona Offshore Wind Project Preliminary Environmental Information Report, Volume 7, annex 24.2: Intertidal ornithology Technical Report. https://enbw-bp-consultation.s3.eu-west-2.amazonaws.com/PEIR/04+Preliminary+Environmental+Information+Report/07+-+Onshore+Annexes/RPS_EOR0801_Mona_PEIR_Vol7_24.2_IO_TR+FINAL.pdf

	significance of cumulative or in-combination assessments presented in the PEIR submission. MH noted that for some older projects no CRM or apportioning of impacts to designated sites was undertaken. The Applicant cannot quantify impacts for these assessments as it would not be appropriate to undertake an assessment for another project and there is no precedent for it. These projects will be considered qualitatively in the CEA and in-combination to ensure they are included. KL- We would like further feedback and discussion on how we should approach this. Do the SNCBs have suggestions for how to proceed. RB- Natural England have a proposed approach. Natural England have secured funding to run a project to gap fill the assessment numbers for old offshore wind farm projects that didn't undertake that analysis. This will consider their Rochdale envelope and the as built scenarios. This is more important for the Irish Sea as there is a higher proportion of older projects, compared to the North Sea. Natural England are looking to get it contracted as soon as possible and once complete the numbers will be in the public domain for future offshore wind projects to use. GV- When do you expect this to be available to use? RB- Natural England are aware of the accelerated timescales for these Irish Sea projects. We are hoping it can be delivered very quickly but we don't have a date at this point. Ideally by the end of the year. GV- Is there any intention to engage with the industry on the methodology and expectation for use? This study sounds very useful but industry buy in will be key to ensure it is used consistently. RB- As soon as the industry is consulted or steering groups established for this type of project, it significantly increases the timescales for delivery. In terms of buy-in, it will be following the Natural England best practice guidance and the intention is to produce something that is live and so can reflect any updates to methods and parameters. Although it will include as built scenarios there is no mechanism for securing projects to those parameters so we won't be using them in the main assessment. SR- We are updating the application documents over the next few months. We are really keen on this approach however we are not sure the timescales between this project and the Mona and Morgan Generation application will match up. We will wait for any updates from Natural England. Projects usually have a cut off of four months ahead of application for including additional information. KL- If the project could be updated on how this is progressing over the next few months that would be very useful. Even if it is headline outputs on what is being produced. For Mona and Morgan Generation we will have to progress with the approach we have set out but we welcome this project from Natural England	**and consider Irish sea as a priority area, given the project programme for DCO submission in Q1 2024.**	

	and as and when outputs are available, we can look to incorporate into the CEA as appropriate. RB- We will keep the Applicant up to date as far as possible. It might be possible to have a phased delivery with the Irish Sea coming first. **<u>Cumulative assessment in non-breeding season:</u>** Originally, the cumulative study area was based on gannet foraging ranges. Statutory consultation response disagreed with this approach. For non-breeding season, the cumulative study area for the application will encompass other relevant marine developments, especially other offshore wind energy developments within the 'UK Western Waters and Channel' which is the relevant Biologically Defined Minimum Population Scales (BDMPS) region (Furness, 2015) and offshore wind energy developments within the Republic of Ireland waters (excluding developments off county Clare, Galway, Mayo and Sligo). Colonies in the Irish Sea do not contribute many birds to the BDMPS population in the North Sea therefore there shouldn't be a need to include projects in the North Sea. *Post meeting note: The action has been updated to request feedback on the cumulative study areas to match the discussion in the EWG.* *Post meeting note from NRW: Do you mean proposed foraging ranges here? - as the approach discussed in the EWG was relating to cumulative assessment in the non-breeding season and the approach does not use foraging ranges, it was to use the 'UK Western Waters and Channel' BDMPS. This is effectively what we advised in our PEIR response – essentially the cumulative assessments should include all plans/projects located within the relevant species specific BDMPS as defined in Furness (2015) – which for most relevant species is the 'UK Western Waters', although should note that for Manx shearwater and kittiwake the relevant BDMPS is 'UK western waters & Channel' and for GBBG, the Mona/Morgan sites are located within the 'SW & Channel waters' BDMPS, although they are also near to the 'West of Scotland' BDMPS as well.* **<u>Foraging ranges and breeding populations:</u>** JNCC recommend using the foraging range for guillemot and razorbill from Woodward et al. (2019) which exclude data from Fair Isle and use colony specific foraging ranges for gannet, see table at the bottom of this section. This is unlikely to affect the assessment significantly but we would like clarification on the foraging ranges we should be using. Foraging ranges proposed to be taken through to the assessment will be included as a post meeting note in the meeting minutes for agreement. RH- Yes, it would be good to have these provided in writing in the meeting minutes. JNCC has colony specific ranges which we can provide, these should be consistent with the NatureScot tool. To calculate the regional breeding population, the Applicant followed the same approach as Awel Y Mor. We calculated the number of birds breeding within the species' foraging ranges of the array areas and added that to the proportion of immature	**EWG to provide feedback on proposed cumulative study area(s)?** **JNCC to provide the colony specific foraging ranges** **NRW to send the regional breeding population calculations for west coast projects**	Complete Complete Complete

	birds from the BPMPS (i.e., western waters) during the return migration. An alternative approach would be to include the proportion of immature birds based on actual numbers of the colony within the foraging range. HR- This has been discussed for a number of west coast projects. NRW and the other SNCBs have produced some calculations for the west coast summing up the adults and immatures including no western water totals. We can send this to these projects to ensure a consistent approach. KL- Will we be able to see how these numbers have been calculated and the rationale behind the calculations. HR- It is a table summing up the numbers for all the colonies so it should be clear. RS- Is the change to regional breeding populations for just immature birds or adults as well. LM- Yes, we sum up all the colonies within breeding range. HR- Will that be used for the whole assessment or just displacement and CRM. LM- Used across the whole assessment. MH- For the regional breeding population, would it mean that the population is the same for any project on the west coast? HR- Yes. RH- JNCC are also happy with this approach. *Post-meeting query: Can JNCC confirm the foraging range to apply for puffin. For guillemot and razorbill the foraging ranges excluding data from Fair Isle are recommended however for puffin, the foraging ranges incorporating Fair Isle data are recommended. Can JNCC explain the different treatment of foraging range data for puffin?* **<u>Whooper Swan:</u>** The Applicant has assessed collision risk on whooper swan. We have had a response to the PEIRs from Orsted that they have data from monitoring at Western Duddon Sands. Should we be requesting this data from Orsted or are there other data sources from Irish Sea we should be using? We have done an assessment based on the data included in the SOSMAT tool. RS- TWT did tracking of Whooper swan in the Irish Sea. MH- That data would have been included in the SOSSMAT tool. KL- Does the EWG think we need these data considering we have done an assessment using the SOSSMAT tool. We aren't sure what data this is or how quickly it could be attained. RS- Do we know anything about their flight heights offshore.	**JNCC to confirm the foraging range to apply for puffin** **EWG to provide feedback as to whether the applicant needs to request the whopper swan data from Orsted.**	Complete Complete

LM- There are some general guidance on flight heights in the Wright *et al*. (2012)[2] paper that have been used in the assessment.

Post meeting note: NRW Advisory did not raise anything about Whooper Swan and were content with it being assessed using the SOSSMAT approach, so no further comment on this.

Post meeting note: Please see below table of foraging ranges suggested to be used in the application.

Mean- max foraging ranges with standard deviation (SD) for seabird species (Woodward et al., 2019). Sample sizes are shown in parentheses (i.e. no of individuals tracked).

Species	Mean Max foraging range + SD
Arctic tern	25.7±14.8 (9)
Black-headed gull	18.5 (1)
Common gull	50 (1)
Common tern	18.0±8.9 (16)
Great cormorant	25.6±8.3 (4)
Northern fulmar	542.3±657.9 (16)
Northern gannet	315.2±194.2 (21) for colonies without site specific maximum values. However, for Grassholm SPA and St Kilda SPA where site specific evidence exceeds this value (509.4 km), 516.7 km and 709 km are used respectively.
Common guillemot	(55.5±39.7) Use of mean max+1SD discounting Fair Isle values, as presented in Woodward *et al.* (2019).
Herring gull	58.8±26.8 (10)
Black-legged kittiwake	156.1±144.5 (37)
Lesser black-backed gull	127±109 (18)
Little tern	5 (1)
Manx shearwater	1,346.8±1,018.7 (6)
Atlantic puffin	137.1±128.3 (7)
Razorbill	(73.8±48.4). Use of mean max+1SD discounting Fair Isle values, as presented in Woodward *et al.* (2019).
Roseate tern	12.6±10.6 (3)
Sandwich tern	34.3±23.2 (9)
European shag	13.2±10.5 (17)

<u>LSE screening and ISAA approach (presented by KL)</u>

This slide is a repeat of what has been presented in previous EWGs. It summarises the updated approach to the HRA screening and ISAA that was sent to the steering group and offshore ornithology EWG in May 2023. The applicant is looking for feedback on if this approach is acceptable for the application.

Feedback provided by SNCBs ahead of the meetings (as action from Steering Group meeting 5 on 29/06/2023).

Key points:

RPS to update HRA

[2] Wright, L.J., Ross-Smith, V.H., Austin, G.E., Massimino, D., Dadam, D., Cook, A.S.C.P., Calbrade, N.A. and Burton, N.H.K., 2012. Assessing the risk of offshore wind farm development to migratory birds designated as features of UK Special Protection Areas (and other Annex 1 species). *BTO Research Report*, *592*.

	Approach is only for these wind farms – not to be applied to other offshore wind farms. SNCBs broadly content with the approach for the projects alone and agree unlikely to be substantial effects for the projects alone. SNCBs do not agree with use of the 1% threshold for in-combination. KL noted that the approach needs to be amended to clarify that the 1% threshold would only be used if it could be demonstrated that the effect was under this threshold for all projects considered in the in-combination assessment (noting limitations on data availability for historic projects as set out above). RPS to update HRA methodology paper. *Post meeting note: NRW Advisory would like to see the updated HRA methods paper first before making any agreement on the proposed approach.* Approach does not refer to non-breeding birds – see discussion points above relating to non-breeding birds. Approach is acceptable for the test against conservation objectives relating to populations from distant SPAs, but not for conservation objectives related to distribution of features in SPAs and availability of habitat. KL noted this broadly aligns with the approach taken for PEIR, where SPAs such as the Irish Sea front and Liverpool Bay SPA were screened in. HR- Can you put explanation in writing and we can consider it. KL- Yes it will go in the meeting minutes for review. RB noted the comment and reiterated that this is why the approach is likely to be only appropriate for these projects. RB- In relation to the in-combination approach, discussion like this would benefit from the slides ahead of time. It is difficult to share our opinion in meeting without thinking it through if we haven't seen the slides before. KL- Fully understand we will send over slides ahead of the meeting in October.	**methodology paper to clarify in-combination approach.**	Complete
	<u>Power analysis (presented by LM)</u> Power analysis was requested from the SNCBs, following feedback during Expert Working Group (EWG) meetings, in order to demonstrate that the current coverage is appropriate for the purposes of the EIA and ISAA. The original request for a power analysis was to determine the adequacy of coverage of the baseline characterisation survey. As 'adequacy' is not clearly defined, the power analysis in this report determines how appropriate the survey coverage would be for any potential monitoring of ornithology populations (e.g. pre- and post-construction monitoring), should this be required. However, this can be used to infer the adequacy of coverage for the EIA, specifically in relation to the magnitudes of change which are predicted in the EIA. Thus, this report determines the statistical		

	power to determine a potential displacement effect of building the Mona Offshore Wind Project and the Morgan Generation Assets given the current coverage and a range of displacement scenarios used in the EIA and ISAA. The analysis revealed that to achieve a statistical power of 80% a minimum number of 852 birds across 12 months of breeding season or non-breeding season was required to detect a displacement of 30%, providing that 12 months of breeding season and non-breeding season data are available. For the scenario with a 40% displacement, this number decreases to 467 birds over 12 months of breeding season and non-breeding season. In the EIA and the ISAA the range of displacement rates used was 30% to 70% for auks and kittiwake, and 60 to 80% for gannet. For the higher displacement scenarios which the EIA and ISAA are based on, the numbers of birds and densities required to achieve 80% power would be considerably lower. Based on the lowest level of potential effect outlined in both the EIA and the Information to Support the Appropriate Assessment (ISAA), which stands at 30% displacement, the set of analyses demonstrates that the coverage of analysis of the baseline characterisation surveys are sufficient for detecting changes in the majority of bird species. Where the coverage is not sufficient to detect change, even if displacement was very high for these species this would not be detectable given their consistent low abundances in the Mona and/or Morgan digital aerial survey area. Consequently, it can be concluded that these surveys and resulting data are appropriate for establishing the baseline to inform the EIA and ISAA. RB- Thanks for undertaking the analysis. We will review the report and provide any comments. RH- Agree, thanks for undertaking it and look forward to reviewing the paper.	**EWG to provide feedback on power analysis and update agreement logs on baseline characterisation.**	Complete
	<u>Agreement logs (presented by KL)</u> The latest agreement logs were circulated in May and it would be useful if stakeholders could review their positions within those agreement logs and update them now the PEIR has been reviewed. Parallel to that the Applicant and RPS is working through the statutory consultation responses and looking at where we consider agreement has been reached. If stakeholders can provide feedback on agreement logs to date and then following the EWGs, we will circulate the meeting minutes two weeks after the meeting, but the agreement logs may be a week or so behind that to incorporate the statutory consultation feedback.	**Stakeholders to provide updated EWG agreement logs to reflect the information provided in the PEIR.**	Complete
	<u>Next Steps (presented by KL)</u> KL noted that meeting minutes are to be circulated 2 weeks following the meeting, with agreement logs circulated after the meeting minutes. Next EWG meeting planned for October 2023.		

D.6.2 Response from JNCC regarding the meeting minutes

From: [redacted]
To:
Cc:
Subject: FW: Morgan Generation & Mona fifth offshore ornithology EWG meeting
Date: 28 July 2023 15:38:42
Attachments: [redacted]

Hi [redacted]

Regarding the fifth Ornithology EWG, please see our response to the actions below (attached for convenience) and the reviewed Agreement Log.

Stakeholders to provide their feedback on the approach to the CEA for Morgan Generation.
We agree with the proposed approach to the CEA for Morgan Generation.

EWG to clarify if scenario testing is still suggested considering the updated Auk ID rates.
Once further detail on the methodology for raising the Auk ID rates from Apem has been provided we can clarify whether scenario testing is still suggested.

EWG to provide feedback on the proposed methodology for scoping of migratory seabirds.
We agree with the use of the SOSSMAT tool for scoping migratory seabirds.

EWG to provide feedback on proposed foraging ranges.
We agree with the proposed foraging ranges as listed in the minutes.

JNCC to provide the colony specific foraging ranges.
A full table of the foraging ranges we recommend is provided.

Species	Foraging Range (km)	Metric
Common eider	21.5	MM
Red-throated diver	9	Max/MM
European storm petrel	336	Max/MM
Leach's storm petrel	657	Mean
Northern fulmar	1200.2	MM+SD
Manx shearwater	2365.5	MM+SD
Northern gannet	509.4	MM+SD
European shag	23.7	MM+SD
Cormorant	33.9	MM+SD
Black-legged kittiwake	300.6	MM+SD
Black-headed gull	18.5	Max/MM
Mediterranean gull	20	Max/MM
Common gull	50	Max/MM
Great black-backed gull	73	Max/MM
Herring gull	85.6	MM+SD
Lesser black-backed gull	236	MM+SD
Sandwich tern	57.5	MM+SD

Little tern	5	Max/MM
Roseate tern	23.2	MM+SD
Common tern	26.9	MM+SD
Arctic tern	40.5	MM+SD
Great skua	931.2	MM+SD
Common guillemot*	95.2	MM+SD
Razorbill*	122.2	MM+SD
Black guillemot	9.1	MM+SD
Atlantic Puffin	265.4	MM+SD

*Excludes Fair Isle Data

Exceptions to recommended foraging ranges:

Species	Exception Applied	Foraging range (km)	Metric
Northern gannet	Forth Islands SPA	590	Max
	Grassholm SPA	516.7	Max
	St Kilda SPA	709	Mac
Common guillemot	All Northern Isle SPAs	153.7	MM+SD
Razorbill	All Northern Isle SPAs	164.6	MM+SD

JNCC to confirm the foraging range to apply for puffin.

We confirm that the foraging range to use for Atlantic puffin is 265.4km (MM+SD). Woodward et al. (2019) state (page 138) that "As was the case for common guillemot and razorbill, foraging distances travelled by Atlantic puffin from Fair Isle are higher than those at most other sites (RSPB dataset), although they are not as exceptional when compared to other sites as those of the other two auk species" and "Observations of birds carrying fish have been made at distances of 250 km from the Faeroe Islands (Harris & Wanless 2011), offering further speculative evidence that Atlantic puffins forage at longer distances than the other auk species. Hence the distances observed from Fair Isle and Hermaness should not necessarily be considered exceptional until more data and data from additional colonies have been collected, particularly data from colonies where local prey availability may be greater". Therefore, we advise using the generic mean max +1SD value as stated in table 5.

EWG to provide feedback as to whether the applicant needs to request the whopper swan data from Orsted.

We suggest that the applicant enquire as to the type and duration of whooper swan data that Orsted hold and provide a summary of the outcomes of the study, before determining whether or not the full data needs to be requested.

EWG to provide feedback on power analysis and update agreement logs on baseline characterisation.

It is stated that the power isn't affected by the survey coverage, but is affected by the density of birds, which is affected by the survey coverage. The results compared to Mona and Morgan data are given in number of birds. But as this power analysis is trying to determine whether survey coverage is sufficient to detect change in both density and abundance, JNCC considers it more appropriate to compare the required densities of birds rather than the required number of birds.

Stakeholders to provide updated EWG agreement logs to reflect the information provided in the PEIR.

Update provided to Mona Item 10 and Item 11 in the Agreement Log.

Please let me know if you have any questions.

Kind regards,

[redacted]

[redacted] **| Offshore Industries Adviser | JNCC**

Pronouns: [redacted]

Inverdee House, Baxter Street, Aberdeen, AB11 9QA | [redacted]

Working pattern: Monday to Friday

Website **Twitter** **Facebook** **LinkedIn**

D.6.3 Response from Natural England regarding additional actions

Date: 17 August 2023
Our ref: DAS/UDS A009203 442325
Your ref: Morgan and Mona Offshore Ornithology EWG05 Additional Actions

[redacted]
RPS/ Energy
Goldvale House
27-41 Church Street West
Woking
Surrey
GU21 6DH

cc [redacted]
RPS

Hornbeam House
Crewe Business Park
Electra Way
Crewe
Cheshire
CW1 6GJ

[redacted]

BY EMAIL ONLY

Dear [redacted]

Discretionary Advice Service (Charged Advice): UDS A009203
Development proposal: Morgan Generation and Mona Offshore Windfarm
Consultation: Morgan and Mona Offshore Ornithology EWG05 additional actions via email (7th August 2023)

This advice is being provided as part of Natural England's Discretionary Advice Service (DAS) in accordance with the Quotation and Agreement dated 23rd May 2023 to Morgan Offshore Wind Limited & Mona Offshore Wind Limited.

The following advice forms Natural England's response to the email sent to Natural England on 7th August 2023 regarding additional actions from the fifth Offshore Ornithology EWG.

Natural England were asked to provide a response to the actions:

- EWG to clarify if scenario testing is still suggested considering the updated Auk ID rates
- EWG to review the updated HRA methodology note and confirm progress to agreement on approach to LSE Screening

Detailed comments

Auk ID rates and apportioning

Natural England appreciate the clarification provided on the enhanced QA methodology for improving auk ID rates. We note that at Mona significant improvements were made in some months, although ID rates of <50% remain for 2 months. We also note that in some months the sample size differed, with increases and decreases apparent. It would be useful to understand why. Although improved ID rate data from Morgan has not been presented we assume that the same QA process has, or will be applied. In this case, we do not consider it necessary to carry out scenario testing in support of using the identified fraction of the auk population to apportion unidentified birds.

Updated HRA methodology

Natural England highlight that we did not agree with the approach taken to LSE screening of birds in the non-breeding season(s) undertaken by the Round 4 HRA. Our position remains unchanged. Furthermore, we do not consider plan-level HRA to necessarily be an appropriate 'guide' for methodologies to be applied at the project level, as certain concessions/adaptations may be made due to the scale of the process.

Natural England retain concerns regarding the approach to non-breeding season LSE screening detailed in paragraph 1.2.14. Natural England do not consider it appropriate to consider breeding season foraging ranges to identify sites for consideration in the non-breeding season, and consider this approach to be fundamentally flawed due to the generally wide ranging and migratory nature of seabirds outside of the breeding season. Natural England advise that the Applicant reviews the approach taken in the Morecambe OWF PEIR. In this case, potential connectivity (and thus, LSE if there is an impact pathway) has only been assumed for cases where the contribution of an SPA population is thought to represent >1% of the BDMPS population. This provides a proportionate and sensible screening approach to reduce the site/species combinations for consideration, while ensuring those that may be at risk are properly considered.

In paragraph 1.3.2.1 we suggest the following edit as highlighted, *'If the predicted magnitude for the project alone and/or in-combination (acknowledging the known uncertainties related to effects from other projects in the Irish Sea) is <1% of the baseline mortality of the reference population for a qualifying feature, then a high level assessment will be presented and a conclusion of no AEOI can be made.'*

For clarification of any points in this letter, please contact me using the details provided below.

Yours sincerely,

[redacted]
Marine and Coastal Lead Adviser
Coast and Marine Team
Cheshire to Lancashire Area Team
[redacted]

☒ The advice provided in this letter has been through Natural England's Quality Assurance process

The advice provided within the Discretionary Advice Service is the professional advice of the Natural England adviser named below. It is the best advice that can be given based on the information provided so far. Its quality and detail is dependent upon the quality and depth of the information which has been provided. It does not constitute a statutory response or decision, which will be made by Natural England acting corporately in its role as statutory consultee to the competent authority after an application has been submitted. The advice given is therefore not binding in any way and is provided without prejudice to the consideration of any statutory consultation response or decision which may be made by Natural England in due course. The final judgement on any proposals by Natural England is reserved until an application is made and will be made on the information then available, including any modifications to the proposal made after receipt of discretionary advice. All pre-application advice is subject to review and revision in the light of changes in relevant considerations, including changes in relation to the facts, scientific knowledge/evidence, policy, guidance or law. Natural England will not accept any liability for the accuracy, adequacy or completeness of, nor will any express or implied warranty be given for, the advice. This exclusion does not extend to any fraudulent misrepresentation made by or on behalf of Natural England.

Cc [redacted]

Annex 1
European Protected Species

A licence is required in order to carry out any works that involve certain activities such as capturing the animals, disturbance, or damaging or destroying their resting or breeding places. Note that damage or destruction of a breeding site or resting place is an absolute offence and unless the offences can be avoided (e.g. by timing the works appropriately), it should be licensed. In the first instance it is for the developer to decide whether a species licence will be needed. The developer may need to engage specialist advice in making this decision. A licence may be needed to carry out mitigation work as well as for impacts directly connected with a development. Further information can be found in Natural England's 'How to get a licence' publication.

If the application requires planning permission, it is for the local planning authority to consider whether the permission would offend against Article 12(1) of the Habitats Directive, and if so, whether the application would be likely to receive a licence. This should be based on the advice Natural England provides at formal consultation on the likely impacts on favourable conservation status and Natural England's guidance on how the three tests (no alternative solutions, imperative reasons of overriding public interest and maintenance of favourable conservation status) are applied when considering licence applications.

Natural England's pre-submission Screening Service can screen application drafts prior to formal submission, whether or not the relevant planning permission is already in place. Screening will help applicants by making an assessment of whether the draft application is likely to meet licensing requirements, and, if necessary, provide specific guidance on how to address any shortfalls. The advice should help developers and ecological consultants to better manage the risks or costs they may face in having to wait until the formal submission stage after planning permission is secured, or in responding to requests for further information following an initial formal application.

The service will be available for new applications, resubmissions or modifications – depending on customer requirements. More information can be found on Natural England's website.

D.6.4 Response from Natural England regarding the meeting minutes

Date: 27 July 2023
Our ref: DAS/UDS A009203 442325
Your ref: Morgan and Mona Offshore Ornithology EWG05 30th June 2023

[redacted]
RPS/ Energy
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GU21 6DH

cc [redacted]
RPS

Hornbeam House
Crewe Business Park
Electra Way
Crewe
Cheshire
CW1 6GJ

[redacted]

BY EMAIL ONLY

Dear [redacted]

Discretionary Advice Service (Charged Advice): UDS A009203
Development proposal: Morgan Generation and Mona Offshore Windfarm
Consultation: Morgan and Mona Offshore Ornithology EWG05

This advice is being provided as part of Natural England's Discretionary Advice Service (DAS) in accordance with the Quotation and Agreement dated 23rd May 2023 to Morgan Offshore Wind Limited & Mona Offshore Wind Limited.

The following advice forms Natural England's response to the meeting minutes provided for the Morgan and Mona Offshore Ornithology EWG05 attended by Natural England on 30th June 2023.

Natural England were asked to provide feedback on the following points:

- The approach to the CEA for Morgan Generation
- Clarify if scenario testing is still suggested considering the updated Auk ID rates
- The proposed methodology for scoping of migratory seabirds
- Whether the applicant needs to request the whooper swan data from Orsted.
- Proposed foraging ranges

Detailed comments

Meeting Minutes

The statement "*RB – Will that be used for the whole assessment or just displacement and CRM*" on page 8 of the meeting minutes has been mistakenly attributed to Richard Berridge. We are unsure who made the statement.

Cumulative and in-combination assessments

Natural England have secured funding for a project to quantify displacement and collision impacts from all relevant extant offshore wind farms using contemporary assessment methods projects. We anticipate the project can prioritise the assessment of Irish Sea projects to facilitate a more comprehensive cumulative and in-combination assessment of relevant Round 4 and Round 5

projects.

Natural England will keep the Applicant up to date as far as possible in terms of timelines and outputs from this work, and their potential application for the assessments of the Morgan and Mona OWFs. Given the accelerated timelines for submission, this project may not deliver data to enable gap-filling of relevant impacts in time for the cumulative effects assessment. Thus, Natural England would welcome further discussion and consideration of this issue through the EWG. A qualitative assessment/consideration of unknown impacts may be an appropriate compromise.

Auk ID Rates

Natural England retain concerns regarding the reported large auk ID rates, and the apportioning of unidentified birds to species. We reiterate that the provision of updated ID rates with no explanation as to how or why these have improved relative to previous analysis simply raises further concerns around the data processing that has been undertaken.

Natural England therefore consider that scenario testing to confirm that apportioning of unidentified large auks is appropriate may still be required. However, we suggest in the first instance that a full explanation of the methods used to improve ID rates, and some evidencing of those rates should be presented to the EWG for review and discussion.

Migratory seabirds - proposed methodology

Natural England agree with the proposed methodology for assessing impacts on migratory seabirds and propose further discussion through the EWG if required as the Applicant progresses this assessment.

Proposed foraging ranges and breeding populations

Natural England have discussed and agreed the approach for species-specific foraging ranges and calculation of EIA breeding populations with JNCC and NRW, which we understand have now been supplied to the Applicant. We welcome further discussion through the EWG if required.

Assessment of red-throated diver

Natural England note that the assessment of red-throated diver has not been discussed further with the EWG following PEIR submission. Natural England agree that red-throated diver at Liverpool Bay SPA can be screened out at the LSE stage for HRA due to the 10km distance from the Morgan and Mona projects. However, we do not consider it appropriate to screen the species out of a displacement assessment for EIA due to low abundance in the survey area. It is of note that red-throated diver tend to occur at low density. Furthermore, this analysis if of importance for consideration in cumulative assessments.

Natural England advise that displacement is assessed from the Morgan and Mona sites + 4km buffer using a displacement rate of 100% and mortality rates of 1-10%.

For clarification of any points in this letter, please contact me using the details provided below.

Yours sincerely,

[redacted]
Marine and Coastal Lead Adviser
Coast and Marine Team
Cheshire to Lancashire Area Team
[redacted]

☐ The advice provided in this letter has been through Natural England's Quality Assurance process

The advice provided within the Discretionary Advice Service is the professional advice of the Natural England adviser named below. It is the best advice that can be given based on the information provided so far. Its quality and detail is dependent upon the quality and depth of the information which has been provided. It does not constitute a statutory response or decision, which will be made by Natural England acting corporately in its role as statutory consultee to the competent authority after an application has been submitted. The advice given is therefore not binding in any way and is provided without prejudice to the consideration of any statutory consultation response or decision which may be made by Natural England in due course. The final judgement on any proposals by Natural England is reserved until an application is made and will be made on the information then available, including any modifications to the proposal made after receipt of discretionary advice. All pre-application advice is subject to review and revision in the light of changes in relevant considerations, including changes in relation to the facts, scientific knowledge/evidence, policy, guidance or law. Natural England will not accept any liability for the accuracy, adequacy or completeness of, nor will any express or implied warranty be given for, the advice. This exclusion does not extend to any fraudulent misrepresentation made by or on behalf of Natural England.

Cc [redacted]

Annex 1
European Protected Species

A licence is required in order to carry out any works that involve certain activities such as capturing the animals, disturbance, or damaging or destroying their resting or breeding places. Note that damage or destruction of a breeding site or resting place is an absolute offence and unless the offences can be avoided (e.g. by timing the works appropriately), it should be licensed. In the first instance it is for the developer to decide whether a species licence will be needed. The developer may need to engage specialist advice in making this decision. A licence may be needed to carry out mitigation work as well as for impacts directly connected with a development. Further information can be found in Natural England's 'How to get a licence' publication.

If the application requires planning permission, it is for the local planning authority to consider whether the permission would offend against Article 12(1) of the Habitats Directive, and if so, whether the application would be likely to receive a licence. This should be based on the advice Natural England provides at formal consultation on the likely impacts on favourable conservation status and Natural England's guidance on how the three tests (no alternative solutions, imperative reasons of overriding public interest and maintenance of favourable conservation status) are applied when considering licence applications.

Natural England's pre-submission Screening Service can screen application drafts prior to formal submission, whether or not the relevant planning permission is already in place. Screening will help applicants by making an assessment of whether the draft application is likely to meet licensing requirements, and, if necessary, provide specific guidance on how to address any shortfalls. The advice should help developers and ecological consultants to better manage the risks or costs they may face in having to wait until the formal submission stage after planning permission is secured, or in responding to requests for further information following an initial formal application.

The service will be available for new applications, resubmissions or modifications – depending on customer requirements. More information can be found on Natural England's website.

Proposed methodology for 'gap-filling' the Irish Sea R4 cumulative & in-combination assessments

At present, Natural England do not consider that AEOI can be ruled out beyond reasonable scientific doubt for several species/SPA combinations at Round 4 Irish Sea projects. This is due in part to a lack of appropriate consideration of impacts arising from pre-existing OWFs. This presents a clear consenting risk and would ideally be resolved prior to examination. Natural England consider that some estimate of impact must be attributed to all projects screened in to cumulative and in-combination assessments to reduce or eliminate this risk which arises in some cases simply from a lack of provision of relevant information.

A basic approach is suggested to generate **indicative** numbers for currently 'unknown' displacement and collision impact estimates, depending on the level of data available for the relevant projects. It is acknowledged that the approach detailed below is flawed. However, the intention is simply to enable an informed expert judgement to be made on the likelihood of risk with respect to AEOI, and thus the necessity of assessing this risk in more detail.

It is of note that some OWFs screened into the assessments may be nearing end-of-life with limited (or no) overlap with the proposed project. It would be appropriate to consider timelines and determine if any of these sites can be screened out.

Where it is necessary to 'gap-fill' for a particular development, the following methods are proposed.

Displacement

1. Review the submitted environmental statement. It is accepted that displacement mortality estimates may not be presented. However, if there is abundance data, utilise this to populate project-specific displacement matrices for relevant species. We also suggest review of the Round 4 plan-level HRA to determine if any suitable estimates are presented therein.

If no abundance data available…

2. Use a nearby windfarm with a published estimate of mortality arising from displacement as a proxy. Scale this estimate according to the relative area of the two arrays and appropriate buffers.

Collision

1. Review the submitted environmental statement. It is accepted that collision mortality estimates may not be presented. However, if there is abundance data, utilise this to run project-specific CRMs according to current best practice for relevant species. We also suggest review of the Round 4 plan-level HRA to determine if any suitable estimates are presented therein.

If no abundance data available…

2. Use a nearby windfarm with a published estimate of mortality arising from collision as a proxy. Scale this estimate according to the relative number of turbines in the two arrays. The difference in the turbine specifications should be considered to determine if this method is likely to over or underestimate impact.

In the absence of any relevant site-specific data for a given development from which estimates of displacement or collision mortality can be derived, Natural England consider that the relatively clustered nature of OWFs in the Irish Sea lends itself to the alternative approach of using a site within a 'cluster' as the proxy to base the scaling of impacts upon. This could be carried out for multiple sites simultaneously if the same proxy is used.

If >1 nearby sites to a given development requiring "gap-filling" have data, the most appropriate proxy site according to location, data quality & comparability should be selected. Alternatively, consideration of multiple sites could be discussed further.

If, having generated estimates as detailed above, the total impacts lead to cumulative and/or in-combination increases in baseline mortality of >1% it will be necessary to undertake a more rigorous assessment of estimated impacts at projects where gap-filling has been necessary.

We suggest further engagement with relevant SNCBs on this point if required.

If a more rigorous assessment is considered necessary, the best available bird density estimates and known array footprint + buffers and consented turbine parameters should be used to generate refined project specific assessments of displacement and collision mortality. If baseline characterisation data are not available for a given "gap-filling" project, MERP, strategic VAS of OWF areas, or the recent Welsh Atlas data could be considered (links and references available on request).

D.6.5 Advice to Mona/Morgan regarding EIA scale reference populations for assessment

Advice to Mona/Morgan generation regarding EIA scale reference populations for assessments

For the breeding season, the BDMPS is defined as the breeding population within foraging range from the project, plus non-breeders and immature birds. The population is likely to originate from a much wider range of colonies (not just SPA colonies) and may include young immature birds spending the summer in their wintering area as well as immatures loosely associated with local colonies (Furness 2015).

Given that there is little evidence to support calculations of the number of juveniles, immatures and non-breeding birds that remain in their wintering areas into the breeding season, we advise that regional baseline population sizes for the breeding period can be derived from the relevant BDMPS tables in Appendix A of Furness (2015) by summing the adult and immature population estimates for all colonies that sit within a given regional scale:

Species	**Breeding season reference population (sum of adults and immatures at relevant colonies)**	**Relevant BDMPS and Tables from Appendix A of Furness (2015) used**
Gannet	522,888	Western waters, Tables 15/17
Kittiwake	245,234	Western waters & Channel, Tables 48/50
Lesser black-backed gull	240,750	Western waters, Tables 37/41
Herring gull	217,167	Western waters, Table 43
Great black-backed gull	44,753	South-west & Channel waters, Table 46
Guillemot	1,145,528	Western waters, Table 63
Razorbill	198,969	Western waters, Table 65
Puffin	1,482,791	Western waters, Table 69
Manx shearwater	1,821,544	Western waters & Channel, Table 13

Worked example for calculation for gannet 'UK western waters' breeding season reference population calculation (all information taken from Tables 15 and 17 of Furness (2015):

Population	**Most recent count**	**Breeding adults**	**Immatures**	**Total**
Sule Skerry & Sule Stack	2004	9,350	7,574	16,924
North Rona & Sula Sgeir	2004	18,450	14,944	33,394
St Kilda	2004	119,244	96,588	215,832
Ailsa Craig	2004	54,260	43,951	98,211
Grassholm	2009	78,584	63,653	142,237
UK western non-SPA colonies	2004	9,000	7,290	16,290
TOTAL		*288,888*	*234,000*	***522,888***

For EIA assessments, we advise calculating the total predicted annual impact for a species and assessing this against the largest seasonal population (breeding or non-breeding) at the appropriate BDMPS (largest BDMPS for use in annual assessments highlighted yellow):

Species	Breeding season BDMPS	Autumn/post-breeding BDMPS*	Winter/non-breeding BDMPS*	Spring/pre-breeding BDMPS*
Gannet	522,888	545,954	-	661,888
Kittiwake	245,234	911,586	-	691,526
Lesser black-backed gull	240,750	163,304	41,159	163,304
Herring gull	217,167	-	173,299	-
Great black-backed gull	44,753	-	17,742	-
Guillemot	1,145,528	-	1,139,220	-
Razorbill	198,969	606,914	341,422	606,914
Puffin	1,482,791	-	304,557	-
Manx shearwater	1,821,544	1,580,895	-	1,580,895

* Non-breeding season BDMPSs from Furness (2015)

Annual predicted impacts should be assessed against the baseline mortality of the relevant BDMPS.

References

Furness, R.W. (2015) *Non-breeding season populations of seabirds in UK waters: Population sizes for Biologically Defined Minimum Population Scales (BDMPS)*. Natural England Commissioned Reports, Number 164.

D.6.6 Response from NRW regarding updated HRA methodology

From: [redacted]
To:
Cc:
Subject: RE: Mona and Morgan Gen updated HRA methodology
Date: 29 June 2023 17:32:51
Attachments: [redacted]

Good afternoon, all.

As discussed in this morning's Steering Group meeting, please see over-arching comments from our Ornithologists regarding the updated HRA methodology.

1. We agree with the proposed updated HRA methodology with regard to the project alone assessment.

2. We disagree with the proposed updated HRA methodology with regard to the in-combination assessment. It is stated in 1.3.2.3 that "If the predicted magnitude is >1% of the baseline mortality of the reference population for a qualifying feature, then further consideration will be given to the magnitude of the likely effect, including the contribution of impacts from other plans and projects, in-combination." We do not agree that sites are not further considered in-combination where the predicted impact from the project alone is <1% of baseline mortality. While <1% of baseline mortality may be insignificant in the context of a project alone, this additional level of mortality should be included in an assessment of in-combination impacts.

Kind regards,
[redacted]

[redacted] | **Offshore Industries Adviser | JNCC**
Pronouns: [redacted]
Inverdee House, Baxter Street, Aberdeen, AB11 9QA | [redacted]
Working pattern: Monday to Friday

Website **Twitter** **Facebook** **LinkedIn**

From: [redacted]
Sent: Thursday, June 29, 2023 11:49 AM
To [redacted]
Cc [redacted]
[redacted]

[redacted]

Subject: RE: Mona and Morgan Gen updated HRA methodology

> CAUTION: Please remember your Cyber Security training. This email originated from outside the organisation. Do not click links or open attachments unless you recognise the sender and know the content is safe.

Good Morning [redacted]

In response to the updated HRA methodology, Natural England are satisfied that the two-stage process to the appropriate assessment is sensible due to the projects potential connectivity with a large number of designated sites with an expectation that the likelihood of substantial impacts is low. However, we note that this approach might not always be appropriate for all projects.

We retain two major concerns relating to the methodology described in the update document.

1. Screening of non-breeding season impacts is not mentioned. The BDMPS should be used to identify potential connectivity and screen in relevant sites for assessment.
2. Project alone impacts resulting in <1% increase in baseline mortality are screened out of in-combination assessment. Natural England advise that this approach is not acceptable and these impacts should be considered in-combination.

Natural England also highlight that step 1 of the integrity test makes a high-level assessment against the conservation objectives, but relies solely on magnitude of increase in baseline mortality as a 'test' against which to conclude no AEOI, or move on to step 2. Given the project location, this approach is likely fine. However, we note that for assessment against conservation objectives that are not linked to the abundance of features (e.g. distribution of features within the site or availability of habitat) this would not be satisfactory.

Kind regards,

[redacted]

[redacted]
Pronouns: [redacted]
Marine and Coastal Lead Adviser
Cheshire to Lancashire Area Team

Natural England

[redacted]

www.gov.uk/natural-england

From: [redacted]
To:
Cc:

Subject: RE: Mona and Morgan Gen updated HRA methodology NE
Date: 29 June 2023 11:49:18
Attachments: [redacted]

Good Morning [redacted]

In response to the updated HRA methodology, Natural England are satisfied that the two-stage process to the appropriate assessment is sensible due to the projects potential connectivity with a large number of designated sites with an expectation that the likelihood of substantial impacts is low. However, we note that this approach might not always be appropriate for all projects.

We retain two major concerns relating to the methodology described in the update document.

1. Screening of non-breeding season impacts is not mentioned. The BDMPS should be used to identify potential connectivity and screen in relevant sites for assessment.
2. Project alone impacts resulting in <1% increase in baseline mortality are screened out of in-combination assessment. Natural England advise that this approach is not acceptable and these impacts should be considered in-combination.

Natural England also highlight that step 1 of the integrity test makes a high-level assessment against the conservation objectives, but relies solely on magnitude of increase in baseline mortality as a 'test' against which to conclude no AEOI, or move on to step 2. Given the project location, this approach is likely fine. However, we note that for assessment against conservation objectives that are not linked to the abundance of features (e.g. distribution of features within the site or availability of habitat) this would not be satisfactory.

Kind regards,
Elliott

[redacted]
Pronouns: [redacted]
Marine and Coastal Lead Adviser
Cheshire to Lancashire Area Team

Natural England

[redacted]

www.gov.uk/natural-england

D.6.7 Response from NRW regarding updated HRA methodology

From: [redacted]
To:
Cc:
Subject: RE: Mona and Morgan Gen updated HRA methodology NRW
Date: 29 June 2023 17:38:23
Attachments: [redacted]

Hi [redacted]

Following on from the Steering Group meeting this morning, NRW Advisory's comments / advice on the Mona and Morgan updated HRA approach are as follows:

NRW Advisory (A) considers that the proposed updated HRA methodology can be considered appropriate with regard to the project alone assessment for breeding colonies for this particular project, where there is potential connectivity to a very large number of sites, but the likelihood of substantial impacts is generally low. However, it should be acknowledged that this approach will not necessarily be appropriate for all offshore wind cases.

NRW (A) note that the method as described appears to focus on impacts to breeding birds with no consideration to non-breeding birds. We advise, as previously, that Furness (2015) is used to identify potential connectivity in the non-breeding season. Relevant sites should then be considered in the Appropriate Assessment, which would most likely be at the Step 1 Phase.

However, NRW (A) disagree with the proposed updated HRA methodology with regard to the in-combination assessment. Paragraph 1.3.2.3 states that:
"*If the predicted magnitude is >1% of the baseline mortality of the reference population for a qualifying feature, then further consideration will be given to the magnitude of the likely effect, including the contribution of impacts from other plans and projects, in-combination*."
We do not agree with this approach, as whilst <1% of baseline mortality may be insignificant in the context of a population from project alone impacts, this does not mean that this level of additional mortality should not be added to an assessment of in-combination impacts.

NRW (A) also note that Step 1 of the integrity test makes a high-level assessment against the conservation objectives, but relies on magnitude of increase in baseline mortality only as a 'test' against which to conclude no AEOI, or move on to Step 2. Given the project location, this approach is likely satisfactory, but we note that for assessment against conservation objectives that are not linked to the abundance of features (e.g. distribution of features within the site or availability of habitat) this would not be satisfactory.

As discussed during the meeting, we are happy for you to share our response with PINS assuming this is approved by bp who are the named customer on our DAS agreement under which this advice is provided.

Kind regards,

[redacted]

Enw / [redacted]
Teitl swydd / Uwch Gynghorydd Morol - Rhaglen Ynni Adnewyddadwy ar y Môr / Senior Marine Advisor - Offshore Renewable Energy Programme

Adran / Tîm Cyngor a Rheoli Ardal Morol / Marine Area Advice & Management Team

Croesewir gohebiaeth yn Gymraeg a byddwn yn ymateb yn Gymraeg, heb i hynny arwain at oedi.
Correspondence in Welsh is welcomed, and we will respond in Welsh without it leading to a delay.

D.6.8 Provision of Auk ID paper

Auk identification guide

1. Main identification criteria used by APEM

Identifying winter auks in digital aerial still imagery requires skill and experience on the part of the observer, including consideration of several lines of evidence and influencing factors. Such factors arise from survey image quality which varies due to weather conditions, sea state and light levels during the image capture stage of surveys. Factors relating to image processing, resolution, and location of birds within the image footprint are also considered. Conditions vary between, and even within, surveys, meaning the appearance of a given species may not be identical in different images. We must therefore adapt our approach to survey conditions.

In favourable conditions, winter guillemots are lighter coloured than razorbills. Under different lighting conditions, plumage appearance can range from light brown, to darker grey-brown, to almost charcoal grey in colour. Razorbills in winter are usually darker than guillemots; however, additional features required to confidently classify a sitting razorbill include the subtle tapered shape and the narrower black central band towards the tail, which gives them a rather pointed appearance. Nearby birds may also provide a useful point of comparison.

Identification of birds in flight is straightforward in favourable light conditions when plumage colour is apparent. Razorbills exhibit blacker upper parts and are whiter on the flanks and the trailing edge to the wings. Differentiation between species is easier in mixed flocks as it enables direct comparison of diagnostic features.

It is not possible to identify every guillemot or razorbill to species level during winter surveys. All efforts are made to survey in the most favourable conditions possible to achieve the highest quality imagery; however, less favourable conditions are more likely to occur in winter. Confidence in identification to species level may be reduced where birds are captured in the trough of a wave and behaviours such as sitting low in the water, diving, splashing at the surface or wing stretching may also impede identification. Strong lighting may also alter apparent plumage colouration, below, you can find some examples of varying conditions and imagery.

Distinguishing between the two subspecies of guillemot that occur in the UK is extremely difficult. The guillemot subspecies *aalge* is a darker and larger subspecies compared to the subspecies *albionis*[1]. These distinguishing features are subtle and difficult to separate, even in the field[1]. This makes it practically impossible to identify the individual subspecies in the imagery and therefore this is not something APEM offers.

[1] JNCC – Guillemot (*Uria aalge*) (accessed via https://jncc.gov.uk/our-work/guillemot-uria-aalge/ - 01/08/2023)

2. Example imagery used for guidance in auk species identification

Figure 1 Perfect light and sea conditions (January).

Perfect light and sea conditions show conspicuous plumage detail of razorbills and guillemots (top 2 birds) (Figure 1). Note the oval-shaped, brownish plumage of guillemots compared to the tapered black plumage on razorbills. Direct comparison of the two species within the same image increases confidence in identification.

Figure 2 Clear image of guillemots and razorbills (early February).

A mixed group of guillemots and razorbills in flight (Figure 2) shows the distinct differences in plumage, including the whiter sides and trailing edges to the wings on the razorbills. Again, identification is aided by direct comparison between species within the same image.

Figure 3 Mixed group of guillemots and razorbills in flight (November).

Two guillemots (red underlined) are easily distinguished from the surrounding razorbills by their lighter plumage and less white colouration in the trailing edges to the wings (Figure 3).

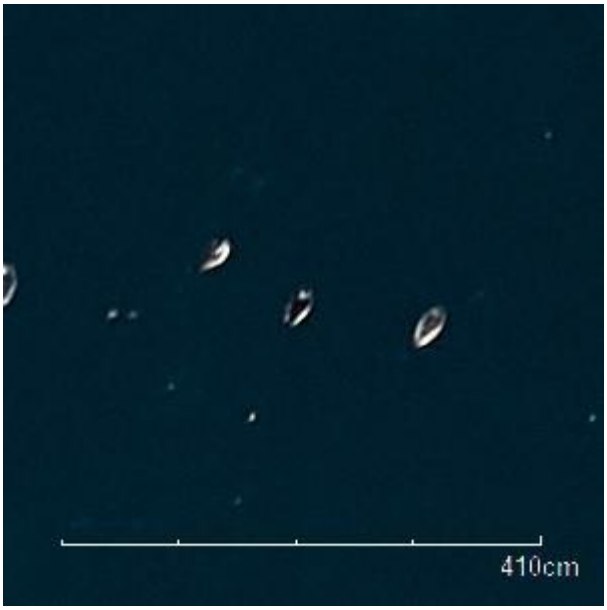

Figure 4 Sitting razorbill, guillemot and guillemot/razorbill.

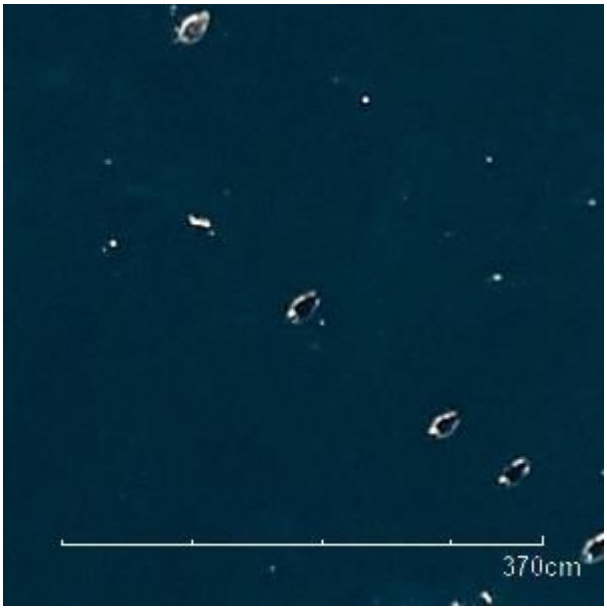

Figure 5 Sitting razorbills and one guillemot in favourable light conditions (January).

Good lighting and image quality enable distinction between a razorbill (centre) and guillemot (right) (Figure 4). However, the positioning and posture of the left-hand bird precludes identification with full confidence. Although likely to be a guillemot based on colouration, it would be recorded as guillemot/razorbill.

Figure 5 illustrates the overall shape and plumage of four razorbills (sitting in line from the centre to the bottom-right corner of the image), in comparison to the guillemot at the top of the image. The razorbills also show white necks and cheeks and a black 'cap' on the head.

Figure 6 Guillemots and a razorbill imaged in less favourable conditions (October).

Although image clarity is lower in Figure 6, subtle differences in plumage and bird shape still enable four razorbills to be distinguished from the single guillemot to the right of the image.

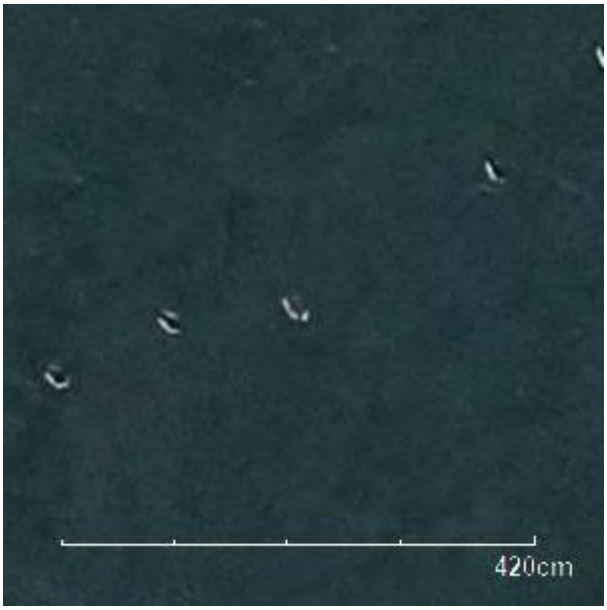

Figure 7 Guillemots and razorbills imaged in less favourable conditions (October).

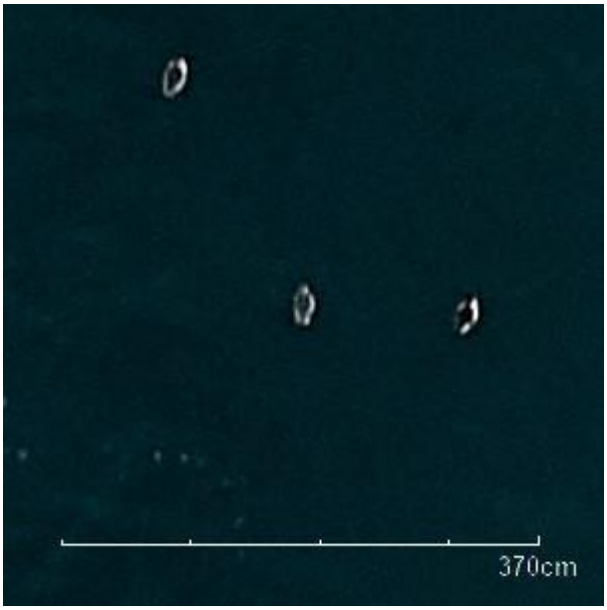

Figure 8 Darker image of two guillemots and a razorbill (November).

Despite the less favourable conditions, the guillemot in the centre of Figure 7 can be distinguished from the surrounding razorbills by the narrower shape of the dark plumage of the razorbills in comparison to the paler dark plumage of the guillemot.

Although Figure 8 was taken under less favourable lighting conditions, the razorbill on the right can be distinguished from the guillemots to the left by its darker and more tapered black plumage.

3. Example imagery Auk species in Morgan with 100% ID certainty

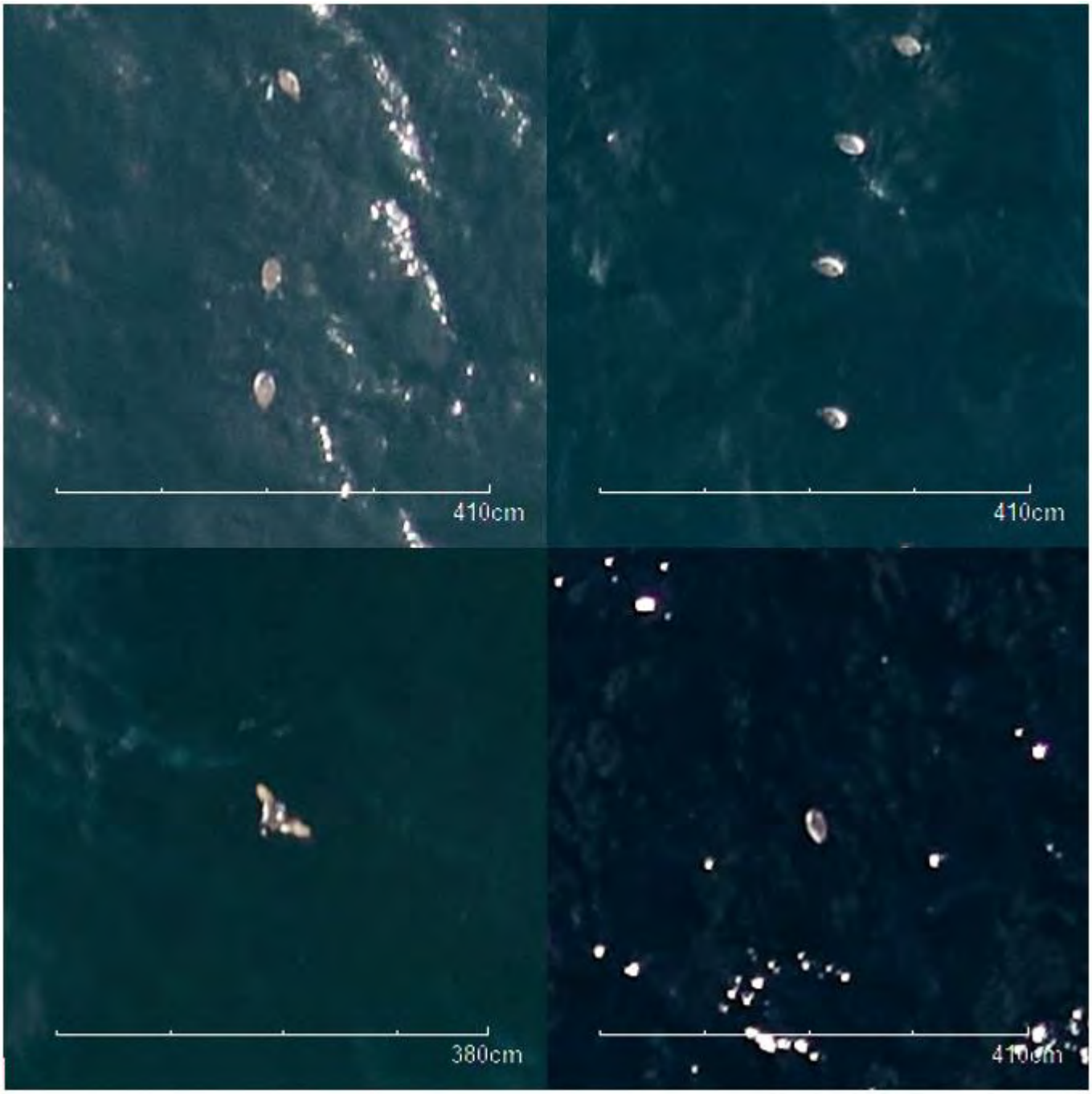

Figure 9 Examples of Guillemot identified with 100% certainty in the Morgan project.

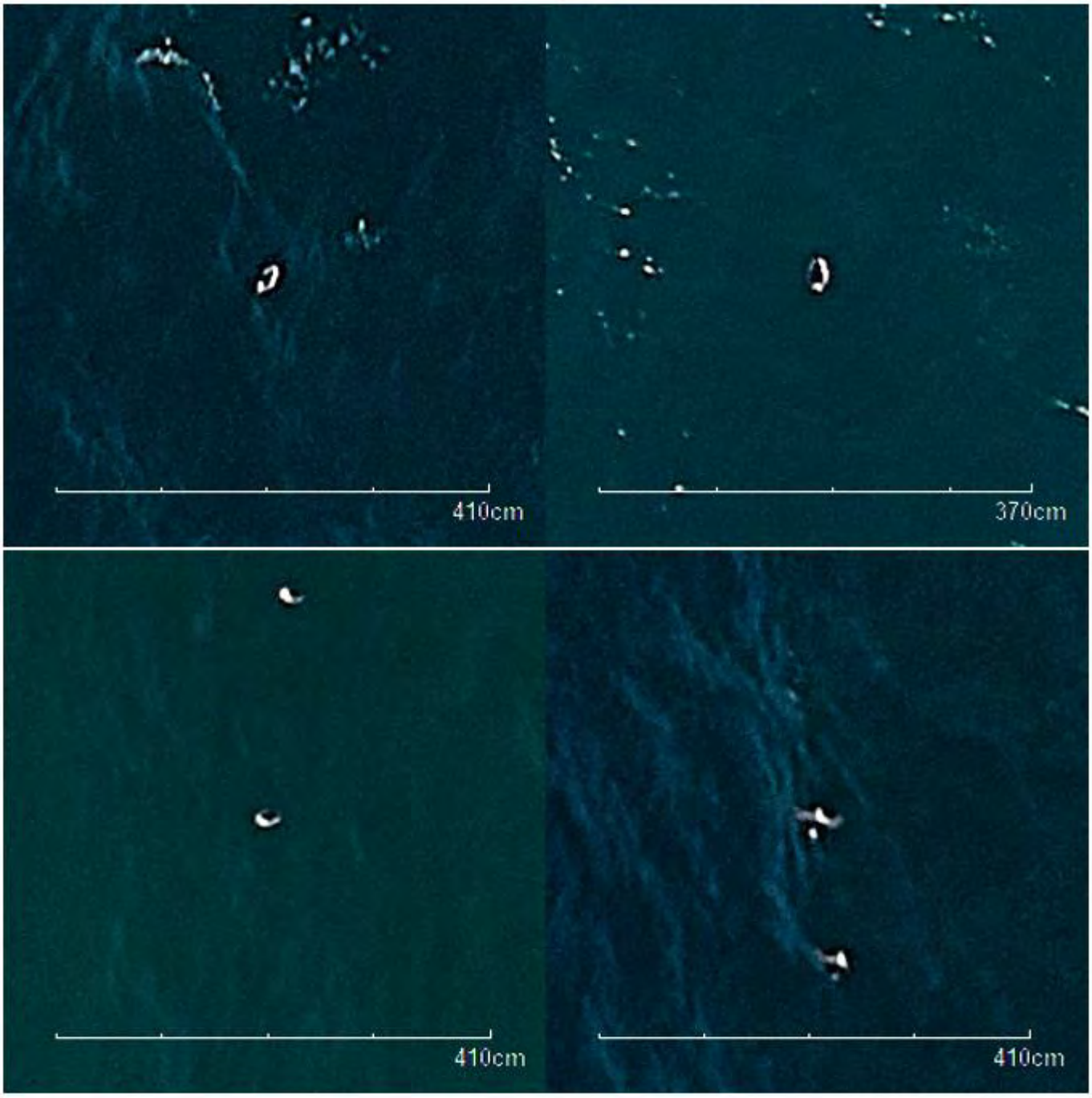

Figure 10 Examples of Razorbill identified with 100% certainty in the Morgan project.

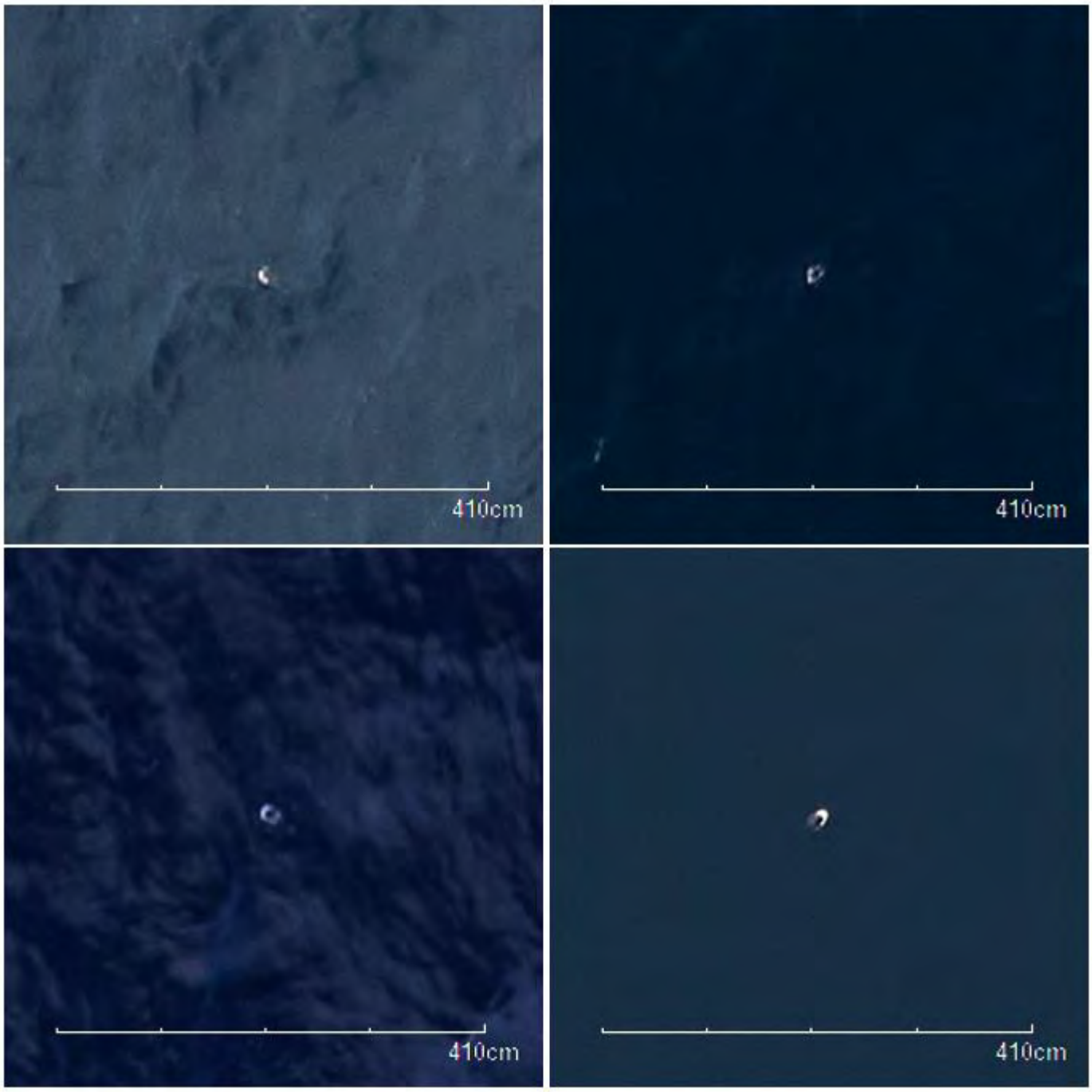

Figure 11 Examples of Puffin identified with 100% certainty in the Morgan project.

D.6.9 Response from APEM regarding the Auk ID rate paper

[redacted]
BP
Chertsey Road,
Sunbury on Thames,
Middlesex
TW16 7BP

25th July 2023

APEM Ref: P00006098

RE: Morgan auk identification review

Dea [redacted]

As requested, please find enclosed an explanation of the process followed to review auks previously identified in group-level categories and determine if identification levels could be improved to species-level, and APEM's identification criteria used to distinguish auk species, with some examples.

As part of APEM's image analysis process, 50% of targets identified within the imagery pass through quality assurance (QA) checks, where the bird image is checked by another team member and re-identified if needed. The QA team have now increased QA of auk species so that 100% of the auks identified in images are checked by APEM's QA team. Additionally, for any auks where there is still uncertainty around the level of ID or that remain identified to group level, are reviewed by a senior member of the QA team. APEM only identify to a species level when completely confident in that ID, if there is any uncertainty APEM uses a higher classification level.

I trust this information meets your requirements but if you have any further questions or require any additional supporting information, please do not hesitate to contact me.

Yours sincerely,

[redacted]

[redacted]

D.6.10 Mona and Morgan Generation Power Analysis report

Partners in UK offshore wind

MONA OFFSHORE WIND PROJECT

MORGAN GENERATION ASSETS

Mona and Morgan Generation Power Analysis

Image of an offshore wind farm

July 2023

F01

www.morganandmona.com/en

Document status

Version	Purpose of document	Authored by	Reviewed by	Approved by	Review date
F01	Issue to the Offshore Ornithology Expert Working Group	RPS/Niras	bpEnBW	bpEnBW	05/07/23

Prepared by:

RPS

Prepared for:

Mona Offshore Wind Ltd.
Morgan Offshore Wind Ltd.

Contents

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Glossary

Term	Definition
Confidence Intervals	A range of values that provides an interval estimate for the true parameter values, typically calculated at a specified confidence level (e.g., 95% confidence intervals).
Dispersion Structure	The component of the model that accounts for the overdispersion in the dependent variable, allowing for a variance that is not equal to the mean.
Overdispersion	The condition in which the observed variability in a data set is greater than what would be expected under a Poisson distribution.
Overdispersion Parameter (phi)	A parameter that represents the relationship between the variance and the mean in Quasi-Poisson analysis, accounting for overdispersion.
Overdispersion Test	A statistical test used to formally assess the presence of overdispersion in the data by comparing the fitted Quasi-Poisson model to a Poisson model.
Effect Size	A measure of the magnitude of a phenomenon or the strength of the relationship between variables.
Null Hypothesis (H_0)	The hypothesis of no effect or no relationship between variables.
Alternative Hypothesis (H_1)	The hypothesis that contradicts the null hypothesis, indicating an effect or relationship.
Poisson Regression	A regression model used to analyse count data, assuming a Poisson distribution with equal mean and variance.
Quasi-Poisson Analysis	A statistical analysis method used when the assumptions of Poisson regression, such as equal mean and variance, are violated. It accounts for overdispersion, where the variance exceeds the mean.
Power Analysis	A statistical method used to determine the probability of detecting an effect or relationship in a statistical test.
Power Curve	A graphical representation of the relationship between sample size and statistical power.
Sample Size	The number of individuals or units included in a study or experiment.
Significance Level (alpha)	The predetermined threshold used to determine if a result is statistically significant. Commonly set at 0.05 or 0.01.
Statistical Power	The probability of correctly rejecting a null hypothesis when it is false, or the probability of detecting a true effect.
Type I Error	Also known as a false positive, it occurs when a null hypothesis is rejected when it is actually true.
Type II Error	Also known as a false negative, it occurs when a null hypothesis is not rejected when it is actually false.

Executive Summary

A comprehensive series of power analyses was conducted to ascertain the suitability of the 24 months' worth of aerial survey data collected by APEM for the purpose of conducting an Environmental Impact Assessment (EIA). At the request of the Statutory Nature Conservation Bodies (SNCBs), RPS carried out tests to determine the power to detect seabird population changes from the baseline characterisation surveys.

Based on the lowest level of potential effect outlined in both the EIA and the Information to Support the Appropriate Assessment (ISAA), which stands at 30% displacement, the set of analyses demonstrates that the coverage of analysis of the baseline characterisation surveys are sufficient for detecting changes in the majority of bird species. Where the coverage is not sufficient to detect change, even if displacement was very high for these species this would not be detectable given their consistent low abundances in the Mona and/or Morgan digital aerial survey area. Consequently, it can be concluded that these surveys and resulting data are appropriate for establishing the baseline to inform the EIA and ISAA.

The analysis revealed that a minimum average presence of 71 birds per month (or 852 birds across 12 months of breeding season data) was required to detect a displacement of 30%, provided that 12 months of breeding season data are available. For the scenario with a 40% displacement, this number decreases to at least 39 birds (or 467 birds over 12 months of breeding season data).

In the EIA and the ISAA the range of displacement rates used was 30% to 70% for auks and kittiwake, and 60 to 80% for gannet. For the higher displacement scenarios which the EIA and ISAA are based on, the numbers of birds and densities required to achieve 80% power would be considerably lower.

It is worth noting that these numbers remain unaffected by coverage, but reducing the coverage would necessitate higher bird densities in order to reach the required monthly threshold. For instance, if the coverage were halved, the bird densities on-site would need to double to achieve sufficient power to detect change.

Similarly, when dealing with a smaller site, it is equivalent to reducing the coverage. As the Morgan digital aerial survey area is slightly smaller than the Mona digital aerial survey area, the density requirement in the Morgan digital aerial survey area would be marginally higher than in the Mona digital aerial survey area. This is because the figure of 852 (30% displacement) or 467 birds (40% displacement) over 12 months of data remains independent of coverage or site size.

It is important to emphasize that this set of analyses is less intricate compared to real-world data, and as a result, a degree of caution has been exercised in determining the necessary sample size. For instance, the assumption has been made that displaced birds disappear rather than being displaced to the buffer zone. In reality, the truth lies somewhere in the middle, where some displaced birds may indeed move to the buffer zone while others may not.

Overall, the power analyses have shown that for all relevant species, the expected species specific displacement rates will be detectable with the current sample size and coverage and therefore the surveys and resulting data are appropriate for establishing the baseline to inform the EIA and ISAA.

1 Introduction

1.1 Introduction

1.1.1.1 RPS has been commissioned by Mona Offshore Wind Ltd and Morgan Offshore Wind Ltd. to conduct a power analysis on the seabird data collected for the Mona Offshore Wind Project and Morgan Offshore Wind Project: Generation Assets. The digital aerial surveys were undertaken by APEM over the course of 24 months from March 2020 to February 2022 (inclusive) for Mona and April 2021 to March 2023 for Morgan Generation.

1.2 Power analysis

1.2.1.1 A power analysis is a statistical technique used to determine the statistical power of a hypothesis test. It involves calculating the probability of correctly rejecting the null hypothesis when it is false (i.e., detecting a true effect) for a given sample size, effect size, and level of significance.

1.2.1.2 In simpler terms, power analysis helps to determine the sample size needed to detect a significant effect with a certain level of confidence. A statistical power of 80% is generally considered appropriate, as it strikes a balance between controlling the risk of Type I[1] errors and achieving a reasonable level of sensitivity to detect true effects.

1.2.1.3 The power of a statistical test is influenced by several factors, including the sample size, the level of significance, the variability of the data, and the effect size. A power analysis takes these factors into account and provides an estimate of the probability of detecting a true effect, given a specific combination of these factors.

1.3 Context

1.3.1.1 The power analysis was a request from the SNCBs, following feedback during Expert Working Group (EWG) meetings, in order to demonstrate that the current coverage is appropriate for the purposes of the EIA and ISAA. Table 1.1 sets out the requests for power analysis and the Applicant's response to date.

1.3.1.2 When an offshore wind farm is built, seabirds may avoid the area in which construction and operation takes place. This is known as displacement. To monitor displacement effects of the wind farm on different species, data on bird abundance and distribution is needed both within the array area and outside the array area (buffer). To test whether the difference in abundance between the array area and the buffer area is significant requires a certain amount of data.

1.3.1.3 The original request for a power analysis was to determine the adequacy of coverage of the baseline characterisation survey. As 'adequacy' is not clearly defined, the power analysis in this report determines how appropriate the survey coverage would be for any potential monitoring of ornithology populations (e.g. pre- and post- construction monitoring), should this be required. However, this can be used to infer the adequacy of coverage for the EIA, specifically in relation to the magnitudes of change which are predicted in the EIA. Thus, this report determines the statistical power to determine a potential displacement effect of building the Mona Offshore Wind Project and the

[1] Also known as a false positive, it occurs when a null hypothesis is rejected when it is actually true.

Morgan Generation Assets given the current coverage and a range of displacement scenarios used in the EIA and ISAA.

Table 1.1: Stakeholder request for power analysis.

Date	Source	Stakeholder	Comments
01 June 2022	Mona scoping response	NRW	The level of coverage required to be sufficient for baseline characterisation will depend on the nature of the area being surveyed and the abundance and distribution of receptors across the area. A power analysis should be undertaken to inform survey design and ensure that such designs maximise the probability of detecting changes in abundance and distribution through future comparison with data that may be collected post-consent.
07 June 2022	Ornithology Baseline Characterisation Technical Note response	Natural England	Although analysis of 12% of the sea surface is likely to be sufficient, best practice would be to conduct a power analysis to determine the level and distribution of survey coverage to analyse. We recommend that a power analysis is undertaken to demonstrate that survey coverage is appropriate.
08 June 2022	Ornithology Baseline Characterisation Technical Note response	NRW	NRW Advisory (A) advise that further information on how the survey design has been arrived at is needed, including results of a power analysis to detect the sample size required for the analysis of aerial survey data.
13 July 2022	Offshore ornithology EWG meeting 2	The Applicant	There has been a request for power analysis to be carried out to detect the appropriateness of the 12%. We are asking for more clarification in this EWG on what the EWG members are looking for from this power analysis. We have used the MRSeaPower package before for the ability to detect changes as power analysis is usually used to define the ability to detect future changes rather than characterise a baseline. The purpose of these surveys is to characterise the baseline; they are not pre-construction monitoring surveys. The power to detect changes is not what the Applicant is seeking to do with these surveys.
13 July 2022	Offshore ornithology EWG meeting 2	JNCC	It [power analysis] is something that JNCC would consider worth doing as it can inform if the current survey design has enough power to be used for the pre-construction surveys. Does it detect the level of displacements that we would expect to see for the species that may be impacted?
13 July 2022	Offshore ornithology EWG meeting 2	The Applicant	RPS and the Applicant to discuss additional analysis of survey images to ensure site variability is being captured. Power analysis will be considered internally.
03 August 2022	Response to Offshore ornithology EWG meeting 2 meeting minutes	NRW	Meeting minute action: LR to discuss clarity around request for power analysis with NRW specialists. The NRW Scoping Response stated that “The level of coverage required to be sufficient for baseline characterisation will depend on the nature of the area being surveyed and the abundance and distribution of receptors across the area. A power analysis should be undertaken to inform survey design and ensure that such designs maximise the probability of detecting changes in abundance and distribution through future comparison with data that may be collected post-consent.” The applicant proposes to collect data from approximately 30% of the sea surface and analyse 12%. It is unclear where the justification for the 12% analysed comes from and how it relates to these survey data, hence advising the applicant to make this clearer. Typically, NRW (A) would recommend a power analysis to ensure that there is sufficient statistical power to detect changes in abundance

Date	Source	Stakeholder	Comments
			and distribution through future comparison with data that may be collected at a later stage, demonstrating that the applicant has considered whether the current survey design has enough power to be used for the pre-construction surveys. It is important that analyses have the power to detect trends in abundance or distribution and the level of displacements for the species that may be impacted.
19 August 2022	Response to Offshore ornithology EWG meeting 2 agreement log	Natural England	We note that there was an action from the EWG02 for RPS and the applicant to discuss the possibility of additional analysis of survey images to ensure variability is being captured across the survey area. We await further information regarding the outcomes of these conversations in regard to our recommendation of power analysis to demonstrate that survey coverage is appropriate.
14 November 2022	Response to Offshore ornithology EWG meeting 1&2	The Applicant	The rationale for the digital aerial survey design is presented in the Offshore ornithology baseline characterisation of the PEIR. As per previous responses, the applicant is investigating the use of power analysis.
01 June 2023	Section 42 response to the Mona PEIR	Natural England	The SNCBs recommended in the EWGs that a power analysis is undertaken to demonstrate that survey coverage is appropriate. Although the analysis of 12% of the sea surface is thought likely to be sufficient, best practice would be to conduct a power analysis to determine and evidence this.
01 June 2023	Section 42 response to the Morgan Generation PEIR	Natural England	The SNCBs recommended in the EWGs that a power analysis is undertaken to demonstrate that survey coverage is appropriate. Although the analysis of 12% of the sea surface is thought likely to be sufficient, best practice would be to conduct a power analysis to determine and evidence this.
01 June 2023	Section 42 response to the Mona PEIR	JNCC	Coverage required for good survey and data quality is likely to be site specific, therefore stating that others have done 10% and been approved does not negate the need for power analysis to verify the survey method used. Coverage of Mona aerial surveys is noted as at least 12%.

2 Methods

2.1 Input

2.1.1.1 The digital aerial survey data provided has a quasi-poisson distribution, because birds tend to aggregate more than expected from a regular poisson distribution. A power analysis for a quasi-poisson distribution is similar to that for a standard poisson distribution, with a few modifications to account for overdispersion (phi).

2.1.1.2 The steps involved in running a single power analysis are the following:

1. Define the null and alternative hypotheses (H0: birds are not being displaced, H1: birds are displaced at a rate d).
2. Specify the significance level (alpha) to use for the test (in this case 0.05).
3. Determine the expected effect size, in this case the expected difference in mean bird numbers (lambda) between the Mona Array Area/Morgan Array Area+2km and the buffer zone (ranging from 30% to 70% for this analysis, as agreed with SNCBs for the EIA).
4. Estimate the overdispersion parameter (phi) for the Quasi-Poisson distribution based on the data available (based on the data available a phi of 3 was deemed appropriate, and ranged from 2.1 to 3.4 for the more common species, which are the most reliable to determine this parameter).
5. Use the estimated phi and lambda to generate a control dataset and a reduced dataset (reduced by displacement rate) and run a generalised linear model on it. Data is generated using a negative binomial estimator (Wang & Fuller 2003).
6. Determine statistical significance of this iteration using quasi-poisson generalised linear models (Stasinopoulos et al., 2006, Bolker et al., 2009).
7. Repeat 1000 times to calculate how many of the outcomes are significant at the determined alpha level (0.05).
8. The power is the number of tests test that were significant divided by the total number of tests.

2.1.1.3 The power analysis will vary with sample size, effect size, significance level, and the overdispersion parameter.

2.2 Assumptions

2.2.1.1 The power analysis contains a number of assumptions which are described in this section.

2.2.1.2 The number of photos taken by APEM in each survey month was 5868 for the Mona Offshore Wind Project. The average photo covers 0.0377 km^2, meaning these 5868 photos cover on average ~221 km^2, which is ~15.5% of the survey area.

2.2.1.3 For the purpose of the displacement modelling exercise, it was assumed that half of these photos would serve as a displacement area (array+2km), and the other half as a baseline area with no effect of the wind farm (buffer area outside of the array+2km). In reality, these areas were ~639 km^2 and ~781 km^2 respectively. However, for the purpose of the power analysis any variation in bird numbers generated by a difference in area size was to be eliminated. Moreover, if post-construction monitoring data will be gathered, it is logical to assume that a balanced experimental design will be chosen, for example by increasing coverage in the core area and decreasing it in the buffer

area (so that the number of photos taken in the core and buffer area are the same, which will maximise statistical power).

2.2.1.4 A spatial component was not needed to run the power analysis, as the main determinant of the model outcome was the displacement condition, which was modelled as a two-factor variable (baseline versus displacement). A spatial component was therefore not required to statistically detect differences.

2.2.1.5 To be conservative, in this analysis it was assumed that the number of birds seen in the real data pre-construction will be reduced by the displacement rate within the area dedicated for the wind farm, and will not necessarily increase in the buffer zone. The sample sizes on the x-axes can therefore be directly compared to the real data available, even though in the displacement models fewer birds were modelled to be present.

2.2.1.6 To exemplify this point, assume 500 birds are present in the dataset pre-construction. In the model these will be split evenly among the baseline and displacement site, so 250 and 250. However, the displacement site data is generated assuming 30% to 70% of birds are displaced, making the modelled number of birds present in the displacement site 75 to 175 rather than 250. To remain conservative however, we assume these birds have disappeared rather than moved to the buffer zone. In this scenario, to facilitate ease of comparison with real pre-construction data, the sample size to compare the result to is displayed as 500 birds rather than 325 or 425.

2.2.1.7 Densities were calculated using the average area size covered by a photo in the APEM data, which was 0.0377km^2. Coverage was the average area size per photo multiplied by the number of photos, divided by the size of the digital aerial survey area.

2.3 Detailed breakdown of steps

2.3.1.1 The power analysis was run in the R environment (R Core Team, 2023) using loops and storing the outputs.

2.3.1.2 The initial set of power analyses was run for four effect size scenarios (30%, 40%, 50%, and 70% displacement) and 199 sample size scenarios (between 10 and 1000 birds per month of data), which meant 896 power analyses were done. In this initial set, it was assumed data was collected for a single month (5868 photos).

2.3.1.3 For each of the 896 iterations, an internal loop was run 1000 times, which is the equivalent of a single power analysis for one specific scenario (for example, a displacement rate of 30% and a sample size 500/5868). A single iteration of this internal loop consisted of the following steps (using said example):

1. Generate a baseline dataset of 2934 photos with a mean of 500/5868 birds using a quasi-poisson estimator and an overdispersion term of 3 (this step creates variable datasets across the 1000 iterations due to it being a random process within the boundaries set).
2. Generate a ‘reduced’ dataset of 2934 photos with a mean of 500/5868*(1-0.3) birds using a quasi-poisson estimator and an overdispersion term phi of 3 (this step also creates variable datasets for the same reason, but was reduced in size due to displacement).
3. Run a statistical test (in this case a generalized linear model with a quasi-poisson estimator) between the baseline and the reduced dataset.
4. Extract p-value from the model and compare to the alpha level of 0.05. If $p<0.05$, assign a 1, otherwise assign a 0.

5. Add the outputs to a data frame.

2.3.1.4 When the internal loop was run 1000 times, the number of times a statistical test was significant was determined and divided by the total number of tests. The statistical power is the number of times a test was significant, divided by the total number of tests. For example, if 250 tests out of 1000 were significant, power is 25%.

2.3.1.5 The outputs of a single scenario were added to a data frame and stored, before running the next scenario. As mentioned before, there were 896 scenarios, for each of which 1000 datasets were generated making the total number of iterations (and tests) 896,000.

2.3.1.6 It must again be highlighted that the first analysis was done assuming a single month of data. However, typically these types of analyses will be run on seasonal data, making it likely that at least six months of data will be available for the test using real data. If two years of data are available, the sample size would even be increased to 12 months of data assuming a six-month breeding season.

2.3.1.7 Therefore, a second set of iterations was run to specifically determine the effect of collecting several months of data on the sample size required to detect a statistically significant difference. This set of power analyses considered having six and 12 months instead of one month of data available (assuming one and two breeding seasons of six months each). It was only run for the most conservative 30% displacement scenario for computational purposes, but comparing these two scenarios was considered sufficient to describe the effect of collecting several months of data. Because 30% is the smallest recommended effect size, this requires the highest sample size, and so any larger displacement scenarios will require smaller sample sizes.

2.3.1.8 A third set of iterations was run to model the effect of coverage on the sample sizes required. This assumed that coverage was halved, reducing the number of photos by 50%. Finally, the outputs were compared to the raw data in the Mona and Morgan aerial surveys.

3 Results

3.1 Power analyses

3.1.1 Displacement scenarios 30% to 70%

3.1.1.1 Outputs of the power analyses are presented in figures and tables below. As expected, larger sample sizes are required to detect smaller differences.

3.1.1.2 When a single month of data is available (5868 photos for the Mona Offshore Wind Project), a sample size of 582 birds is required to detect an effect size of 30% displacement 80% of the time. This sample size is 295 birds, 180 birds, and 80 birds for 40%, 50%, and 70% displacement respectively, which is based on the range of effects on seabirds considered in the EIA and ISAA (Figure 3.1,Table 3.1).

Table 3.1: Number of birds (sample size per month) required in the raw data to detect displacement ranging from 30% to 70% with a certain statistical power, modelled for a single month of data.

Sample size required per displacement scenario				
Power	**30%**	**40%**	**50%**	**70%**
<0.20	50	26	20	15
0.20 to 0.40	150	75	50	28

	Sample size required per displacement scenario			
0.40 to 0.60	296	153	93	43
0.60 to 0.80	490	250	153	68
>0.80	582	295	180	80

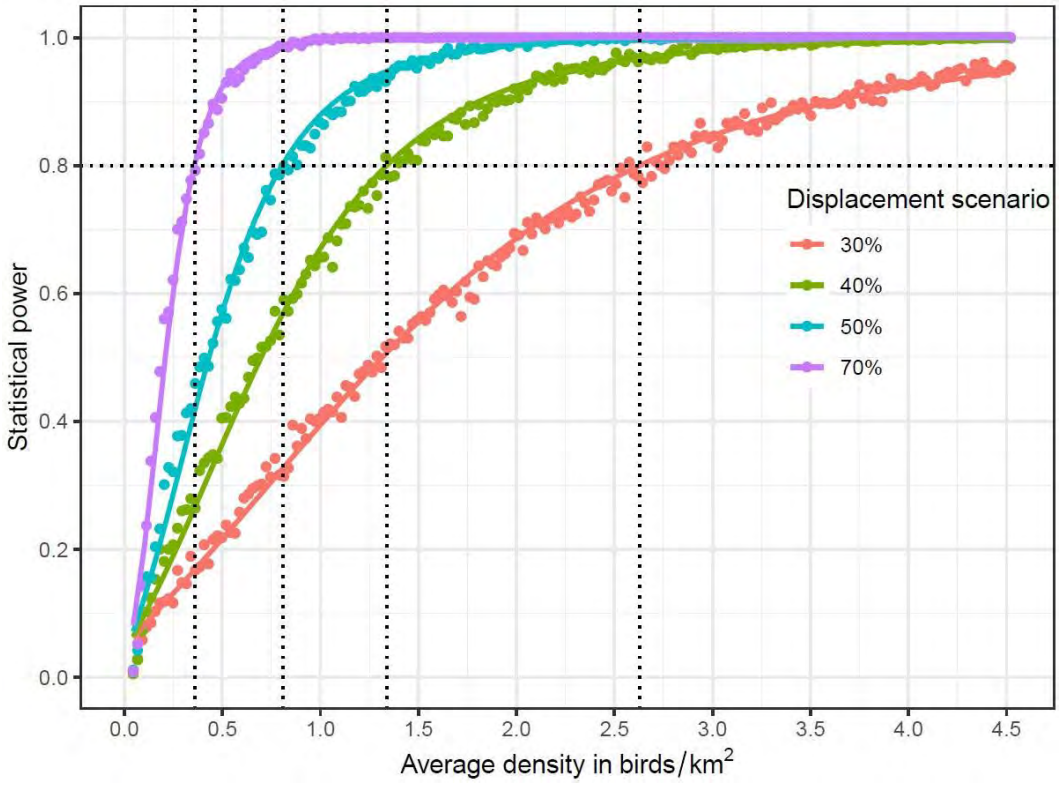

Figure 3.1: Density of birds required in the raw data to detect displacement ranging from 30% to 70%, modelled for a single month of data. Each point is the outcome of 1000 statistical tests, where power is the number of significant tests divided by 1000. Power increases with sample size and more quickly for larger displacement scenarios.

3.1.1.3 When looking at this from a density point of view, the densities required for a single month of data were 2.63 birds/km^2, 1.34 birds/km^2, 0.81 birds/km^2, and 0.36 birds/km^2 for the 30%, 40%, 50%, and 70% displacement scenario respectively (Figure 3.1).

3.1.2 One month versus more months of data available

3.1.2.1 So far, we have assumed that only one month of data was available, which is unrealistic. Typically, there will be at least two years of breeding season data available. Assuming a breeding season of six months, and assuming breeding and non-breeding displacement are generally tested separately, two additional scenarios tested here were six and 12 months of data available rather than one month.

3.1.2.2 When using a more realistic number of months available, the sample size required per month dropped dramatically. With six months of data available, an average of 140 birds per month was required to detect a 30% displacement 80% of the time compared to 582 for one month of data available (Table 3.2). This dropped to 71 birds per month with 12 months of data.

Table 3.2: Number of birds (sample size per month) required in the raw data to detect a displacement of 30% with a range of statistical powers, modelled for one month versus six months of data available and for different power scenarios.

Sample size required per month, 30% displacement			
Power	**1 month of data**	**6 months of data**	**12 months of data**
<0.20	50	15	8
0.20 to 0.40	153	41	20
0.40 to 0.60	299	76	36
0.60 to 0.80	490	118	60
>0.80	582	140	71

Figure 3.2: Density of birds required in the raw data for one versus six versus 12 months of data available. Each point is the outcome of 1000 statistical tests, where power is the number of significant tests divided by 1000. Power increases with sample size and more quickly when more data is available.

3.1.2.3 When looking at this from a density point of view, the density required to reach 80% power for a single month of data was 2.63 birds/km^2, whereas it was 0.63 birds/km^2 for six months of data, and 0.32 birds/km^2 for 12 months of data (Figure 3.2).

3.1.3 Current coverage versus half the current coverage

3.1.3.1 Thus far, we have assumed that the coverage for the power analyses was the same as the coverage in the Mona array area, namely 5868 photos per month covering ~221 km^2, which is about 15.5% of the total digital aerial survey area. However, it was

deemed important to also model the effect of reducing coverage on the statistical power. To this end a set of power analyses was run using half the current coverage (2934 photos per month covering 7.75% of the survey area), assuming six months of breeding season data availability and 30% displacement.

Table 3.3: Number of birds (sample size per month) required in the raw data to detect a displacement of 30% with a range of statistical powers, modelled for one month versus six months of data and for different power scenarios.

Sample size per coverage scenario, 30% displacement		
Power	**Current coverage**	**Half coverage**
<0.20	15	15
0.20 to 0.40	41	38
0.40 to 0.60	76	73
0.60 to 0.80	118	120
>0.80	140	140

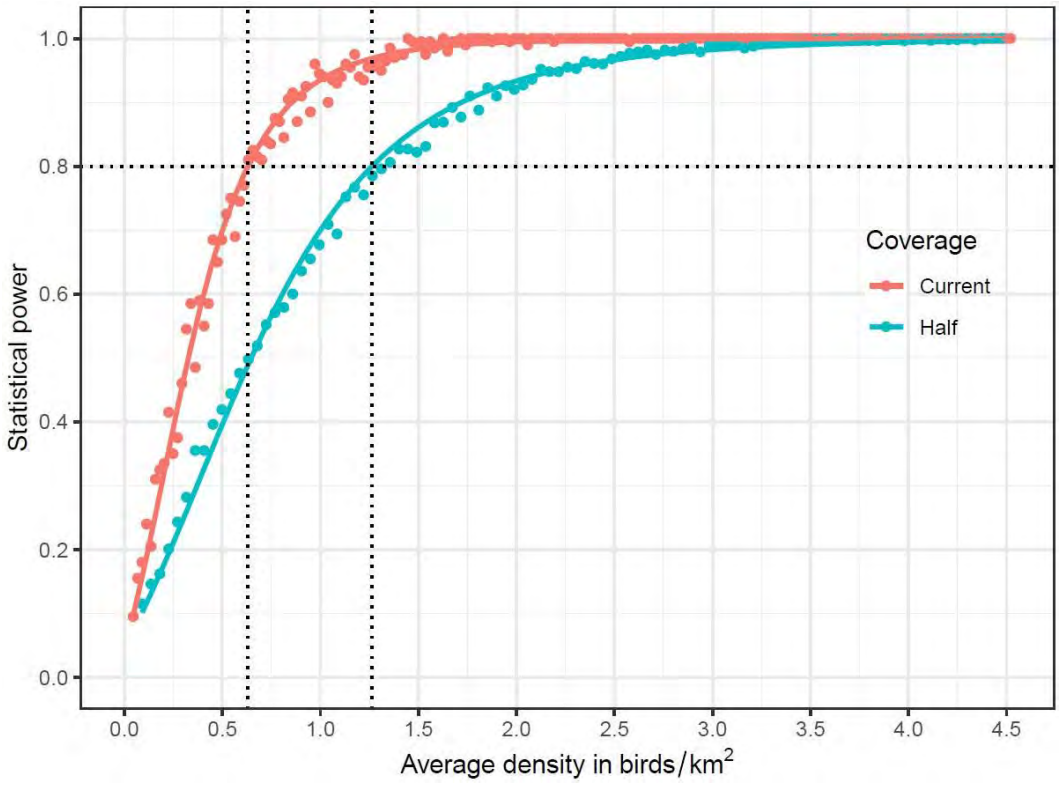

Figure 3.3: Density of birds required in the raw data for current versus half the current coverage. Each point is the outcome of 1000 statistical tests, where power is the number of significant tests divided by 1000. Power increases with sample size and more quickly when more data is available.

3.1.3.2 When coverage was halved, this had no bearing on the number of birds required to reach 80% power (Table 3.3). In other words, whether 5868 photos covering ~221 km^2 (15.5% coverage) or 2932 photos covering ~111 km^2 (7.75% coverage) were available, the number of birds required in the photos remained the same. Any

differences in Table 3.3 are due to differences in random outcomes of generating the data and were not significant.

3.1.3.3 The consequence of halving the current coverage, therefore, is that the density of birds required is double that of the full coverage to reach 80% power (Figure 3.3). For Mona, this means that instead of a density of 0.63 birds per km^2, an average density of 1.26 birds per km^2 was required to have an 80% chance of detecting a significant effect of 30% displacement.

3.1.3.4 Similarly, if coverage was doubled, the number of birds required to detect a change would not change, but the density required would be halved to 0.32 birds per km^2.

3.2 Comparison to Mona data

3.2.1.1 The 24 months of Mona digital aerial survey data was compared to the power analyses by summarising the data per season. For ease of comparison, a simplification was made by splitting the year up in two periods of six months: 'breeding' and 'non-breeding' was assigned in the same way for each species, which is an oversimplification, but will be sufficient for the purpose of this report. March to August (inclusive) was designated as breeding season, and September to February (inclusive) as 'non-breeding'.

3.2.1.2 It must also be noted that only raw data of identified species can be used for displacement analysis. Corrections for attributing unknown species and availability bias cannot be considered before the modelling, but are applied afterwards. Therefore, the raw data required pertains only to individuals identified to species level.

3.2.1.3 Table 3.4 presents the species recorded in the Mona digital aerial surveys that have been taken forward for displacement analysis in the EIA and HRA.

Table 3.4: Mona aerial survey data raw data numbers of two consecutive breeding seasons (March to August inclusive), and numbers required to detect 30% to 40% displacement with 80% power for 2 years of breeding season data (12 months). Green: >80% power, yellow: 50-80% power, orange: 25-50% power, red: <25% power.

Species	Season	Number of birds in raw data	Number of birds required 30% displacement	Number of birds required 40% displacement
Gannet	Breeding	652	852	467
Gannet	Non-breeding	306	852	467
Guillemot	Breeding	5228	852	467
Guillemot	Non-breeding	3577	852	467
Kittiwake	Breeding	1873	852	467
Kittiwake	Non-breeding	1593	852	467
Manx Shearwater	Breeding	2480	852	467
Manx Shearwater	Non-breeding	64	852	467
Puffin	Breeding	28	852	467
Puffin	Non-breeding	4	852	467
Razorbill	Breeding	1051	852	467
Razorbill	Non-breeding	1223	852	467

3.2.1.4 The current coverage is adequate to detect displacement effects of at least 30% for guillemot, razorbill, and kittiwake throughout the year, and for Manx Shearwater during the breeding season. Coverage should also be sufficient to detect at least 40% displacement for gannet during the breeding season, so the power to detect changes with the current survey design is sufficient.

3.2.1.5 A displacement effect of 30% or 40% will not be detectable for Atlantic puffin, nor for Manx shearwater during the non-breeding season. Even if displacement was very high for these species this would not be detectable given their consistent low abundances in the Mona digital aerial survey area. For northern gannet during the non-breeding season this is true to a lesser extent, but a displacement effect of 50% should still be detectable given the gannet numbers present during the non-breeding season. Given the low numbers of these birds in the Mona digital aerial survey area, the effects of displacement on these species during those times of year is expected to be negligible.

3.2.1.6 In the EIA and the ISAA the range of displacement rates used was 30% to 70% for auks and kittiwake, and 60-80% for gannet. For the higher displacement scenarios which the EIA and ISAA are based on, the numbers of birds and densities required to achieve 80% power would be considerably lower.

3.3 Comparison to Morgan data

3.3.1.1 The 24 months of Morgan digital aerial survey data was compared to the power analyses by summarising the raw total number of birds of each species within the array and buffer areas combined per season. For ease of comparison, a simplification was made by splitting the year up in two periods of six months: 'breeding' and 'non-breeding'. This was assigned in the same way for each species, which is an oversimplification, but will be sufficient for the purpose of this report. March to August (inclusive) was designated as breeding season, and September to February (inclusive) as 'non-breeding'.

3.3.1.2 It must also be noted that only raw data of identified species can be used for displacement analysis. Corrections for attributing unknown species and availability bias cannot be considered before the modelling, but are applied afterwards. Therefore, the raw data required pertains only to individuals identified to species level.

3.3.1.3 Table 3.5 presents the species recorded in the Morgan digital aerial surveys that have been taken forward for displacement analysis in the EIA and HRA.

Table 3.5: Morgan aerial survey data raw data numbers of two consecutive breeding seasons (March to August inclusive), and numbers required to detect 30% to 40% displacement with 80% power for 2 years of breeding season data (12 months). Green: >80% power, yellow: 50-80% power, orange: 25-50% power, red: <25% power.

Species	Season	Number of birds in raw data	Number of birds required 30% displacement	Number of birds required 40% displacement
Gannet	breeding	351	852	467
Gannet	non-breeding	245	852	467
Guillemot	breeding	6382	852	467
Guillemot	non-breeding	6018	852	467

Species	Season	Number of birds in raw data	Number of birds required 30% displacement	Number of birds required 40% displacement
Kittiwake	breeding	1126	852	467
Kittiwake	non-breeding	1896	852	467
Manx Shearwater	breeding	1347	852	467
Manx Shearwater	non-breeding	825	852	467
Puffin	breeding	13	852	467
Puffin	non-breeding	3	852	467
Razorbill	breeding	175	852	467
Razorbill	non-breeding	848	852	467

3.3.1.4 The current coverage is adequate to detect displacement effects of at least 30% for guillemot, Manx shearwater, and kittiwake throughout the year, and for razorbill during the non-breeding season. Coverage should also be sufficient to detect at least 40% displacement for gannet during the breeding season so the power to detect changes with the current survey design is sufficient.

3.3.1.5 A displacement effect of 30% or 40% will not be detectable for puffin, or for gannet, nor for razorbill during the breeding season. Even if displacement was very high for these species this would not be detectable given their low numbers in the Morgan digital aerial survey area. For northern gannet during the non-breeding season this is true to a lesser extent, but a displacement effect of 50% should still be detectable given the gannet numbers present (noting the EIA and ISAA assume 60-80% displacement for this species). Given the low numbers of these birds in the Morgan digital aerial survey area, the effects of displacement on these species during those times of year is expected to be negligible. The same applies to the other species recorded in low numbers in the Morgan digital aerial survey area.

3.3.1.6 In EIA and the ISAA the range of displacement rates used was 30% to 70% for auks and kittiwake, and 60-80% for gannet. For the higher displacement scenarios which the EIA and ISAA are based on, the numbers of birds and densities required to achieve 80% power would be considerably lower.

3.4 Summary

3.4.1.1 Based on the lowest level of potential effect outlined in both the EIA and the Information to Support the Appropriate Assessment (ISAA), which stands at 30% displacement, the set of analyses demonstrates that the coverage of analysis of the baseline characterisation surveys are sufficient for detecting changes in the majority of bird species. Where the coverage is not sufficient to detect change, even if displacement was very high for these species this would not be detectable given their consistent low abundances in the Mona and/or Morgan digital aerial survey area. Consequently, it can be concluded that these surveys and resulting data are appropriate for establishing the baseline to inform the EIA and ISAA.

D.6.11 Response from NRW regarding the Mona and Morgan Generation Power Analysis report

From: [redacted]
To:
Cc:

Subject: RE: Morgan Generation & Mona fifth offshore ornithology EWG meeting
Date: 11 August 2023 14:37:21
Attachments: [redacted]

Hi [redacted]

As [redacted] is on leave, please see below for NRW(A)'s comments on the power analysis note.

Kind regards,

[redacted]

NRW(A) welcome the power analysis work that has been undertaken for Mona/Morgan of using baseline survey data to ensure an appropriate level of survey coverage and data analysis has been achieved. We consider the approach taken to be adequate, essentially comparing theoretical baseline and impacted areas to determine how many birds would need to be sampled to achieve suitable power to detect desired effect sizes. The work undertaken does provide some confidence that the surveys conducted are fit for purpose in terms of baseline characterisation for consideration in EIA and HRA.

D.6.12 Response from Natural England regarding the Mona and Morgan Generation Power Analysis report

From: [redacted]
To:
Cc:
Subject: RE: NE Response Power Analysis Technical Note
Date: 10 August 2023 17:32:19
Attachments: [redacted]

CAUTION: This email originated from outside of RPS.

Hi [redacted]

Please see below comment from our ornithologist regarding the power analysis technical note:

Natural England Comment: "*Natural England welcome the Applicants power analysis using baseline survey data to ensure an appropriate level of survey coverage and data analysis has been achieved. We consider the methods employed to be adequate, essentially comparing theoretical baseline and impacted areas to determine how many birds would need to be sampled to achieve suitable power to detect desired effect sizes. We are in agreement with Applicant that the results suggest that the survey coverage and data analysis undertaken are appropriate for establishing a baseline to be considered for EIA and HRA.*"

Many thanks,

[redacted]
Senior Marine Advisor
Cheshire to Lancashire Area Team
[redacted]

D.6.13 Natural England proposed methodology for 'gap-filling' the Irish Sea R4 cumulative and in-combination assessments

Proposed methodology for 'gap-filling' the Irish Sea R4 cumulative & in-combination assessments

At present, Natural England do not consider that AEOI can be ruled out beyond reasonable scientific doubt for several species/SPA combinations at Round 4 Irish Sea projects. This is due in part to a lack of appropriate consideration of impacts arising from pre-existing OWFs. This presents a clear consenting risk and would ideally be resolved prior to examination. Natural England consider that some estimate of impact must be attributed to all projects screened in to cumulative and in-combination assessments to reduce or eliminate this risk which arises in some cases simply from a lack of provision of relevant information.

A basic approach is suggested to generate **indicative** numbers for currently 'unknown' displacement and collision impact estimates, depending on the level of data available for the relevant projects. It is acknowledged that the approach detailed below is flawed. However, the intention is simply to enable an informed expert judgement to be made on the likelihood of risk with respect to AEOI, and thus the necessity of assessing this risk in more detail.

It is of note that some OWFs screened into the assessments may be nearing end-of-life with limited (or no) overlap with the proposed project. It would be appropriate to consider timelines and determine if any of these sites can be screened out.

Where it is necessary to 'gap-fill' for a particular development, the following methods are proposed.

Displacement

1. Review the submitted environmental statement. It is accepted that displacement mortality estimates may not be presented. However, if there is abundance data, utilise this to populate project-specific displacement matrices for relevant species. We also suggest review of the Round 4 plan-level HRA to determine if any suitable estimates are presented therein.

If no abundance data available…

2. Use a nearby windfarm with a published estimate of mortality arising from displacement as a proxy. Scale this estimate according to the relative area of the two arrays and appropriate buffers.

Collision

1. Review the submitted environmental statement. It is accepted that collision mortality estimates may not be presented. However, if there is abundance data, utilise this to run project-specific CRMs according to current best practice for relevant species. We also suggest review of the Round 4 plan-level HRA to determine if any suitable estimates are presented therein.

If no abundance data available…

2. Use a nearby windfarm with a published estimate of mortality arising from collision as a proxy. Scale this estimate according to the relative number of turbines in the two arrays. The difference in the turbine specifications should be considered to determine if this method is likely to over or underestimate impact.

In the absence of any relevant site-specific data for a given development from which estimates of displacement or collision mortality can be derived, Natural England consider that the relatively clustered nature of OWFs in the Irish Sea lends itself to the alternative approach of using a site within a 'cluster' as the proxy to base the scaling of impacts upon. This could be carried out for multiple sites simultaneously if the same proxy is used.

If >1 nearby sites to a given development requiring "gap-filling" have data, the most appropriate proxy site according to location, data quality & comparability should be selected. Alternatively, consideration of multiple sites could be discussed further.

If, having generated estimates as detailed above, the total impacts lead to cumulative and/or in-combination increases in baseline mortality of >1% it will be necessary to undertake a more rigorous assessment of estimated impacts at projects where gap-filling has been necessary.

We suggest further engagement with relevant SNCBs on this point if required.

If a more rigorous assessment is considered necessary, the best available bird density estimates and known array footprint + buffers and consented turbine parameters should be used to generate refined project specific assessments of displacement and collision mortality. If baseline characterisation data are not available for a given "gap-filling" project, MERP, strategic VAS of OWF areas, or the recent Welsh Atlas data could be considered (links and references available on request).

D.7. Offshore ornithology EWG meeting 6

D.7.1 Meeting minutes

MINUTES OF MEETING

Security Classification: Project External

Partners in UK offshore wind

MOM Number	:	20231019_Morgan and Mona Offshore Ornithology	**REV. No.** :	F02
MOM Subject	:	Morgan and Mona Evidence Plan Offshore Ornithology meeting 6		

MINUTES OF MEETING

MEETING DATE	:	19/10/2023
MEETING LOCATION	:	Teams
RECORDED BY	:	[redacted] (RPS)
ISSUED BY	:	[redacted] (RPS)

PERSONS PRESENT:

- [redacted] – bp (SR)
- [redacted] – bp (MP)
- [redacted] - RPS (ST)
- [redacted] – RPS (AP)
- [redacted] – RPS (BM)
- [redacted] – RPS (AM)
- [redacted] RPS (LM)
- [redacted] – Niras (MH)
- [redacted] – Niras (WG)
- [redacted] – Niras (FC)
- [redacted] – JNCC (RS)
- [redacted] JNCC (RH)
- [redacted] – NRW (LR)
- [redacted] NRW (NP)
- [redacted] – NRW (HR)
- [redacted] – NRW (EL)
- [redacted] NRW (PB)
- [redacted] – IoM (RS)
- [redacted] MMO (AMP)
- [redacted] -MMO (MS)
- [redacted] -RSPB (AD)
- [redacted] – Natural England (EW)
- [redacted] – The Wildlife Trust (GJC)

APOLOGIES:

- [redacted] GV)
- [redacted] – RPS (KL)
- [redacted] JNCC (JW)
- [redacted] Natural England (KB)
- [redacted] Natural England (RB)
- [redacted] Natural England (AR)
- [redacted] – NRW (RN)
- [redacted] –RSPB

ITEM NO:	DISCUSSION ITEM:	Responsible party	Date
1.	**Introduction and Agenda (ST)** Introductions and welcome to the meeting. Agenda: project update followed by explanation of the approach to LSE screening and the ISAA. This has been previously discussed therefore the aim is to formalise what has been agreed. The NE advice note regarding gap filling for cumulative/in-combination assessments circulated by Richard Berridge at Natural England will be discussed briefly, albeit the advice is currently being considered by the Applicant and RPS at this time. Our ornithology team LM and AM will explain the updates to the Mona Technical Reports and comparisons of the Preliminary Environmental Information Report (PEIR) results and MH will discuss the Morgan Generation updates. Finally the agreement logs will be discussed along with next steps.		
2.	**Project updates (presented by MP)** Following responses to the Mona and Morgan Generation Preliminary Environmental Information Reports (PEIRs), the project design envelope has been reviewed and updated. The Mona and Morgan array areas have been reduced in size, mainly in response to shipping and navigation and commercial fisheries consultation and assessments. Slide 5 of pre-meeting presentation pdf provides links to the offshore newsletters for Mona and Morgan Generation that were published in September 2023 and presents key offshore updates. The maximum number of wind turbines has been reduced from 107 to 96 for both Mona and Morgan Generation projects. The rotor diameter of the largest wind turbine has increased from 280 m to 320 m for both Mona and Morgan Generation. Monopiles have been removed from the list of foundation options included in the project design envelopes. Gravity base foundations and jackets on suction buckets or pin piles (drilled or driven) are retained. No cable protection higher than 70 cm will be installed within the Menai Strait and Conwy Bay SAC. The percentage of export cable requiring cable protection has been reduced to not exceed 10% of the total length within the SAC. Additionally, no more than a 5% reduction in water depth will occur at any point along the export cables without prior written approval from the Licensing Authority in consultation with the MCA. The Mona export cables will be installed under the intertidal area from below MLWS to above MHWS		

	onshore via trenchless techniques. Open-cut trenching within the intertidal area has been removed for the project design envelope. The Mona sandwave clearance volume for the inter-array cables has been reduced from 9,542,806 m^3 to 4,188,876 m^3 through a reduction in clearance width from 104 m to 80 m. The Mona sandwave clearance volume for the offshore export cables has been reduced from 12,051,955 m^3 to 1,504,000 m^3 through a reduction in clearance width from 104 m to 40 m and a reduction in the percentage of offshore export cable requiring clearance from 70% to 20%. The Morgan Generation sandwave clearance volume for the inter-array cables has been reduced from 11,843,641 m^3 to 5,026,651 m^3 through a reduction in clearance width from 104 m to 80 m and a reduction in the percentage of inter-array cable requiring clearance from 50% to 40%.		
3.	**<u>Project updates – Liverpool Bay SPA (presented by AP)</u>** The Applicant can now confirm that intertidal installation of the export cable will be via trenchless techniques; open cut trenching has been removed from the project design envelope. In regard to installation of the export cable through the Liverpool Bay Special Protection Area (SPA), in the previous EWG the Applicant discussed and committed to implementing a voluntary timing restriction to export cable installation activities within the SPA to avoid the most sensitive winter periods for the relevant bird species in the SPA (for example red throated diver and common scoter), with a caveat around nearshore works. This was following receipt of Section 42 consultation responses regarding concerns about potential disturbance to SPA ornithological features. The applicant requested at the last EWG that the installation of any trenchless techniques at the landfall would not be included in that voluntary seasonal restriction. This was on the understanding that the main area disturbed by trenchless techniques would be the nearshore (at the cable exit pit), where the abundances of these key species are significantly lower (e.g. red throated divers aggregate further offshore than the landfall works), the highly limited extent of cable installation at the landfall and that any increase in vessels would be limited in extent and duration. Natural England and NRW previously indicated the following at the last Offshore Ornithology EWG:		

	RB - This sounds ok for red throated diver, but it would be worth taking a close look at common scoter who may be found closer to shore. *HR- NRW provisionally agree with Natural England, as long as all qualifying features (so including the wintering waterbird assemblage) are considered and a justification provided.* As discussed in the last EWG there would be a small number of vessel movements associated with those trenchless technique operations and the applicant has been looking to refine the number of vessel movements to as few as possible during the wintering period. The conclusions from the Applicant's work after the last EWG were that there could be a need for **up to 8 vessel movements** during the winter period associated with installation of the export cable at the landfall. All vessel movements associated with the installation of the export cable at the landfall during the wintering period would be subject to industry best practice measures such as sticking to defined routes, crew briefings and avoiding sudden changes to speed and direction etc. An Outline Vessel Management Plan will be produced to manage these vessel movements. This is to ensure there will be minimal disturbance to birds above the baseline levels and no adverse effect on the integrity of the SPA. The applicant is looking for agreement from stakeholders that trenchless technique operations and associated vessel movements (as detailed above, up to 8) in the wintering period will not be included in the voluntary seasonal restriction for the Liverpool Bay SPA. *Post meeting note from NRW: I think it was noted on the last EWG by NE that there isn't much that can be done to minimise disturbance to red throated diver due to cable installation works; the measures to minimise disturbance were more related to activities such as Crew Transfer Vessel movements, rather than cable installation works. The only effective measure is to not be present in the area. So not sure that the VSP plan bit will be particularly relevant?* HR – Having listened, it probably sounds okay as it will be a temporary activity, but it would be useful to look through it in writing to check before agreement. *Post meeting note from NRW: Will there be anything further provided in writing?* *Applicant response:* Vessel *movements associated with trenchless technique operations to install the export cable in the intertidal area will be detailed in writing in the Outline Landfall method statement to be submitted with the application for consent.*	**EWG to advise whether agreement can be reached that up to 8 vessel movements at the Mona landfall to facilitate the export cable installation via trenchless techniques will not be subject to seasonal restrictions in Liverpool Bay SPA but managed via industry best practice measures (such as an Outline Vessel Traffic Management Plan).**	Complete

	RH – Sounds fine in principle but please put it in writing and we can take it away to look over and discuss. *Post meeting note from NRW and JNCC: This should be RH from JNCC (now updated).* EW – Best to take some written confirmation to the ornithologists. *Post meeting note from NRW: Given that: any disturbance impact to features of the SPA will be temporary for the time of the vessel presence; birds will be able to return once the vessel has gone; there will be other habitat available within the SPA to the birds for the time they are disturbed from the landfall area; up to 8 movements across the key winter period of Nov-Mar represents a small proportion over this timescale; and a commitment to HDD for landfall has been made, NRW Advisory do not expect this temporary activity to result in an AEOSI, but it would be worth also obtaining NE and JNCC agreement.*		
4.	**<u>LSE Screening and ISAA Approach (presented by AP)</u>** Slide 8 of pre-meeting presentation pdf - The Applicant will issue a revised Habitats Regulations Assessment (HRA) Methodology paper to the EWG following this meeting to formalise this agreement. The approach on breeding birds has been agreed. Where the apportioning assessment shows 0 birds are impacted in a SPA, those SPAs/features will be screened out at LSE in the HRA Stage 1 Screening Report and will not be taken forward to the ISAA. *Post meeting note from NRW: True zero? As think that's what was agreed?* *Applicant response: Less than 0.1 when using one decimal place. Anything above 0.05 has been rounded up (i.e. to 0.1). For example, 0.04 has been rounded to 0.0 so has been excluded.* *Post meeting note from NRW: Not agreeing to approach until we see and have reviewed the final updated HRA methodology note.* *Applicant response: Noted, the final updated HRA methodology note was provided on 23/11/23.* It is agreed that this approach does not apply to SPAs where assessment is against conservation objectives (CO's) that are not linked to the abundance of features (e.g. distribution of features within the site or availability of habitat, such as for Liverpool Bay SPA).. The approach to SPAs like Liverpool Bay is unaffected; Liverpool Bay is	**The Applicant will issue a final updated HRA methodology note to the EWG attendees following the meeting to formalise the agreement on approach to LSE screening and the ISAA.**	Complete

	screened in and will be fully assessed as was done in the PEIR. For birds during the non-breeding season, the approach the project is adopting is based on Natural England and NRW feedback, and will be based on the Morecambe PEIR approach (which has also been used on Berwick Bank offshore windfarm). For the BDMPS areas, SPAs within foraging ranges/breeding colonies and where a non-breeding population of an SPA contributes less than 1% of the BDMPS, LSE is screened out for this SPA/feature. *Post meeting note from NRW: I'm a bit confused by what is written here – I thought from what had been discussed before and what is in the slide pack pdf sent prior to this EWG that the approach would be:* *SPAs located within foraging range will be screened in for LSE in the breeding season and non-breeding season impacts will also be apportioned to these colonies to give an overall annual predicted impact.* *Then for SPAs that are not located within foraging range and hence not screened in in the breeding season, these will be screened in for LSE in the non-breeding season if the non-breeding SPA populations contribute >1% of the BDMPS population (based on info presented in tables in Appendix A of Furness 2015). So those that aren't within foraging range in breeding season and contribute <1% of BDMPS population in non-breeding season(s) are screened out?* *Applicant response: NRWs description is correct, that is the approach that has been followed.* Where the non-breeding bird population of an SPA population represents more than 1% of the BDMPS, in the SPA will be taken through to the ISAA. The key SPAs in the region are screened in for birds during the non-breeding season. Then the projects have the Step 1 and Step 2 Adverse Effect On Integrity (AEOI) test. For Step 1 a 'high level' assessment of AEOI is undertaken using the threshold of a 1% increase in baseline mortality for concluding no AEOI. This High-level assessment is likely to be tabulated. The project is working through the details of this, but there will be a section heading in the ISAA for each SPA and then tables below that. One table for the project alone – which will present the numbers of birds affected (all of which are <1% baseline mortalities) with a clear conclusion of no AEOI. Then there will be another table for each feature/species, with the project alone number and the other plans/projects considered cumulatively.		

	This will have a lot more accompanying text, explaining any caveats associated with the in-combination numbers. AP showed an example of the tables for Ailsa Craig SPA project alone and in-combination for the High-Level Step 1 AEOI Test. The EWG mentioned in the last meeting that they would like to see what the Step 1 assessment might look like, we have presented an example template for how the assessment may be presented for the project alone and in-combination assessments. HR – we would advise that the tables include information/figures for: the apportioned impact for the colony, the colony count/size and date, the mortality rate (%), the baseline mortality for the colony and hence 1% baseline mortality figure and then the % of baseline mortality the impact equates to. This is so it is clear exactly how the figures and conclusions have been derived. The Applicant will not be circulating these detailed slides with these minutes as RPS/Niras are currently developing the assessments. However, the EWG have the draft slides shared ahead of this EWG meeting for reference. RPS and Niras are currently working on this and there are extra items that will be added in (e.g. whether the numbers are apportioned or not from certain projects). We have presented examples in this meeting to give attendees an idea of what the 'Step 1' is broadly aiming at. The ISAA won't include much supporting text for the project alone tables. As was set out in the HRA Methodology paper, the aim is to present a succinct AEOI test where the SPA is at very low risk to the project – so not going through the full AEOI test against all the CO's if we can demonstrate its <1% increase in baseline mortality. For in-combination the Applicant is looking to take the same approach as for the project alone, however there are differences. For in-combination the assessment is being presented by SPA and then species. The project mortalities will be presented, the percentage increase in baseline mortalities for each project (where available) will then be added up at the end to determine whether the project results in a <1% increase in baseline mortalities. Broadly the aim is to quantify the in-combination effects on each SPA/feature. For those recent projects (e.g. Morgan Generation, Mona and Morecambe), it's a bit more straightforward as the methodologies have been agreed and they are comparable across the projects. But for the older projects, it's likely these tables will require more supporting text; for example, there may be some CRM numbers, but it's likely these would not necessarily be apportioned to the SPA. So as was discussed at	**The Applicant and RPS will review the advice note issued by Natural England regarding the CEA and confirm the project approach following the meeting.**	Ongoing

	previous EWGs, although numbers can be presented, these would need to come with caveats, so the project is not overstating impacts. It is understood that Natural England advised in the last offshore ornithology EWG that a project was being commissioned by Natural England to help provide some quantification of the impacts associated with these historic projects. Unfortunately, that project will not be available in time to inform the Application. Advice was provided by Natural England with suggestions on addressing the including of older offshore wind projects within the CEA and in-combination assessments. It was noted that this was not a long-term solution but a note to enable the impacts to be quantified for these applications. The advice note will be looked at by the Mona and Morgan Gen projects and how older projects can be incorporated into the projects assessments, including the Step 1 integrity test and the CEA in the Environmental Statement chapter. The approach of the project will be confirmed after the meeting. *Post meeting note from NRW: We cannot make any comments/agreements to the proposed approach to the in-combination assessments (step 1 or step 2) until we see the proposed approach set out/example provided and until we know what is being proposed following the gap filling advice provided by NE.*		
5.	**<u>Mona updated results (presented by LM)</u>** Slide 10 of pre-meeting presentation pdf – Due to the number of project changes to address stakeholder comments, the baseline characterisation presented in the Environmental Statement will be slightly different to that presented in the PEIR. The reduction of the Mona Array Area, abundance estimates have been revised for the baseline characterisation. The notable changes to the Mona baseline characterisation relate to revised Auk ID rates which we have used to characterise the baseline in the Environmental Statement. The Apportionment of unidentified species was applied to design and model-based estimates of known species. Those species taken froward include red-throated diver, guillemot, razorbill, Atlantic puffin, Manx shearwater, northern gannet, black-legged kittiwake, northern fulmar, herring gull, lesser black-backed gull and great black-backed gull. The table in the slides (slide 10 of pre-meeting presentation pdf) shows the monthly breakdown of total raw abundance for identified and unidentified auk and shearwater species. There have been updates to the regional breeding population for the Environmental Statement method since the PEIR.		

	In the breeding season, regional populations have been calculated utilising data from the Seabird Monitoring Programme (SMP) database. Breeding data within the mean-maximum foraging range plus one standard deviation has been extracted from the online SMP database up to the year 2023. To not significantly under-estimate the regional breeding population a check of all designated and non-designated site colonies within the relevant foraging range has been undertaken to ensure all of these colonies are accounted for within the regional breeding population estimated for each species. In these cases, the most recent population estimate for each colony was used. In addition to breeding adult birds associated with the breeding colonies, there will be immature and juvenile seabirds present within the region. Population counts therefore have been adjusted to account for these seabirds. Calculation of the total regional breeding population was explored collaboratively with the Offshore Ornithology Expert Working Group (EWG) due to there being little evidence to support the calculation of the number of juveniles, immatures and non-breeding birds that remain in their wintering areas into the breeding season. The SNCBs proposed that the sum of the adult and immature population estimates for all colonies that sit within the relevant species BDMPS scale (e.g. UK Western waters) from Furness (2015) should be used in order to estimate the total regional breeding population. The EWG noted that there are potential inaccuracies associated with this approach. The Applicant notes that this approach makes broad assumptions about immature populations and therefore increases the total regional breeding population figure. The Applicant is proposing a more precautionary approach for the Environmental Statement whereby the number of immature birds present in the regional BDMPS has been estimated using the ratio of immatures per breeding adult provided in the relevant species accounts in Furness (2015). This approach, used in the Mona and Morgan Gen project's assessments to date, assumes that all immatures associated with each breeding colony will be present within the foraging range defined for each species. The Applicant acknowledges there are also potential inaccuracies with this approach. This approach likely under-estimates the true count of juvenile and immature birds due to failing to account for juvenile and immature birds migrating across to UK colonies in the breeding season from wintering grounds outside of the UK. However, this will result in a more precautionary assessment due to making use of a much smaller total regional breeding population against which the impacts have been assessed. The assessment would		

	lead to impacts being considered greater than if the Applicants used the SNCB recommended approach. Two tables were presented using guillemot for the SNCB recommended approach as an example stating that the BDMPS is over a million birds, and the Applicant has considered all colonies within the foraging ranges for the approach used in the Environmental Statement. *Post meeting note from NRW: Please could these comparisons be included in any written document of proposed approaches? As these slides were not included in the pre-meeting slide pdf – the slide for regional breeding population calculations was blank in the pdf I was sent.* *Applicant response: The Applicant has since circulated a note to the EWG on regional breeding population which shows the population size for common guillemot for our proposed approach and SNCB.* ST - Any thoughts on this approach? HR – Following the last EWG, NRW (on behalf of NRW/JNCC/NE) shared with the Applicants the approach to calculating EIA scale breeding season reference populations that the SNCBs have agreed. It is worth noting that this approach has been sent to multiple other projects, including all of the Irish Sea R4 projects and most of the Celtic Sea demonstrator flow projects. NRW understand from Natural England that the Morecambe project is happy to use the SNCB approach as sent to Mona/Morgan and NRW have received no comments to date from the Celtic Sea demonstrator project this has been sent to and hence we assume they are also happy to use the proposed approach. We also note that the approach to calculating the numbers follows that used at projects in the North Sea, I believe since around Hornsea 2 and East Anglia 3, so it has a lot of precedence for being taken forward. Also note that the approach proposed by the Mona/Morgan projects is not appropriate when you are thinking about cumulative assessments. LM – the project is taking a different approach for cumulative assessments; we are basing our approach on the BDMPS. HR – The project's proposed approach has also been using a mishmash of data. For the breeding season for birds within foraging ranges most recent SMP data is being used. The project is then using immature data from Furness (2015). NRW would recommend the project follow the approach that we have set out which is consistent with the advice being given to other projects as agreed between SNCBs, JNCC, Natural England and NRW. This methodology is what we are all advising to use		

	for projects currently. Acknowledging that it has limitations and requires a lot of further work, which is being looked at through an SNCB task and finish group. That work will not happen in time for this project so we would suggest you use the consistent approach that has the precedent from what happens in the North Sea. This is what we understand other projects coming in around the same time will be using. MH – This approach was not used for the assessments for Hornsea 2 or Hornsea 3. NIRAS produced these assessments. The approach only incorporated breeding birds in the breeding season. HR – I don't know whether that was the case; I understand that this approach came up for Hornsea 2 and on one of the East Anglia projects, which referred to it from Hornsea 2. MH – I can confirm that the approach was not undertaken as NIRAS led the assessments for both projects. HR – That was my understanding of what Natural England's advice was. *Post meeting note from NRW: Whilst the Hornsea 2 and 3 Applicants may not have taken the approach themselves, from when I was working at NE at this time, I understand it was the approach advised by the specialists working on the Hornsea 2 and 3 projects and is what they used in formulating their advice. The NE approach was taken by the more recent Norfolk and East Anglia projects and Hornsea 4.* *Applicant response: We note that Hornsea 4 did not follow the approach provided by Natural England in the application but they have provided an Assessment Sensitivity Report post-application which updates the assessment and presents three approaches to calculate regional breeding populations, including the SNCB approach.* MH – The immatures weren't included in the breeding season for the Hornsea 2 and 3 assessments; it was just the breeding adults. The projects (Hornsea 2 & 3) tried to include immatures within a regional population due to apportioning advice received from Natural England that this approach was not suitable. To move forward from this, we agree that using this for cumulative does underestimate the population. The project will review the detail provided for the approach to the cumulative assessment by the SNCBs. The foraging ranges of guillemot, for example, are much less than Manx shearwater. While the approach advised by the SNCBs would give the same answers as using the foraging	**The Applicants will review the detail provided for the cumulative approach and organise discussions with stakeholders to seek agreement with the final approach.**	Ongoing

	ranges of breeding adult birds for species such as Manx shearwater and gannets, by introducing the method for guillemot the population might be overestimated. In the Irish sea because you have a split between the Irish sea and Celtic Sea projects using a BDMPS area you will overestimate the population. We suggest it would be better to apply the guillemot foraging ranges to the projects considered cumulatively in the breeding season to see what sea area that covers and therefore what colonies that covers. For guillemot the results are likely to illustrate a smaller area than for example gannet which has a much larger foraging range. The suggested approach to the use of foraging ranges will be reviewed for the approach to the cumulative assessment. HR – This approach could be used for breeding adults. However, when considering non-breeding birds and immatures that are not constrained to the colonies, foraging ranges don't apply and as such are not appropriate to use for calculations for these.. MH – Immatures is the population we know least about so the approach at the moment uses the Furness (2015) ratio to multiply the population rather than the population provided in the Furness 2015 report. HR – That is how Furness has come up with the population numbers in those Appendix A tables. Those are refined for a colony so you will end up with the same numbers? MH – No because the data the project is using is the most up to date from SMP so it is those numbers multiplied by the ratio (for immatures). The immature ratio from Furness isn't dependent on the number of adult birds, it's a stable age population so the ratio shouldn't change. The project doesn't know how these immature birds are distributed, there is evidence for kittiwake that they will get closer to their natal colonies as their natal classes increases. Our populations (immature) should always be smaller than what is calculated in the whole BDMPs so it should more readily identify significant effects. *Post meeting note from NTW: The suggestion was that the ratio shouldn't change, but I thought this was going to be checked by Niras?* *Applicant response: The ratio may change if there have been changes in adult survival (possible) or age at first breeding (unlikely). We don't however propose to update the ratio as provided in Furness (2015).* MH – Worth thinking about how project alone and cumulative might differ for certain species.	**The Applicant will review the BDMPS advice from**	

	HR – This needs a lot of thought, so is unlikely to get resolved here. MH - The populations of immature birds in the region of the Mona and Morgan Generation Offshore Wind Project are smaller so that could mean they more readily identify significant effects. HR – Or perhaps identify significant effects which are not really significant. MH – Hopefully the assessment will come to the same conclusions whether we have the need for PVA or not. HR - It would be good to see any revised methods set out in writing and any assessment conclusions/comparisons from approaches set out, so this can be considered further outside this meeting. AM – We can prepare a separate technical note explaining the approach taken in the PEIR, the comments we received from the SNCBs and the approach for the Environmental Statement. HR – If that could be set out it would be useful to be able to see the reasoning behind the proposed approach. SR – The project was unsure about some of the wording in the SNCB advice; NIRAS do you want to clarify that? MH - I think that has been clarified. HR - There is inaccurate wording throughout the information that has come from the Furness report. MH - Thank you for clarifying. SR – We asked the SNCBs if the advice received was advised to all projects or was it project specific. Due to the timescales and low impact level would there be an opportunity for the SNCBs to see this project as an exception due to the low levels of impact. Would our proposed approach be acceptable as our assessments will be submitted prior to the advice coming through from the SNCB task and finish group? HR - Advice sent to the project has been sent to all R4 Irish sea projects and has also gone to Celtic Sea flow demonstrator projects so it is consistent across projects. SR - The Mona and Morgan projects are ahead of other projects so we thought there might be opportunities due to low bird numbers and looking at the most realistic and precautionary approach. The projects will take this discussion forward and get back with a more detailed response.	**SNCBs and prepare and share a note explaining the approach taken in the PEIR and the approach now being taken for the Environmental Statement including the comments received from the SNCBs for review by the EWG.**	Complete

	Post meeting note from NRW: It should be noted that even if NRW Advisory were to agree that this approach may be acceptable in this specific case as a result of low numbers and that it wouldn't materially alter our advice/conclusions, we would still note in our response that we do not necessarily agree with the approach in general and would not recommend other projects take it, as we do not want to set a precedent that other projects, with larger impacts, may follow.		
6.	**Displacement, CRM and Apportioning (presented by LM)** LM – Slide 12 of pre-meeting presentation pdf - Displacement - shows the increase to baseline mortality presented at PEIR and for the Environmental Statement for a range of species. Manx shearwater is presented after discussions from the previous offshore ornithology EWG meeting, and red throated diver is also included. The new approach to calculate regional breeding populations proposed by Mona/Morgan (as set out in discussion on item 5 above results in changes in background baseline mortality and % increases in baseline mortality in the Environmental Statement for displacement assessments. Manx shearwater (using auk displacement & mortality rates) has been added to the displacement assessment in the Environmental Statement. Red-throated diver has also been added to the displacement assessment in the Environmental Statement. The Environmental Statement has been updated to include data based on the updated Auk ID rates. *Post meeting note from NRW: No new approach was agreed following EWG05 and the SNCBs have said we don't agree with the approach the projects have set out for this EWG. This matter is still to be considered further and the Applicants are to produce a technical note on this for the SNCBs to consider – we have not seen this yet, so this issue is not yet resolved.* *Applicant response: Noted, the technical note produced to clarify the Applicant's position regarding calculation of the regional breeding populations was issued on 29/11/23.* Slide 13 of pre-meeting presentation pdf - Collision – the new approach to calculate regional breeding populations proposed by Mona/Morgan (as set out in discussion on item 5 above results in changes in background baseline mortality and % increases in baseline mortality for CRM in the Environmental Statement. There are no changes except for northern gannet and the change in mortality rates is shown in the table on the slide. Northern gannet		

	was specifically recommended to be modelled using both a 'no displacement' and a '70% displacement' scenario (agreed in EWG meeting 2, 13th July 2022). Have presented both JNCC avoidance rates (Ozanlav-Harris et al., 2023)and Natural England draft guidance on recommended avoidance rates (Natural England, pers. comm., 7 July 2022). *Post meeting note from NRW: Don't understand this, as the slide on CRM in the pdf I was sent pre-meeting suggests changes to all species baseline mortality and % increase in mortality except fulmar, LBBG and Manx shearwater. Although note changes are very small and don't affect conclusions.* *Or is this meaning no changes to input parameters to CRM/methodology except for gannet?Applicant response: For collision, the only increase in mortality is for Gannet in ES - in the scenario which assumed no displacement.* *Post meeting note from JNCC: I'd prefer this report to be cited as Ozsanlav-Harris et al., 2023 whenever it is used. Although it is a JNCC report, it does not in itself constitute our recommended avoidance rates. Referring to it as 'JNCC avoidance rates' incorrectly gives the message that we advise use of every number in the report as it appears, which is not necessarily the case. Our advice on implementation of the results of Ozsanlav-Harris et al., 2023 will be included in the joint SNCB guidance note on CRM. This uses the rates from Ozsanlav-Harris et al., 2023, but species grouping is an important aspect of this, therefore advice from the joint SNCB guidance note on CRM should be followed.* *Applicant response: Thank you - we have updated the reference throughout our documents.* RH – Please clarify what the JNCC avoidance rates are as referred to, as far as I am aware the numbers are the same as those in the Natural England draft guidance. AM – The draft guidance was given to us by Natural England, which didn't specify the species-specific rates for large gulls. The JNCC paper from 2023 specify species specific rates including for great black back gull. The project has used both the Natural England's large gulls (non-species specific rates of 99.39) and the JNCC paper for species specific rates which are 99.91. Therefore, the project has modelled both of the rates from each paper. RH – Recommend the project use groupings in Natural England's advice. It is the groupings in the Natural England report that are most appropriate to use.	**JNCC to check and provide the reasonings for using groupings over species specific rates.**	Complete

	HR - Agree with Rebecca's point regarding the groupings; what's in the Natural England advice will be in the SNCB advice note when it is available. AM – For using groupings over species specific is there some reasoning? RH – It will say in the advice note the reasoning for the groupings but would have to go back to check these. AM - For the Environmental Statement we will present both the species specific and groupings rates to show we have taken into account all the evidence available to us. AM - Apportioning - at PEIR the Applicant only presented SPAs and non-SPAs. In the Environmental Statement the project has also shown apportioning for non-designated sites and used updated ranges. Used where possible the age class site specific data to determine what proportion of immature and adult populations would be affected. At PEIR stable age populations were used alongside site specific age-class data per the advice from SNCBs. For the non-breeding season, we did not update Furness counts, we have lifted them directly from the appendix A tables of the Furness 2015 report, for all colonies within the BDMPS region. The table presented shows the differences between increase in baseline mortality for gannet SPAs at PEIR and Environmental Statement as an example. For one of the gannet SPAs the increase in average annual mortality is greater in the Environmental Statement (Ailsa Craig). The other three shown in the table (Grassholm, Saltee Islands and Irelands Eye SPAs) all have a lower increase in average mortality values than in the PEIR. *Post meeting note from NRW: NRW advice was not to use stable age structures, so not sure why this seems to be saying PEIR used stable age structures alongside site specific data?* *Also, I don't recall the PEIR using site-specific age class data, it just used stable age structures, which NRW advised were not used and advised to use site-specific age-class data from digital aerial surveys.* *Applicant response: The Applicant has used site-specific age classes data in the ES wherever possible. We made assumptions about age classes where low sample size.* AM –PVA – Following advice from NRW and updates to the apportioning regarding Great Ormes Head SSSI and Little Ormes Head SSSI, PVA was carried out for common guillemot as the predicted increase in baseline mortality exceeded 1%. The predicted impacts did not exceed 1% baseline mortality for any other species for the project alone and hence no other PVAs were conducted for		

	species for impacts from the project alone. For great black-backed gull both Natural England and Ozsanlav-Harris et al. (2022) avoidance rate collision results were modelled. Both guillemot and great black-backed gull were selected for further assessment of the predicted cumulative impacts due to the predicted cumulative increase in baseline mortality exceeding 1% of baseline mortality for their BDMPS. The PVAs included a 5-year burn in period. The CEA PVA will include updates on other project and plans up to the cut off of 3 months for CEA projects and plans before the application. *Post meeting note from NRW: The Ozsanlav-Harris report does not strictly represent JNCC advice, the report is available on the JNCC website as they commissioned the report – it should be referred to by the authors and not as JNCC advice. The 'NE' advice referred to here, represents SNCB (incl. NE, JNCC and NRW) advice*		
7.	**Mona updated EIA (presented by LM)** Updates on EIA - The impacts assessed for the ES are the same as the PEIR and there are no significant differences between the PEIR and the Environmental Statement. The impacts assessed are disturbance and displacement from airborne noise, underwater sound and vessel presence; indirect impacts from underwater sound affecting prey species, temporary habitat loss/disturbance and increased suspended sediment concentrations; collision risk; barriers to movement and combined displacement and collision risk. The conclusions from the PEIR remain unchanged; no significant effects are anticipated for the Environmental Statement.		
8.	**Morgan Generation updated results (presented by MH)** Morgan Generation assessments are currently being undertaken and are not complete at this stage. This section of the meeting presents the indicative results for Morgan Generation. An update on the Morgan Generation assessments will be provided in the December 2023 EWG meeting. MH - Baseline - Updates made between PEIR and the Environmental Statement are similar for Mona and Morgan Generation. We now have 24 months of survey data for the Morgan project and the Morgan array area has been reduced. As with Mona, the auk ID rates for Morgan Gen have been improved and attribution of unidentified birds to species level has been updated to reflect the improved ID rates and was applied when calculating design and model-based abundance estimates – table on slide 21 shows these identifications and abundance.		

	Slide 19 of pre-meeting presentation pdf shows the results of the baseline characterisation based on the full 24 months of data. The project is using population estimates for the Morgan array plus a 4km buffer. The Species identified within this range that are of regional importance have been taken forward into the Environmental Statement assessments. The species of regional importance include the following during their breeding seasons; kittiwake, great black-backed gull (also during non-breeding season), herring gull, guillemot and razorbill. Little gull was a species of regional importance during their non-breeding season. No species was recorded in numbers greater than the regional importance. Migratory seabirds were not recorded in large numbers during the baseline surveys, but they have been taken through into the EIA with the low numbers recorded due the SPA connectivity. For those species not considered of regional importance, this is due to low or zero abundance around the array area. Three of these species were not recorded in baseline surveys (red-throated diver, cormorant and shag). These species won't be taken through to HRA due to lack of SPA connectivity. *Post meeting note from NRW: Note the pre-meeting slide pack pdf sent out only has 22 slides in it – as additional slides were presented during the meeting and the slide numbers don't match up with those referenced in these minutes, it would be useful if the updated slide pack could be sent for reference.* *Applicant response: The slide references in these minutes have been updated to reflect the slide pack set to the EWG.* CRM species included are unlikely to change from the draft presented on the slides. Manx shearwater species have been included due to uncertainty surrounding the vulnerability metrics. Migratory seabirds and migratory waterbird species have been taken through to the CRMs standard approach. All have been modelled. Following the PEIR the full 24 months of baseline digital aerial survey data is incorporated and new parameters included. *Post meeting note: Not sure what is meant here – taken through the migration modelling approaches (e.g. SOSS MAT for waterbirds), or taken through using the migrants tab of the Band CRM spreadsheet?* *Applicant response: A combination of two approaches/ tools were followed to quantify the number of birds that may cross the morgan Array Area during migration periods: the SOSS Migration Assessment Tool (SOSSMAT)*		

	and an approach used in a Strategic assessment of collision risk of Scottish offshore wind (WWT Consulting and MacArthur Green, 2014). The resulting number of seabird and non-seabirds estimated to cross the Morgan Array Area was inputted into the Band (2012) single transit Collision Risk Model (CRM). Comparison of difference between PEIR and Environmental Statement shows increases in collision risk for kittiwake, great black-backed gull and lesser black-backed gull. There is a reduced collision risk or no change in the collision risk for herring gull, gannet and Manx shearwater. It is noted there isn't a large difference, the values are low even where proportionally the collision risk has increased percentage wise. The values of great black-backed gull show that even with a percentage increase the values in terms or numbers of birds only shows 5.7 birds are estimated in the collision risk assessment compared to 2.8 from the PEIR. It is an increase within the ES but is still a very low number of individuals at risk. Displacement – The project has included kittiwake due to JNCC request to include kittiwake in the displacement analysis and slide 26 shows those species considered in the Environmental Statement including guillemot, razorbill, fulmar, Manx shearwater and gannet. The update from the PEIR is that the full 24 months of data is now incorporated, rather than just the 12 months analysed at PEIR. Comparison of draft results between PEIR and the Environmental Statement. The apportioning has not been completed in time for this presentation and PVAs will be undertaken as required when we know what sites we are considering. ST - Are there any questions or queries? SR – Elliot, did Richard Berridge (Natural England) have any specific comments that were shared with you? EW - I haven't been given any comments to bring forward in this discussion.		
9.	**<u>Agreement logs (presented by ST)</u>** As discussed in previous EWG meetings we have made good progress on methodologies, and these have been logged in the agreement logs. The next aim is to map out progress towards conclusions and mitigation agreements as we move to application submission. The projects are looking to agree topics now based on the PEIR and project update and information provided in this presentation, and other EWG discussions. The projects are aware that there will be some items under discussion		

	and so agreements will be made once these discussions take place and as the projects progress the advice received from the PEIR and EWGs. Regarding the offshore ornithology agreement log, the agreement log includes a request for agreement that for the project alone there will not be any significant or adverse effects on integrity of designated sites. This is based on the PEIR and updates shown today that there is no greater magnitude of impact than was presented at PEIR. The applicant understands the EWG will wish to see the full cumulative assessment ahead of providing agreements on impact levels, but we wanted to highlight that we are not in a position of significant/adverse effects or impacts for Mona or Mogan Gen. Some additional items in the agreement log and others have been flagged as under discussion, and some have been flagged as agreed. We would like to map a pathway to agreement and where we want to progress to, up to application. These logs will form framework for statements of common ground. *Post meeting note from NRW: Based on what was discussed under point 10, we will await review of the technical documents prior to updating the agreement logs.*	**Stakeholders to review and update the agreement log**	Ongoing
10.	**<u>Questions/comments and next steps</u>** LR – Requested we have more information in writing on revised methodologies – and requested this information is provided through the EWGs rather than other pathways – this would be helpful to maintain an accurate audit trail. HR – Regarding the agreement logs will those come through before the updated LSE ISAA approach and other written documents we are expecting? Noted that it would be better to see these documents before updating the agreement logs. ST – The project will issue the meeting minutes but we are aware it will be better for you to get the updated documents with the agreement logs. Therefore, those documents and the agreement logs may be sent out after the meeting minutes. AM – Avoidance rates were mentioned, but the Natural England advice document mentioned previously doesn't explain the reasons between using species specific or groupings. Is that something you can provide so we can understand what is required of us. RH – We will check that all the SNCBs are happy for that to be provided and will get that information regarding	**JNCC to check with SNCBs that they are happy to provide the information requested and to provide the information to the Applicant.**	Complete

	use of species specific or groupings in the assessments across to you if it is. AM – Thank you. SR – The next EWG is scheduled for December 2023 but the project would like to reach resolutions/agreements as soon as possible. Would attendees be open to another EWG to focus on these conversations if needed? LR – Happy to have another EWG if that makes sense and time allows. HR – Agree with LR, however if there was another EWG we would suggest that this would be after we have received and had time to consider the technical documents mentioned in the earlier discussions in order for any EWG discussion to be productive. SR – Thank you. EW – If anything can be forwarded, we can ensure we get our specialists in. RH – We would be happy to participate. MP – Any comments from RSPB, IOM or the Wildlife Trusts? GJC- Not from The Wildlife Trust, we will need to get specialists to review this information.	**The applicant to review discussions, issue the updated notes, and once feedback is received to confirm whether another offshore ornithology EWG is required.**	Complete
11.	**<u>Next Steps (presented by ST)</u>** The meeting minutes will be circulated 2 weeks following the EWG and the agreement logs and updated LSE ISAA approach and other written documents will be circulated shortly after that. The next EWG will be December 2023 to present the Morgan Generation assessment unless it is agreed and organised that another meeting prior to that is deemed useful. MP – If specialists can't attend the next EWG in December, please let us know, and please look into getting specialist cover attendance for the meeting from your organisations so that we can have a productive discussion ahead of the DCO submissions in the new year. Thank you for your time today. **Meeting closed.**	**EWG attendees to confirm specialist attendance at the December EWG meeting**	Complete

D.7.2 Response from NRW regarding the meeting minutes

From: [redacted]

Subject: RE: Morgan Mona offshore ornithology EWG meeting 6
Date: 24 November 2023 10:30:07

Hi [redacted]

Thank you for circulating the meeting minutes from the sixth Offshore ornithology EWG on 19th October. Please find attached NRW Advisory comments – and apologies again for the slight delay. Thank you for also providing the updated HRA methodology note and technical note on Avoidance rates. We also note that further discussion / additional documentation will be circulated relating to the following two actions from the 6th Offshore Ornithology EWG (in addition to the updated Agreement Log):

- The applicants to review the detail provided for the cumulative approach and organise discussion with stakeholders to seek agreement with the final approach.
- The applicant will review the BDMPS advice from SNCB's and prepare and share a note explaining the approach taken in the PEIR and the approach now being taken for the Environmental Statement including the comments received from the SNCBs for review by the EWG.

Kind regards,
[redacted]

D.7.3 Response from JNCC regarding the meeting minutes

Mona and Morgan Ornithology EWG 06

19/10/2023

JNCC actions

NRW and Natural England to check and provide the reasonings for using groupings over species specific rates.

Natural England to check with SNCBs that they are happy to provide the information requested and to provide the information to the Applicant

Please find below an excerpt from the soon to be published joint SNCB advice note on Collision Risk Modelling regarding the use of species groupings.

The SNCB recommended avoidance rates are those presented in Ozsanlav-Harris *et al.* (2023) (which incorporates collision data from all suitable terrestrial, coastal and offshore wind farms that was available at the time of the analyses).

The previous 2014 advice note provided avoidance rate advice on five key species (lesser black-backed gull *Larus fuscus*, herring gull *Larus argentatus*, great black-backed gull *Larus marinus*, black-legged kittiwake *Rissa tridactyla* and northern gannet *Morus bassanus*). Aside from herring gull, all recommended avoidance rates were derived from a species group data set (e.g. 'all gull' for kittiwake and gannet) or a species sub-group ('large gull' for lesser black backed gull and great black backed gull) and for all other species (e.g. terns, skuas) a default rate of 98% was advised.

This current guidance seeks to simplify this further, acknowledging that the paucity of offshore, species-specific data undermines the confidence we can place in species-specific rates at this stage.

3.1 Lesser black-backed, great black-backed, and herring gull

We recommend the 'large gull' rate for these species.

Whilst individually, these species had data to estimate avoidance rates from up to 12 sites, data quality is variable. Individual species avoidance rates are similar (Tables 2 – 5 Ozsanlav-Harris *et al.* 2023) as expected from these biologically similar species, particularly for the Basic Band model. We therefore recommend an amalgamated 'large gull' rate for each of these species.

3.2 Kittiwake

We recommend that the 'all gull' rate is used for black-legged kittiwake.

There was data with which to estimate avoidance rates for this species from only two sites. Whilst kittiwake are a small gull, behaviourally they may be considered as not very similar to the other small gull species for which we have data to estimate avoidance rates, insofar as kittiwake are considered more marine in nature and forage much further offshore than other small species for which we have data (e.g. Woodward *et al.* 2019). We therefore recommend an amalgamated 'all gull' rate for this species.

3.3 Common and black headed gulls

We recommend the 'small gull' rate for these species.

Whilst individually, these species had data to estimate avoidance rates from up to 13 sites, data quality is variable. We therefore recommend an amalgamated 'small gull' rate for each of these species.

3.4 All other gulls and skuas

We recommend the 'all gull' rate is used for all other gull species, and for skuas.

Given the lack of data for other gull species, we recommend using the 'all gull' rate for any gull species not already covered. Given the lack of data for skua species and the fact that skuas are behaviourally similar to gulls, we recommend using the 'all gull' rate for any skua species.

3.5 Gannet

We recommend the 'all gull' rate is used for gannet.

There is extremely limited species-specific data to estimate an avoidance rate for this species. Whilst we might consider the most biologically similar species for which we do have data to be the larger gull species, given the uncertainties around gannet avoidance behaviours in vicinity of turbines and manoeuvrability, we have chosen to use an amalgamation of data across all gulls to reflect this uncertainty.

The avoidance rates calculated in Ozsanlav-Harris *et al.* (2023), as with previously estimated avoidance rates, are within-windfarm avoidance rates. Whilst this is sufficient to capture avoidance for most species, studies have consistently shown that gannet exhibit macro-avoidance (similar to displacement but affects flying birds only; reduces the number of birds entering an OWF footprint compared to what might be expected in the absence of the OWF).

We recommend that the 'all gull' within-windfarm avoidance rate is used for gannet. Consideration should be given to applying a macro-avoidance rate in addition to this. This may be achieved in practice by reducing the density of gannet in flight going into the CRM by an appropriate macro-avoidance rate. NE have commissioned a review of gannet macro-avoidance rates which can inform this. Potential application of macro-avoidance rates to gannet may differ between countries and therefore should be discussed with relevant SNCB.

3.6 Terns

We recommend that the 'all gulls and terns' rate is used for all tern species.

Individually, and collectively, tern species had data to estimate avoidance rates from only two sites. The data set is heavily influenced by one of these sites, Zeebrugge, where the turbine locations relative to the colony are not considered representative; the Zeebrugge turbines are positioned on a breakwater between the tern colony and the sea and account for 44 of the 45 sandwich tern collisions.

In the absence of a more balanced set of data for tern behaviour we consider it more appropriate to recommend that the 'all gulls and terns' rate is used for terns at this time.

3.7 Other marine species

For any species not covered above, we recommend discussion with the relevant SNCB. The 'all gulls and terns' rate is likely to be the default for most species not already covered.

D.8. Offshore ornithology EWG meeting 7

D.8.1 Meeting minutes

MINUTES OF MEETING

Security Classification: Project External

Partners in UK offshore wind

MOM Number	:	20231208_Morgan and Mona Offshore Ornithology	**REV. No.**	:	F02
MOM Subject	:	Morgan and Mona Evidence Plan Offshore Ornithology meeting 7			

MINUTES OF MEETING

MEETING DATE	:	08/12/2023
MEETING LOCATION	:	Teams
RECORDED BY	:	[redacted] (RPS)
ISSUED BY	:	[redacted] (RPS)

PERSONS PRESENT:

- [redacted] – bp (SR)
- [redacted] – bp (MP)
- [redacted] bp (GV)
- [redacted] - RPS (ST)
- [redacted] – RPS (KL)
- [redacted] RPS (AM)
- [redacted] RPS (LM)
- [redacted] – RPS (NG)
- [redacted] Niras (MH)
- [redacted] England (RB)
- [redacted] England (MT)
- [redacted] – JNCC (RH)
- [redacted] NRW (NP)
- [redacted] – NRW (PM)
- [redacted] – Natural England (KB)
- [redacted] – NRW (HR)
- [redacted] – NRW (EL)
- [redacted] – NRW (PB)
- [redacted] – IoM (RS)
- [redacted] MMO (AMP)
- [redacted] - RSPB (AD)
- [redacted] – The Wildlife Trust (GJC)

ITEM NO:	DISCUSSION ITEM:	Action	Date
1.	**Project Updates (presented by MP)** Assessments are being finalised right now, the Applicant is aiming to submit the Mona DCO application towards end of February 2024 and the Morgan Gen DCO application after Easter 2024. Any further comments and completion of the agreement logs before the Christmas break would be appreciated as we are now at a critical time and are unable to include anything new at this stage. All	**The Applicant to provide an update on the response to the advice from Natural England**	

	previous stakeholder comments have been considered. KL: The Applicant is still considering the advice from Natural England regarding how to incorporate historic offshore wind projects into the cumulative and in-combination assessments. The Applicant is engaging in the spirit of the Natural England advice to consider a solution, an update will be provided in due course.	**regarding how to incorporate historic offshore wind projects into the cumulative and in-combination assessments**	25/01/24
2.	**<u>Mona and Morgan Generation regional baseline population calculation (presented by LM and AN)</u>** LM presented the approach to calculating the regional population for the project alone assessments and explained how and justified why it differed from the SNCBs advice. The approach is detailed in the meeting slides and the technical note sent to the EWG. Regional populations have been calculated utilising data from the SMP database. Breeding data within the mean maximum foraging range plus one standard deviation has been extracted from the online SMP database from between 2018 and 2023. Population counts were adjusted as the colony count does not include birds (e.g. immatures) which might summer in the area but do not attend the colony. The Applicant is not comfortable with the populations proposed to be used in the SNCB project alone assessment as they are not based on species specific foraging ranges. Using the populations calculated using the SNCB approach will lead to an over estimation of the population that may interact with the project alone and may under estimate the increase in baseline mortality (resulting from displacement and collision).The applicant would like to highlight that the age of these populations (based on colony counts) as some colonies used within the Furness (2015) Appendix tables are based on Seabird 2000 surveys (counts undertaken between 1998 and 2002). The number of birds in the regional baseline population used by the applicant's approach is lower for most species. HR- for gannet and Manx shearwater the SNCB advised numbers are lower and hence more precautionary. RB- We will need to "agree to disagree" on other species but for gannet and Manx shearwater the lower number should be used. NRW and JNCC agreed with RB.		

	LM and AN confirmed that the population numbers calculated using the Applicants approach will be presented for all species, but the numbers presented for gannet and Manx shearwater would be both the applicant's and the SNCBs regional baseline populations. The most precautionary (lowest) number of birds will be presented within the EIA/HRA. MH: Is there a proposal to update the Furness report now the seabirds count data is available? RB: Yes we are hoping to do this but further funding is required. AD: The SMP has been updated with the latest Grassholm count data and this shows that numbers have dropped.	**Applicant to include SNCB's regional baseline population for gannet and Manx shearwater**	For the Environmental Statement
3.	**<u>CEA breeding regional population (presented by LM and AN)</u>** Whilst we have previously highlighted shortcomings of the SNCB approach for the project alone assessment, we have followed the SNCB approach outlined for the CEA breeding population. For the breeding season, BDMPS figures (i.e. to sum the adult and immature population estimates for all colonies that sit within the relevant species specific BDMPS scale, e.g. UK western waters) were included and the annual predicted EIA impacts are assessed against the largest seasonal BDMPS figures.		
4.	**<u>Avoidance rates (presented by LM/AN)</u>** Collision risk modelling has been undertaken using a range of avoidance rates that incorporate those recommended by the EWG. Resulting collision risk estimates are also discussed within the assessments conducted. The Applicant believes that the use of species specific avoidance rates presented in Ozsanlav Harris *et al*. (2023) is the most accurate approach which allows the most representative modelling of species level impacts. The Applicant would like to understand the literature based rationale for using group avoidance rates as advised by Natural England, Natural Resource Wales and JNCC rather than using species specific rates. RB- Previous advice has been to use grouped rates. Formal advice will be out soon but will be almost identical to advice previously given. May need to agree to disagree. Happy for both grouped and		

	species specific rates to be presented. It's absolutely fine to present an alternative approach. AM- both rates would be presented and any impact over 1% of baseline mortality (from either avoidance rate) would be investigated further using PVA for the project alone and cumulatively.		
5.	**<u>Mona Updated HRA (Presented by LM)</u>** LM presented an update to the Mona HRA with a worked example of a stage 1 screening table, followed by a stage 2: Step 1 integrity table for project alone and in-combination. Within the breeding foraging range of the Mona Array Area (mean-max 127.0 km ± 109), there are six SPAs with Lesser Black Backed Gulls (LBBG) as a feature in the breeding season (Ribble & Alt Estuaries SPA, Morecambe Bay and Duddon Estuary SPA, Lambay Island SPA, Ailsa Craig SPA, Rathlin Island SPA, Skomer, Skokholm and the Seas off Pembrokeshire/Sgomer, Sgogwm a Moroedd Penfro SPA). Only the Ribble and Alt Estuaries SPA has mortality from collisions over 0.0 with mortality from collisions of 0.1 (with an avoidance rate of 0.994). The leads to an increase in baseline mortality of 0.01% (with an avoidance rate of 0.994). Therefore, LSE has been screened out for all SPAs for LBBG with the exception of the Ribble and Alt Estuaries SPA. Only two colonies of LBBG in the non-breeding season have mortality from collisions greater than 0.0, 'Skokholm, Skomer, Mholm' and UK Western non-SPA colonies which have mortality from collisions of 0.1 and 0.2 respectively. This results in an increase in baseline mortality of 0.00% for both colonies. Quantitative information from projects in-combination have been presented where available, and qualitative information has been done where this information is not available. For LBBG at the Ribble and Alt Estuary the impact from the Mona Offshore Wind Project in-combination is considered to present an increase in baseline mortality of 0.32%. It can be concluded that there is no risk of an adverse effect on the integrity of the Ribble and Alt Estuaries SPA and Ramsar site beyond reasonable scientific doubt as a result of collision risk with respect to operations and maintenance of the Mona Offshore Wind Project in-combination with other projects. SNCBs noted that the Morgan and Mona HRA Updated Methodology F03 and Natural England's guidance on incorporating historic offshore wind		

	projects into the cumulative and in-combination assessments were still in circulation and couldn't comment on the validity of this approach for the in-combination assessment. KL – The Mona and Morgan numbers are so low they don't meaningfully contribute to in-combination and we have taken the most precautionary approach in the ISAA. Overall we have concluded no adverse effect on site integrity for all sites assessed. A recent planning appeal decision made by the Planning Inspectorate with regard to the Breckland SPA and The Plough determined that the impact on designated features (i.e. curlew nests) was so low as to not act in-combination with other plans or projects. [redacted] RB – In terms of apportioning methods have you used site specific data? Have sabbaticals been removed? AN- confirmed no, all birds have been included including sabbaticals. HR – were site specific ages classes used? AN- confirmed that for species which had enough data from the site specific data (e.g. gulls). RB – fantastic, so used all aged birds, great. SR- so does that still stand as the most precautionary approach? RB- Yes, it's rare our advice regarding using site specific age classes is followed on this. Glad the projects are following the Natural England advice.		
6.	**Morgan Generation updated results for offshore ornithology (presented by MH)** Morgan Generation assessments are currently being undertaken and are not complete at this stage. This section of the meeting presents the indicative offshore ornithology results for Morgan Generation. The species included in the collision risk modelling are: kittiwake, great black backed gull, herring gull, lesser black backed gull, Manx shearwater and gannet. Modelling has been conducted using EWG recommended parameters alongside other values (e.g. range of avoidance rate from Ozsanlav-Harris et al., 2023; Skov et al., 2018) to account for uncertainty and variability. MH presented a comparison of the CRM results for the Preliminary Environmental Information Report		

	(PEIR) and the Environmental Statement. There are no major differences, and no significant effects are predicted. Migratory CRM has been undertaken using the SOSSMAT Tool and WWT Consulting and MacArthur Green (2014) approaches. For migratory waterbirds collision risk estimates represent less than 0.1% increase in baseline mortality for all species and therefore no significant effect is predicted. For migratory seabirds all results represent <0.01% increase in baseline mortality and therefore no significant effect is predicted. For the displacement assessment, the following species have been included: guillemot, razorbill, fulmar, Manx shearwater, gannet and kittiwake at the request of JNCC. Displacement and mortality rates used are those that have been recommended by the EWG. MH presented the approach to apportioning for Morgan Generation. Apportioning approach incorporates all breeding colonies (SPA and non-SPA) within relevant foraging ranges of Morgan Generation Assets. It follows the two stage NatureScot Approach and uses Seabird 2000 data and as well as more recent data. If required, the Natural England PVA tool will be used. The approach will be consistent with that applied for PEIR incorporating changes as discussed in previous EWG meetings.		
7.	**<u>Morgan Generation updates HRA (Presented by MH)</u>** Within the breeding foraging range of the Morgan Array Area (mean-max 127.0 km ± 109), there are six SPAs with Lesser Black Backed Gulls (LBBG) as a feature in the breeding season. Only the Ribble and Alt Estuaries SPA, Morecambe Bay and Duddon Estuary SPA and Bowlands Fells SPA have mortality from collisions over 0.0 with mortality from collisions of 0.1 (with an avoidance rate of 0.994) for all three. The leads to an increase in baseline mortality of 0.02% for the Ribble and Alt Estuaries SPA and <0.01% for the other two SPAs (with an avoidance rate of 0.994). Therefore, LSE has been screened out for all SPAs for LBBG with the exception of these three SPAs.		

8.	**Questions/comments** SR: Based on what we have presented today, we hope this gives you the reassurance you need and given the low numbers, would you agree that there is no adverse effect on integrity on any SPA both alone and in combination and therefore no requirement for a derogation case for Mona or Morgan Generation? RB – Natural England would not be able to agree that on this call without seeing the full application. It looks promising and I would be amazed if either Mona or Morgan Generation has adverse effects alone. I am also not concerned regarding in combination, but we would need to see the full application assessments. However, it looks good, the numbers look good. HR - NRW would agree with Natural England. We will review the figures in the application.		
9.	**Next Steps (presented by ST)** The meeting minutes will be circulated 2 weeks following the EWG and the agreement logs. The applicant intends to hold an EWG in Q1 2024 to go through outstanding items before the Morgan Generation application.	**Applicant to set up an offshore ornithology EWG for Q1 2024** **Stakeholders to review and respond to the agreement logs**	Complete Ongoing

D.8.2 Response from NRW regarding the meeting minutes

From: [redacted]
ect: RE: Morgan Mona offshore ornithology EWG meeting 7
Date: 22 January 2024 16:09:09
Attachments: [redacted]

H[redacted]

Thank you for sending on the Minutes for Marine Ornithology EWG07 and Agreement Log. Please find our comments included on the minutes as track changes, and the relevant columns of the agreement logs populated for both Mona and Morgan.

We were also wondering if we should still expect to receive an update on the response to the advice from Natural England regarding how to incorporate historic offshore wind projects into the cumulative and in-combination assessments this week, as per the meeting minutes.

If you have any questions or require any clarification please do not hesitate to let me know.

Many thanks,

[redacted]

[redacted]

Croesewir gohebiaeth yn Gymraeg a byddwn yn ymateb yn Gymraeg, heb i hynny arwain at oedi.
Correspondence in Welsh is welcomed, and we will respond in Welsh without it leading to a delay.

D.8.3 Provision of Avoidance Rates Technical Note

Partners in UK offshore wind

MONA AND MORGAN GENERATION OFFSHORE WIND PROJECTS

Avoidance Rate Note for the Mona and Morgen Generation Offshore Ornithology EWG

November 2023

F01

Image of an offshore wind farm

www.morganandmona.com/en

Document status

Version	Purpose of document	Authored by	Reviewed by	Approved by	Review date
F01	Technical note for EWG	RPS/NIRAS	RPS	bpEnBW	23/11/23

Prepared by:

RPS/NIRAS

Prepared for:

Mona Offshore Wind Ltd. Morgan Offshore Wind Ltd.

Contents

Tables

1 AVOIDANCE RATE NOTE

1.1 Introduction

1.1.1.1 This note is developed to provide context and rationale for the Applicant's choice to utilise both the grouped avoidance rates and species-specific avoidance rates extracted from the research conducted by Ozsanlav-Harris *et al.* (2023) in the Applicant's Collision Risk Model (CRM) analysis for the Mona and Morgan generation assets Environmental Statement.

1.1.1.2 The Applicant's objective is to gain agreement on the use of species-specific rates for certain species in their conclusions of the environmental impact assessment. The Applicant aims to achieve agreement by providing evidence and explanation in support of using species-specific avoidance rates, using great black-backed gulls as an example species of interest.

1.1.1.3 Species group avoidance rates were recommended for use by Natural England, Natural Resource Wales and JNCC during the Mona and Morgan Generational Assets Evidence Plan Process. However, with the availability of newly published robust species-specific avoidance rates, the Applicant considers it more appropriate to place emphasis on these in the environmental impact assessment in order to produce more representative species-level impacts for the Mona and Morgan generational assets Environmental Statement. Both approaches outlined below are to be presented within the Environmental Statements (and supporting documents) to ensure these can be readily easily compared by the SNCBs on review of the Environmental Statements.

1.1.1.4 Additionally, the Applicant is requesting Natural England, Natural Resource Wales and JNCC provide justification for using species group avoidance rates over species-specific rates to allow the Applicant to understand the advice given.

1.1.2 Background to Collision Risk modelling

1.1.2.1 CRMs are known to be sensitive to the parameter of avoidance rate and as such there has been extensive research and reviews into the generation of the most accurate estimates of these rates and how they are quantified (Cook, 2021). Previously, due to the unavailability of robust species-specific avoidance rates and the limited sample size associated with calculated species-specific avoidance rates for some species, avoidance rates were often pooled for similar species (e.g. 'large gulls' or 'small gulls'). This was done due to the recommendation from the Statutory Nature Conservation Bodies (SNCB) to the Marine Scotland Science Avoidance Rate Review (Cook *et al.* 2014) in 2014. The SNCB (2014) response was in favour of grouped rates due to stating that:

"*in several instances these [avoidance rates] are not derived from species-specific information and as such represent avoidance rates for species groupings (e.g. 'large gulls') rather than for an individual species*" and

"Therefore, we recommend that, until such time as it is possible to calculate a species-specific avoidance rate for kittiwakes, they are classed under the more generic (and precautionary) 'all gull' category.

1.1.2.2 Since the avoidance rate review by the SNCB (2014), several studies such as Skov *et al.* (2018) and Tjørnløv *et al.* (2023) have been published that provide an in-depth quantitative study into species-specific avoidance rates at offshore wind farms. Cook (2021) reiterates the need to update avoidance rates as new evidence emerges:

"Previous studies have estimated suitable avoidance rates for use in the Band model. However, given ongoing data collection, there is a need to update these estimates to ensure they reflect the best available evidence."

1.2 Applicants approach for the Environmental Statement

1.2.1.1 During the drafting of the Preliminary Environmental Information Report, draft guidance (which was based on the Ozsanlav-Harris *et al.* (2023) study) was provided by Natural England (received from Richard Berridge) on the 7 July 2022, prior to the publishing of the review by Ozsanlav-Harris *et al*. (2023). Below is an extract from that email, which recommends the use of grouped avoidance rates instead of species specific rates:

"*As noted in our response to the Morgan & Mona CRM technical note, there is a forthcoming update to the joint SNCB CRM guidance note. This new guidance is still in draft, and unlikely to be agreed, adopted and published for some time. However, we are fairly confident that the parameters that will be recommended are now unlikely to change. So, please find attached those parameters to enable you to undertake CRM. Note also that we now recommend using the stochastic model."*

1.2.1.2 Upon this advice, the Applicant used group avoidance rates in CRM analysis for their Preliminary Environmental Information Reports for Mona and Morgan generation assets (Volume 2, Chapter 10 Offshore Ornithology: Mona Offshore Wind Ltd, 2023).

1.2.1.3 Due to the timing of the Mona and Morgan generational assets Environmental Statement, the Ozsanlav-Harris *et al.* (2023) review was published allowing for the Applicant to check and utilise the source material that influenced the Natural England avoidance rate guidance. The Applicant has therefore chosen to present collision risk modelling utilising both the grouped avoidance rates (as recommended by Natural England, Natural Resource Wales and JNCC), as well as presenting species-specific rates provided by Ozsanlav-Harried *et al.* (2023).

1.2.1.4 The research conducted by Ozsanlav-Harris *et al*. (2023) reviews the approach to calculate the avoidance rate of specific species and groupings, comparing this to the approach by Cook (2021). The Ozsanlav-Harris *et al*. (2023) dataset contains information on collision data from 23 monitoring reports of 19 wind farms (including one offshore), encompassing 11 species or species groups spanning the years 2000 to 2019. Cook (2021) suggests that a minimum of 10 sites may be used as an arbitrary threshold sample size to inform the selection of species-specific avoidance rates over group-specific estimates. The Applicant considers that the dataset presented in the calculation of species-specific rates in Ozsanlav-Harris *et al*. (2023) represents a robust resource. The avoidance rates presented in Table 1.1 are the recommended group avoidance rates extracted from Ozsanlav-Harris *et al*. (2023). The Applicant has utilised these rates within the Environmental Statement for Mona and Morgan Generation Assets.

Table 1.1 Recommended Species-Group Avoidance Rates (AR) for Collision Risk Modelling from Natural England, Natural Resource Wales and JNCC for use in basic band stochastic CRM. Rates have been extracted from Ozsanlav-Harris *et al*. (2023). Results presented as a median rate (standard deviation; 95% confidence interval). The standard deviation and 95% confidence interval were calculated using the delta method (Powell 2007).

Species	Basic sCRM AR
All gulls rate	0.9928 (0.0003; 0.9921 to 0.9934)
Black-legged Kittiwake **(All gulls rate)**	0.9928 (0.0003; 0.9921 to 0.9934)
Lesser Black-backed Gull **(Large Gulls rate)**	0.9939 (0.0004; 0.9931 to 0.9947)
Herring gull **(Large Gulls rate)**	0.9939 (0.0004; 0.9931 to 0.9947)
Great Black-backed Gull **(Large Gulls rate)**	0.9939 (0.0004; 0.9931 to 0.9947)
Other marine species **All gulls and terns rate**	0.9907 (0.0004; 0.9899 to 0.9914)

1.2.1.5 In addition to modelling the grouped avoidance rate, the Applicant has also chosen to model and present the Ozsanlav-Harris *et al.* (2023) species-specific rates in their analysis and the conclusions of the environmental impact assessment for the Environmental Statement is based on these species-specific rates. These are presented in Table 1.2 below.

Table 1.2 Species-specific Avoidance Rates (AR) from Collision Risk Modelling using basic band stochastic CRM from Ozsanlav-Harris *et al*. (2023). AR presented as a median rate (standard deviation; 95% confidence interval). The standard deviation and 95% confidence interval were calculated using the delta method (Powell 2007). Sample size presented as number of report-years and number of bird flights through turbine rotor-swept area contributing data to calculate avoidance rate from CRM.

Species/species Group	Basic sCRM AR	Sample size (no. of report years contributing data to avoidance rate calculation)	Sample size (number of bird flights through turbine rotor swept area taken from reports to Band CRM)
Kittiwake *Rissa tridactyla*	0.9979 (0.0013; 0.9955 – 0.9993)	3	4,283.58
Black-headed gull *Chroicocephalus ridibundus*	0.9923 (0.0005; 0.9913 – 0.9931)	28	127,946.11 (data not made public for 3 reports)
Herring gull *Larus argentatus*	0.9952 (0.0003; 0.9946 – 0.9958)	26	149,874.96 (data not made public for 2 reports)
Lesser black-backed gull *Larus fuscus*	0.9954 (0.0003; 0.9946 – 0.996)	21	87,763.75 (data not made public for 2 reports)
Great black-backed gull *Larus marinus*	0.9991 (0.0002; 0.9987 – 0.9994)	10	12,123.55
Gull species	0.9928 (0.0003; 0.9921 – 0.9934)	36	539,239.28 (data not made public for 3 reports)
Large gull species	0.9939 (0.0004; 0.9931 – 0.9947)	31	281,068.01 (data not made public for 3 reports)
Small gull species	0.9949 (0.0002; 0.9944 – 0.9954)	29	205,429.87 (data not made public for 3 reports)
Gulls & terns	0.9907 (0.0004; 0.9899 – 0.9914)	38	614,016.02 (data not made public for 3 reports)

1.2.1.6 Using the grouped species avoidance rates would result in higher predicted collision mortalities compared to species specific avoidance rates. However, as species-specific rates are calculated from robust analysis, it is considered that the species-specific rate, specifically for herring gull, lesser black-backed gull and great black-backed gull, represents the best available evidence for use in collision risk modelling. Taking great black-backed gull as a representative example, the difference in basic

Band (2012) model avoidance rate between the large gull group rate of 0.9936 (recommended by the SNCBs) and the species-specific rate of 0.9991 represents an avoidance rate difference of 0.0055. The group avoidance rate estimate for large gulls is lower (0.9936) than the three large gull species-specific rates (lesser black-backed gull 0.9954, herring gull 0.9952, great black-backed gull 0.9991) within Oszanlav-Harris *et al.* (2023). The difference is explained in Cook *et al*. (2021) as being due to the identification of birds to group level rather than species level in surveys for two reports used in the analysis by Cook (2021) and subsequently Oszanlav-Harris *et al.* (2023).

1.2.1.7 The species-specific rates for herring gull, lesser black-backed gull and great black-backed gull create no more uncertainty than that associated with the grouped avoidance rates or Large gull, which incorporate data from species that although superficially similar, may exhibit differences in flight behaviour that can affect avoidance behaviour. The Applicant acknowledges that using the grouped avoidance rate for these species would represent a more precautionary approach to estimating collision mortality. However, it is clear from Table 1.2, that a wide range of avoidance exists between these gull species and therefore the use of a grouped rate would be overestimating impacts for these species.

1.2.1.8 Where the sample size is not at the minimum threshold of 10 (Cook, 2021), for example kittiwake, it is considered appropriate to place emphasis on the all gull rate instead of the species-specific rate. By doing the assessments for kittiwake using the all gull rate it will capture the associated uncertainty as it is calculated using data from species that exhibit different flight behaviour than the more marine-based kittiwake

1.2.1.9 In either case, uncertainty associated with all avoidance rates, and especially species-specific rates, is captured as part of the modelling process through the use of the stochastic collision risk model and standard deviation values.

1.3 Agreement Requested

1.3.1.1 The Applicant remains committed to remaining up to date with the latest developments in the literature, with the aim to reduce the inherent uncertainty in the assessments conducted for offshore wind farms.

1.3.1.2 Based on the information presented in this note, the Applicant believes that the use of species-specific avoidance rates presented in Ozsanlav-Harris *et al.* (2023) is the most accurate approach which allows the most representative modelling of species-level impacts. The Applicant is looking for agreement with the conclusions of the environmental impact assessment for the Environmental Statement based on these species-specific rates from Ozsanlav-Harris *et al.* (2023).

1.3.1.3 For clarity, the Environmental Statements (and supporting documents) will present both approaches (as set out in Table 1.1 and Table 1.2) to ensure the SNCBs can review both sets of avoidance rates and for ease of comparison.

1.3.1.4 The Applicant would like to understand the literature based rationale for using group avoidance rates as advised by Natural England, Natural Resource Wales and JNCC rather than using species-specific rates.

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D.8.4 Provision of Regional Breeding Populations Technical Note

Partners in UK offshore wind

MONA OFFSHORE WIND PROJECT

MORGAN OFFSHORE WIND PROJECT: GENERATION ASSETS

Mona and Morgan Generation Offshore Wind Farm Projects - Technical Note on Regional Breeding Populations Calculations

November 2023

F01

Image of an offshore wind farm

www.morganandmona.com/en

Document status

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APPENDICES

1 TECHNICAL NOTE ON REGIONAL BREEDING POPULATIONS CALCULATIONS

1.1 Background and Aims

1.1.1.1 The following technical note has been produced to clarify the Applicant's position regarding calculation of the regional breeding population used to assess the impact on background mortality for both the project alone and Cumualtive Effects Assessment (CEA). This technical note is produced in response to the advice note sent by Natural Resource Wales which was agreed by Joint Nature Conservation Committee (JNCC) and Natural England on 19 July 2023 (Appendix A). The advice note titled 'Advice to Mona/Morgan generation regarding EIA scale reference populations for assessments' was provided to the Applicant on 19 July 2023 during the Evidence Plan Process for the Mona and Morgan Generation Offshore Wind Projects.

1.1.1.2 For the project alone and CEA in the Mona Offshore Wind Project and Morgan Offshore Wind Project: Generation Assets (hereafter referred to as the Morgan Generation Assets) Preliminary Environmental Information Reports (PEIR), the regional population within the breeding season was calculated as the sum of breeding adults associated with nearby colonies (within mean-max foraging ranges) plus the proportion of immature seabirds from the Biologically Defined Minimum Population Scales (BDMPS) return migration population.

1.1.1.3 The appropriateness of the regional population within the breeding season approach used and presented in the PEIR was queried by JNCC, Natural England and Natural Resource Wales (NRW) during the PEIR Statutory Consultation.

1.1.1.4 The Applicant has examined the advice note provided by NRW. Although it is unclear whether the advice relates to calculation of the regional breeding population within species-specific foraging range distance or across the BDMPS for each species as defined for non-breeding seasons in Furness (2015), the Applicant has the taken the approach to calculate regional breeding population in the Environmental Statement based on species-specific foraging ranges in line with other accepted projects. The Applicant also queries the adequacy of the populations provided within the NRW advice note for the project alone assessment (Table 2). A further query from the Applicant is the potential difference in approach required for project alone and the CEA. The NRW advice note provided to the Applicant, does not refer to CEA and hence the Applicant is seeking further clarification on the specific application of the advice note.

1.1.1.5 This technical note has therefore been prepared to provide clarity to the Statutory Nature Conservation Bodies (SNCB) on the approach taken to calculate regional breeding populations for the Mona Offshore Wind Project and Morgan Generation Assets project alone assessment. This technical note reiterates the approach followed in the PEIR and provides the updated approach taken in the Environmental Statement for the project alone and the approach to define the regional breeding population for the CEA. The Applicant is looking for agreement on the approach to calculating breeding population for the project alone assessment as well as clarification that the approach to calculate the regional breeding population set out in the NRW advice note should be used for the CEA?

1.2 Project alone regional breeding population

1.2.1 Approach taken during PEIR and the statutory consultation response

1.2.1.1 To calculate the regional breeding population, the PEIR followed the latest approach used and accepted at numerous recent wind farms (e.g. Awel y Môr and the Green Volt Assessments).

1.2.1.2 During the breeding season, in addition to seabirds associated with breeding colonies, there will be immature seabirds and 'sabbatical' seabirds (i.e. mature seabirds not breeding in a given year) present within the region. Population counts (i.e., breeding bird colony counts) therefore must be adjusted to account for these seabirds. The approach followed in the PEIR and at other wind farms (e.g. Awel y Môr) assumed that all immature seabirds in the BDMPS population in the bio-season immediately before the breeding season (usually the return migration bio-season) return to breeding colonies.

1.2.1.3 The total regional population within the breeding season is therefore the sum of breeding adults associated with nearby colonies (within mean-max foraging ranges) plus the proportion of immature seabirds from the BDMPS return migration population (Table 1).

Table 1: Calculation of regional population during the breeding season in the Mona Offshore Wind Project PEIR and the Morgan Generation Assets PEIR.

Species	Breeding population within mean-max foraging range (JNCC, 2022)	BDMPS return migration population (taken directly from Furness 2015 Appendix A tables)	Proportion of immature birds (taken directly from Furness 2015)	Immature individuals	Total combined regional breeding population (adults and immatures)
Gannet	152,372	661,888	44.7%	295,863	448,235
Kittiwake	71,198	691,526	46.6%	322,251	397,251
Lesser black-backed gull	30,140	163,304	40.5%	66,138	96,278
Herring gull	12,710	173,299	55.2%	95,661	108,371
Great black-backed gull	594	17,742	55.8%	9,892	10,486
Guillemot	130,389	1,139,220	42.5%	484,169	614,558
Razorbill	28,148	606,914	42.9%	260,366	281,276
Puffin	34,316	304,557	49.4%	150,451	184,767
Manx shearwater	1,253,612	1,580,895	45.6%	720,888	1,974,500

1.2.1.4 Following the Mona Offshore Wind Project PEIR and the Morgan Generation Assets PEIR, the following Statutory Consultation responses were provided to the Applicant regarding the above approach:

1.2.1.5 Feedback from JNCC Statutory Consultation response: *"Calculation of regional population during the breeding season. We are uncertain of the appropriateness of the approach that has been taken to calculate the regional breeding season reference populations. We suggest that approaches to calculating regional breeding reference populations be explored collaboratively through the offshore ornithology EWG."*

1.2.1.6 Feedback from NRW Statutory Consultation response: *"With reference to Breeding Season, NRW (A) are uncertain of the appropriateness of the approach that has been taken to calculate the regional breeding season reference populations and we have been unable to replicate the numbers presented in Table 10.12 Calculation of regional population during the breeding season, (particularly those for the proportions of immatures and juveniles quoted as within information presented in Furness (2015)). NRW (A) suggest that approaches to calculating regional breeding reference populations be explored collaboratively through the Offshore Ornithology EWG."*

1.2.1.7 Feedback from Natural England Statutory Consultation response: *"Natural England are not convinced that the method used to calculate regional breeding populations is appropriate Recommendation - Natural England propose discussing the approach to calculation of regional breeding populations through the EWG to reach agreement with relevant stakeholders and ensure consistency across relevant projects."*

1.2.2 Advice note from NRW (agreed with JNCC and Natural England) on calculation of regional breeding reference population (sent on 19 July 2023 following EWG05).

1.2.2.1 To calculate regional breeding population, the following advice was given by NRW:

1.2.2.2 "*Given that there is little evidence to support calculations of the number of juveniles, immatures and non-breeding birds that remain in their wintering areas into the breeding season, we advise that regional baseline population sizes for the breeding period can be derived from the relevant BDMPS tables in Appendix A of Furness (2015) by summing the adult and immature population estimates for all colonies that sit within a given regional scale (*Table 2*)".*

Table 2: Regional BDMPS Populations provided by Natural Resource Wales (as agreed with JNCC and Natural England).

Species	Breeding season reference population (sum of adults and immatures at relevant colonies)	Relevant BDMPS and Tables from Appendix A of Furness (2015) used
Gannet	522,888	Western waters, Tables 15/17
Kittiwake	245,234	Western waters & Channel, Tables 48/50
Lesser black-backed gull	240,750	Western waters, Tables 37/41
Herring gull	217,167	Western waters, Table 43
Great black-backed gull	44,753	South-west & Channel waters, Table 46
Guillemot	1,145,528	Western waters, Table 63
Razorbill	198,969	Western waters, Table 65
Puffin	1,482,791	Western waters, Table 69
Manx shearwater	1,821,544	Western waters & Channel, Table 13

1.2.2.3 The Applicant considers that the populations proposed to be used in the project alone assessment are not scientifically robust given that they are not based on species-specific foraging ranges and thus omit the latest scientific evidence on foraging ranges. For example, for the project alone assessment during the breeding season, based on the foraging ranges presented in Woodward *et al.* (2019), there is no connectivity between breeding adult guillemot from the North Rona 71 km northwest of Cape Wrath, Sutherland, Scotland) and Sula Sgeir SPA (18 km west of Rona), and the Mona Offshore Wind Project or the Morgan Generation Assets despite both colonies being located in the UK western waters defined by Furness (2015). Using the populations (Table 2) in the assessment of impact collision and displacement on baseline mortality will lead to a sizeable over estimation of the population that may interact with the project alone and may underestimate the increase in baseline mortality.

1.2.2.4 Furthermore, the Applicant would like to highlight the age of the populations (based on colony counts) used for the project alone assessment. Some colonies used within the Furness (2015) Appendix tables (Table 2), which are based on Seabird 2000 surveys (counts undertaken between 1998 and 2002) and are therefore not commensurate with the baseline characterisation surveys undertaken for the Mona Offshore Wind Project and the Morgan Generation Assets.

1.2.2.5 In addition to the NRW note on regional breeding population, the following email was provided by NRW:

1.2.2.6 *"NRW Advisory (A) note that the BDMPS report (Furness 2015) and proportions of immatures presented in the Tables within Appendix A of this report are calculated with respect to the non-breeding seasons and not the breeding season. We do not think the approach suggested by the Mona/Morgan Applicants is valid as it cannot be assumed that the distribution and origin of immature birds is the same in the breeding season compared to the non-breeding season. NRW (A) do not advise that the non-breeding season proportions in Furness (2015) are in any way applicable to the breeding season – either for adults or immatures. Additionally, we note that the proposal to use the number of breeding adults within foraging range of a project would not be appropriate for cumulative assessment given that other projects could be impacting other parts of the wider population.*

1.2.2.7 *NRW (A) acknowledge that there are potential issues associated with the approach and figures we provided for calculations of breeding season BDMPS figures. However, this requires a lot more consideration and work (which is currently being undertaken by an SNCB task and finish group) and hence in the meantime we recommend that Mona/Morgan take the approach we have previously outlined for breeding season BDMPS figures (i.e. to sum the adult and immature population estimates for all colonies that sit within the relevant species specific BDMPS scale, e.g. UK western waters) and assess the annual predicted EIA impacts against the largest seasonal BDMPS figures as previously advised."*

1.2.2.8 The applicant does not consider appropriate to sum adult and immature population estimates for all colonies that sit with the species-specific BDMPS scale (UK western waters for common guillemot). It should be based on latest evidence instead (i.e. species-specific foraging ranges).

1.2.2.9 The Applicant would like to separately present the approach for the project alone assessment and then the approach to CEA for the Environmental Statements to remove any confusion and misunderstanding. The approach to CEA is discussed in Section 1.3.

1.2.2.10 The Applicant is in agreement that calculating the population of immature birds that may interact with a project is difficult due to the limited evidence pertaining to the movements and distribution of these birds in UK waters.

1.2.3 Updated Approach Taken for the Environmental Statements

1.2.3.1 The approach in the project alone assessment was revised for the Mona Offshore Wind Project and Morgan Generation Assets Environmental Statements from the approach in the PEIRs which is presented in Section 1.2.1. The difference in the size of the breeding regional populations between the PEIRs and the Environmental Statements is presented in Table 3. The approach was amended following the Statutory Consultation responses which questioned the appropriateness of the PEIR approach. The revised Environmental Statement approach was proposed and discussed with Offshore Ornithology EWG.

1.2.3.2 In the breeding season, regional populations have been calculated utilising data from the Seabird Monitoring Programme (SMP) database. The most recent breeding data within the mean-maximum foraging range plus one standard deviation has been extracted from the online SMP database. The most recent available data spanned from between 2018 and 2023, depending on colonies coverage. A check of all designated and non-designated site colonies within the relevant foraging range has been undertaken to include all colony counts within the regional breeding population estimated for each species (Figure 1). In these cases, the most recent population estimate for each colony was used (Seabird Monitoring Programme | JNCC (bto.org)). In addition to breeding adult birds associated with the breeding colonies, there will be immature seabirds present within the region. Population counts therefore must be adjusted to account for these seabirds as the colony count does not include birds (e.g. immatures) which might summer in the area but do not attend the colony.

1.2.3.3 Calculation of the total regional breeding population was explored collaboratively with the Offshore Ornithology Expert Working Group (EWG) due to there being little evidence to support the calculation of the number immatures and non-breeding birds that remain in their wintering areas into the breeding season. The EWG proposed that the sum of the adult and immature population estimates for all colonies that sit within the relevant species BDMPS from Furness (2015) should be used to estimate the total regional breeding population. The EWG noted that there are potential inaccuracies associated with this approach. Additionally, this approach makes broad assumptions about immature populations, such as assuming all immature birds associated with UK colonies are present in UK waters which is known to be incorrect, and therefore increases the total regional breeding population figure.

1.2.3.4 As a more precautionary approach therefore, the number of immature birds present in the regional BDMPS has been estimated using the ratio of immatures per breeding adult provided in the relevant species accounts in Furness (2015). This approach assumes that all immatures associated with each breeding colony will be present within the foraging range defined for each species. The Applicant acknowledges there are also potential inaccuracies with this approach as the distribution and movements of immature birds are poorly understood in a UK context. However, the Applicant considers the approach taken for Environmental Statement to be more robust overall than the SNCBs approach as the Applicant's approach is based on latest scientific evidence (i.e., species-specific foraging ranges).

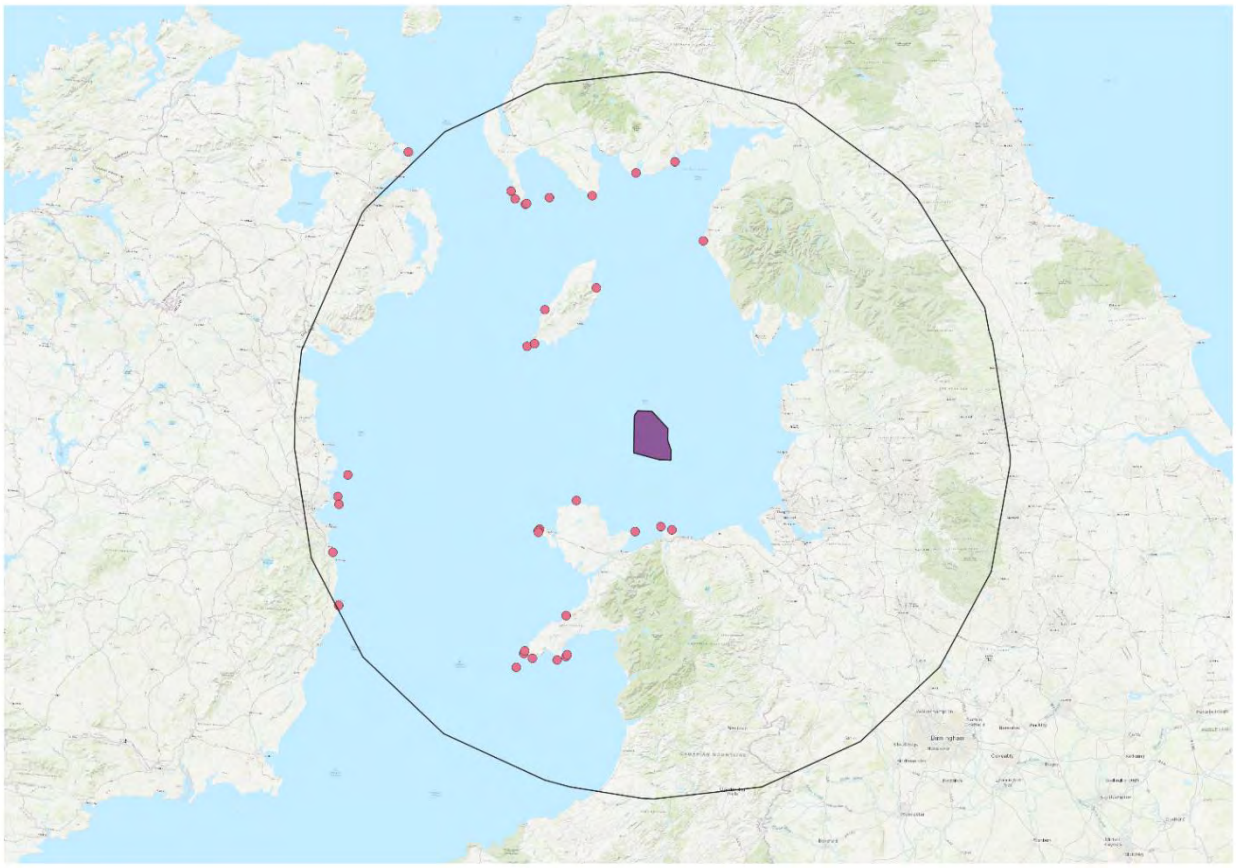

Figure 1: Colony screening example: location of common guillemot SMP colonies. Location of breeding colonies is shown in pink whilst the Mona Array Area is shown in purple. Outline circle indicates the foraging range of common guillemot from the Mona Array Area.

Table 3: Updated regional breeding population for the Mona Offshore Wind Project. The Morgan generation Assets regional breeding population may differ slightly due to project location.

* Note difference also due to inclusion of St Kilda and Grassholm colonies
** Note difference due to utilising Manx foraging range instead of the gannet screening range

Species	Regional BDMPS (adults only)	Immatures per breeding adult (ratio taken from Furness, 2015)	Regional BDMPS (immature birds)	Regional BDMPS (total individuals adult and immature)	Difference between PEIR and ES	Difference between SNCBs and ES
Common guillemot	78,552	0.74	58,128	136,680	-477,878	-1,008,848
Razorbill	10,483	0.75	7,862	18,345	-262,931	- 180,624
Atlantic puffin	99,658	1.04	103,644	203,302	+18,535	-1,279,489
Northern gannet	377,342	0.81	305,647	682,989	+234,754*	+160,101

Species	Regional BDMPS (adults only)	Immatures per breeding adult (ratio taken from Furness, 2015)	Regional BDMPS (immature birds)	Regional BDMPS (total individuals adult and immature)	Difference between PEIR and ES	Difference between SNCBs and ES
Manx shearwater	1,289,394	0.84	1,083,091	2,372,485	+397,985**	+550,941
Black-legged kittiwake	83,340	0.88	73,339	156,679	-240,572	-88,555
European herring gull	14,935	1.09	16,279	31,214	-77,157	-185,953
Lesser black-backed gull	65,348	0.68	44,437	109,785	+13,507	-130,965
Great black-backed gull	662	1.26	834	1,496	-8,990	-43,257

1.2.3.5 The Applicant suggests that considering alternative approaches, this method gives a more precautionary approach as immatures have been estimated using the 'common currency' of Furness (2015) as well as updated counts from SMP whilst ensuring that breeding adult populations are commensurate with the timeframe of baseline surveys.

1.2.3.6 The following email advice was given to the Applicant on 18 October 2023 ahead of EWG06 by NRW:

1.2.3.7 *"The projects approach has also been using a mishmash of data, for the breeding season for birds within foraging ranges most recent SMP data is being used. The project is then using immature data from Furness (2015). NRW would recommend you follow the approach that we have set out which is consistent with the advice being given to other projects as agreed between SNCBs, JNCC, Natural England and NRW. This methodology is what we are all advising to use for projects currently. Acknowledge that it has limitations and requires a lot of further work, that is being looked at through an SNCB task and finish group. That work will not happen in time for this project so we would suggest you use the consistent approach that has the precedent from what happens in the North Sea. This is what we understand other projects coming in around the same time will be using."*

1.2.3.8 As common guillemot as an example, following the Applicants method used for Mona/Morgan the total regional population for common guillemot would be 136,680 individuals (Table 3), whereas using the Natural Resource Wales method, the population would be 1,145,528 individuals (Table 2).

1.2.3.9 Additionally, the Applicant has used breeding season proportion of immature to adult birds (Furness, 2015), which is based on a stable age population model that would not change regardless of season or timeframe from which breeding adult data is sourced. It is also the ratio to calculate the immature population incorporated into the SNCB approach. This ratio has been applied to the breeding adult population which is based on updated SMP count data.

1.2.3.10 NRW states in the email advice from 18 October 2023 to look at approaches taken by wind farms in the North Sea (additionally the Applicant has expanded the search to outside of the North Sea). Following the Applicant review, the following information regarding a selection of offshore wind farms and their approach taken to calculating regional breeding populations for the project alone assessments (Appendix B).

1.2.3.11 It is evident that different approaches have been taken by different wind farms, with the original PEIR method taken by the Applicant when calculating impacts to the regional breeding population utilised by several other recent wind farm applications (e.g. Awel y Môr). The approach taken in PEIR was subsequently deemed inappropriate by the SCNBs during Statutory Consultation and an alternative approach was proposed by SNCBs. It is of note that a recent project (i.e. Rampion 2) has utilised the approach recommended by the SNCBs.

1.2.3.12 The updated approach taken by the Applicant for the Environmental Statements is more precautionary as it does not make assumptions regarding immature birds in the return migration due to estimating immature populations based on updated foraging range adult colony count. Furthermore, using the SNCBs approach will lead to a sizeable over-estimation of the population that may interact with the project alone and may underestimate the increase in baseline mortality. As such, the Applicant's approach is more conservative and precautionary and will result in greater significant of effect than the SNCBs approach.

1.3 CEA regional breeding population

1.3.1 Mona Offshore Wind Project and Morgan Generation Assets PEIRs

1.3.1.1 The approach applied for the Mona Offshore Wind Project and Morgan Generation Assets PEIRs was to take the estimated breeding season regional population used for the project alone assessment in PEIRs (adult plus immatures within the species-specific foraging range), and used that as the cumulative breeding season regional population. This is consistent with the approach used for previous offshore wind farms throughout UK waters.

1.3.1.2 Only wind farms within the species-specific foraging range were considered during the PEIR assessments.

1.3.2 NRW advice note

1.3.2.1 It is the Applicant's understanding that the SNCBs recommends that the Applicant should use the approach provided by Natural Resource Wales for the CEA – 'Advice to Mona/Morgan generation regarding EIA scale reference populations for assessments' provided to the Applicant on 19 July 2023 during the Evidence Plan Process for the Mona and Morgan Generation Offshore Wind Projects.

1.3.2.2 However, the Applicant would like to highlight the following shortcomings relating to this approach:

- The use of historic population count data as it utilises outdated colony count information (as explained in section 1.2.3).
- The use of the BDMPS areas associated with the non-breeding periods for each species for the assessing impacts in the breeding season.

1.3.2.3 In the Natural Resource Wales approach, as seen in Figure 2 for common guillemot, this would mean that for the breeding season, all Round 4 projects within the UK

western water BDMPS would utilise a common guillemot count of 1,145,528 individuals.

1.3.2.4 The Applicant believes the approach is calculated utilising the following method in the NRW approach:

Step 1: The approach consists of taking the return migration period from Furness (2015) which is August to February for common guillemot.

Table 63. BDMPS for common guillemot in non-breeding season (August to February) in 'UK western waters'.

Population	Most recent count	Pairs	Breeding adults	Immatures	Proportion of adults in UK western waters in non-breeding season	Proportion of immatures in UK western waters in non-breeding season	UK western waters number of adults	UK western waters number of immatures	UK western waters Total birds
Faroe Islands	c2000	100,000	200,000	148000	0.05	0.1	10000	14800	24800
Norway	c2000	100,000	200,000	148000	0.01	0.05	2000	7400	9400
Hermaness, Saxavord & Valla Field SPA	2009	4620	9,240	6838	0.02	0.05	185	342	527
Foula SPA	2007	16615	33,230	24590	0.02	0.05	665	1230	1894
Noss SPA	2009	14783	29,566	21879	0.02	0.05	591	1094	1685
Sumburgh SPA	2010	4762	9,524	7048	0.02	0.05	190	352	543
Fair Isle SPA	2010	13066	26,132	19338	0.02	0.05	523	967	1490
West Westray SPA	2007	33900	67,800	50172	0.02	0.05	1356	2509	3865
Calf of Eday SPA	2006	6300	12,600	9324	0.02	0.05	252	466	718
Rousay SPA	2009	6200	12,400	9176	0.02	0.05	248	459	707
Marwick Head SPA	2012	11097	22,194	16424	0.02	0.05	444	821	1265
Hoy SPA	2007	6300	12,600	9324	0.02	0.05	252	466	718
Copinsay SPA	2012	5607	11,214	8298	0.02	0.05	224	415	639
North Caithness Cliffs SPA	2000	47000	94,000	69560	0.02	0.05	1880	3478	5358
East Caithness Cliffs SPA	1999	106500	213,000	157620	0	0	0	0	0
Troup, Pennan & Lion's Heads SPS	2007	10938	21,876	16188	0	0	0	0	0
Buchan Ness to Collieston Coast SPA	2007	12928	25,856	19133	0	0	0	0	0
Fowlsheugh SPA	2012	30100	60,200	44548	0	0	0	0	0
Forth Islands SPA	2011	14674	29,348	21718	0	0	0	0	0
St Abb's Head to Fast Castle SPA	2013	22103	44,206	32712	0	0	0	0	0
Farne Islands SPA	2013	33532	67,064	49627	0	0	0	0	0
Flamborough and Filey Coast pSPA	2008	39641	79,282	58669	0	0	0	0	0
Germany and Denmark	2005	5,000	10,000	7400	0	0	0	0	0
North Sea UK non-SPA populations	2000	147000	294,000	217560	0.01	0.02	2940	4351	7291
Sule Skerry & Sule Stack SPA	1998	7633	15,266	11297	0.95	0.9	14503	10167	24670
North Rona & Sula Sgeir SPA	2012	5000	10,000	7400	0.95	0.9	9500	6660	16160
Cape Wrath SPA	2000	27359	54,718	40491	0.95	0.9	51982	36442	88424
Handa SPA	2011	37993	75,986	56230	0.95	0.9	72187	50607	122793
Shiant Isles SPA	2008	5148	10,296	7619	0.95	0.9	9781	6857	16638
Flannan Isles SPA	1999	9807	19,614	14514	0.95	0.9	18633	13063	31696
St Kilda SPA	1999	15700	31,400	23236	0.95	0.9	29830	20912	50742
Canna & Sanday SPA	1999	3913	7,826	5791	0.95	0.9	7435	5212	12647
Rum SPA	2000	1644	3,288	2433	0.95	0.9	3124	2190	5313
Mingulay & Berneray SPA	2009	13527	27,054	20020	0.95	0.9	25701	18018	43719
North Colonsay and western cliffs SPA	2000	13500	27,000	20000	1	0.95	27000	19000	46000
Ailsa Craig SPA	2013	5247	10,494	7766	1	0.95	10494	7377	17871
Rathlin Island SPA	2011	87398	174,796	129349	1	0.95	174796	122882	297678
Skomer & Skokholm SPA	2013	16300	32,600	24124	0.9	0.8	29340	19299	48639
West coast UK non-SPA populations	2000	79000	158,000	116920	0.95	0.9	150100	105228	255328
Total overseas							12,000	22,200	34,200
Total UK							644,156	460,864	1,105,020
Total							656,156	483,064	1,139,220

Step 2: The second steps consist of summing only the west coast Special Protection Areas (SPAs)/Non-SPA populations.

Sule Skerry & Sule Stack SPA	1998	7633	15,266		
North Rona & Sula Sgeir SPA	2012	5000	10,000	7400	0.95
Cape Wrath SPA	2000	27359	54,718	40491	0.95
Handa SPA	2011	37993	75,986	56230	0.95
Shiant Isles SPA	2008	5148	10,296	7619	0.95
Flannan Isles SPA	1999	9807	19,614	14514	0.95
St Kilda SPA	1999	15700	31,400	23236	0.95
Canna & Sanday SPA	1999	3913	7,826	5791	0.95
Rum SPA	2000	1644	3,288	2433	0.95
Mingulay & Berneray SPA	2009	13527	27,054	20020	0.95
North Colonsay and western cliffs SPA	2000	13500	27,000	20000	1
Ailsa Craig SPA	2013	5247	10,494	7766	1
Rathlin Island SPA	2011	87398	174,796	129349	1
Skomer & Skokholm SPA	2013	16300	32,600	24124	0.9
West coast UK non-SPA populations	2000	79000	158,000	116920	0.95
Total overseas					
Total UK					
Total					

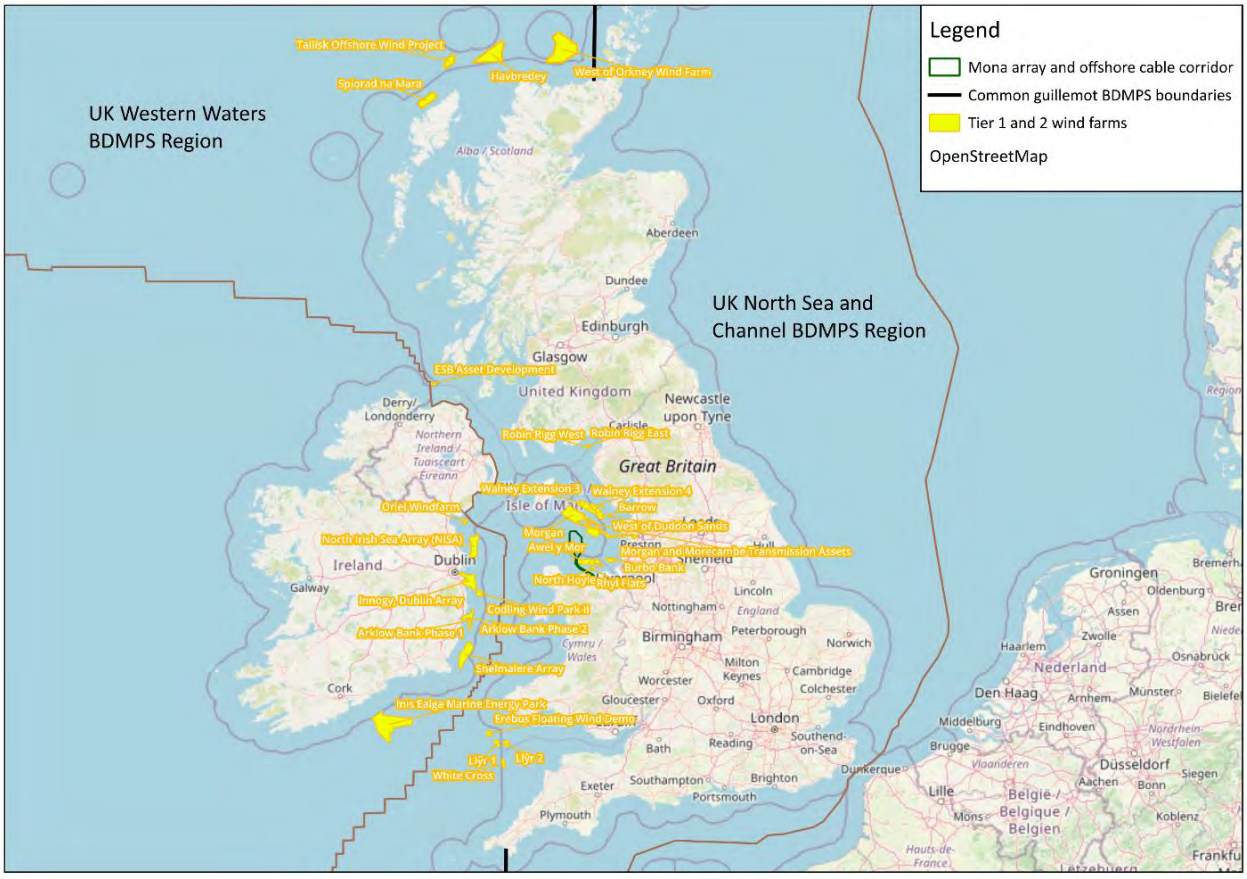

Figure 2: CEA example: common guillemot projects within the same BDMPS region as the Mona Offshore Wind Project and Morgan generation Assets. Please note that the offshore projects within this figure have not been screened further (meaning that some wind farms won't have data available to us yet) and is for demonstration purposes only and should not be considered in the final list of projects considered in the Environmental Statements).

1.3.2.5 This Natural Resource Wales approach makes use of the same Furness proportions as does the project alone assessment, emphasising the 'common currency' approach to calculating immature within the breeding population.

1.3.3 Mona and Morgan Generation Offshore Wind Projects Environmental Statements

1.3.3.1 The Applicant has utilised and calculated an updated regional breeding population (adult and immatures) for the project alone assessment. This approach utilises the foraging range for breeding adult birds and applies an immature proportion (from Furness (2015) to the breeding adult population to calculate the number of immatures associated with the breeding adult population. This therefore represents the population that could interact with the project (accepting the limitations in relation to the movements and distribution of immature birds explained for the project alone approach in section 1.2.2).

1.3.3.2 If this population was used for the CEA it would be consistent with previous project cumulative assessments (Appendix C). It is worth noting that different regional populations for the project alone and cumulative assessments have not been used in the assessments for previous offshore wind projects.

1.3.3.3 Whilst we have highlighted the concerns with the NRW approach in the project alone section, we have included assessments that follow their approach outlined for the CEA assessment in the Environmental Statements. For the breeding season, BDMPS figures (i.e. to sum the adult and immature population estimates for all colonies that sit within the relevant species specific BDMPS scale, e.g. UK western waters) were included and the annual predicted EIA impacts against the largest seasonal BDMPS figures assessed. The Applicant considers the approach proposed by the SNCBs to be robust as it includes the largest population which might be connected and impacted by all projects within the CEA.

1.3.4 Clarifications Requested

1.3.4.1 The Applicant is seeking and clarity on the following point:

- Does the EWG agree with the approach to calculating breeding population for the Morgan Generation and Mona Offshore Wind project alone assessment following consideration of evidence presented in this note?
- Could you confirm that the approach to calculate the regional breeding population set out in the NRW advice note should be used for the CEA?

1.4 References

Blue Gem Wind. (2022) Project Erebus Environmental Statement, Chapter 11: Offshore Ornithology.

Equinor. (2022) Sheringham Shoal and Dudgeon Offshore Wind Farm Extension Projects, Environmental Statement, Volume 1, Chapter 11 - Offshore Ornithology. Document Reference: 6.1.11.

Green Volt. (2023). Green Volt Offshore Windfarm Offshore EIA Report. Chapter 12: Offshore and Intertidal Ornithology.

Orsted. (2022a) Applicant's Response to Deadline 6 Ornithology submissions. Deadline 8. Document Reference: G8.3. Revision 1. EN010098-002113-Hornsea Project Four - G8.3 Comments on responses submitted for Deadline 7.pdf (planninginspectorate.gov.uk).

Orsted. (2022b) Hornsea Project Four, Ornithological Assessment Sensitivity Report, Deadline: 4, Date: 10 May 2022, Document Reference: G4.7. Microsoft Word - G4.7 Ornithology Assessment Sensitivity Report (07649907_A) to pdf.docx (planninginspectorate.gov.uk).

Orsted. (2018). Hornsea Three Offshore Wind Farm Environmental Statement: Volume 2, Chapter 5 - Offshore Ornithology PINS Document Reference: A6.2.5.

RWE. (2023) Awel y Môr Offshore Wind Farm. Category 6: Environmental Statement. Volume 2, Chapter 4: Offshore Ornithology. Deadline 8. Revision: C. Document Reference: 8.70. Application Reference: 6.2.4.

Scottish Power Renewables. (2019a) East Anglia ONE North Offshore Windfarm Chapter 12 Offshore Ornithology Environmental Statement Volume 1, Document Reference: 6.1.12.

Scottish Power Renewables. (2019b) East Anglia TWO Offshore Windfarm Chapter 12 Offshore Ornithology Environmental Statement Volume 1, Document Reference: 6.1.12.

SSE. (2022) Berwick Bank Offshore EIA. Chapter 11 – Offshore and Intertidal Ornithology.

Xodus. (2023) Volume 1, Chapter 13 Offshore and Intertidal Ornithology. DOCUMENT L-100632-S05-A ESIA-013.

Appendix A: Advice to Mona/Morgan generation regarding EIA scale reference populations for assessments. Sent by Natural Resource Wales (agreed by JNCC and Natural England) and provided to the Applicant on 19 July 2023.

1.4.1.1 For the breeding season, the BDMPS is defined as the breeding population within foraging range from the project, plus non-breeding and immature birds. The population is likely to originate from a much wider range of colonies (not just SPA colonies) and may include young immature birds spending the summer in their wintering area as well as immatures loosely associated with local colonies (Furness 2015).

1.4.1.2 Given that there is little evidence to support calculations of the number of immatures and non-breeding birds that remain in their wintering areas into the breeding season, we advise that regional baseline population sizes for the breeding period can be derived from the relevant BDMPS tables in Appendix A of Furness (2015) by summing the adult and immature population estimates for all colonies that sit within a given regional scale:

Species	Breeding season reference population (sum of adults and immatures at relevant colonies)	Relevant BDMPS and Tables from Appendix A of Furness (2015) used
Gannet	522,888	Western waters, Tables 15/17
Kittiwake	245,234	Western waters & Channel, Tables 48/50
Lesser black-backed gull	240,750	Western waters, Tables 37/41
Herring gull	217,167	Western waters, Table 43
Great black-backed gull	44,753	South-west & Channel waters, Table 46
Guillemot	1,145,528	Western waters, Table 63
Razorbill	198,969	Western waters, Table 65
Puffin	1,482,791	Western waters, Table 69
Manx shearwater	1,821,544	Western waters & Channel, Table 13

1.4.1.3 Worked example for calculation for gannet 'UK western waters' breeding season reference population calculation (all information taken from Tables 15 and 17 of Furness (2015):

Population	Most recent count	Breeding adults	Immatures	Total
Sule Skerry & Sule Stack	2004	9,350	7,574	16,924
North Rona & Sula Sgeir	2004	18,450	14,944	33,394
St Kilda	2004	119,244	96,588	215,832
Ailsa Craig	2004	54,260	43,951	98,211

Population	Most recent count	Breeding adults	Immatures	Total
Grassholm	2009	78,584	63,653	142,237
UK western non-SPA colonies	2004	9,000	7,290	16,290
TOTAL		*288,888*	*234,000*	*522,888*

1.4.1.4 For EIA assessments, we advise calculating the total predicted annual impact for a species and assessing this against the largest seasonal population (breeding or non-breeding) at the appropriate BDMPS (largest BDMPS for use in annual assessments highlighted yellow):

Species	Breeding season BDMPS	Autumn/post-breeding BDMPS*	Winter/non-breeding BDMPS*	Spring/pre-breeding BDMPS*
Gannet	522,888	545,954	-	661,888
Kittiwake	245,234	911,586	-	691,526
Lesser black-backed gull	240,750	163,304	41,159	163,304
Herring gull	217,167	-	173,299	-
Great black-backed gull	44,753	-	17,742	-
Guillemot	1,145,528	-	1,139,220	-
Razorbill	198,969	606,914	341,422	606,914
Puffin	1,482,791	-	304,557	-
Manx shearwater	1,821,544	1,580,895	-	1,580,895

* Non-breeding season BDMPSs from Furness (2015)

Furness, R.W. (2015) Non-breeding season populations of seabirds in UK waters: Population sizes for Biologically Defined Minimum Population Scales (BDMPS). Natural England Commissioned Reports, Number 164.

1.4.1.5 Annual predicted impacts should be assessed against the baseline mortality of the relevant BDMPS.

Appendix B: Calculation of Breeding Season Regional Population (Other recent offshore wind farm Environmental Statement approaches) for the project alone assessment

Awel y Môr

Awel y Môr used the Mona Offshore Wind Project and Morgan Generation Assets PEIRs approach for the alone assessment (RWE, 2023). Awel y Môr have assessed impacts against both adult and immature populations. The Applicant would like to highlight that upon inspection of the public examination documents for Awel y Môr there appears to be no disagreement with this approach.

Green Volt

Green Volt used the Mona Offshore Wind Project and Morgan Generation Assets PEIRs approach for the alone assessment (Green Volt, 2023). Green Volt have assessed impacts against both adult and immature populations. Green Volt has only just been submitted and so details regarding outcomes of this approach during are not known at this time.

Hornsea Four

The Environmental Statement was originally submitted following the same approach as Awel y Môr and Green Volt. However, Hornsea Four did receive feedback from Natural England regarding BDMPS:

"Natural England, post-Application, provided the Applicant with a new method to calculate the breeding season population size for relevant species regional BDMPS, which differed significantly to the approach taken for other recently consented OWFs (Orsted, 2022a)".

The authors go on to state:

"The Applicant took a logical approach and added the number of non-UK individuals cited in Furness (2015) with connectivity to the regional BDMPS onto the derived Breeding BDMPS population size but only when considering impacts on an annual basis. Not including non-UK individuals within the regional BDMPS runs the risk of significantly overestimating the potential impacts from UK OWFs on the BDMPS populations."

Orsted submitted an Assessment Sensitivity Report presenting the Applicant and SNCB position on regional breeding population during examination (Orsted, 2022b). The breeding season population for gannet therefore went from 139,302 individuals (DCO Application breeding BDMPS population) to 400,326 individuals (Natural England's breeding BDMPS method population). Orsted also provided a revised annual impact value using Natural England's new breeding BDMPS value plus the additional overseas populations expected based on the value presented in Appendix A of Furness (2015) for the overseas total for each species (e.g. gannet: 445,503 (Revised annual BDMPS population)).

Berwick Bank

For the Berwick Bank Environmental Statement, only the breeding adult population was used for the alone assessment. The impact is assigned to adults and immatures, however only adults impacted have been assessed against the adult population. No immature reference population has been

stated. Below is an extract from the Environmental Statement to make clear that immature and adult impacts were separated before adult impacts were assessed against an adult population;

"Based on the proportion of immature gannets recorded on digital aerial baseline surveys in the breeding season, 1% of the population present are immature birds (Table 11.25), Although this is likely to be an underestimate, since it is not possible to age all birds recorded on surveys, this would mean that an estimated 33 gannets displaced from the Proposed Development array area and 2 km buffer during the breeding season would be immature, with 3,282 adult birds also displaced (SSE, 2022)".

West of Orkney

For the West of Orkney EIA, only adult populations were used in the assessment of impacts. Breeding season populations were calculated from the most recent colony counts from Scottish Seabird Monitoring data for colonies within the mean max foraging range plus one standard deviation from the development area.

"*Impacts on each species' population size have been assessed in relation to relevant adult breeding and non-breeding seasons (Table 13-6) reference populations (Table 13-8). For the breeding season, adult regional populations used for the impact assessment have been based on the best available colony count data obtained from the SMP database (Xodus, 2023)".*

Hornsea 2

The approach taken by Hornsea 2, similarly to Berwick Bank only provided an adult population for the alone assessment, with an immature population not calculated. This population was used for both project alone and cumulative assessments.

Hornsea 3

The approach taken by Hornsea 3, again similarly to Berwick Bank and Hornsea 2 only provided an adult population for the alone assessment, with an immature population not calculated. This population was used for both Project alone and cumulative assessments (Orsted, 2018).

East Anglia One North

Upon investigation into the Environmental Statement for both East Anglia One North, it appears that a similar method to that which was used for Awel y Môr, Green Volt and Hornsea Four was used, estimating immature population from the return migration number from Furness 2015. Below is an extract from the Environmental Statement (Scottish Power Renewables, 2019a):

"Since immature seabirds are known to remain in wintering areas, the number of immature birds in the relevant population during the breeding season may be estimated as 43% of the total wintering BDMPS population (Furness 2015). This gives a breeding season population of 94,007 (BDMPS for the UK North Sea and Channel, 218,622 x 43%)".

This approach has been taken due to the authors of the Environmental Statement stating that no breeding population is within range of both wind farms and hence have used the return migration for the breeding season population. It appears that both immature and adult population have been assessed.

East Anglia Two

Upon investigation into the Environmental Statement for East Anglia Two, it appears that a similar method to that which was used for East Anglia One North was used, estimating immature population

from the return migration number from Furness (2015). Below is an extract from the Environmental Statement (Scottish Power Renewables, 2019b):

"Since immature seabirds are known to remain in wintering areas, the number of immature birds in the relevant population during the breeding season may be estimated as 43% of the total wintering BDMPS population (Furness 2015). This gives a breeding season population of 94,007 (BDMPS for the UK North Sea and Channel, 218,622 x 43%)".

Sheringham Shoal and Dudgeon Extensions

Within the Environmental Statement (Equinor, 2022), the breeding season population has been calculated from the non-breeding component of UK North Sea and Channel BDMPS (0.43 of total population). No updated foraging range count appears to be calculated. This may be due to the author stating for several species that there are no known breeding colonies within the wind farms mean maximum foraging range. Both immature and adult populations have been assessed.

Erebus

For the Erebus Offshore Wind farm, the impacts have been assessed against the adult population only. See the below extract from the Environmental Statement (Blue Gem Wind, 2022):

"For the breeding season, the populations are individual adult birds, whereas for the BDMPS, the populations are adults and immatures".

It is not entirely clear if impacts have been assigned to adult and immature birds during the breeding season, or if the precautionary assumption of all impacts are assumed to be all adult impacts during the breeding season has been adopted.

Appendix C: Calculation of Breeding Season Regional Population (Other offshore wind farm Environmental Statement approaches) for CEA

Hornsea 2 and 3

In the assessment of cumulative impacts, population estimates considered adults only. Below is an extract from the Environmental Statement (Orsted, 2018):

"Furness (2015) indicates that the non-breeding component of a razorbill population will represent 43% of the total population. This would therefore mean that there are an additional 68,124 immature birds associated with breeding colonies in the North Sea. However, the use of these populations is not appropriate in a cumulative context as this would not capture the complexity of the population structure present in the North Sea, as it ignores the distribution of different age classes. Given the complexities of the population affected by cumulative impacts no attempt has been made to compare the predicted impact against a relevant population and instead a qualitative assessment is provided for the breeding season."

East Anglia Two

It appears that only the largest BDMPS population was assessed for cumulative impacts, with CEA not split depending on season. See the following extract (Scottish Power Renewables, 2019b):

"The largest BDMPS for guillemot in UK North Sea waters is 1,617,306 (Furness 2015). At the average baseline mortality rate of 0.14 (Table 12.16) the number of individuals expected to die in a year is 226,423 (1,617,306 x 0.14)."

Awel y Môr

Awel y Môr used the same population that was calculated for the Project Alone assessment in the Environmental Statement and applied to the CEA. The approach is identical to the Mona Offshore Wind Project and Morgan Generation Assets PEIRs approach taken for project alone which is presented in section 1.2.1. In this approach, the total regional population within the breeding season is the sum of breeding adults associated with nearby colonies (within mean-max foraging ranges) plus the proportion of immature seabirds from the BDMPS return migration population.

Green Volt

Green Volt used the same population that was calculated for the Project Alone assessment in the Environmental Statement and applied it the CEA. The approach is identical to the Mona Offshore Wind Project and Morgan Generation Assets PEIRs approach taken for project alone which is presented in section 1.2.1 and summarised above.

Erebus

It appears that this project utilised a different BDMPS CEA breeding population to that of Furness (2015) when calculating CEA impacts. See the following extract (Blue Gem Wind, 2022):

"During the breeding season a total of 41 mortalities are predicted, representing 0.07% of the reference migration free breeding population (55,622; Pritchard et al., 2021)."

Sheringham Shoal and Dudgeon Extensions

It appears that these projects only assessed the annual impacts from CEA and did not break impacts down into season. See the following extract (Equinor, 2022):

"To assess the magnitude of the year-round impact of cumulative OWF collision on lesser black-backed gull, two background populations are considered. Firstly, the largest relevant BDMPS population (autumn migration season UK North Sea BDMPS, consisting of 209,007 individuals (Furness, 2015))."

D.8.5 Provision of CEA Historical Projects Application Approach Technical Note

MONA OFFSHORE WIND PROJECT

MORGAN OFFSHORE WIND PROJECT: GENERATION ASSETS

MORECAMBE OFFSHORE WINDFARM: GENERATION ASSETS

Cumulative Effects Assessment and In-combination Historical Projects Note – Environmental Statement and Habitats Regulations Assessment approach.

Image of an offshore wind farm

January 2024

F01

www.morganandmona.com/en

Document status

Version	Purpose of document	Authored by	Reviewed by	Approved by	Review date
F01	Note for the EWG/ETG	RPS	RHDHV/ NIRAS	Mona Offshore Wind Ltd. Morgan Offshore Wind Ltd. Morecambe Offshore Windfarm Ltd	25/01/2024

Prepared by:	Prepared for:
RPS	**Mona Offshore Wind Ltd.** **Morgan Offshore Wind Ltd.** **Morecambe Offshore Windfarm Ltd**

Contents

1.1 Background and aims

1.1.1.1 This note has been developed collectively by the Mona Offshore Wind Project (hereafter referred to as 'Mona'), Morgan Offshore Wind Project: Generation Assets (hereafter referred to as 'Morgan Generation') and the Morecambe Offshore Windfarm: Generation Assets (hereafter referred to as 'Morecambe Generation'). These three projects will hereafter be referred to collectively as 'the Projects', whilst the applicant of each project will be referred to collectively as 'the Applicants'.

1.1.1.2 The note has been developed in relation to the Projects to outline the approach for quantifying impacts from historic offshore wind projects for which quantitative analyses were not undertaken. The approach has been applied to the offshore ornithology Cumulative Effects Assessment (CEA) of the Projects' Environmental Statements and in the in-combination assessment of the Habitats Regulations Assessments (HRA) of the Projects.

1.1.1.3 The scope of any assessment and information presented within a Report to Inform the Appropriate Assessment (RIAA) or Information to Support Appropriate Assessment (ISAA) must be considered in the context of what is required by the legal regime under the Marine Habitats Regulations (The Conservation of Offshore Marine Habitats and Species Regulations 2017). The appropriate test is whether it can be ascertained beyond reasonable scientific doubt that there will be no Adverse Effects On Integrity (AEOI) of European Sites[1]. That conclusion must be reached taking account the best available scientific evidence. The Courts have re-iterated on a number of occasions that the conclusion reached in an appropriate assessment "*cannot realistically require ascertainment of absolute certainty that there will be no adverse effects*"[2]. It is entirely appropriate for an Appropriate Assessment to be undertaken, working with estimates and expert judgement, provided that there is sufficient information available to allow a conclusion to be reached beyond reasonable scientific doubt.

1.1.1.4 The Applicants' approach has been developed to ensure that the assessments of the Projects are robust, precautionary and provide sufficient detail to conclude no significant effects within the Environmental Statements or no AEOI beyond reasonable scientific doubt for the purposes of the HRAs undertaken for each of the Projects. This includes consideration of all projects that may act cumulatively/in-combination with the focal project, either quantitatively or qualitatively, depending on the availability of data.

1.1.1.5 The Applicants' approach considers the advice given by Natural England (provided advice on 12 October 2023) around 'gap filling' for historical offshore wind projects. The Applicants for the Projects have reviewed the advice provided by Natural England and acknowledge their concern regarding gaps within the CEAs and in-combination assessments, due to older offshore wind farms not undertaking assessments on all key species.

1.1.1.6 It is our understanding that Natural England are in the process of commissioning research to quantify impacts from historic offshore wind projects, but that the outputs of this study will not be available in time for the submission of the application or for the examination phases for the Projects. In the absence of this study, the Applicants will

[1] See decision of the Court of Justice of the European Union in Waddenzee (C-127/02)

[2] See R. (Mynydd y Gwynt Ltd) v Secretary of State for Business [2016] EWHC 2581 (Admin)

work with Statutory Nature Conservation Bodies' (SNCBs) to resolve their concerns regarding potential uncertainty, where it is feasible and practical to do so.

1.2 Advice given by SNCBs during Statutory Consultation and the Evidence Plan Process

1.2.1.1 During the Statutory Consultation on the Mona Preliminary Environmental Impact Report (PEIR) and the Morgan Generation PEIR, Natural Resources Wales (NRW), Joint Nature Conservation Committee (JNCC) and Natural England did not consider it appropriate to base the cumulative (and hence also in-combination) assessments on a large number of 'unknowns' for impacts from many of the historical offshore wind projects. They outlined that, whilst these historic projects may not have undertaken quantitative assessments, or assessments using current approaches, estimates should be generated for these historic projects for which the extent of the impacts are unknown, in order to undertake meaningful CEA and in-combination assessments. NRW, JNCC and Natural England suggested this should be explored collaboratively through the offshore ornithology Expert Working Groups (EWG).

1.2.1.2 Similar consultation comments were received from Natural England and NRW on the Morecambe Generation PEIR. Natural England stated *'The cumulative (and in-combination) assessments do not factor in impacts from a number of other projects due to a lack of data. Unknown impacts have been treated as zero, which will inevitably underestimate impacts, potentially significantly. A qualitative assessment is mentioned for consideration of some projects, but this process is not detailed, or the results fully presented. Natural England consider this approach to be unacceptable, and hence consider it inappropriate to comment on the potential significance of cumulative (or in-combination) presented in the PEIR submission.'*

1.2.1.3 During the pre-application phases for the Projects, Natural England provided advice dated 12 October 2023 on 'gap filling' for historical offshore wind projects, where fully quantitative assessments have not previously been provided.

1.2.1.4 The Natural England advice sets out that AEOI could not be ruled out beyond reasonable scientific doubt for several species and Special Protection Area (SPA) combinations at Round 4 Irish Sea projects, in part due to a lack of appropriate consideration of impacts arising from pre-existing operational offshore wind farm projects. Natural England therefore considered that some estimate of impact must be attributed to all projects screened in to cumulative and in-combination assessments. The Natural England advice note recommended the following two step approach to estimate displacement and collision impacts from the relevant operational projects:

Displacement

1. Review the submitted environmental statement. It is accepted that displacement mortality estimates may not be presented. However, if there is abundance data, utilise this to populate project-specific displacement matrices for relevant species. We also suggest review of the Round 4 plan-level HRA to determine if any suitable estimates are presented therein.

If no abundance data available…

2. Use a nearby windfarm with a published estimate of mortality arising from displacement as a proxy. Scale this estimate according to the relative area of the two arrays and appropriate buffers.

Collision

1. Review the submitted environmental statement. It is accepted that collision mortality estimates may not be presented. However, if there is abundance data, utilise this to run project-specific CRMs according to current best practice for relevant species. We also suggest review of the Round 4 plan-level HRA to determine if any suitable estimates are presented therein.

If no abundance data available…

2. Use a nearby windfarm with a published estimate of mortality arising from collision as a proxy. Scale this estimate according to the relative number of turbines in the two arrays. The difference in the turbine specifications should be considered to determine if this method is likely to over or underestimate impact.

1.3 Applicants' approach to cumulative/in-combination assessments for historic projects

1.3.1 Cumulative displacement

1.3.1.1 The Applicants have used the Step 1 proposed by Natural England (advice of 12 October) in the CEA of the Projects' EIAs. Where possible, the Applicants have obtained abundance data from historical offshore wind farm projects from project-specific documentation (e.g. the original Environmental Statement).

1.3.1.2 The impacts using the obtained abundance estimates are presented in the CEA of the Projects' Environmental Statements as displacement matrices ranging from 1% to 100% mortality and 5% to 100% displacement.

1.3.1.3 Detailed qualitative assessments for historical offshore wind farm projects, for which a quantitative consideration of displacement impacts was not undertaken in project-specific documentation, are also presented in the CEA of the Projects' Environmental Statements.

1.3.1.4 The Applicants consider that Step 2 (utilising data from a nearby wind farm, as suggested by Natural England) is not appropriate. The data from a proxy offshore wind farm, which was collected over a specific spatial and temporal scale, cannot be applied to another offshore wind farm in another area, as conditions within the two areas may be very different. In addition, data associated with many of the projects, from which abundance estimate could be derived, have used survey methods that would no longer be considered robust enough to inform project-level assessments.

1.3.1.5 By adopting Step 1 proposed by Natural England, together with qualitative assessment of projects where no data is available, the Applicants consider that sufficient information is available without undertaking a 'gap-filling exercise' to allow a robust assessment of effect in the EIA.

1.3.2 Cumulative collision

1.3.2.1 The Applicants used part of the Step 1 proposed by Natural England (advice provided on 12 October) in the CEA of the Projects' Environmental Statements. Where possible, the Applicants have obtained collision mortality estimates from historical operational offshore wind farm projects from project-specific documentation (e.g. the original Environmental Statement).

1.3.2.2 Qualitative assessment of historical offshore wind farm projects, for which quantitative consideration of collision impacts was not undertaken in project-specific documentation, are also presented in the Projects' Environmental Statements.

1.3.2.3 The Applicants do not consider it appropriate to run project-specific collision risk models for historical offshore wind farm projects where this data is not available from those projects. Robust collision risk modelling relies on wind farm parameters and project specific abundances, something which is not available for historical projects if the information is not published.

1.3.2.4 Even if information or baseline data from other sources is available, the Applicants would note that there is no precedent for this type of exercise in the offshore wind industry to 'gap-fill' information from existing projects. The Secretary of State has been able to conclude that other such developments would not have an AEOI on European sites without similar information being provided, including the recently consented Awel-y-Môr offshore wind farm.

1.3.2.5 The Applicants consider that Step 2 (use a nearby windfarm with a published estimate of mortality arising from collision as a proxy) is not appropriate. Similarly to the displacement assessment, the data from a proxy offshore wind farm, which was collected over a specific spatial and temporal scale, cannot be applied to another offshore wind farm in another area.

1.3.2.6 The Applicants consider that sufficient information is available without undertaking a quantitative 'gap-filling exercise' and that the combination of quantitative and qualitative information is sufficient to allow a robust assessment of effect in the EIA.

1.3.3 In-combination in HRA (apportioning of displacement and collision)

1.3.3.1 For the HRAs, where possible, the Applicants have utilised apportioned impacts from publicly available, project-specific, documents or the Round 4 plan level HRA documentation within the in-combination assessments for the relevant SPAs and Ramsar sites. This approach is consistent with the approach taken for previous offshore wind farm projects consented in UK waters.

1.3.3.2 When a historical offshore wind farm project has presented a total impact (mortalities) and have apportioned this impact to a specific Ramsar site or SPA, these numbers have been presented. When a historical offshore wind project has presented a total impact (mortalities), but not presented quantitatively an apportioned impact, the total impact has been reviewed. If appropriate, the apportioned value (e.g. the proportion of the species which is likely to have come from a specific colony) from a nearby offshore wind farm which has presented an apportioned value, has been used as a proxy. For example, if West of Duddon Sands Offshore Wind Farm did not present an apportioning value, the apportioning value presented by Walney Extension 4 Offshore Wind Farm could be used. This is only appropriate during the breeding season. The use of proxy values is consistent with the approach taken for previous offshore wind farm projects in UK waters (e.g. the Hornsea Three offshore wind farm).

1.3.3.3 In non-breeding seasons, apportioning values may not have been calculated for SPAs or Ramsar sites in project-specific documentation for historical offshore wind farm projects considered in-combination. However, apportioning values for these seasons are readily calculated from Furness (2015)[3], where a value for total impact (mortalities) has been presented by the historical project. This approach has therefore been adopted by the Projects within the in-combination assessment and is consistent with

[3] Furness, R. (2015) Non-breeding season populations of seabirds in UK waters: Population sizes for Biologically Defined Minimum Population Scales (BDMPS). Natural England Commissioned Report. 164.

the approach taken for previous offshore wind farm projects in UK waters (e.g. East Anglia One North, East Anglia Two, Hornsea Three, Hornsea Four, etc.).

1.3.3.4 Where a historical offshore wind farm has not presented any quantitative data relevant to the in-combination assessment, a qualitative assessment has been undertaken. In addition to the conclusions of historic projects' assessments (where relevant), this considers the relative scale of the historic project, its potential connectivity (e.g. across-sea distance) to the Ramsar site or SPA, and other factors that may affect the likelihood that the historic project would impact the relevant qualifying features.

1.3.4 Consideration of timeframe of historical project

1.3.4.1 Within the Natural England advice (provided on 12 October) it states:

"*some OWFs screened into the assessments may be nearing end-of-life with limited (or no) overlap with the proposed project. It would be appropriate to consider timelines and determine if any of these sites can be screened out".*

1.3.4.2 The Applicants have considered the project lifecycle (i.e. construction, operation and maintenance and decommissioning) of each relevant historical offshore wind project within the UK Western Waters (and Channel) BDMPS region that may act cumulatively or in-combination with the Projects. Those historic projects with lifecycles that have no overlap with the timeframes for the Projects were removed from the CEA or in-combination assessment. Three offshore wind farms (Arklow Bank Phase 1, Barrow and North Hoyle) with end of life pre-2030 were excluded from the CEA and in-combination assessment.

1.4 Conclusions

1.4.1.1 The Applicants consider the methodology presented in this note to be precautionary and robust for assessing impacts from historic offshore wind farm projects, using the best available scientific information with appropriate consideration of the Natural England advice.

1.4.1.2 The approach proposed provides an understanding of the cumulative or in-combination impacts stemming from these historic offshore wind farm projects, thereby enabling a suitable assessment of the risks associated with significant effects or AEOI with greater certainty.

1.4.1.3 The approach presented is also consistent with the approach taken for previous offshore wind farm projects in UK waters (see examples provided above). The Applicants would note that there is no precedent in the offshore wind industry to 'gap-fill' information from existing projects. The Secretary of State has been able to conclude that other developments would not have an AEOI on European sites without similar information being provided, including the recently consented Awel-y-Môr offshore wind farm.

D.9. Offshore ornithology EWG agreement log

Item	Meeting Date	Issue on which agreement is sought	Consultee	Progress of agreement in the EWG	Agreement?	Notes
1	18/02/2022	Agreement on the Remit and Inputs to the EWG (as set out in Section 4.4 of the Evidence Plan Template).	NRW	NRW Advisory (A) agree in principle to the remit and inputs to the EWG, although, as stated previously, NRW (A) needs to be able to carefully consider, plan and manage our resources at all times and as such we can only commit to the Evidence Plan Process on a 'best-endeavours' basis. It should also be noted, that the Evidence Plan process falls under our Discretionary Advice Service – whilst we aim to meet demand for the service, there may be times when our capacity to do so is limited. In those instances, we reserve the right to not offer the service. NRW (A) would like to clarify in Section 3.1.1.3 Natural Resources Wales Advisory within the Evidence Plan Template that JNCC remain the statutory consultee for Welsh waters beyond 12 nm, but we will endeavour to align our advice where possible.	Agreed	NRW (A) will endeavour to 'agree' the points outlined in Section 4.4 where possible, but as acknowledged within the Evidence Plan process, it may not always be possible to reach full agreement between all parties. Where agreement is not reached, NRW (A) will advise according to our remit and clearly outline our reasoning. Similarly, in the second to last bullet point in Section 4.4.1, it may not be possible to 'ensure' the effects are reduced to an acceptable level. It should be noted that any advice that we provide is advisory only and will not be binding, or in any way restrict NRW in performing its statutory functions. All advice provided by NRW will be based on the information that has been made available to us, and policies that are in place at that time.
			JNCC	JNCC should be included in any Offshore and Coastal Ornithology EWG meetings as outlined in table 4.6 of the Evidence Plan Template. JNCC have been included in the equivalent table in the meeting presentation of 18/02/2022, but the evidence plan should be updated to reflect this.	Agreed	none
			Natural England		Agreed	Natural England provided comment on the draft Evidence Plan, via a comments log, on 4 November 2021. It was our view that the Evidence Plan set out the basic framework of the Evidence Plan. This was ahead of the 1st Evidence Plan meeting on 16 November 2021. We welcome the update of the Evidence Plan (version F02, provided 4 February 2022) which has incorporated our earlier comments. The remit of the Offshore Ornithology as set out under 4.4 of the Evidence Plan (v F02) is appropriate and in line with Natural England's previous comments, we agree the remit as set out. We
2	18/02/2022	Agreement on Ways of Working document, including timescales.	NRW	NRW (A) agree in principle to the Ways of Working document and the timescales for responding, although we reiterate that more time may be required for a response if there are large / multiple documents or due to unforeseen circumstances. Where deadlines cannot be reached, NRW (A) will notify RPS / bp / EnBW as soon as possible. As above, NRW (A) can only commit to the Ways of Working on a 'best endeavours' basis and reserve the right to not offer our Discretionary Advice Service at times when our capacity to do so is limited.	Agreed	none
			JNCC	Agreed	Agreed	none
			Natural England		Agreed	We welcome the Evidence Plan Ways of working document (version F01, provided 4 February 2022) as a clear reference document. Natural England agrees with the Ways of Working document which aligns with previous comments in terms of timescales for review and comment provided as part of our comments on the draft Evidence Plan
3	18/02/2022	Agreement on broad approach to aerial surveys.	NRW	NRW (A) agree with the broad approach to aerial surveys.	Agreed	Apologies that NRW Advisory were unable to attend the initial Ornithology EWG due to unforeseen circumstances. Based on the information provided in the PowerPoint presentation and the meeting minutes, NRW Advisory are broadly in agreement with the approach
			JNCC	We agree with some of the broad aspects of the approach to aerial surveys, based on what we understand this approach to be. We agree with the broad approach to aerial survey, as we understand it, with regards to the use of digital aerial surveys, a grid-based sampling design, monthly surveys, and the use of a 10km buffer to east, south, and west and a 4km buffer to north for Mona. We do not have sufficient details to be able to agree with a flight altitude of 396m stated in the minutes of the 18/02/2022 meeting. Rational for this flight altitude would need to be provided with evidence to show that such a flight altitude would not disturb species sensitive to disturbance. We would require more detail before confirming agreement on any other aspect of the aerial surveys.	Agreed	none

Item	Meeting Date	Issue on which agreement is sought	Consultee	Progress of agreement in the EWG	Agreement?	Notes
			Natural England		Agreed	We agree with the survey method set out for the aerial surveys, as set out for the area covered and frequency of coverage, as well as the grid based design and a 12% surface analysis coverage. Natural England agree with the survey method presented for the intertidal and nearshore waterbird surveys, which align with our previous advice (our reference 362549 and 374171, provided 25 August 2021 and 12 November 2021 respectively). As previously stated, we would welcome further discussion regarding the potential continuation of these surveys to cover May to July inclusive so as to cover any passage waders. Once there has been further refinement on the Points of Interconnection for the cables, we would welcome further discussion or update on any changes to the locations for these surveys. As raised in the meeting, we would highlight the risk assessment based on the desk based study where surveys have not been planned, i.e. along the cable route between the array Zone of Influence and the intertidal survey areas. This risk assessment should be considered on the age of the data used. Natural England have
			RSPB	RSPB request more detail than presented in the outline in these slides to be able to provide agreement on approaches. The RSPB would not be able to agree the survey methodology without further detail, the RSPB has not been party to the discussion that have gone on previously on the survey methodology.	Under discussion	none
4	18/02/2022	Agreement on broad approach to characterisation for the export cable corridor using desktop data sources only.	NRW	NRW Advisory agree with the broad approach to characterisation for the export cable corridor.	Agreed	Apologies that NRW Advisory were unable to attend the initial Ornithology EWG due to unforeseen circumstances. Based on the information provided in the PowerPoint presentation, the meeting minutes and previous discussions on the Intertidal and Nearshore Waterbird Survey Methodology, NRW Advisory are broadly in
			JNCC	We agree with the approach to begin the assessment on export cable corridor using desktop data sources, with the understanding that an assessment will be made of the suitability of the data as the sole source of information, and consideration of the requirement for further survey based on the outcomes of the initial desktop data investigation.	Agreed	none
			Natural England	none	Agreed	The approach to the baseline characterisation, using site-specific data and contextualisation from wider reports and evidence, as set out in the Ornithology EWG meeting is supported. We welcome the data sources listed and again refer to the currently unpublished report, which may be of use to be incorporated to contextualise the primary data collection. Natural England have set up a SharePoint Online (SPOL) site to share
5	13/07/2022	Agreement on the approach to baseline characterisation	JNCC	We agree with the approach to baseline characterisation as set out in the Morgan Mona baseline characterisation technical paper and as discussed in the EWG meeting on 13th July 2022.	Agreed	

Item	Meeting Date	Issue on which agreement is sought	Consultee	Progress of agreement in the EWG	Agreement?	Notes
			NRW	We note that at the EWG 05 on 30/06/23, some information on a power analysis was presented. We await the power analysis document from RPS before we can comment further. Update 19/01/2024 - Power analysis report has since been recieved and reviewed by NRW (A) and the work undertaken does provide some confidence that the surveys conducted are fit for purpose in terms of baseline characterisation for consideration in EIA and HRA (see row 41 for updated info).	Agreed	NRW Advisory (A) advise that further information on how survey design has been arrived at is needed, including results of a power analysis to detect the sample size needed for the analysis of aerial survey data. The NRW Scoping Response stated that “The level of coverage required to be sufficient for baseline characterisation will depend on the nature of the area being surveyed and the abundance and distribution of receptors across the area. A power analysis should be undertaken to inform survey design and ensure that such designs maximise the probability of detecting changes in abundance and distribution through future comparison with data that may be collected post-consent.” The applicant proposes to collect data from approximately 30% of the sea surface and analyse 12%. It is unclear where the justification for the 12% analysed comes from and how it relates to these survey data, hence advising the applicant to make this clearer. Typically, NRW (A) would recommend a power analysis to ensure that there is sufficient statistical power to detect changes in abundance and distribution through future comparison with data that may be collected at a later stage, demonstrating that the applicant has considered whether the current survey design has enough power to be used for the pre-construction surveys. It is important that analyses have the power to detect trends in abundance or distribution and the level of displacements for the species that may be impacted. Please see NRW "At sea ornithological survey guidance" https://cdn.cyfoethnaturiol.cymru/media/695080/at-sea-ornithological-guidance-checked-accessible.pdf. NRW (A) await further information in the PEIR. Progress cell updated following new information presented on power analysis during EWG 05
			Natural England	-	Agreed	Natural England have no further comments to those set out in our advice letter (our reference: 393974) on the Baseline Characterisation technical paper (dated 7 June 2022) provided by RPS. We note from discussions at the Offshore Ornithology EWG Meeting 2 (EWG02) that the designs to be presented at the Preliminary Environmental Information Report (PEIR) will not be a sited design and therefore some aspects raised in our advice will be considered at a future stage in the project (e.g. cold spotting/ hot spotting). We note that there was an action from the EWG02 for RPS and the applicant to discuss the possibility of additional analysis of survey images to ensure variability is being captured across the survey area. We await further information regarding the outcomes of these conversations in regard to our recommendation of power analysis to demonstrate that survey coverage is appropriate.
6	13/07/2022	Agreement on the approach to displacement	JNCC	We agree with the approach to displacement as set out in the Morgan Mona Displacement techncial paper, taking into account our previous written comments on the displacement technical paper (24/06/2022), and comments during the EWG meeting on 13th July 2022 and subsequent comments.	Agreed	

Item	Meeting Date	Issue on which agreement is sought	Consultee	Progress of agreement in the EWG	Agreement?	Notes
			NRW	Following review of the PEIR and the RTD design-based abundance data across the Mona array and various buffers for the two years of data, we note that the abundance of RTD recorded in the surveys is very low. However, we consider that RTD displacement from the array area during the operation and maintenance phase should be assessed for EIA scale across the array footprint and 4km buffer, assuming displacement of up to 100% and mortality of 1-10%. Updated 19/01/2024 - From EWG06, we understand that RTD displacement assessment will be carried out for EIA in the ES.	Agreed	NRW (A) would like to have sight of the survey data and/or results of modelling before we are able to conclude if further assessment is needed for displacement of any species, including Red Throated Diver and sea duck species. NRW (A) advise that displacement and mortality rates for all species assessed should present a full range of variability for displacement and mortality rates, following the precautionary approach. For Manx Shearwater and Kittiwake, NRW (A) advise that whole displacement matrices are presented. At a later stage, the applicant can work back to establish what levels of displacement and mortality are likely to have an effect. NRW (A) advise using a range of mortality rates from 1-10%. NRW (A) advise that a combined estimate of the number of birds on the water (corrected for survey coverage) and of the number of birds in flight (corrected for survey coverage) are used for an assessment of Manx shearwater displacement.
			Natural England		Agreed	Natural England has previously provided a response to the Morgan and Mona Displacement technical paper (dated 24 June 2022, our ref: 394421). Following on from the discussions in the EWG02, Natural England additionally do not recommend that displacement is assessed for kittiwake as we currently consider the evidence base to be insufficient and suggestive of inconsistent responses to Offshore Wind Farms (OWFs). If the project chooses to assess kittiwake for displacement effects we advise that it is not acceptable to reduce the densities considered in collision risk modelling. At this stage in the assessment Natural England recommend that full displacement matrices are presented, for all species excluding kittiwake. An investigation into the range of levels of displacement and mortality rate that would lead to an adverse effect would then enable discussion around the likelihood of impacts occurring. Natural England considers that the formulation of appropriate mortality rates to be used in defining the estimated impact should be guided by site-specific sensitivity for each species. Natural England advise that a combined estimate of birds on the water and in flight is used to assess displacement of Manx shearwater.
7	13/07/2022	Agreement to the approach to the Collision Risk Modelling	JNCC	We agree with the approach to sCRM as discussed in the EWG02 meeting, which superceed the Morgan Mona CRM technical paper following the NE advice, taking into account our previous written comments on the CRM technical paper (24/06/2022), and comments during the EWG meeting on 13th July 2022 and subsequent comments.	Agreed	
			NRW	Updated 19/01/2024 - Please see item 24/row 80 comment regarding applicant's use of avoidance rates the Collision Risk Modelling.	Under discussion	NRW ornithological specialist advisors were not in attendance at the EWG02 meeting and are therefore unable to comment on sCRM in full at this stage. NRW (A) await further information in the PIER.

Item	Meeting Date	Issue on which agreement is sought	Consultee	Progress of agreement in the EWG	Agreement?	Notes
			Natural England	-	Agreed	The parameters presented in the email from Andie Nicholls, RPS (email dated 26 July 2022, with references provided by email 10 August 2022) appear to be suitable for the species covered. Natural England reiterate that we believe it is of limited value to model CRM for these species. Johnston et al. (2014)1 flight curves for these species indicate a very low risk of collision. If new evidence (e.g. from tagging studies) on flight height can be presented and considered that would significantly alter the expected outputs, Natural England would encourage investigation of this. If CRM is to be undertaken a novel approach may be more appropriate considering these species might be most at risk of collision with the turbine bases, although we note again that very low levels of collision would be expected. Natural England are not currently able to share the draft CRM parameters which were provided in draft to support RPS's progression of work on the project with the wider EWG members and therefore request that the information we shared with the project team (email dated 7 July 2022, sent by Richard Berridge) is treated as not for further dissemination. Our draft guidance has been provided to the Marine Industry Group for Ornithology for review. Once approval has been received other interested parties may have access to the final guidance, as required. We note that Natural Resources Wales and the Joint Nature Conservation Committee have received this information as members of the Marine Industry Group for Ornithology. We advise that the project proceed with presenting the rates and reference as draft Natural England guidance until the guidance has formally been published. We will provide an update when the guidance has been published.
8	13/07/2022	Agreement on the approach to identification of sites and features in the LSE Screening as set out in the slide pack for the EWG02. Note for Steering Group members, this will be agreed via the Steering Group.	JNCC	Comments provided via the steering group	Agreed	
			NRW	Following submission of PEIR, note our comments in PEIR response on Welsh SPAs and SSSIs with marine or estuarine birds screened into assessment. Updated 19/01/2024 - Please see updates on row 37.	Agreed	It is likely that all Welsh SPAs and SSSIs with marine or estuarine bird features should be scoped in at this stage, until surveys are complete and data analysis has been finalised. NRW (A) await further information in the PIER.
			Natural England	-	No comments in agreement log	As set out in the Evidence Plan Steering Group Meeting 3 (held on 20 July 2022) the ornithology approach is only broadly described, and will be reviewed at a future date once work has been carried out on the
9	30/11/2022	Agreement on approach to HRA Stage 1 Screening using outputs for collision risk modelling, displacement assessment and associated apportioning paper.	JNCC	LSE is a coarse screening filter, should be simple and if further evidence is bought in, then effectively this should be part of the appropriate assessment. This provides a transparent approach that can be followed through the RIAA. Therefore, we would expect all sites where a qualifying feature has been recorded on the development site and where there is potential connectivity (e.g. within foraging range) and a potential impact pathway (e.g. displacement or collision) and hence the potential to undermine the conservation objectives for the feature to be carried through to the AA phase. Any additional work looking at e.g. apportioning impacts and assessments of predicted impacts against baseline mortality etc. should be included in the AA.	Under discussion	27/03/2023 Update: We advise that a fully detailed methodology should be presented in writing to support the proposed approach to LSE & the AA prior to seeking agreement on the approach. 19/06/2023 Update: We agree with the proposed updated HRA methodology with regard to the project alone assessment. We disagree with the proposed updated HRA methodology with regard to the in-combination assessment. It is stated in 1.3.2.3 that "If the predicted magnitude is >1% of the baseline mortality of the reference population for a qualifying feature, then further consideration will be given to the magnitude of the likely effect, including the contribution of impacts from other plans and projects, in-combination." We do not agree that sites are not further considered in-combination where the predicted impact from the project alone is <1% of baseline mortality. While <1% of baseline mortality may be insignificant in the context of a project alone, this additional level of mortality should be included in an assessment of in-combination impacts.

Item	Meeting Date	Issue on which agreement is sought	Consultee	Progress of agreement in the EWG	Agreement?	Notes
			NRW	Since submission of the PEIR, an updated HRA approach was provided for comment by RPS. Following review of this document, NRW Advisory (A) considers that the proposed updated HRA methodology can be considered appropriate with regard to the project alone assessment for breeding colonies for this particular project, where there is potential connectivity to a very large number of sites, but the likelihood of substantial impacts is generally low. However, it should be acknowledged that this approach will not necessarily be appropriate for all offshore wind cases. NRW (A) note that the method as described appears to focus on impacts to breeding birds with no consideration to non-breeding birds. We advise, as previously, that Furness (2015) is used to identify potential connectivity in the non-breeding season. Relevant sites should then be considered in the Appropriate Assessment, which would most likely be at the Step 1 Phase. However, NRW (A) disagree with the proposed updated HRA methodology with regard to the in-combination assessment. Paragraph 1.3.2.3 states that: “If the predicted magnitude is >1% of the baseline mortality of the reference population for a qualifying feature, then further consideration will be given to the magnitude of the likely effect, including the contribution of impacts from other plans and projects, in-combination.” We do not agree with this approach, as whilst <1% of baseline mortality may be insignificant in the context of a population from project alone impacts, this does not mean that this level of additional mortality should not be added to an assessment of in-combination impacts. NRW (A) also note that Step 1 of the integrity test makes a high-level assessment against the conservation objectives, but relies on magnitude of increase in baseline mortality only as a ‘test’ against which to conclude no AEOI, or move on to Step 2. Given the project location, this approach is likely satisfactory, but we note that for assessment against conservation objectives that are not linked to the abundance of features (e.g. distribution of features within the site or availability of habitat) this would not be satisfactory. Following EWG5 we understand that an updated HRA methodology paper will be produced that will clarify the un-combination approach. Following receipt and review of this paper NRW(A) will review our position regarding the	Under discussion	NRW Advisory (A) do not agree with the approach set out during the EWG to LSE screening. This is because LSE is a coarse screening filter, should be simple, and if further evidence is brought in, then effectively this should be part of the Appropriate Assessment (AA). This provides a transparent approach that can be followed through the RIAA. NRW (A) would therefore expect all sites where a qualifying feature has been recorded on the development site and where there is potential connectivity (e.g. within foraging range) and a potential impact pathway (e.g. displacement or collision) and hence the potential to undermine the conservation objectives for the feature, to be carried through to the AA phase. Any additional work looking at e.g. apportioning impacts and assessments of predicted impacts against baseline mortality etc. should be included in the AA. 19/01/2024 - Progress cell updated in light of updated HRA approach presented since submission of PEIR.
			Natural England		Under discussion	Natural England advise that LSE should be treated as a coarse screening filter to identify all instances of qualifying features with potential protected site connectivity and an impact pathway. If significant (possible) effects cannot be excluded on the basis of objective information without extensive investigation, further assessment should be presented in an Appropriate Assessment. Natural England appreciate the desire to reduce the burden of
10	02/11/2023	Agreement on the provision, scope and results of the Power analysis	Natural England	Natural England welcome the Applicants power analysis using baseline survey data to ensure an appropriate level of survey coverage and data analysis has been achieved. We consider the methods employed to be adequate, essentially comparing theoretical baseline and impacted areas to determine how many birds would need to be sampled to achieve suitable power to detect desired effect sizes. We are in agreement with Applicant that the results suggest that the survey coverage and data analysis undertaken are appropriate for establishing a baseline to be considered for EIA and HRA.”	Agreed	
			JNCC	Update 08/01/2024: JNCC welcome the power analysis work that has been undertaken for Mona/Morgan of using baseline survey data to ensure an appropriate level of survey coverage and data analysis has been achieved. We are in agreement that the surveys conducted are fit for purpose in terms of baseline characterisation for consideration in EIA and HRA.	Agreed	
			NRW	NRW(A) welcome the power analysis work that has been undertaken for Mona/Morgan of using baseline survey data to ensure an appropriate level of survey coverage and data analysis has been achieved. We consider the approach taken to be adequate, essentially comparing theoretical baseline and impacted areas to determine how many birds would need to be sampled to achieve suitable power to detect desired effect sizes. The work undertaken does provide some confidence that the surveys conducted are fit for purpose in terms of baseline characterisation for consideration in EIA and HRA	Agreed	

Item	Meeting Date	Issue on which agreement is sought	Consultee	Progress of agreement in the EWG	Agreement?	Notes
11	02/11/2023	Agreement on the methodology used to improve auk ID rates	Natural England	Natural England appreciate the clarification provided on the enhanced QA methodology for improving auk ID rates. We note that at Mona significant improvements were made in some months, although ID rates of <50% remain for 2 months. We also note that in some months the sample size differed, with increases and decreases apparent. It would be useful to understand why. Although improved ID rate data from Morgan has not been presented we assume that the same QA process has, or will be applied. In this case, we do not consider it necessary to carry out scenario testing in support of using the identified fraction of the auk population to apportion unidentified birds.	Agreed	
			JNCC	Email 21/08/23: Thank you for providing further detail on the methodology for raising the auk ID rates. In response to the action 'EWG to clarify if scenario testing is still suggested considering the updated Auk ID rates', we do not suggest that any scenario testing is required.	Agreed	
			NRW	NRW Advisory (A) welcome the further detail provided by APEM on the methodology for raising the auk ID rates. With regard to the action 'EWG to clarify if scenario testing is still suggested considering the updated Auk ID rates', NRW (A) note that during EWG05 a graph of the old and new guillemot and razorbill ID rates for Mona was presented and significant improvements were made in some months, although ID rates of <50% remain for 2 months for this project. Based on this information, NRW (A) are satisfied that no scenario testing is required for Project Mona. As no information for Morgan has been presented, we assume that the same process has, or will be undertaken for Morgan. Assuming that this is the case, NRW (A) also do not consider that any scenario testing is required for Project Morgan.	Agreed	
12	02/11/2023	Agreement on approach to CRM for migratory seabirds	Natural England	Letter 27/07/23: Natural England agree with the proposed methodology for assessing impacts on migratory	Agreed	
			JNCC	Letter 27/07/23: JNCC agree with the use of the SOSSMAT tool for scoping migratory seabirds.	Agreed	
			NRW	See NRW post EWG 05 meeting note Updated 19/01/2024: NRW (A) confirmed agreement to the approach set out by the Applicant in EWG 05 during that meeting - as set out in EWG05 meeting minutes	Agreed	
13	02/11/2023	Agreement on approach to estimating regional breeding populations	Natural England	Discussed at EWG07 - NE maintain that our initial advice should be followed, but are satisfied that the projects population estimates are more precautionary with the exceptions of gannet and manx shearwater, which will be assessed against populations derived using the SNCB advised method. Futher, we understand the cumulative assessments will be made against the SNCB advised reference populations.	Agreed with caveats	

Item	Meeting Date	Issue on which agreement is sought	Consultee	Progress of agreement in the EWG	Agreement?	Notes
			JNCC	Update 08/01/2024: We remain in disagreement with the proposed approach to the project alone assessment as previously stated and reiterated below. Following the response from the Mona/Morgan applicants to NRW regarding breeding season BDMPS population calculations (presented during NRW's monthly meeting with Mona), the SNCBs (NRW/NE/JNCC) have collectively discussed this and can confirm that our suggested approach is to consider breeding adults birds at colonies within the relevant BDMPS in which the project is located, plus the immatures associated with those colonies. Data should come from the tables in Appendix A of Furness (2015) for both breeding adults and immatures. We do not recommend using breeding adults from colonies within foraging range of the project, as this would not be appropriate for cumulative assessment given that other projects could be impacting other parts of the wider population. The SNCBs also note that the approach we have suggested for the breeding season BDMPS calculations (of summing adults and immatures from colonies within the relevant BDMPS a project is located within) has precedent in that this approach has been taken by North Sea projects since the Hornsea 2 project and we also note that the same advice and figures as were sent to Mona/Morgan have also been sent to Morecambe and a Celtic Sea FLOW demonstrator project, both of which we understand are planning to use these figures in their calculations of 1% baseline mortality for EIA scale assessments. Whilst we again note that there are potential issues associated with the approach and figures we provided, this requires a lot more consideration and work (which is currently being undertaken by an SNCB task and finish group) and hence we again advise that Mona/Morgan take the approach we have previously outlined for breeding season BDMPS figures, and note that this is consistent with advice we are currently providing to other projects. The SNCBs also note that whilst the approach proposed by Mona/Morgan may result in more precautionary figures, at present it cannot be agreed that both approaches will necessarily result in conclusions of no significant effect for EIA, as at present the cumulative total displacement and collision impacts are unknown due to the gaps in data for many of the other wind farms located within the Irish Sea. NE have proposed an approach to filling these gaps to the Applicants, and we note that once these gaps are filled there is the possibility that the cumulative totals for additional species beyond those already identified by current assessments may exceed the 1% baseline mortality threshold, which is more likely if the more precautionary Applicant's approach (that is not appropriate for cumulative assessment) that potentially risks overestimating impact levels is taken.	Under discussion	
			NRW	NRW Advisory (A) note that the BDMPS report (Furness 2015) and proportions of immatures presented in the Tables within Appendix A of this report are calculated with respect to the non-breeding seasons and not the breeding season. We do not think the approach suggested by the Mona/Morgan Applicants is valid as it cannot be assumed that the distribution and origin of immature birds is the same in the breeding season compared to the non-breeding season. NRW (A) do not advise that the non-breeding season proportions in Furness (2015) are in any way applicable to the breeding season – either for adults or immatures. Additionally, we note that the proposal to use the number of breeding adults within foraging range of a project would not be appropriate for cumulative assessment given that other projects could be impacting other parts of the wider population. NRW (A) acknowledge that there are potential issues associated with the approach and figures we provided for calculations of breeding season BDMPS figures. However, this requires a lot more consideration and work (which is currently being undertaken by an SNCB task and finish group) and hence in the meantime we recommend that Mona/Morgan take the approach we have previously outlined for breeding season BDMPS figures (i.e. to sum the adult and immature population estimates for all colonies that sit within the relevant species specific BDMPS scale, e.g. UK western waters) and assess the annual predicted EIA impacts against the largest seasonal BDMPS figures as previously advised. Updated 19/01/2024 - During EWG07, the Applicant set out that in the ES they will use their approach to estimating regional breeding populations for EIA for the project alone as they consider them to be more precautionary. NRW (A) noted that the SNCB advised figures for gannet and Manx shearwater are more precautionary than those calculated by the Applicant. We will need to "agree to disagree" on other species but for gannet and Manx shearwater the lower SNCB number should be used. Applicant confirmed that the population numbers calculated using the Applicants approach will be presented for all species, but the numbers presented for gannet and Manx shearwater would be both the applicant's and the SNCBs regional baseline populations. For the cumulative assessments, the Applicant set out that they will follow the SNCB recommended approach for estimating regional breeding populations.	Agreed	Update 19/01/2024 - NRW (A) agree to disagree on the alone regional breeding populations. However NRW (A) welcome/agree that the more precautionary SNCB figures for gannet and Manx shearwater will be presented. NRW (A) also agree with use of SNCB recommended approach for CEA.

Item	Meeting Date	Issue on which agreement is sought	Consultee	Progress of agreement in the EWG	Agreement?	Notes
14	02/11/2023	Agreement on approach to cumulative assessment for projects where impact magnitudes are unavailable	Natural England	Letter 27/07/23 : Natural England have secured funding for a project to quantify displacement and collision impacts from all relevant extant offshore wind farms using contemporary assessment methods projects. We anticipate the project can prioritise the assessment of Irish Sea projects to facilitate a more comprehensive cumulative and in-combination assessment of relevant Round 4 and Round 5 projects. Natural England will keep the Applicant up to date as far as possible in terms of timelines and outputs from this work, and their potential application for the assessments of the Morgan and Mona OWFs. Given the accelerated timelines for submission, this project may not deliver data to enable gap-filling of relevant impacts in time for the cumulative effects assessment. Thus, Natural England would welcome further discussion and consideration of this issue through the EWG. A qualitative assessment/consideration of unknown impacts may be an appropriate compromise.	Under discussion	Further advice has been supplied, superseding this item.
			JNCC	No update 09/01/2024: Awaiting update on consideration of Natural England's proposal.	Under discussion	
			NRW	Updated 19/01/2024 - Following EWG07, we understand that the Applicant will be providing an update on the response to the advice from Natural England regarding how to incorporate historic offshore wind projects into the cumulative and in-combination assessments. We await this document from the Applicant before we can comment further as per MoM for EWG07.	Under discussion	
15	02/11/2023	Agreement on proposed foraging ranges to be used in EIA and for apportioning impacts to designated sites	Natural England	Letter 27/07/23: Natural England have discussed and agreed the approach for species-specific foraging ranges and calculation of EIA breeding populations with JNCC and NRW, which we understand have now been supplied to the Applicant. We welcome further discussion through the EWG if required.	Agreed	
			JNCC	Letter 27/07/23: JNCC agrees with the proposed foraging ranges as listed in the EWG05 minutes.	Agreed	
			NRW	Updated 19/01/2024 - NRW (A) have discussed and agreed the approach for species-specific foraging ranges and calculation of EIA breeding populations with JNCC and NE, which we understand have now been supplied to the Applicant. We agree with the proposed foraging ranges as listed in the EWG05 meeting minutes	Agreed	
16	19/10/2023	There will be no significant effects on ornithology receptors in EIA terms for the project alone.	Natural England	Natural England consider this likely, but can not draw any firm conclusions until we have fully reviewed the relevar	Under discussion	
			JNCC		No comments in agreement log	
			NRW	Updated 19/01/2024 - Whilst the numbers look low based on the updates presented during the EWGs, NRW (A) cannot agree without seeing the full application	Under discussion	
17	19/10/2023	There will be no adverse effects on integrity on SPAs with ornithology features for the project alone.	Natural England	Natural England consider this likely, but can not draw any firm conclusions until we have fully reviewed the relevar	Under discussion	
			JNCC	Update 09/01/2024 JNCC would not be able to agree this without seeing the full application.	Under discussion	
			NRW	Updated 19/01/2024 - Whilst the numbers look low based on the updates presented during the EWGs, NRW (A) cannot agree without seeing the full application	Under discussion	
18	19/10/2023	There will be no significant effects on ornithology receptors in EIA terms for the project cumulatively with other plans and projects.	Natural England	Natural England can not draw any firm conclusions until we have fully reviewed the relevant assessments.	Under discussion	
			JNCC	Update 09/01/2024 JNCC would not be able to agree this without seeing the full application.	Under discussion	
			NRW	Updated 19/01/2024 - Awaiting update from the Applicant regarding how they will incorporate historic projects into the cumulative assessments. However, NRW (A) will not be able to agree to any levels of significance without seeing the full application	Under discussion	
19	19/10/2023	There will be no adverse effects on integrity on SPAs with ornithology features for the project in-combination with other plans and projects.	Natural England	Natural England can not draw any firm conclusions until we have fully reviewed the relevant assessments.	Under discussion	
			JNCC	Update 09/01/2024 JNCC would not be able to agree this without seeing the full application.	Under discussion	
			NRW	Updated 19/01/2024 - Awaiting update from the Applicant regarding how they will incorporate historic projects into the in-combination assessments. However, NRW (A) will not be able to agree to any levels of significance	Under discussion	
20	19/10/2023	The mitigation and management measures are appropriate to ensure significant effects and AEOI are avoided for marine ornithological receptors.	Natural England	Natural England can not draw any firm conclusions until we have fully reviewed the relevant assessments.	Under discussion	
			JNCC	Update 09/01/2024 JNCC would not be able to agree this without seeing the full application.	Under discussion	
			NRW	Updated 19/01/2024 - NRW (A) will need to see full application before we can agree. Although note comments in row 74 below regarding timing restrictions and cable laying activities regarding RTD and common scoter features of Liverpool Bay SPA	Under discussion	
21	19/10/2023	Liverpool Bay - It is agreed that a restriction on cabling activities will be used to avoid the period of November to March.	Natural England		No comments in agreement log	
			JNCC	Update 09/01/2024 JNCC agree to this approach.	Agreed	
			NRW	Updated 19/01/2024 - Timing restriction is appropriate to mitigate AEoSI on RTD and common scoter features of Liverpool Bay SPA if it is adequately secured within the conditions of the licence	Agreed with caveats	
22	19/10/2023	Cable installation in the intertidal area using trenchless techniques and vessels assciated	Natural England	Natural England consider this an appropriate mitigation measure, but highlight that it mist be secured by licence cc	Agreed with caveats	

Item	Meeting Date	Issue on which agreement is sought	Consultee	Progress of agreement in the EWG	Agreement?	Notes
		with this at the Mona landfall will not be included in the seasonal restriction but vessel movements will be managed to minimise effects on features of Liverpool Bay SPA via the Measures to Minimise Impacts to Marine Mammals and Rafting Birds.	JNCC	Update 09/08/2024: Any disturbance impact to features of the SPA will be temporary for the time of the vessel presence, therefore JNCC do not expect this temporary activity to result in an AEOSI. However, no justification is given for the need to do this during winter. It is also not clear what “vessel movements” actually means. For instance, how many and long will these vessels be in the SPA? More information is required before JNCC can fully agree to this approach.	Under discussion	
			NRW	Updated 19/01/2024 - As we noted in our comments on EWG06 meeting minutes, given that: any disturbance impact to features of the SPA will be temporary for the time of the vessel presence; birds will be able to return once the vessel has gone; there will be other habitat available within the SPA to the birds for the time they are disturbed from the landfall area; up to 8 movements across the key winter period of Nov-Mar represents a small proportion over this timescale; and a commitment to HDD for landfall has been made, NRW (A) do not expect this temporary activity to result in an AEoSI. These commitments should be appropriately secured within the conditions of the licence. However, on further consideration since EWG06, we suggest that more information is required before we can fully agree to this approach as no justification is given for the need to do this during winter and it is also not clear what “8 vessel movements” actually means - for instance, how long will these vessels be in the SPA?	Under discussion	
23	19/10/2023	Use of the latest species-specific avoidance rates from Ozsanlav-Harris *et al.* (2023) in the non-migatory CRM.	Natural England	Natural England are content with the approach suggested at EWG07	Agreed with caveats	
			JNCC	Update 09/08/2024: We have no issue with species-specific collision estimates being presented, providing the collision estimates based on the joint SNCB grouped avoidance rates are also presented and are carried through the remainder of the assessment, e.g. to PVA where appropriate.	Agreed	Agreed on the basis that collision estimates based on the joint SNCB grouped avoidance rates are also presented and are carried through the remainder of the assessment, e.g. to PVA where appropriate
			NRW	Updated 19/01/2024 - We note that previous advice sent to the Applicant by NE has been to use species-group avoidance rates. Formal advice will be out soon but will be almost identical to advice previously given. May need to agree to disagree. However, we would be happy for impact for both species group and species-specific rates to be presented. During EWG07, the Applicant confirmed that both rates would be presented and any impact over 1% of baseline mortality (from either avoidance rate) would be investigated further using PVA for the project alone and cumulatively. If this is done, NRW (A) are content with this approach	Agreed with caveats	

Appendix E: Evidence Plan Onshore ecology EWG

E.1. Onshore ecology EWG overview

Table E.5: Overview of onshore ecology EWG consultation materials.

Date	Meeting	Information provided
16 June 2022	Onshore ecology EWG meeting 1	Meeting minutes (E.2.1)
08 December 2022	Onshore ecology EWG meeting 2	Meeting minutes (**Error! Reference source not found.**)
24 April 2023	Onshore ecology EWG meeting 3	Meeting minutes (**Error! Reference source not found.**) Invasive Non-Native Species Survey Methodology (E.4.2) Aquatic Invertebrate Survey Methodology (E.4.3) Badger Survey Methodology (E.4.4) Bat Survey Methodology (E.4.5) Great Crested Newt Survey Methodology (E.4.6) Hazel Dormouse Survey Methodology (E.4.7) Hedgerow Survey Methodology (E.4.8) NVC Survey Methodology (E.4.9) Otter and Water Vole Survey Methodology (E.4.10) Reptile Survey Methodology (E.4.11) Terrestrial Invertebrates Survey Methodology (E.4.12) White-Clawed Crayfish Survey Methodology (E.4.13) Site-specific surveys and contextual data background methodology at the Mona Preliminary Landfall Area and the Onshore Cable Corridor Search Area (E.4.14)
19 July 2023	Onshore ecology EWG meeting 4	Meeting minutes (E.5.1) Wintering and Migratory Bird Surveys (2022/23) (E.5.2)
04 October 2023	Onshore ecology EWG meeting 5	Meeting minutes (E.6.1)
November 2023	Onshore ecology EWG meeting 6	Meeting minutes (E.7.1)

E.2. Onshore ecology EWG meeting 1

E.2.1 Meeting minutes

MINUTES OF MEETING

Security Classification: Project Internal

Partners in UK offshore wind

MOM Number	:	20220616_Morgan and Mona Onshore Ecology EWG01	**REV. No.** :	F01
MOM Subject	:	Morgan and Mona Evidence Plan Onshore Ecology expert working group meeting 1.		

MINUTES OF MEETING

MEETING DATE	:	16/06/2022
MEETING LOCATION	:	Microsoft Teams
RECORDED BY	:	[redacted]RPS)
ISSUED BY	:	[redacted] (RPS)

PERSONS PRESENT:

[redacted]	CR	RPS
	EW	RPS
	JW	RPS
	KL	RPS
	LM	RPS
	VR	bp
	IG	
	PRW	bp
	MP	bp
	VR	bp
	h N	mru (Natural Resources Wales)
	ME	Cyfoeth Naturiol Cymru (Natural Resources Wales)
	SW	Cyfoeth Naturiol Cymru (Natural Resources Wales)
	JW	Denbighshire County Council
	SR	RSPB

APOLOGIES:

- [redacted]

ITEM NO:	DISCUSSION ITEM:	Responsible party	Date
1.	**Introduction** (Presented by CR) This meeting is the first onshore ecology expert working group (EWG) meeting for Mona. The meeting will focus on the Mona Offshore Wind Project – a separate onshore ecology EWG will be established for the Morgan Offshore Wind Project. Evidence Plan (EP) Steering Group (SG) meetings were held in November and December; meetings have been held with the offshore expert working groups including benthic ecology, physical processes and marine mammals. The agenda for the meeting is as follows:		

	• Introductions • Overview of the Mona Offshore Wind Project • Programme • Overview of the Evidence Plan Process • Expert Working Groups – remit and inputs, indicative meeting programme, ways of working • Onshore Eology – ongoing surveys		
2.	**Overview of the Project** (Presented by IG) bp are working with EnBW in a 50/50 partnership (the Applicants) to develop the Morgan and Mona offshore wind farms which are being progressed as two separate projects. These sites were awarded as part of The Crown Estate's Round 4 offshore wind leasing round and are currently at 'preferred bidder' status, subject to completion of the plan level Habitats Regulations Assessment (HRA). The intention is for both projects to be developed as fixed bottom offshore wind farms. Mona is the southern project located mostly in Welsh waters and will have a capacity of 1.5GW. It will be developed on a similar but slightly staggered timescales to Morgan and will be under a separate consent application. The Mona project is aiming to be operational in 2028 and the Morgan project is aiming to be operational in 2029. **Key dates** The Applicants are working on the basis that The Crown Estate (TCE) will conclude the plan-level HRA in spring 2022. The Applicants will then be in a position to sign the agreement for lease for seabed rights. Due to the size and nature of both project, Mona is considered a Nationally Significant Infrastructure Project (NSIP). The Applicants are looking to submit seperate Development Consent Order (DCO) application for Mona. Currently the Applicants are targeting the 2025 Contract for Difference (CfD) round, noting the recent announcement on annual CfD rounds. The Applicants are currently undertaking pre-scoping engagement including local authority engagement. Throughout 2022 the Applicants will progress with pre-application activities including both offshore and onshore surveys. Local authority engagement has begun with an introduction to the project. Public consultation is also underway with the establishment of project website and a series of phase 1 community (non-statutory) consultation during June and July 2022. The scoping report for Mona was submitted on 5 May 2022 and the Scoping Opinion was received on 15 June. The Applicants aim to publish the Preliminary Environmental Information Report (PEIR) in early 2023 with formal consultation. The Mona DCO application is currently planned to be submitted in Q1 2024.		

	Indicative export cable corridor (presented by CR) Confirmation was received from National Grid in April 2022 that Bodelwyddan is the preferred point of interconnection (POI) for the Mona Offshore Wind Project. Site selection work is ongoing: the Applicants have identified indicative onshore cable corridor search areas to the north and south of the A55 with landfall options at Llandulas and Pensarn. A search area for the onshore substation has also been identified; site selection work continues to progress to refine these search areas. **Evidence Plan process** (presented by KL) The Evidence Plan (EP) process has been developed following the Planning Inspectorate and Defra guidance. The Applicants have also considered draft guidelines provided by Natural England [1]. The EP process is a mechanism for the Applicants to agree with the stakeholders what is needed to be included with the consent application and to discuss any issues or concerns. The aim is to agree as much as possible during the pre-application phase so only key issues are left for examination. If the Applicant uis seeking agreement on something discussed during the EWG meeting, it will be highlighted in the meeting minutes and the EWG will be asked to review. The EP has historically been HRA focused however in line with recent best practice, the Applicants propose to extend this to include the EIA process for ecology topics, including designated sites such as SSSIs and MCZs.		
	EWG (presented by KL) The aim of the EWGs will be to discuss and where possible, agree key topics for the EIA and HRA so we are only left with key issues at examination. . The EP Template was issued to the SG early in 2021 and has been updated following receipt of comments. If there are any other comments, please let us know in writing after the meeting. The Applicants are seeking to agree the remit of the EWG. The indicative timeline of the EWG meetings is subject to change (particularly the latter meetings) but this gives stakeholders an indication of the number of meetings and expected timings to inform their resourcing over this time. The broad approach to EWGs as set out in the Ways of Working (WoW) document was circulated prior to the meeting: • Information circulated to EWG minimum 2 weeks ahead of meeting. • Meeting is held with attendees prepared to comment on materials provided.		

[1] Natural England (2021) Expectations for pre-application engagement and best practice guidance for the evidence plan process.

	• Full meeting minutes will be taken, and agreement logs will be compiled where matters are agreed, and after each meeting the minutes and agreement log will be circulated. • Minutes and agreement logs to be returned/agreed within 2 weeks following receipt, alongside written comments on documents submitted. The agreement log and meeting minutes will be ultimately be appended to the DCO application.		
3.	**Intertidal ornithology – Wintering and Passge Birds** (presented by LM) The Applicants have undertaken year 1 of surveys at a number of landfalls close to potential POIs. The surveys commenced in Sept/Oct 2021; landfall search areas for 4 POIs were considered (with up to 3 search areas POI); this was reduced to one POI in March 2022. The search areas extend a minimum 500 m in each direction along the coast (buffer zone). A scoping visit and a desk study was undertaken to inform the surveys at each search area. The surveys have been extended beyond March in order to capture passage species. The intertidal surveys looked at birds up to 1.5km offshore from Mean High Water Spring (MHWS). Recording sectors are segregated in 500m zones in which the locations of individual birds are counted and mapped as well as recording bird behaviour. The frequency of 'through the tide count' over the tidal cycle varies between landfall sites, and counts go down to one every 2 hours for low usage areas. Early stakeholder comments on the methodology also request that level of baseline disturbance are accounted for. The surveys will also record the perceived effect of disturbance on bird abundance and distribution for each count. The aim of the nocturnal surveys is to determine the difference between counts in the day and night. Early indications are a similar assemblage is being recorded with a lower abundance during the night. The landfall search areas are located close to the offshore Liverpool Bay SPA which is an important bird area during the breeding and non-breeding seasons. The landfall search area is also located adjacent to the Traeth Pensarn SSSI. Key observations from the surveys are: • Common scoter – (a qualifying species of the Liverpool Bay SPA) are present in notable numbers (a peak count of 2,150 was recorded in January). • Other names qualifying species for the Liverpool Bay SPA are present iin relatively low numbers i.e. cormorant (peak count 34), red-breasted merganser (peak count 15) and red-throated diver (peak count 65). • Counts of waders and terns are low, including for the qualifying species of the Dee Estuary SPA (peak counts		

	of 71 curlew, 188 oystercatcher, 34 redshank and 2 Sandwich terns).		
4.	**Other Onshore Ecology Surveys** Presented by LM and JW) The following surveys are underway and are being undertaken in line with industry standard methodologies: • Breeding birds • Phase 1 habitat survey • Bat roost assessment - daytime ground level survey of builsings and trees • Badgers and water voles The survey methodology for great crested newts was shared and agreed with NRW in March 2022. eDNA surveys are ongoing where access has been agreed. Surveys are being undertaken from Public Rights of Way and where access has been granted by the landowner. Desktop data has been obtained from various sources and is being reviewed.		
5.	**Questions** SR – asked whether bp/EnBW had considered a single connection for Mona and Morgan to help reduce the impact of the projects. PRW - National Grid had confirmed that Bodelwyddan in North Wales was the preferred point of interconnection with the grid and that there would be another interconnection point in NW England. SR - asked if National Grid Ventures (NGV) had been consulted over seabed cabling issues. PRW - confirmed that NGV had not been approached. bp/EnBW are working with Cobra and Flotation Energy on sharing a grid connection in NW England. News of joint working has just been released. ME – Defra's Biodiversity Net Gain metric is not applicable in Wales, so contact should be made to either Steve Spode or Chris Worker at the Welsh Government to advise on the BNG approach to be used for the Mona Offshore Wind Project. CR – confirmed that the Applicants would make contact with SS and/or CW to confirm the approach to be used. The outcome of the discussion would raised in next EWG. ME- the Conservation Statutus of Species should be added to the impact assessment taking into account section 3 of the updated European Guidance on what to consider within ecological assessments. CR – Noted	**bp**	15/07/2022

	NS- expressed reservations about the landfall option which is located within Traeth Pensarn SSSI; the future management of the SSSI may be compromised and NS would like to see further detail on the landfall selection particularly given the extent of non-designated land within the intertidal area. PRW – explained that engineering factors has influenced the landfall selection but noted that the project would seek to minimise impacts on the SSSI and would look into providing further information on the site selection process. ME- will the Wildlife Trust and the local Amphibian and Reptile Group (ARG) be attending future onshore ecology EWG meetings? CR – suggested looking at the scoping responses to identify if the Wildlife Trust had raised any concerns, and agreed to extending the invitation. CR suggested that ARG may be invited to specific EWGs that discussed the substation or they may be asked to engage on certain matters. ME - The GCN population at Bodelwyddan is well established and surveys have been undertaken for 4 recent major projects including Awl y Mor and solar projects. Could some of this data be used on the Mona Offshore Wind Project and reduce the survey burden? CR – the project would look into where there was overlap in the study areas and identify opportunities to use some of the data,	**RPS** **RPS**	04/07/2022 15/07/2022
6.	**Next steps** (Presented by KL) The Applicants would look for agreement on the following points following the meeting: • Agreement on the Remit and Inputs to the EWG (as set out in the Evidence Plan Template) • Agreement on Ways of Working Documents, including timescales The next EWG will discuss the following: • The approach to baseline characterisation (including study areas) • The comments within the Scoping Opinion • The approach to BNG assessment.	**All- to fill in agreement log to provide progress of agreement for each of the points listed.**	15/07/2022
7.	**Close of meeting**		
8.	**Post meeting note** Review the scoping opinion of The Wildlife Trust	**bp/RPS**	

E.3. Onshore ecology EWG meeting 2

E.3.1 Meeting minutes

Appendix A Onshore Ecology EWG02 Meeting Minutes

Reference:	20221208_Mona Onshore Ecology EWG02. Rev. 01
Meeting Name:	Mona Evidence Plan Onshore Ecology Expert Working Group (EWG) – Meeting 2
Meeting date:	08 December 2022
Meeting location:	Virtual (Microsoft Teams)

Attendees

Name	Initials	Company	Role
[redacted]	CR	RPS	Consultant
	JW	RPS	Consultant
	BJ	RPS	Consultant
	LM	RPS	Consultant
	AM	RPS	Consultant
	SM	RPS	Consultant
	PRW	bp	Applicant
	KS	Conway County Borough Council (CCBC)	Statutory body
	SW	Cyfoeth Naturiol Cymru (Natural Resources Wales, NRW)	Statutory body
	SR	RSPB	Statutory body

Apologies

Name	Initials	Company	Role
[redacted]	NS	Cyfoeth Naturiol Cymru (Natural Resources Wales, NRW)	Statutory body

Item	Detail	Actions	Date
1	Agenda • Introductions • Actions from the First Onshore Ecology EWG • Project update and site selection process • Approach to baseline characterisation, including study areas • Indicative meeting programme updates • Survey results to date • Questions	N/A	N/A
2	<u>Introductions - CR</u> This meeting is the Second Onshore Ecology Expert Working Group (EWG) meeting for Mona Offshore Wind Project.		
3	<u>Actions from the First Onshore Ecology EWG - CR</u> RPS attempted to contact the Welsh Government to advise on the approach to achieving an overall biodiversity benefit to be used for the Mona Offshore Wind Project. RPS are in the process of identifying other major projects and/or EIA development which		

Item	Detail	Actions	Date
	could provide baseline data to inform the onshore ecology chapters of the ES.		
4	Project update and site selection process - PRW bp/EnBW completed its first community consultation earlier this year, which presented a search area within which onshore substations would be located. Through a combination of site visits, surveys and assessments bp/EnBW were able to identify a short list of substation options. The following Site Selection Workshops for Mona Offshore Wind Project are proposed: • Site Selection Workshop 01: September 2022; and • Site Selection Workshop 02: December 2022. bp/EnBW completed a second targeted consultation in September 2022 to request feedback from stakeholder regarding the short list of substation options identified. Feedback in response to the second targeted consultation was limited, which was attributed primarily to stakeholder fatigue due to the large number of projects seeking consent in the area. bp/EnBW intend to hold Site Selection Workshop 02 in December 2022 to discuss the design of the Mona Offshore Wind Project to be presented in the Preliminary Environmental Information Report (PEIR), including refinements to the onshore cable route and substation options.		
5	Comments from Scoping - CR RPS summarised comments from the Planning Inspectorate and NRW in the Scoping report to highlight what matters would be scoped out of the assessment, where further information was required to scope out other matters; and the matters to be addressed in the application.		
6	Approach to baseline characterisation, including study areas - CR The study area to be used for the purposes of the Terrestrial ecology and intertidal birds' chapter of the PEIR/ ES was also presented, which was used to inform the scope of surveys for intertidal/ breeding birds and terrestrial ecology currently being undertaken in 2022 or proposed in 2023.		
7	Indicative meeting programme updates - CR The Indicative Meetings Programme was presented, including the stage in the EIA process when further Onshore Ecology EWGs would be held and the focus of each meeting. Further Onshore Ecology EWGs were proposed in: February 2023; June 2023; September 2023; and November 2023.		
8	Intertidal Waterbird Survey - LM: RPS provided a recap on the survey methodology and coverage for the Year 1 survey, and presented peak survey counts for December 2021 to April 2022 and the distribution of waterbird species. The survey area includes the landfall area plus a 500m buffer either side along the coast, and up to 1.5 km seaward from the MHWS to capture the nearshore area. • Diurnal Surveys: undertaken through the tidal cycle done over two visits to record sightings and behaviours of flocks and individual birds:		

Item	Detail	Actions	Date
	– Common scoter (Liverpool Bay SPA designated feature) were the most abundant species recorded with a peak count of 2,150 in January and were highly distributed with records of birds beyond 1.5km. – Oystercatcher, curlew, redshank, and turnstone were present throughout the wintering period. Oystercatcher were the most abundant wader species (188), followed by curlew (71), turnstone (54), and redshank (34). – Gulls were the most abundant species group in the survey area with high peak counts for common gull (713), black-headed gull (546), and herring gull (915). – Red throated divers had a relatively low abundance (a peak count of 63) and their distribution was predominantly between MLWS and MHWS. – Red-breasted merganser also had a low abundance (a peak count of 15); their distribution was mainly in the intertidal area where some use the groynes for nesting. • Nocturnal Surveys: undertaken through half the tidal cycle done over one visit per month between November and March: – Lower number of birds recorded at night because of equipment limitations (i.e., range of optical equipment) and survey coverage. – Ringed plover was however more abundant at night (albeit of low abundance compared to other species). • Further proposed surveys: – Daytime surveys continued from April 2022 to account for inter-annual variation and capture seasonal fluctuations (i.e. spring, autumn passage and winter). Propose to continue survey until June 2023. – Programme of nocturnal surveys continued from April 2022 and will continue until February 2023. – High-tide field roost survey (daytime only) commenced in October 2022 and will extend to April 2023. Survey area comprises terrestrial habitats located within 1.5km of the landfall. Survey period will coincide with over-wintering and passage periods of waterbirds.		
9	<u>Breeding Birds Surveys - AM</u> • The breeding bird surveys were carried out between April to August 2022 and a total of forty-seven surveys were carried out from a combination of Public Rights of Way and private land for which access had been granted. • Records were also sought from Cofnod. • Most of the habitat is pasture and fragmented sand habitat. • The breeding bird survey results show that the breeding species present in the Mona Onshore Ornithology Breeding Birds Study Area were predominantly widespread and common species. The only Annex 1 or Schedule 1 species recorded were: – Little ringed plover, found on an active nest near Llanelwy.		

Item	Detail	Actions	Date
	– Red kite, displaying possible breeding behaviour over suitable breeding habitat in three locations, including one near the Llanddulas Limestone and Gwyrch Castle SSSI. • No qualifying species from any SPAs or Ramsar sites were recorded within the Mona Onshore Ornithology Breeding Birds Survey Area.		
10	<u>Onshore Ecology Surveys: JW</u> • Phase 1 Habitat Surveys: – Phase 1 Habitat Surveys have been completed for most land parcels where access has been agreed with landowners. Phase 1 Habitat Surveys undertaken to date have not identified habitat of high potential value for Water vole. Phase 1 Habitat surveys are still ongoing for the remaining land parcels and will be used to inform protected species surveys in 2023. • GCN HSI / eDNA surveys: – 13 ponds located within 250m of the Mona Construction Infrastructure Search Area have been subject to HSI assessment. Two of the ponds subject to eDNA survey returned positive results for the presence of GCN – these ponds had not been identified in the Cofnod data. One pond has not yet been subject to eDNA survey. This pond will be subject to eDNA survey in 2023. • Bat Tree Roost Potential Assessment: – 132 Bat Tree Roost Potential Assessments (daytime) have been undertaken to date. 34 trees (high potential), 74 trees (moderate potential), 18 trees (low potential). • Badger Sett Survey: – 29 badger setts have been identified: of these, 15 badger setts are located within the Mona Construction Infrastructure Search Area. Two main setts (active), six subsidiary setts (four active, two disused), 18 outlier setts (14 active, four disused). • Bat Activity Survey: – Due to the large extent of Mona Construction Infrastructure Search Area bat activity surveys will now be undertaken in 2023. Desk based analysis alongside Phase 1 Habitat surveys will be used to inform the location of bat activity surveys to be undertaken in 2023. • Further surveys proposed in 2023: – Habitat condition assessment; Badger sett activity surveys; Bat roost (external, trees); Bat activity surveys; Dormouse nest tube; GCN HSI, eDNA and presence/absence; Reptile presence/absence; and Otter surveys.		
11	<u>Approach to PEIR - CR</u> Desk based analysis and the extended Phase 1 Habitat Surveys will be used to identify locations for Phase 2 surveys, which are proposed to be undertaken in 2023. The Terrestrial ecology chapter of the PEIR will include assumptions regarding the likely presence or absence of protected species within the Mona Construction Infrastructure Search Area based on		

Item	Detail	Actions	Date
	the results of the extended Phase 1 Habitat surveys and desk based analysis. A series of figures will be submitted in support of the Terrestrial ecology chapter of the PEIR, which will present the proposed locations of Phase 2 protected species/ habitat surveys proposed in 2023.		
12	Consultation on Survey Results - JW As the majority of the protected species surveys will be undertaken after the PEIR, the survey results will be shared with the stakeholders via the Onshore Ecology EWG meetings. The proposed approach is set out below: 1. Provide a survey schedule, proposed methodologies, and timeframe for when the results can be shared. This approach will allow stakeholders to review survey results and provide feedback regarding mitigation proposals. 2. Agree the approach for sharing the survey information and the scope of surveys before publication of the PEIR for surveys to proceed early next year. 3. Use future EWGs (post PEIR) as a platform to discuss key survey results and feedback received from Stakeholders to date.		
13	Questions • CR (RPS) – asked if NRW had received an update regarding approach to achieving an overall biodiversity benefit as RPS are yet to receive a response from the Welsh Government. • CR (RPS) – asked if there was a suitable/ preferred format for which survey data can be shared with stakeholders. • KS (CCBC)– asked if known bat roost features (e.g. at Kinmel Hall, Brook Castle) will be considered in the assessment. JW suggested that this would be clarified outside the call and that a response would be provided to KS. • KS was encouraged to hear that high tide roosts are being included in the bird survey. She noted that a different survey had recorded a barn owl hunting along the beach, however no nests had been found. • KS (CCBC) – asked where the pond (yet to be subject to eDNA/HSI assessment) was located. • KS (CBBC) – asked what format the survey information would be in and how this would be shared. • SR (NRW) – requested that the bird survey methodology consider the Welsh Birds of Conservation Concern (BOCC), which has now been published. • SM (RPS) – noted that the Bat Conservation Trust methodology was quite prescriptive and asked KS (CBBC) if it was acceptable to focus bat surveys in areas identified with high potential for bats (e.g. reduce survey effort on poorer agricultural quality land). KS agreed that the approach sounded sensible.		
14	Actions		08/12/2022

Item	Detail	Actions	Date
	1. NRW to identify if there is a preferred approach to achieving an overall biodiversity benefit based on previous projects. 2. RPS to review information within the Awel y Mor application on achieving an overall biodiversity benefit. 3. RPS - to update bird survey methodology and subsequent reporting in accordance with the Welsh BOCC (where required). 4. RPS - to prepare survey methodology for bats, which will be shared as part of future Onshore Ecology EWGs. 5. CCBC – to provide further data on known bat roost features within or proximity to the Mona Proposed Onshore Development Area (previously refererred to as the 'Construction Infrastructure Search Area')	NRW RPS CCBC – already sent All – to fill in agreement log to provide progress of agreement for each of the points listed.	
15	<u>Next steps</u> The third Onshore Ecology EWG will be held in February 2023 and will discuss the following items: • Discuss the methodologies and proposed locations of the protected species surveys • Assumptions on presence/absence of species • Discuss approach to achieving an overall biodiversity benefit .	bp/RPS	08/12/2022

E.4. Onshore ecology EWG meeting 3

E.4.1 Meeting minutes

Appendix A Onshore Ecology EWG03 Meeting Minutes

Reference:	RPS_EOR0801_Mona_Onshore_Ecology_EWG03_MoM_Rev01
Meeting Name:	Mona Evidence Plan Onshore Ecology Expert Working Group (EWG) – Meeting 3
Meeting date:	24 April 2023
Meeting location:	Virtual (Microsoft Teams)

Attendees

Name	Initials	Company	Role
[redacted]	CR	RPS	Consultant
	BJ	RPS	Consultant
	LM	RPS	Consultant
	AM	RPS	Consultant
	SM	RPS	Consultant
	PRW	bp	Applicant
	KS	Conway County Borough Council (CCBC)	Statutory body
	SW	Cyfoeth Naturiol Cymru (Natural Resources Wales, NRW)	Statutory body
	NS	Cyfoeth Naturiol Cymru (Natural Resources Wales, NRW)	Statutory body
	ME	Cyfoeth Naturiol Cymru (Natural Resources Wales, NRW)	Statutory body
	SR	RSPB	Statutory body
	MC	Amphibian and Reptile Conservation Trust (ARC)	Non-statutory body

Item	Detail	Actions	Date
Introduction			
1	Introduction RPS provided a summary of the agenda for the Third Onshore Ecology EWG. This included the following items: Summary of 2nd Onshore Ecology EWG; project update; meeting programme update; onshore and intertidal ornithology; onshore ecology; methodologies for surveys; developing mitigation and questions.		
2	Summary of 2nd Onshore Ecology EWG RPS provided a summary of the points covered during the 2nd Onshore Ecology EWG. This included the approach to baseline characterisation, programme updates, survey results and actions. CR explained that minutes from the previous EWG had been circulated before the call; the minutes include the areas of agreement for the attendees to review and provide comment The actions and updates are summarised below: • Update bird survey methodology in line with the latest BOCC guidance: COMPLETED • CCBC to to provide data on bat roost features: KS CONFIRMED THAT THE BAT ROOST FEATURES WERE ALREADY INCLUDED IN THE COPNOD RECORDS • RPS to prepare survey methodologies for onshore ecology surveys: SEE ITEM 21 OF THE MEETING MINUTES • Approach to biodiversity benefit: SEE BELOW CR – a consistent approach to biodiversity enhancement has not been applied to recent projects. Awel y Mor provided an area of land for enhancement and identified a management regime in agreement with NRW. SW – confirmed that there was no agreed position from WG advising projects on how to identify the area of net gain required. ME – The HyNet scheme has used a financial payment approach and identified where the payments should go. For the Mona Offshore Wind Project, ME explained that NRW would be looking for the long term ecological management of an area of land. CR – asked for clarification on the size of area that NRW would be expecting. ME – the area should be (as a minimum) equivalent to the size of the onshore substation footprint. As an example, ME suggested looking at the enhancement area created by Burbo Bank, which is managed and monitored by a third party.	Members of the Onshore EWG to review the agreement logs	09/06/2023

Item	Detail	Actions	Date
	ME clarified that the monitoring and management must be undertaken by 'responsible bodies' as defined by Part 7 of the Environment Act 2021 (conservation covenants) .		
3	Update on the Mona Offshore Wind Project Statutory consultation on the Mona Offshore Wind Project PEIR was launched on 19 April 2023 and it will run until 04 June 2023. Consultation events are being held at various locations during May 2023. The consultation follows on from the non-statutory events. The project will avoid the Traeth Pensarn SSSI at landfall – access may be required to works on the beach but will avoid the shingle. HDD will be used to cross the A55, A547, railway, sea defences and coastal path. The exit pit for the HDD will either be located between MHWS and MLWS (i.e. a short drill with trenching in the intertidal area), or the exit pit will be located below MLWS (a long drill). Site investigations are programmed to take place shortly that will determine the drill profile (the length of the drill and therefore the location of the exit pit). There are options in some areas of the onshore cable corridor to allow for further surveys and information to be obtained. Glascoed Road will provide the key access for these options. The PEIR includes two options for the onshore substation locations: these options are in line with the consultation events undertaken in November last year. The options will fall away as part of the project refinement. All of these details are presented in the Project Description and Site Selection chapters of the PEIR. NS – the requirement for construction activities on the beach should not conflict with the ongoing beach feeding process of the shingle, coastal protection (via long shore drift) and management of the SSSI. The recreational uses of the beach should be also maintained. PRW – the Project is proposing not to be undertake significant works on the beach. It is primarily included in the redline boundary to provide access. NS – Construction vehicles should avoid travelling on the vegetated shingle as it is a habitat of great concern and is susceptible to damage. NRW suggests that vehicles use the foreshore area as an alternative to the shingle area, but works would have to be timed according to the tide.	CR to confirm where long shore drift is considered in the PEIR	
4	Indicative Meeting Programme RPS provided a summary of the indicative meeting programme, including updated dates for future EWGs which are proposed to take place July, September, and November 2023.	N/A	

Item	Detail	Actions	Date
	CR – Further meetings could be added to the programme if there was a need to share additional information,		
5	Methodologies for onshore ecology surveys The Phase 1 habitat survey undertaken for the Mona Offshore Wind Project (and reported in the PEIR) identified a number of habitat types with the potential to supported various protected species. Surveys are being undertaken during 2023 to confirm the presence/absence of these species and the results will be used to inform the mitigation measures in the Environmental Statement. Methodologies for these surveys will be circulated to the Onshore Ecology EWG with the meeting minutes; members will be asked to review and make comments/record their agreement in the agreement log. Where surveys have already commenced, amendments to methodologies will be implemented to future survey visits where necessary.	Members of the Onshore Ecology EWG to review, make comments, and record their agreement in the agreement log.	09/06/2023
6	Developing mitigation Mitigation measures to avoid and minimise impacts to onshore ecology and intertidal/onshore ornithology will continue to be developed during the application process. The development of these measures will largely be achieved by: • Ongoing site selection, refinement of the onshore cable corridor and micro-siting to avoid damage and disturbance to habitats and protected species. • The Hydrological, Ecological and Landscape Management Plan – this will include strategies to avoid disturbance during construction (e.g. breeding bird protection plan); measures to protect and restore habitats during and after constuction; and the creation of new habitats together with monitoring and aftercare activities. The Plan will be developed during the ES stage and will be largely informed by the results from the protected species surveys and the ongoing consultation with the Onshore Ecology EWG. • Outline Code of Construction Practice – this will build on the Outline CoCP submitted in the PEIR and will include further measures to minimise construction impacts. These measures will be informed by consultation responses and the refinement of the project design. • Biodiversity Statement –areas for enhancement will be identified and a strategy will be prepared that sets out management objectives and monitoring measures. The strategy will be developed in consultation with the Onshore Ecology EWG and will complement other enhancement schemes in the local area. The strategy will be reported via a Biodiversity Statement in line with local plannign policy. KS – how will the project secure the long term maintenance/ management of retained or newly created habitats?		

Item	Detail	Actions	Date
	CR – These measures will be documented in the Hydrological, Ecological and Landscape Management Plan and/or the Biodiversity Statement which would be secured as a requirement of the DCO.		
Onshore and intertidal ornithology			
7	Introduction RPS provided a summary of the agenda for onshore and intertidal ornithology. This included the following items: field surveys undertaken to date, Valued Ornithological Receptors (VORs) identified, potential impacts considered, mitigation proposed, likely significant effects on VORs, assessment of cumulative effects and next steps between PEIR and ES.		
8	Field Surveys Undertaken RPS provided a summary of the field surveys undertaken to date, including intertidal birds, breeding birds, and onshore wintering, passerine and raptor surveys (slide 3 of the Ornithology presentation). RPS also explained the survey extent, methodology, frequency and survey period. Further information on the surveys is found in volume 3, chapter 24: Onshore and intertidal ornithology, of the PEIR.		
9	Ornithology study areas RPS explained the location and geographical extents of the intertidal ornithology study area and onshore ornithology study area and how these were used to inform field surveys for intertidal birds, breeding birds, and onshore wintering birds (slides 4 and 5 of the Ornithology presentation). SR – questioned the 1.5km study area with regards to the disturbance impacts at the landfall. Will mitigation measures be considered in the intertidal and onshore ornithology chapter or as part of the offshore ornithology chapter? AM – confirmed that mitigation relating to disturbance at landfall will be captured within the offshore ornithology chapter of the PEIR and ES.		
10	VORs identified RPS provided a summary the VORs identified for consideration within the PEIR within the study areas, including the criteria used. These included 5 seabird VORs, 5 Waterbird VORs and 2 Breeding bird VORs.		
11	Potential impacts considered RPS provided a summary of the potential impacts of the Mona Offshore Wind Project on VORs which have been considered in the PEIR. This included temporary/permanent habitat loss,		

Item	Detail	Actions	Date
	habitat disturbance, fragmentation and species isolation, pollution caused by accidental spills/contaminant release.		
12	Mitigation measures proposed RPS provided a summary of the mitigation measures adopted as part of the Mona Offshore Wind Project which have been considered in the PEIR. These included the Outline Code of Construction Practice (CoCP), pre-commencement surveys for breeding birds, Ecological Clerk of Works (ECoW) (see section 7.5 of the CoCP) and the Hydrological, Ecological, Landscape Management Plan that will be submitted with the DCO application.		
13	Likely significant effects on VORs RPS provided a summary of the likely significant effects of the Mona Offshore Wind Project on VORs reported in the PEIR. RPS explained that, at this stage, significant effects on VORs are not anticipated during each phase of the Mona Offshore Wind Project.		
14	Cumulative effects RPS provided a summary of the other proposed developments considered in the assessment of cumulative effects, including the cumulative study area (1km from the Mona Proposed Onshore Development Area). RPS explained that, at this stage, significant effects on VORs are not anticipated during each phase of the Mona Offshore Wind Project.		
15	Next steps between PEIR and ES RPS provided a summary of the additional surveys proposed between PEIR and ES. These include a second year of intertidal ornithology surveys and breeding bird surveys.		
Onshore Ecology			
16	Introduction RPS provided a summary of the agenda for onshore ecology. This included the following items: extent of field surveys, interim findings, surveys proposed for the ES, process for sharing survey findings and mitigation measures proposed.		
17	Extent of field surveys The following surveys have been undertaken to date or are ongoing, such as Phase 1 Habitat survey, Great Crested Newt (GCN) Habitat Suitability Index (HIS), GCN eDNA, Ground Level Roost Assessment (GLRA) (trees), badger sett, otter,		

Item	Detail	Actions	Date
	water vole, bat automated ultrasound and hazel dormice surveys.		
18	Interim findings in the PEIR Interim findings for the following surveys were reported in the volume 7: Phase 1 Habitat Survey, GCN eDNA surveys and GCN HSI surveys. RPS stated that full survey coverage would be achieved for the ES subject to securing access. RPS also stated that interim findings would be shared with the Onshore Ecology EWG between PEIR and ES.		
19	Phase 1 Habitat Survey Coverage for PEIR RPS provided a summary of the Phase 1 Habitat Surveys undertaken and reported in the PEIR (volume 7, annex 18.2). Good coverage was achieved and the results were used to inform the requirements for phase 2 field surveys. Phase 1 habitat surveys will be undertaken on those parcels where access had not been secured or where updates are required as the original survey was undertaken in suboptimal conditions.		
20	Surveys proposed for the ES RPS provided a summary of the proposed Phase 2 field surveys that will be undertaken to inform the ES. These included: GCN (eDNA, HSI, population size class), Bats (GRLA, tree surveys, building surveys, activity surveys), Badger (sett surveys), Aquatic Invertebrates, Fish and eel, Hazel dormouse, Hedgerow, INNS, NVC, Otter, Water vole, Reptile, Terrestrial invertebrates, and White clawed crayfish. RPS then identified the location and number of land parcels proposed to be scoped in for each of the phase 2 surveys listed, including the relevant survey requirements and progress to date (refer to the slide pack for information) Survey results will be shared through Field Maps (see slide 28 of the Onshore ecology presentation) and will be discussed during future Onshore Ecology EWG meetings (as highlighted in slide 6 of the Presentation introduction).		
21	GCN HSI and eDNA Survey ME – there are a number of well-established GCN monitoring programmes in the area around St Asaph. Has RPS had considered using data from this ongoing monitoring as an alternative to carrying out new surveys? SM – confirmed that extant records and ongoing monitoring have been considered. It was agreed (March 2022) that St Asaph, Gwynt Y Mor and Burbo Bank ponds (which are being monitored annually) could be excluded from the proposed survey programme.		

Item	Detail	Actions	Date
	SM – confirmed recorded positive eDNA results in a pond closer to the landfall area where GCN had not been previously recorded.		
22	GCN Population Size Class Assessment SM—a screening report submitted in 2022 for the proposed St Asaph Solar Farm included GCN monitoring that was undertaken in July 2022 by SLR. Is there a need for the Mona Offshore Wind Project to undertake population size class surveys on ponds that overlap with other projects where recent monitoring has been undertaken? Or could the project focus survey efforts on ponds not already surveyed? ME – if surveys have been undertaken within the last 2 years (by the time of the application) then the data should be suitable (and further population size class assessment would not be necessary). ME – liaise with the WG ecology advisor to identify any other monitoring data in the area ME suggested the St Asaph Solar Farm applied a rigorous approach to GCN surveys – he raised concern in survey techniques that placed an over reliance on HSI and eDNA surveys, whereas they should be considering where the longer term impacts will occur.	SM to contact WG ecology advisor	09/06/2023
23	Bat Building Surveys SM – several land parcels have been scoped into the survey as they contain buildings, only one building is located within the Mona Proposed Onshore Development Area and is therefore scoped in for a bat building surveys		
24	Bat Activity Surveys Bat activity transect surveys have been scoped out due to the temporary nature of the works (as previously agreed with NRW). Ten strategic locations have been identified for static bat detectors (e.g. Gwrych Wood). SM – a large bat roost (for lesser horseshoe bats) is located at Kinmel Hall which is located outside the Mona Proposed Onshore Development Area, however static bat detectors have been placed around locations of high quality habitat and areas of permanent habitat loss. Visits will be made twice a month over a period of 5 months. SM - requested feedback on the information required by NRW from the monitoring at Kinmell Hall. ME – NRW want to understand the functionality and importance of the habitats, in particular the potential disruption to foraging and dispersal so that the project can take the necessary steps to avoid these impacts.		

Item	Detail	Actions	Date
25	Badger Surveys SM –more badger setts have been identified from incidental findings during other surveys than are currently shown on the slides.		
26	Hazel Dormouse Surveys SM – the traps are all in place and data will be collected from May onwards		
27	Hedgerow Surveys SM – condition assessments of the hedgerows will be used to inform the baseline of the biodiversity net gain.		
28	Reptile Surveys SM – as the potential impacts along the onshore cable corridor will be temporary, a targeted approach to surveying reptiles is proposed. This would seek to refine the survey effort particularly in areas grazed by livestock where damage to refugia is likely to occur. Feedback on the proposed approach (see methodology document) is requested from NRW and ARC.	NRW to provide feedback on proposed approach	09/06/2023
29	Process for sharing survey findings RPS explained how the onshore ecology team have setup a system called Field Maps, which digitally captures survey information (slide 28 of the Onshore ecology presentation). RPS explained that Field Maps would be used as the platform to share survey findings with the EWG and progress to date between PEIR and ES.		
30	Mitigation measures RPS provided a summary of the primary (embedded into the design) and tertiary mitigation measures adopted as part of the Mona Offshore Wind Project, which have been considered in the PEIR. This included an explanation as to how each of these measures would be secured in the DCO. ME – ecological audits and associated KPIs will be required for the ES. The KPIs should be developed as soon as possible. ME – how is the project assessing the importance of hedgerows to bats? Hynet carried out a separate assessment that considered the connectivity of linear features – contact [redacted]co.uk). A similar approach could be used for the purposes of Mona Offshore Wind Project.	SM to look at the Hynet scheme and confirm approach for Mona Offshore Wind Project	09/06/2023

Item	Detail	Actions	Date
	MC – explained her experience in designing and creating habitat features for GCN and reptiles. Good quality habitats can be created with a relatively short time frame.	MC to send case studies.	
31	Summary of actions: Members of the Onshore Ecology EWG are to review the agreement logs that will accompany the meeting minutes. Confirm where longshore drift is considered in the PEIR. Members of the Onshore Ecology EWG to review the survey methodologies, make comments, and record their agreement in the agreement log. Provide feedback on proposed approach for reptile surveys Look at the Hynet scheme for assessing the importance of hedgerows to bats and confirm approach for Mona Offshore Wind Project MC to send case studies on creating habitat features for GCN and reptiles	 All CR All NRW SM MC	
32	Post meeting note Volume 2, chapter 6: Physical processes of the PEIR considers sediment transport and the processes that support the beach The Project can confirm that vehicles will use the foreshore area to access any works on the beach and avoid the shingle area. Case studies of GCN and reptile habitat creation were sent after the call.	 CR PRW MC	

E.4.2 Invasive Non-Native Species Survey Methodology

Partners in UK offshore wind

MONA OFFSHORE WIND PROJECT

Invasive Non-Native Species Survey Methodology

EOR0801
Mona Offshore Wind
Project April 2023

Document status

Version	Purpose of document	Authored by	Reviewed by	Approved by	Review date
Rev01	For review	RPS	RPS	RPS	28/04/2023
Rev02	For issue	RPS	RPS	RPS	02/05/2023

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Figures

1 INTRODUCTION

1.1.1.1 To inform the Environmental Impact Assessment (EIA), ecology mitigation strategy, and consenting process for the Mona Offshore Wind Project, a series of phase 2 terrestrial ecology surveys will be undertaken, including invasive non-native species (INNS) surveys, which are considered in this document.

1.1.1.2 The main objectives of the INNS surveys are to:

- Confirm presence / absence of INNS.

1.1.1.3 This document sets out the methods of INNS surveys that are proposed for the Mona Offshore Wind Project and the options for survey coverage that the project would like to scope with the Expert Working Group (EWG).

2 SURVEY METHODOLOGY

2.1.1.1 The following INNS survey methods are proposed.

2.2 Qualifications and experience

2.2.1.1 All personnel conducting detailed INSS survey will be competent and experienced in the identification of INNS listed on Schedule 9 of the Wildlife and Countryside Act 1981 (as amended).

2.3 Walkover survey

2.3.1.1 For all areas subject to survey, a systematic walkover will be conducted of all parcels scoped in for INNS to record any plants listed on Schedule 9 of the Wildlife and Countryside Act 1981 (as amended).

2.3.1.2 Specific attention will be given for the presence of Rosa Rugosa as flagged by Natural Resources Wales in their EIA Scoping Response.

2.3.1.3 The site walkover survey will be undertaken between April to September, ideally within the summer months.

2.3.1.4 Results will be recoded and mapped digitally using the internal GIS system known as Field Maps.

2.4 Incidental records

2.4.1.1 Any sightings of non-target species (or evidence of) recorded during surveys will be reported in the separate incidental records form on the Arc GIS Field Maps application.

3 SURVEY SCOPING

3.1.1.1 The Mona Offshore Wind Project would like to agree this methodology and coverage with the EWG to ensure that the data collated is sufficient to inform the ecology impact assessment and an appropriate mitigation strategy. We seek to agree the following:

3.2 Survey area

3.2.1.1 The survey would include all land parcels scoped in for INNS, as shown on Figure 3.1.

3.3 Survey methods

3.3.1.1 A detailed survey for INNS would be undertaken for all parcels considered suitable for INNS.

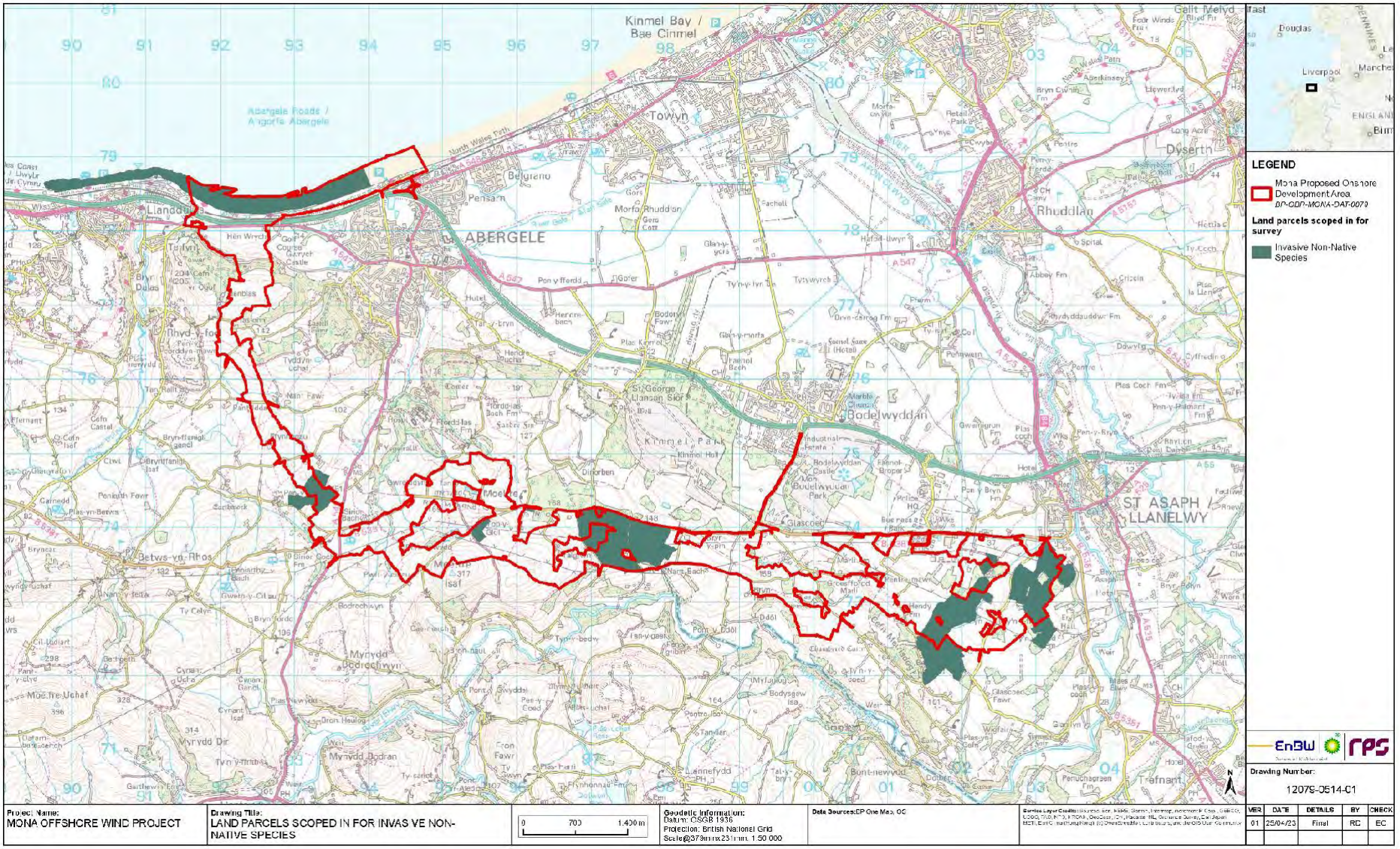

Figure 3.1: Land parcels scoped in for INNS surveys.

E.4.3 Aquatic Invertebrate Survey Methodology

Partners in UK offshore wind

MONA OFFSHORE WIND PROJECT

Aquatic Invertebrate Survey Methodology

EOR0801
Mona Offshore Wind Project
April 2023

Document status

Version	Purpose of document	Authored by	Reviewed by	Approved by	Review date
Rev01	For review	RPS	RPS	RPS	28/04/23
Rev02	For issue	RPS	RPS	RPS	02/05/23

Contents

Figures

1 INTRODUCTION

1.1.1.1 To inform the Environmental Impact Assessment (EIA), ecology mitigation strategy, and consenting process for the Mona Offshore Wind Project, a series of phase 2 terrestrial ecology surveys will be undertaken, including aquatic invertebrate surveys, which are considered in this document.

1.1.1.2 The main objectives of the aquatic invertebrate surveys are to:

- Sample and identify invertebrate species in the waterbodies on site; and
- Classify the sites importance in relation to the invertebrate community present.

1.1.1.3 This document sets out the methods of invertebrate surveys that are proposed for the Mona Offshore Wind Project and the options for survey coverage that the Mona Offshore Wind Project would like to scope with the Expert Working Group (EWG).

2 SURVEY METHODOLOGY

2.1.1.1 This section of the document describes the invertebrate survey methods which are proposed. The proposed approach will broadly follow the guidelines set out in '*Surveying Terrestrial and Freshwater Invertebrates for Conservation Evaluation*' (English Nature, 2007).

2.2 Qualifications and experience

2.2.1.1 All surveyors involved in surveying invertebrates will be experienced in the following:

- field identification of widespread Invertebrate species and life stages (e.g. adults, larvae, eggs and exuviae);
- assessing the potential suitability of on-site habitats for widespread aquatic invertebrate species;
- determining appropriate spatial scope for survey; and
- identifying appropriate survey techniques to achieve a robust survey in a variety of habitat types.

2.2.1.2 Surveys are only anticipated to involve widespread invertebrate species, as such no survey licence is required.

2.3 Aquatic Invertebrate Survey

2.3.1 Survey programme and effort

2.3.1.1 At each site selected for aquatic invertebrate survey, areas which are safely accessible are to be sampled using a sweep net and by general searching.

2.3.1.2 The time spent in each survey area is to be in accordance with the size of the area and the extent of the habitat to be sampled. To estimate species richness, Magurran (2004) quotes ten samples as a minimum.

2.3.1.3 Pond netting will be the main technique used. This is suitable for shallow water bodies such as pons, streams, and river margins. The net used will be rectangular, 20 to 25 cm along the bottom edge and 19 to 22 cm tall with a net at least 30 cm deep with a 1 mm mesh.

2.3.1.4 While standing at the water margin, the surveyor nets the vegetation by making short jabbing thrusts into dense emergent and raft forming plants and making occasional longer strokes into submerged plants and over bare substrate in deeper water.

2.3.1.5 The surveyor will move steadily along the bank and will stop netting after 1 to 3 minutes, when the net begins to fill to the point where it becomes difficult to push.

2.3.1.6 The sample will then be emptied onto a white polythene sheet and spread out into a thin layer. The sample will be searched for 10 minutes. Then all plant material is tipped into a bucket of water, larger pieces are removed, most of the water is decanted, and the heavy residue is tipped into a white tray with

around 1 cm of water. By tipping the contents to one end of the tray, then slowly tipping the tray back again, molluscs will be left stranded.

2.3.1.7 When sampling is completed, the contents will be killed using 70% alcohol or formalin and transferred to 30 ml soda glass tubes together with a data label.

2.3.1.8 Streams and shallow rivers will be sampled by kick-netting. The surveyor will stand in the water facing downstream. Holding the net upright in the water in front of them, they will then disturb the sediment immediately upstream of the net, upturning stones and displacing gravel with their feet

2.3.1.9 The surveyor will move backwards, upstream, all the while, and from one side of the stream to the other so that the banks are sampled as well as midstream. Pools and shallower riffle are included in the same sample. Sampling is timed for 1 minute. The samples will be treated as for pond netting.

2.3.1.10 At least three separate site visits – taking in spring months, summer months, and autumn months will be undertaken between July and August 2023, in suitable weather. Ideal conditions for sampling invertebrates are warm, dry, and sunny. Up to six surveys may be required if significant communities of aquatic invertebrates are likely to be present and if they are impacted by the Mona Offshore Wind Project.

2.3.1.11 For a robust survey, it is preferable to spread visits over a long period. This will enable the collection of invertebrate groups with varying activity patterns and life stages producing more accurate sampling.

2.3.1.12 Areas of suitable habitat may be in areas where it is anticipated that there may be both health and safety and access issues that will prevent survey of all those areas of habitat identified as potentially suitable for invertebrates. In these cases, the consultants undertaking surveys will be expected to liaise with the overseeing consultant to determine a suitable approach for these areas. It is anticipated that this will involve consideration of the following potential approaches:

- sampling of areas of similar adjacent habitat;
- visual search only; and
- risk assessment based on habitat suitability.

2.3.2 Identification

2.3.2.1 Where practical, invertebrates will be identified in the field but wherever doubt exists, one or more specimens will be collected for more detailed inspection. Where the surveyor is unable to identify any specimens, they will be submitted to relevant experts.

2.3.2.2 It is desirable that as wide a taxonomic range as possible is identified, to sample numerous ecological types (i.e. invertebrates with widely differing natural histories).

2.3.2.3 Where possible, the following orders and families of invertebrates will be named to species.

- **Araneae** – Spiders;

- **Clitellata** – Leeches;
- **Coleoptera** – Beetles (all except small Aleocharine rove beetles and other very small obscure families);
- **Crustacea** – Shrimps, Water fleas, Water louse;
- **Araneae** – Spiders;
- **Clitellata** – Leeches;
- **Coleoptera** – Beetles (all except small Aleocharine rove beetles and other very small obscure families);
- **Crustacea** – Shrimps, Water fleas, Water louse;

2.3.2.4 Selected specimens will be retained as vouchers.

2.3.3 Analysis

2.3.3.1 The quality of the site for invertebrates will be assessed with reference to the species found which are nationally scarce or rare by the various Natural Resources Wales Commissioned Reports published by Joint Nature Conservation Committee (e.g. Falk 1991a; Falk 1991b; Hyman, 1992) and subsequently Natural Resources Wales. These reviews place all nationally scarce species into categories according to their degree of rarity and their vulnerability to extinction and are accepted as the "official" Joint Nature Conservation Committee/Natural Resources Wales designations. The more recent ones also assess taxa with reference to IUCN threat categories.

2.3.3.2 As a simple and readily comparable indication of quality, the proportion of Nationally Scarce and Red Data Book (RDB) species of the total diversity will be calculated. The same calculation will be done for the rarest taxa with RDB status. Depending on the habitat type, a proportion of Nationally Scarce/RDB species between 3-5% needs to be exceeded before it can be safely concluded that the site has some conservation significance. Very high-quality sites of national importance will have a proportion close to or exceeding 10% Nationally Scarce/RDB species.

2.3.3.3 The surveyor will compare the site and surveyed habitats with other sites of similar habitat and nature, and will be classified as one of the following:

- little/no importance;
- local/county importance;
- regional importance;
- national importance; or
- European importance.

2.3.3.4 As well as describing the communities present, any species of high interest will be reported. These could include:

- UK Biodiversity Action Plan listed species;
- Schedule 5 species; or
- threatened species.

2.3.3.5 Where these species occur, their locations and the locations of suitable habitat will be recorded.

2.4 Incidental records

2.4.1.1 Any sightings of non-target species (or evidence of) recorded during surveys will be reported digitally in the separate incidental records form using an internal GIS application (known as Field Maps)

3 SURVEY SCOPING

3.1.1.1 The Mona Offshore Wind Project would like to agree this methodology and coverage with the EWG to ensure that the data collated is sufficient to inform the ecology impact assessment and an appropriate mitigation strategy. We seek to agree the following:

3.2 Survey area

3.2.1.1 The survey would include all parcels within the potential corridor that have been scoped in for aquatic invertebrates. The location of land parcels scoped in for aquatic invertebrate surveys is presented in Figure 4.1 of this document below.

4 REFERENCES

Buglife (2019). *Good Planning Practice for Invertebrates: Surveys*. Buglife, Peterborough.

English Nature (2006) *Organising surveys to determine site quality for invertebrates: A framework guide for ecologists (IN108)*. English Nature, Peterborough.

Magurran, A.E. (2004) *Measuring Biological Diversity*. Blackwell Publishing, Oxford

Natural England (2007). Surveying Terrestrial and Freshwater Invertebrates for Conservation Evaluation. Natural England, Peterborough.

Sutherland, W. J. (2006). *Ecological Census Techniques, Second Edition*. Cambridge University Press, Cambridg

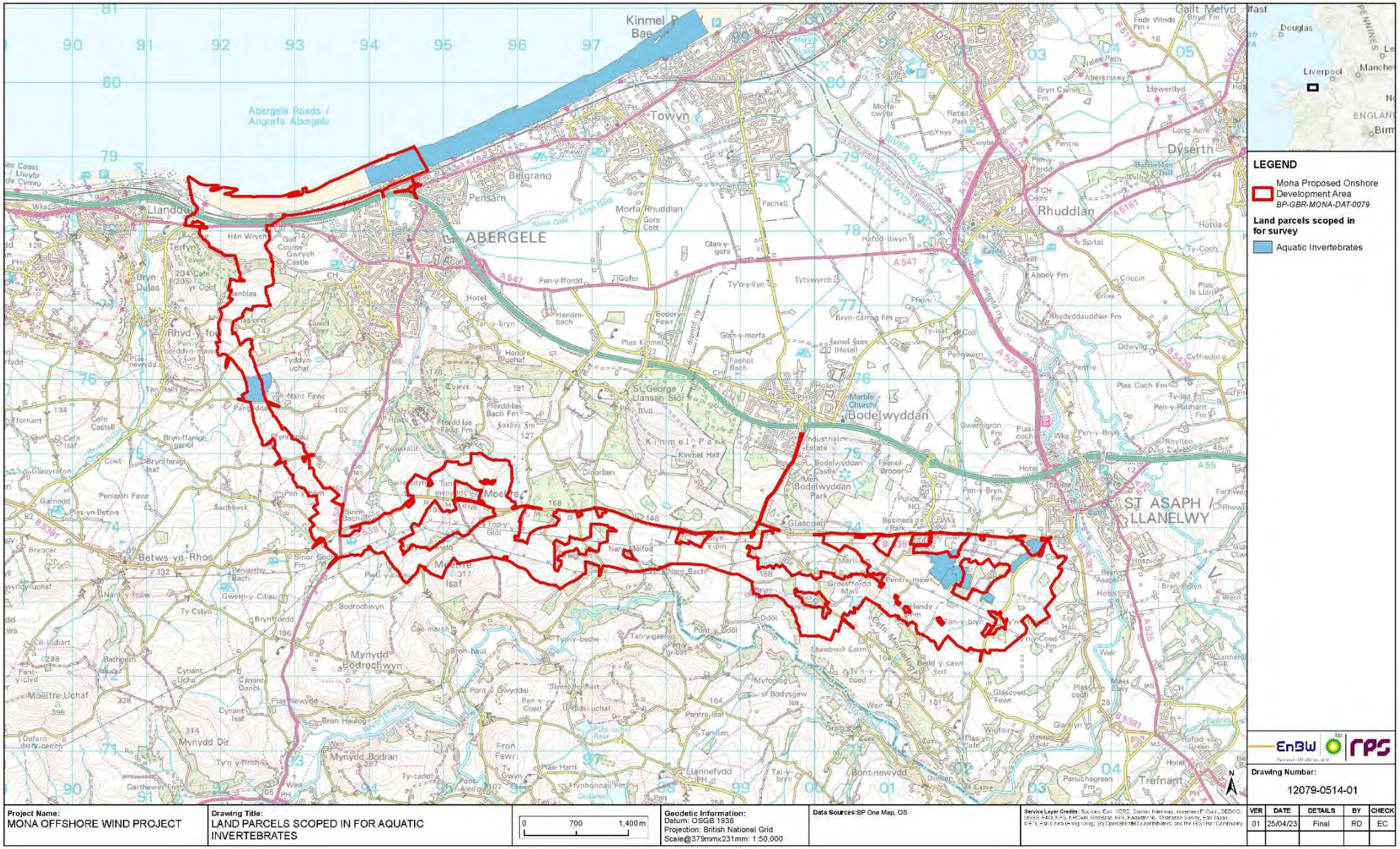

Figure 4.1: Land parcels scoped in for aquatic invertebrate surveys.

E.4.4 Badger Survey Methodology

Partners in UK offshore wind

MONA OFFSHORE WIND PROJECT

Badger Survey Methodology

EOR0801
Mona Offshore Wind Project
April 2023

Document status

Version	Purpose of document	Authored by	Reviewed by	Approved by	Review date
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Contents

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1 INTRODUCTION

1.1.1.1 To inform the Environmental Impact Assessment (EIA), ecology mitigation strategy, and consenting process for the Proposed Developments, a series of phase 2 terrestrial ecology surveys will be undertaken, including badger surveys, which are considered in this document.

1.1.1.2 The main objectives of these badger surveys are to:

- identify evidence of badger and confirm sett locations;
- determine sett type; and
- monitor any setts present that may be impacted by works.

1.1.1.3 This document sets out the methods of badger surveys that are proposed for the Mona Offshore Wind Project and the options for survey coverage that the project would like to scope with the Expert Working Group (EWG).

2 SURVEY METHODOLOGY

2.1.1.1 The following badger survey methods are proposed. Where these survey methods would be carried out is discussed in section 3.

2.1.1.2 Badger bait marking is not considered necessary for this project due to the lack of permanent severance / fragmentation of territories because of the works.

2.2 Qualifications and experience

2.2.1.1 All personnel conducting detailed badger survey should be competent and experienced in the identification of the full range of badger field signs including setts, latrines, hairs, badger paths and foraging signs including 'snuffle' holes. In addition they should be competent in identifying field signs of other species, such as foxes, rabbits, otters, dogs and cats.

2.2.1.2 All personnel conducting badger survey should be familiar with the definitions of sett type detailed by Harris et al (1989), and the classification of setts utilising this methodology in the field.

2.3 Detailed survey for field signs

2.3.1.1 For all areas subject to survey, a systematic walkover will be conducted of all suitable habitat to obtain records of the following:

- Setts;
- Hairs;
- Badger paths/runs;
- Mammal paths (possible badger);
- Foraging signs;
- Latrines;
- Footprints;
- Bedding material; and
- Evidence of rabbit and fox.

2.3.1.2 For all setts identified during the walkover survey, entrances and the orientation of entrance holes should be mapped. The sett should be classified against the criteria laid out in Harris et al (1989) as either a 'main', 'annexe', 'subsidiary' or 'outlying' sett. The level of use for each entrance should be classified as either 'active', 'partially active', or 'disused'.

2.3.1.3 Data should be recorded using the Arc GIS Field Maps application.

2.4 Badger sett monitoring

2.4.1.1 Any badger setts identified should be subject to sett monitoring surveys to determine use.

2.4.1.2 Sett monitoring surveys involve setting up infra-red cameras with automated triggers close to the entrance of any setts to record activity.

2.4.1.3 Sand should also be laid outside the sett to record badger footprints and sticks to record movement in and out of the holes, ensuring that the sticks used are not large enough to block access in/out of the hole.

2.4.1.4 Sett monitoring can be undertaken at any time of year. Cameras should be left in place for a minimum of 21 days, with sand/stick checks undertaken intermittently through the period, to coincide with battery changes/data upload for the infrared cameras.

2.5 Incidental reports

2.5.1.1 Any sightings of non-target species (or evidence of) recorded during surveys should be reported in the separate incidental records form on the Arc GIS Field Maps application.

3 SURVEY SCOPING

3.1.1.1 Sensitive areas within the Proposed Onshore Development Area were identified from aerial photography and phase 1 habitats surveys. The Mona Offshore Wind Project would like to discuss the following proposals with EWG:

3.2 Survey Area

3.2.1.1 The survey would include all parcels scoped in as being suitable for badger, within the Mona Proposed Onshore Development Area, plus a 30m buffer surrounding the survey area.

3.2.1.2 Badger sett monitoring should be undertaken on any setts located within 30m of proposed works.

3.2.1.3 The land parcels scoped in for badger surveys are presented in Figure 3.1 of this report below.

3.3 Survey methods

3.3.1.1 A detailed survey for field signs would be undertaken for all parcels considered suitable for badger.

3.3.1.2 Badger sett monitoring should be undertaken for any setts identified to determine usage.

4 REFERENCES

Harris, S., Cresswell, P., and Jefferies, D. (1989). Surveying Badgers. The Mammal Society, London.

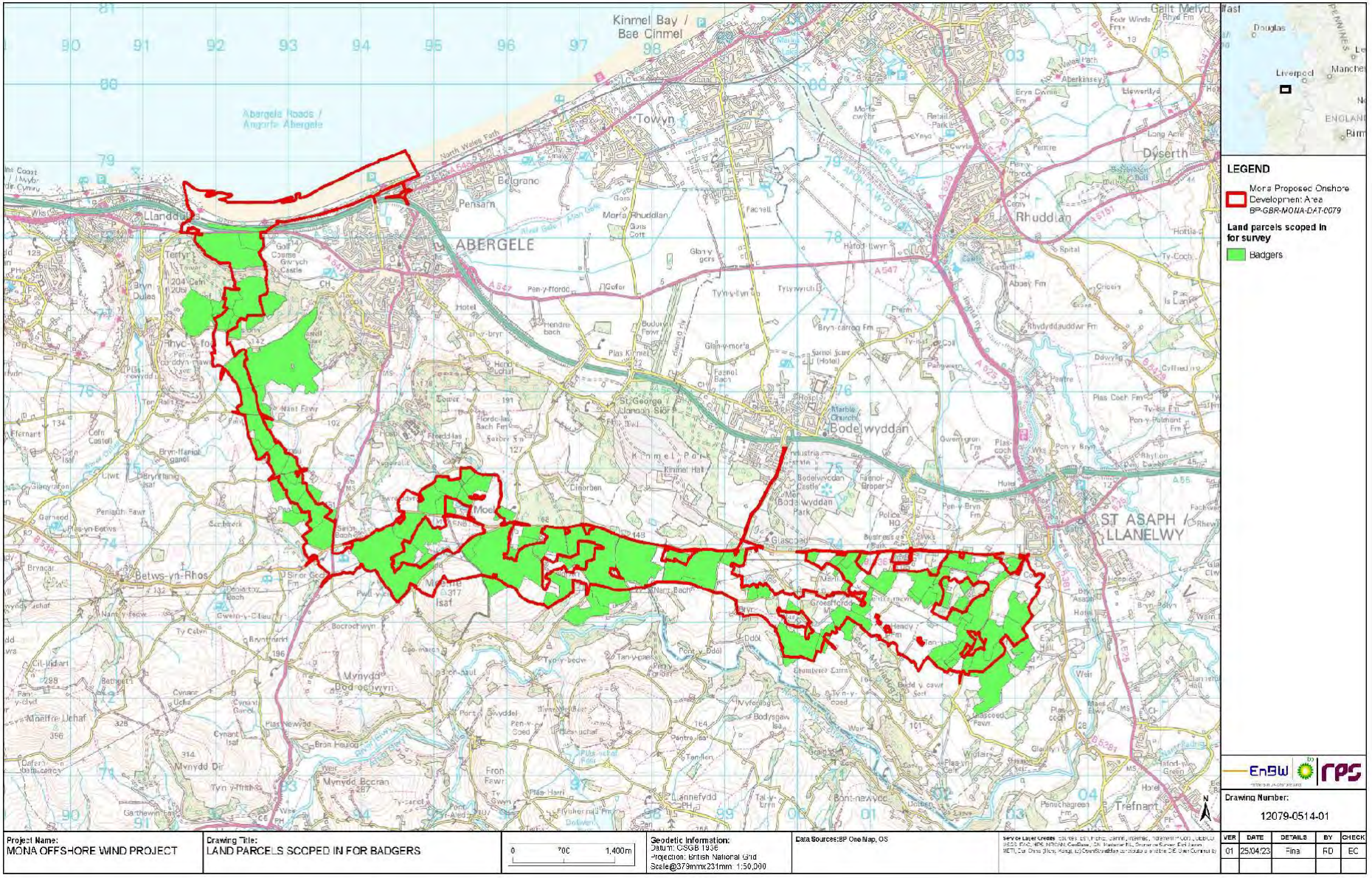

Figure 3.1: Land parcels scoped in for Badger surveys.

E.4.5 Bat Survey Methodology

Partners in UK offshore wind

MONA OFFSHORE WIND PROJECT

Bat Survey Methodology

EOR0801
Mona Offshore Wind Project
April 2023

Document status

Version	Purpose of document	Authored by	Reviewed by	Approved by	Review date
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Contents

Figures

1 INTRODUCTION

1.1.1.1 To inform the Environmental Impact Assessment (EIA), ecology mitigation strategy, and consenting process for the Proposed Developments, a series of phase 2 terrestrial ecology surveys will be undertaken, including bat surveys, which are considered in this document.

1.1.1.2 The main objectives of the bat surveys are to:

- Assess trees and structures for bat roost suitability;
- Confirm presence / likely absence;
- Determine species and roost type present; and
- Determine activity levels at strategic locations across the survey area.

1.1.1.3 This document sets out the methods of invertebrate surveys that are proposed for the Mona Offshore Wind Project and the options for survey coverage that the Mona Offshore Wind Project would like to scope with the Expert Working Group (EWG).

2 SURVEY METHODOLOGY

2.1.1.1 The following bat survey methods are proposed. Survey methodologies are principally based on the Bat Survey Guidelines (Collins, 2016). Specific methodology relating to climbing, and any health and safety requirements associated with surveys, will be detailed in the Risk Assessment Method Statement (RAMS).

2.2 Qualifications and experience

2.2.1.1 All bat survey work undertaken will be conducted by suitably qualified persons. All work that is considered likely to result in disturbance of bats or their roosts will be conducted by holders of Natural Resource Wales licences (or Accredited Agents under these licences) to 'take and disturb' bats for the purpose of science and conservation.

2.3 Ground level tree assessments

2.3.1 Trees subject to survey

2.3.1.1 Generally, in the first instance all trees of diameter at breast height of 0.25 m or above will be subject to survey from ground level by a suitably experienced ecologist (i.e. one with knowledge of tree roosting in bats). Land parcels scoped in for ground level tree assessments are shown in Figure 4.2 of this document below.

2.3.2 Methodology

2.3.2.1 The tree will be fully inspected using binoculars, high powered torch, and endoscope (if licenced to do so) to survey the tree. The inspection will be undertaken systematically and consistently around all parts of the tree (from all angles and close to the trunk and further away). Any potential roosting features (PRFs) identified will be graded based on their suitability for roosting bats (see Table 2.1 below).

2.3.2.2 Survey data will be collected using the application Arc GIS Field Maps. All trees will be numbered, with the location mapped and cross referenced to photographs taken. The following information will be recorded digitally using an internal GIS application (known as Field Maps):

- surveyor name;
- survey date;
- land parcel;
- tree information:
  - species;
  - height;
  - condition;
  - location (obtained by plotting a point in the application); and

  - photo.

- roost potential – overall potential of the tree, taking into consideration the number and type of feature, as well as surrounding habitat and location; and
- hibernation potential.

2.3.2.3 Preliminary surveys of trees will, ideally, be undertaken before trees come into full leaf. Where this is not possible and leaf cover is considered to significantly obscure initial inspection then trees will be given a precautionary 'high' grading, triggering the requirement for future climb-and-inspect survey.

2.3.2.4 In addition, surveyors will, where possible, also give an indication of the type of roost the feature is considered most likely to support based on current evidence (e.g. summer maternity roost, transitory roost, feeding perch, swarming site, or hibernation roost) and/or the number of bats it is considered to have the potential to support on a three-point scale of small, medium, or large. It is acknowledged that for many features classification under these criteria may not be possible based on initial inspection alone.

Table 2.1: suitability of buildings and trees for roosting bats.

Suitability	Description of roosting habitat
Negligible	Negligible habitat features on site likely to be used by roosting bats
Low	A structure with one or more potential roost sites that could be used by individual bats opportunistically. However, these potential roost sites do not provide enough space, shelter, protection, appropriate conditions (e.g. temperature, humidity, height above ground level, light levels or levels of disturbance) and/or suitable surrounding habitat to be used on a regular basis or by larger numbers of bats (i.e. unlikely to be suitable for maternity or hibernation). A tree or sufficient size and age to contain Potential Roost Features (PRFs) but with none seen from the ground or features seen with only very limited roosting potential.
Moderate	A structure or tree with one or more potential roost sites that could be used by bats due to their size, shelter, protection, conditions, and surrounding habitat but unlikely to support a roost of high conservation status (with respect to roost type only – the assessments in this table are made irrespective of species conservation status, which is established after presence is confirmed).
High	A structure or tree with one or more potential roost sites that are obviously suitable for use by larger numbers of bats on a more regular basis and potentially for longer periods of time due to their size, shelter, protection, conditions and surrounding habitat.

2.4 Aerial tree inspection

2.4.1 Trees subject to survey

2.4.1.1 Any trees where the presence of a roost has been confirmed during the initial assessment will not be subject to aerial tree inspections and will instead progress directly to emergence survey.

2.4.1.2 Any trees with moderate or high suitability for bats, that are considered safe to climb, will be subject to an aerial tree inspection. When trees are not considered safe to climb, those with moderate or high suitability will instead progress directly to emergence survey.

2.4.1.3 If features can be fully inspected from the ground using a torch and/or endoscope, confirming no bats present, then the tree will not be subject to an aerial tree inspection.

2.4.1.4 Any trees with low suitability will not be subject to further survey and will instead be covered by precautionary working methods as required. Any trees with negligible suitability will not be subject to further survey.

2.4.2 Methodology

2.4.2.1 All inspections will be conducted either by a trained tree climber who is also a Natural Resources Wales licensed bat worker or Accredited Agent, or by a tree climber under the direct supervision of a licensed bat worker. To minimise the risk of disturbance during inspections, all tree climbers who are not licensed bat workers will be briefed by a licenced bat worker.

2.4.2.2 Aerial tree inspections can be undertaken at any time of year to provide information on the exact nature of PRFs identified during the ground level tree assessment. To determine presence/likely absence, surveys will ideally be undertaken between May and September when bats are more likely to be present.

2.4.2.3 Aerial tree inspections involve accessing any PRFs using a harness and ropes to carry out a detailed internal inspection using torches, mirrors, and endoscopes to determine presence/likely absence of bats, and to obtain information on the suitability of the PRF for bats.

2.4.2.4 The results of the aerial tree inspection will be recorded using Field Maps and will include the information listed for the ground level roost assessment above (excluding further action) but with the addition of the following information:

- Specific feature information including height from ground, and feature dimensions.
- Recorded species evidence will be included. This will include the criteria:
  - can noises be heard;
  - evidence of non-target species; and
  - evidence of bats.
- Notes will include information on the specifics of the points above, including any other information that may be required.

- The overall suitability of the tree for roosting bats (including hibernation potential) will be updated following the aerial tree inspection.

2.4.2.5 Where droppings are found and cannot be identified definitively, a small sample (considered to represent droppings from a single species) will be collected and sealed in a plastic bag marked with the following details:

- date sample collected (day/month/year);
- parcel code;
- building number;
- GPS coordinates; and
- surveyor name.

2.4.2.6 The sample will subsequently be stored in a cool, dry place. DNA analysis will be conducted where appropriate on these samples to help confirm species present. A note will be added to Field Maps results to make it clear that a sample has been obtained.

2.5 Preliminary roost assessment – structures

2.5.1.1 Buildings/structures (including natural structures such as caves or adits) identified as requiring survey during scoping survey will be assessed for their potential to support bat roosts.

2.5.1.2 Internal and external inspection of the structure for potential bat access/egress points and signs of bat activity will be undertaken and recorded on Arc GIS Field Maps with the following information:

- external structure survey:
  - structure ID (starting at 001);
  - structure type;
  - description;
  - whether a loft void is present;
  - feature assessment:
    - feature ID (a, b, c etc);
    - feature type;
    - further action:
      - emergence surveys for structures of moderate of high suitability for bats; and
      - inspection of features prior to soft demolition for structures of low suitability for bats.
  - roost potential;
  - hibernation potential;
  - photographs – these will include labelled/annotated photos showing all elevations of the structure, all features present, any evidence of bats, and a photograph of the site plan showing the structure layout

to show the aspect and height of any features/signs of bats, and potential access/egress points.

- Internal Structure Survey:
  - temperature/humidity/lux if equipment for these measurements is available;
  - structure description;
  - height of void;
  - width of void;
  - photograph;
  - truss type;
  - beam material;
  - lining;
  - whether light is visible;
  - any evidence of bats;
  - roost potential; and
  - hibernation potential.

2.5.1.3 Where droppings are found and cannot be identified definitively a small sample (considered to represent droppings from a single species) will be collected and sealed in a plastic bag marked with the following details:

- date sample collected (day/month/year);
- parcel code;
- building ID;
- GPS coordinates; and
- surveyor name.

2.5.1.4 The sample will subsequently be stored in a cool, dry place. DNA analysis will be conducted where appropriate on these samples to help confirm species present. A note will be added to the Arc GIS Field Maps results to make it clear that a sample has been obtained.

2.5.1.5 Wherever possible and safe to do so, surveys will access all areas including cellars/underground structures and loft spaces. High-powered torches with red filters, binoculars and endoscopes will be used to investigate all accessible areas. Where there are any constraints to the survey these will be clearly identified in the survey notes and consideration given to the effect these constraints may have had on the results obtained.

2.5.1.6 Each building/structure will be classified according to its suitability for roosting bats during the active season as confirmed, high, moderate, low or negligible based on Table 2.1.

2.5.1.7 In addition, surveyors will, where possible, also give an indication of the type of roost the structure is considered most likely to support based on current evidence (e.g. summer maternity roost, transitory roost, feeding perch, swarming site, or hibernation roost). This will be recorded in the notes section

on Arc GIS Field Maps. It is acknowledged that for many features classification under these criteria may not be possible based on initial inspection alone.

2.5.1.8 Each building/structure subject to initial assessment will also be assessed for its potential to support hibernating bats or act as a swarming site. Assessment will in this case simply classify sites as having of lacking potential for hibernation/swarming.

2.5.1.9 Land parcels with structures suitable for supporting bats and scoped in for survey are shown in Figure 4.1 of this document below.

2.6 Dusk emergence/dawn re-entry surveys

2.6.1 Requirement for dusk emergence and/or dawn re-entry surveys

2.6.1.1 No further survey is required of structures/trees assessed to have low or negligible suitability, but sufficient information will need to be collected to give confidence to this assessment.

2.6.1.2 Where structures/trees are confirmed roosts or are considered to have moderate or high suitability for bat roosts; or where a full inspection cannot be undertaken due to access restrictions (e.g. unsafe structure/unsafe to climb the tree), then subsequent dusk emergence and dawn re-entry surveys will be required. For structures/trees with moderate suitability this would comprise two dusk emergence / dawn re-entry surveys, with three dusk emergence / dawn re-entry surveys for structures/trees with high suitability/confirmed roosts. Should bats be recorded roosting within a structure/tree with moderate suitability then the number of surveys will be increased to three to accurately characterise the roost.

2.6.2 Methodology

2.6.2.1 Surveys can be undertaken between May and August, with at least three weeks between surveys. Dusk emergence surveys will commence 15 minutes prior to sunset and continue for two hours. Dawn re-entry surveys will commence two hours prior to sunrise and continue until 15 minutes after sunrise. Surveys will be undertaken in appropriate weather conditions as defined in Collins (2016).

2.6.2.2 All surveyors will be equipped with night vision aids (infrared or thermal imaging cameras) during dusk emergence surveys, as per recommendations set out in the Bat Conservation Trust's (BCT's) Interim Guidance Note (BCT, 2022). Cameras can be used to replace one or more surveyors when required, providing the appropriate equipment is deployed, ensuring full coverage of the feature surveyed.

2.6.2.3 Surveyors will use full spectrum echolocation detectors. Following survey work, all recordings are to be analysed by an experienced ecologist using call analysis software to confirm species (where possible) and number of passes made. All recordings are to be retained for future reference.

2.6.2.4 Surveyors are to be positioned in sufficient numbers that all PRFs can be seen by at least one surveyor. All surveyors will be briefed prior to the start of survey as to the findings of the preliminary assessment and shown the presence of

any potential access/egress points. Surveyors will remain at their survey station throughout the emergence survey period.

2.6.2.5 The following information will be recorded using the application Arc GIS Field Maps or separate survey form:

- sunrise/sunset time;
- weather conditions at start and end of survey;
- structure/tree reference;
- station ID (i,ii, iii etc) – to identify where surveyors are located around the structure/tree;
- surveyor name;
- station location;
- detector type;
- bat observations (emergence/re-entry only); and
- notes – to include information on the location of any cameras used that were independent of surveyors, including aspect of the structure/tree covered, along with any information on consistent foraging/commuting behaviour observed e.g. lesser horseshoe were recorded using the adjacent hedgerow to commute.

2.7 Bat activity surveys

2.7.1.1 There is deliberation about the value of the effectiveness of walked activity transects in determining bat activity levels and determining potential impacts of proposed schemes as studies have found that transects underrepresented bat species richness compared to stationary surveys across all major vegetation communities. For schemes where long-term permanent impacts are likely, activity transects may be recommended. However, as most impacts for the proposed works for the terrestrial area of the Mona Offshore Wind Project are short-term and temporary (excluding the construction of the substations), and operational impacts have been scoped out, it is considered that the survey effort in undertaking activity transects is not proportional to the impact of the works. As such, activity transects are not proposed to be undertaken for the terrestrial surveys for the Mona Offshore Wind Project.

2.7.1.2 However, automatic static bat detector surveys will be undertaken at 10 key strategic locations that have been identified as likely to be important habitats for bats and the impacts are considered to be highest (i.e., around the proposed substations). The locations of the parcels scoped in for static bat detector surveys are shown in Figure 4.3 of this document below.

2.7.1.3 Full spectrum detectors will be placed at secure points at each location (likely within hedgerows), with the microphone facing outwards to maximise the likelihood of recording bats passing. Full spectrum detectors will be set to record a maximum length of five seconds per file.

2.7.2 Bat sound analysis

2.7.2.1 Full spectrum, automated static bat detectors will be deployed for a minimum of five consecutive nights in appropriate weather conditions, twice monthly from April to October.

2.7.2.2 Auto-identification analysis will be undertaken by running the sound data through the British Trust for Ornithology's Acoustic Pipeline (BTO AP) which provides the infrastructure to allow audio recordings (wav files) to be uploaded to a secure remote server, to be processed to find and identify bat calls, and to return results back. This program automatically analyses any calls within the sound files and provides a level of confidence for the calls recorded. The recommendation is that identifications with a probability of less than 0.5 (50%) will be discarded (after checking, if appropriate; see below).

2.7.2.3 A verification and quality assurance of the auto-identification will then be undertaken. The BTO AP results will be split into three groups to facilitate this:

- recordings where probability is more than or equal to 0.5;
- recordings where probability is less than 0.5; and
- a random sample of recordings where no bat species were identified.

2.7.2.4 All recordings with a probability of more than or equal to 0.5 will be manually checked to ensure correct species identification.

2.7.2.5 A random sample of 10% of recordings with a probability of less than 0.5, or where no bat species have been identified will be checked to ensure the BTO AP is missing very little that could be assigned to species.

2.7.2.6 Species will automatically be assigned by BTO AP. However, any *Myotis* species will be grouped into genus and will require post-analysis due to the uncertainty associated with identifying this group to species level.

2.7.2.7 Where any uncertainty is present in analysis, species may be grouped into genus (e.g. Pipistrelle sp.) if the call parameters overlap between species.

2.8 Incidental records

2.8.1.1 Any sightings of non-target species (or evidence of) recorded during surveys will be reported in the separate incidental records form on the Arc GIS Field Maps application.

3 SURVEY SCOPING

3.1.1.1 The Mona Offshore Wind Project would like to agree this methodology and coverage with the EWG to ensure that the data collated is sufficient to inform the ecology impact assessment and an appropriate mitigation strategy. The Mona Offshore Wind Project seek to agree the following.

3.2 Survey Area

3.2.1.1 The surveys of trees/structures would include all buildings and trees within the Mona Proposed Onshore Development Area, excluding areas of ancient woodland as it is understood that direct impacts to these areas will be avoided.

3.2.1.2 Activity surveys will include strategic locations where suitable habitats are present and impacts are considered to be highest (e.g. around the Onshore Substations).

3.3 Survey methods

3.3.1.1 A ground level roost assessment will be undertaken for all accessible trees within the survey area, excluding those within ancient woodland blocks.

3.3.1.2 An aerial tree inspection will be undertaken on all accessible trees that are considered safe to climb and were identified as having moderate or high suitability for roosting bats during the ground level roost assessment or confirmed as a known roost.

3.3.1.3 Dusk emergence and/or dawn re-entry surveys will be undertaken on all accessible trees that were considered unsafe to climb and were identified as having moderate or high suitability for roosting bats during the ground level roost assessment or confirmed as a known roost.

3.3.1.4 Preliminary roost assessments will be undertaken for all accessible buildings within the survey area.

3.3.1.5 Dusk emergence and/or dawn re-entry surveys will be undertaken on all accessible buildings within the survey area that either could not be subject to a full inspection during the preliminary roost assessment or were considered to have moderate or high suitability for roosting bats during the preliminary roost assessment.

3.3.1.6 There is deliberation about the value of the effectiveness of walked activity transects in determining bat activity levels and determining potential impacts of proposed schemes as studies have found that transects underrepresented bat species richness compared to stationary surveys across all major vegetation communities.

3.3.1.7 For schemes where long-term permanent impacts are likely activity transects may be recommended. However, as most impacts for the proposed works are short-term and temporary (excluding the construction of the Onshore Substations), and operational impacts have been scoped out, it is considered that the survey effort in undertaking activity transects is not proportional to the impact of the terrestrial works for the Mona Offshore Wind Project.

3.3.1.8 As such, activity transects are not proposed to be undertaken for the Mona Offshore Wind Project. However, automatic static bat detector surveys will be undertaken at ten key strategic locations that have been identified as likely to be important habitats for bats and the impacts are considered to be highest (e.g. around the Onshore Substations).

3.3.1.9 However, following consultation with the Evidence Working Group (EWG) on 24th April 2023, it was concluded that more data was required to establish if there were any important flightlines and/or dispersal and/or foraging areas within the red line boundary that are associated with the known lesser horseshoe bat *Rhinolophus hipposideros* recording roosting at Kimnell Hall, approximately 1km north of the redline boundary to the west of the proposed access track at Bodelwyddan, As such we proposed to undertake summer activity fixed point count surveys using multiple surveyors on different features, on the same night, to identify key flightlines within the red line boundary which could be impacted as a consequence of the cable route construction. A detailed scope with be appended to this documented and re-submitted to the EWG within two weeks once a site scoping visit has been undertaken to ascertain the connectivity, features, and habitats of value to lesser horseshoe bats south of the Kimnell Hall roost.

4 REFERENCES

Bat Conservation Trust (2022) Interim Guidance Note: use of night vision aids for bat emergence surveys and further comment on dawn surveys. Bat Conservation Trust, London.

Collins, J. (ed) (2016) Bat Surveys for Professional Ecologists: Good Practice Guidelines (3rd edition). Bat Conservation Trust, London.

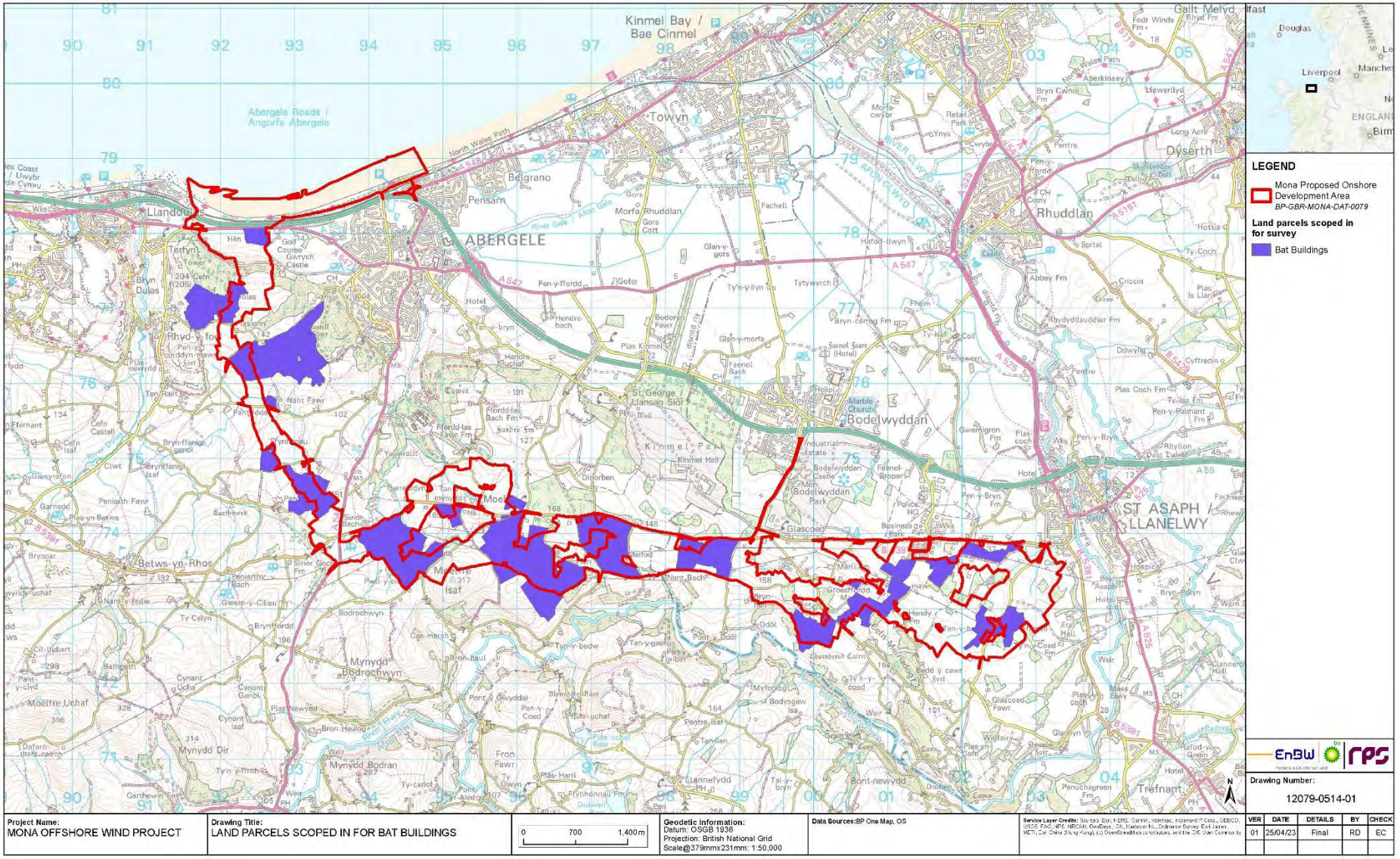

Figure 4.1: Land parcels scoped in for bat building surveys.

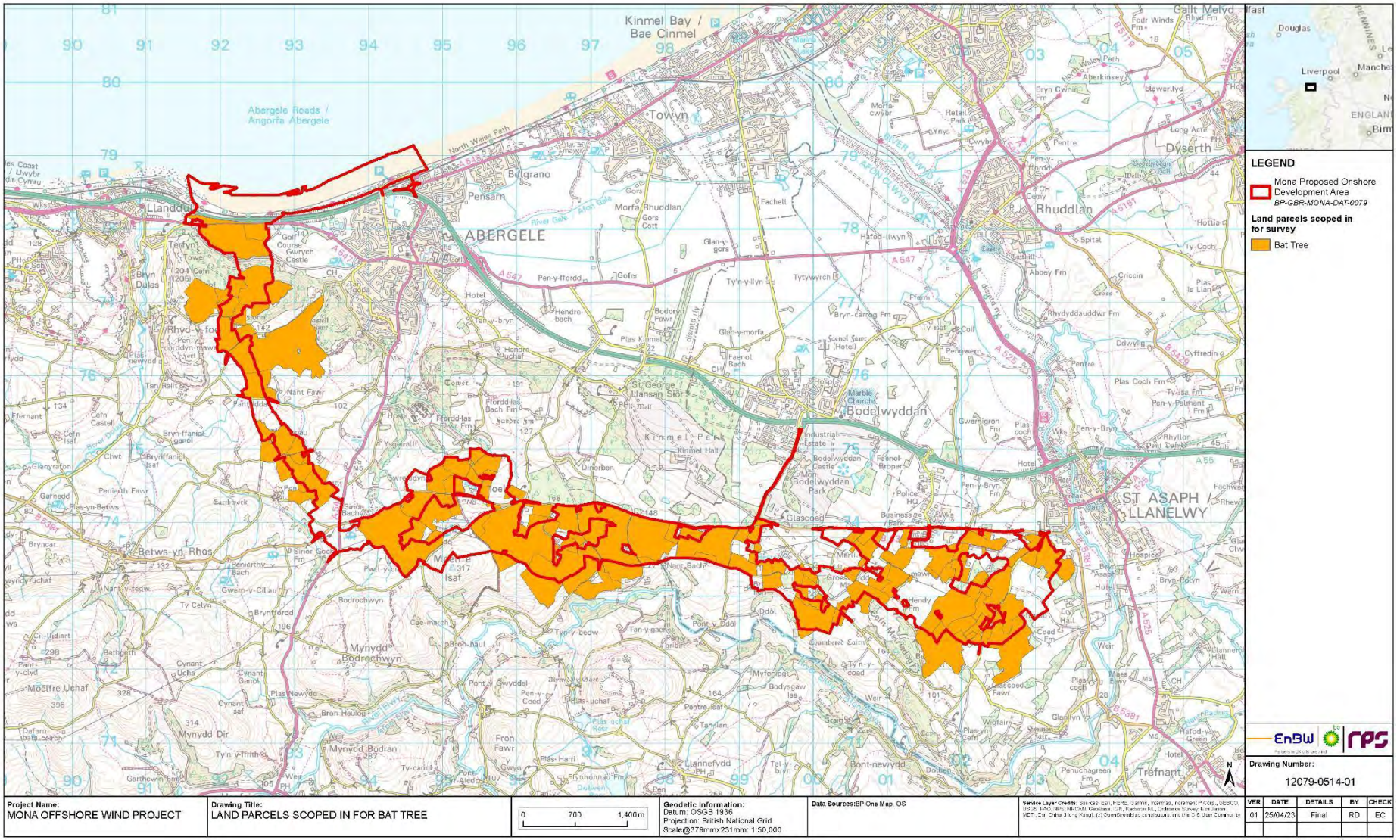

Figure 4.2: Land parcels scoped in for bat tree surveys.

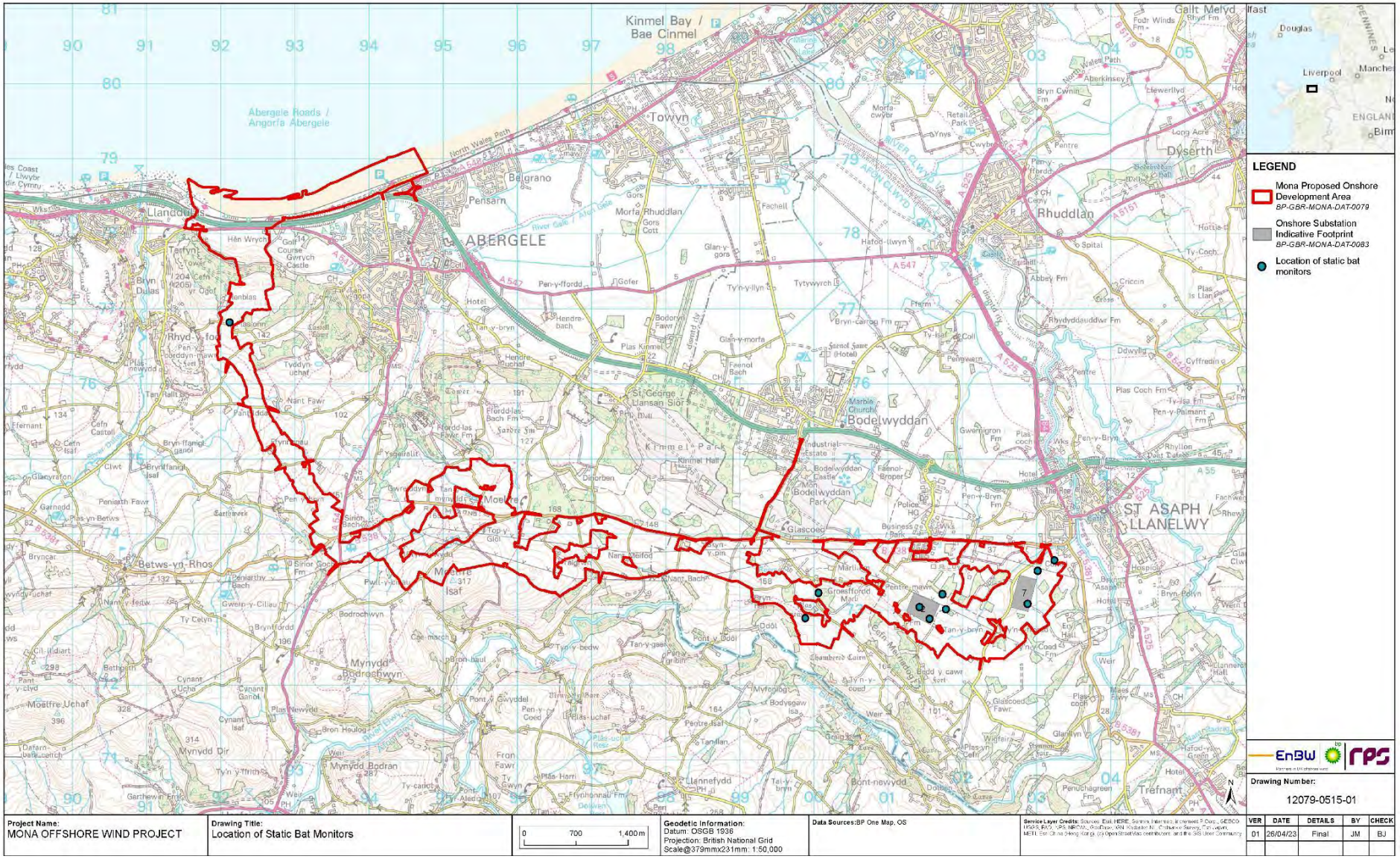

Figure 4.3: Automated static bat detector locations.

E.4.6 Great Crested Newt Survey Methodology

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Great Crested Newt Survey Methodology

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1 INTRODUCTION

1.1.1.1 To inform the Environmental Impact Assessment (EIA), ecology mitigation strategy, and consenting process for the Mona Offshore Wind Project, a series of phase 2 terrestrial ecology surveys will be undertaken, including great crested newt surveys, which are considered in this document.

1.1.1.2 The main objectives of the great crested newt surveys are to:

- Assess habitat suitability and condition;
- Confirm presence / absence; and
- Estimate population class sizes.

1.1.1.3 This document sets out the methods of great crested newts surveys that are proposed for the Mona Offshore Wind Project and the options for survey coverage that the Mon Offshore Wind Project would like to scope with the Expert Working Group (EWG).

2 SURVEY METHODOLOGY

2.1.1.1 The following three great crested survey methods are proposed. The methodology is largely based on that provided in Amphibian and Reptile Group (ARG) UK (2010), Biggs et al (2014), and English Nature (2001).

2.2 Habitat Suitability Index Assessment

2.2.1.1 The suitability of a pond to support great crested newts would be assessed following the Habitat Suitability Index (HSI) assessment methodology described in the UK ARG Group's Advice Note 5 (ARG UK, 2010). This method is a modified version of the original HSI methodology described in Oldham et al (2000).

2.2.1.2 The HSI method involves the assessment of ten key habitat parameters, listed in Table 2.1 below, which are typically associated with ponds used by great crested newts. Each parameter is given a score from 0-1 based on the descriptions and HSI scoring system provided in Advice Note 5 (ARGUK 2010).

Table 2.1: HSI Indices.

Suitability Index	Topic	Description
SI1	Location	Sites scored according to UK zone in which they occur.
SI2	Pond area	Surface area of the pond when water is at its highest level (excluding flooding events); usually in the spring. For ponds smaller than 50 m^2 a score of 0.05 is used. For ponds larger than 2000 m^2 this factor is omitted. Index score measured from a correlation graph.
SI3	Permanence	Local knowledge and personal judgement. 4 category scale: never dries, rarely dries, sometimes dries, dries annually.
SI4	Water quality	Based on invertebrate diversity, presence of submerged plants, knowledge of the water sources. Not to be confused with water clarity. 4 point scale: good, moderate, poor, bad.
SI5	Shade	Estimate % pond perimeter shaded, to at least 1 m from shore, excluding emergent vegetation. May – September inclusive. Score taken from correlation graph.
SI6	Waterfowl	3 point scale of impact: absent, minor, major.
SI7	Fish	Local knowledge and site observations.4 point scale: absent, possible, minor, major.
SI8	Pond count	Number of ponds within 1 km. Score taken from correlation graph.
SI9	Terrestrial habitat	Require understanding of newt requirements. Habitat within 250m of a pond, not separated by a significant barrier to newt movement. 4 point scale: good, moderate, poor, none.
SI10	Macrophytes	Estimate of % pond surface area covered by macrophytes (including emergent, floating (not duckweed) and submerged plants reaching the surface). May – September inclusive. Score taken from correlation graph.

2.2.1.3 An overall HSI score is calculated from the scores for each habitat parameter listed in Table 2.1, using the following equation:

HSI Score = (SI1 x SI2 x SI3 x SI4 x SI5 x SI6 x SI7 x SI8 x SI9 x SI10)1/10

2.2.1.4 The overall HSI score is then translated into a classification of habitat suitability, as listed in Table 2 below.

Table 2.2: HSI Classification.

HSI Score	Suitability for Great Crested Newt
>0.8	Excellent
0.7 – 0.79	Good
0.6 – 0.69	Average
0.5 – 0.59	Below average
<0.5	Poor

2.2.1.5 Data for HSI surveys will be recorded digitally using an internal GIS system known as Field Maps.

2.3 eDNA Analysis

2.3.1.1 An eDNA analysis of water samples collected from the ponds would be undertaken following the method set out in the document Analytical and Methodological Development for Improved Surveillance of the Great Crested Newt (Biggs et al., 2014). This method has been developed for standing waterbodies only, due to the potential for eDNA to be washed downstream from a sample location before samples can be collected in flowing waterbodies / watercourses.

2.3.1.2 Water samples are collected using sampling kits provided by a laboratory approved in the use of this survey method.

2.3.1.3 Surveyors collect 30 millilitres (ml) of water samples from twenty locations along the margins of a waterbody, using a sterile ladle. The samples are collected from the bank edge without entering or touching the water to prevent contamination of samples. Where access allows, water samples are collected from points evenly spaced along the banks. When collecting the water samples, the surveyors use a ladle to gently agitate the water and mix the water column before collecting each sample, whilst taking care not to disturb any sediment.

2.3.1.4 The twenty samples collected from each waterbody are emptied into a sterile plastic bag and homogenised by gently shaking the bag to ensure eDNA is evenly mixed through the sample. A pipette is then used to transfer six 15 millilitre (ml) sub-samples of the water from the bag into sterile tubes containing 35 ml of ethanol to preserve the eDNA samples.

2.3.1.5 The samples are then stored in a refrigerator before being couriered to the lab for analysis to confirm presence or absence of great crested newt eDNA.

2.4 Standard Presence / Absence – Population Class Size Survey

2.4.1.1 The standard presence / absence or population class size survey would be undertaken in accordance with the methodology detailed in the Great Crested Newt Mitigation Guidelines (English Nature, 2001), and as described below.

2.4.1.2 Surveyor teams would include ecologists who hold or are accredited on Natural England great crested newt survey licences.

2.4.1.3 Four survey visits would be required to determine presence/likely absence within the waterbody. Should great crested newts be recorded present either through eDNA, or from standard presence/absence surveys then a total of six

survey visits would be required to undertake the population class assessment. The surveys would be carried out between mid-March and mid-June, at least half of the surveys undertaken between mid-April and mid-May. Survey visits would be completed when night-time air temperatures are 5°C or above, to ensure that newts are active.

2.4.1.4 The waterbody would be surveyed using three of the following survey methods (i.e. bottle trapping, torch light survey, net, and egg search).

2.4.2 Bottle Trapping

2.4.2.1 Bottle traps consist of 2 litre plastic bottles with the tops cut off and inverted inside the bottle, and air holes cut into the bottom. The traps are partially submerged upside down in the water, leaving the base of the bottle above the water-level with a pocket of air at the exposed end, to help prevent the drowning of any trapped animals. The traps are supported in place by attaching them to bamboo canes pushed into the substrate of the waterbody, or by floating polystyrene rafts that are attached to the banks by a secure cord.

2.4.2.2 Traps are set around the margins of the water body and where access enables, at a density of one every two metres.

2.4.2.3 The traps are set around 1-2 hours before sunset and left overnight. Surveyors empty the traps the following morning and the number, sex, and age / life stage of any captured newts are recorded.

2.4.3 Torch light survey

2.4.3.1 Torchlight surveys are undertaken between 30 minutes after sunset and midnight, avoiding periods of moderate to heavy rain or wind that would disturb the surface of the water and prevent an effective survey of below-surface activity.

2.4.3.2 All accessible parts of a water body are systematically surveyed for great crested newts by shining a 1,000,000 candlepower torch across the surface of the water. Surveyors record the number and, where possible, the sex, of any great crested newts or other amphibians observed. Factors that could impact the effectiveness of the survey are also recorded, such as water clarity, accessibility, and dense vegetation.

2.4.4 Egg Search

2.4.4.1 The eggs of great crested newts can readily be distinguished from those of other species by their size and colour. The eggs are typically laid on pliable leaves of aquatic vegetation; however, where vegetation is limited or absent, artificial egg strips can be provided (e.g. strips of plastic sheets secured to bamboo poles, inserted around the margins of a water body).

2.4.4.2 All suitable vegetation and/or artificial egg strips are inspected and any folded sections that could contain an egg are carefully opened to determine whether any eggs are those of great crested newts.

2.4.5 Net Survey

2.4.5.1 All accessible parts of a waterbody are systematically surveyed for great crested newts using a long-handled net with a fine mesh small enough to catch adult newts and larvae with minimal risk of injury. After each sweep of the net, the contents are carefully inspected to identify any great crested newts that might be present.

2.5 Incidental records

2.5.1.1 Any sightings of non-target species (or evidence of) recorded during surveys will be reported in the separate incidental records form on the Arc GIS Field Maps application.

3 SURVEY SCOPING

3.1.1.1 The Mona Offshore Wind Project would like to scope the survey methodology and coverage with Natural Resources Wales, to help ensure that the data collated is sufficient to inform the ecology impact assessment and an appropriate mitigation strategy.

3.1.1.2 For example, the project would like to discuss the following proposals with Natural Resources Wales:

3.2 Survey Area

3.2.1.1 The survey would include all ponds within the Mona Proposed Onshore Development Area, plus a surrounding 250 m wide buffer zone (considered to be the main area of activity around a breeding pond), as shown on Figure 3.1 (i.e. exclude ponds further than 250 m).

3.2.1.2 The survey area would exclude ponds that are currently part of an on-going monitoring programme (e.g. including ponds associated with the St Asaph Business Park and the Gwent Y Mor and Burbo Bank sub-station monitoring).

3.3 Survey methods

3.3.1.1 An HSI assessment would be undertaken for all accessible ponds within the survey area. Subsequent eDNA analysis would be undertaken on all ponds within the survey area, if accessible and suitable for the method. It is acknowledged that absolute reliance on eDNA for presence / absence can not always be reliable, particularly in areas of high rainfall where the presence of GCN can be difficult to detect. As such, it will be reviewed for a site where there are ponds adjacent within 250 metres of a positive result. They would be assessed for GCN doing a eDNA survey along with a HIS and if considered necessary a further presence / absence survey would be undertaken.

3.3.1.2 A standard presence/absence - population class size survey would be undertaken for all ponds that could not have an eDNA analysis completed (e.g. due to limited access).

3.3.1.3 A population class size survey would be undertaken for all ponds from which positive eDNA results were obtained, or that are located within 250 m of a pond from which positive eDNA results were obtained (i.e. if eDNA results are negative and the pond is located more than 250 m from a pond where eDNA was recorded, no further survey would be undertaken).

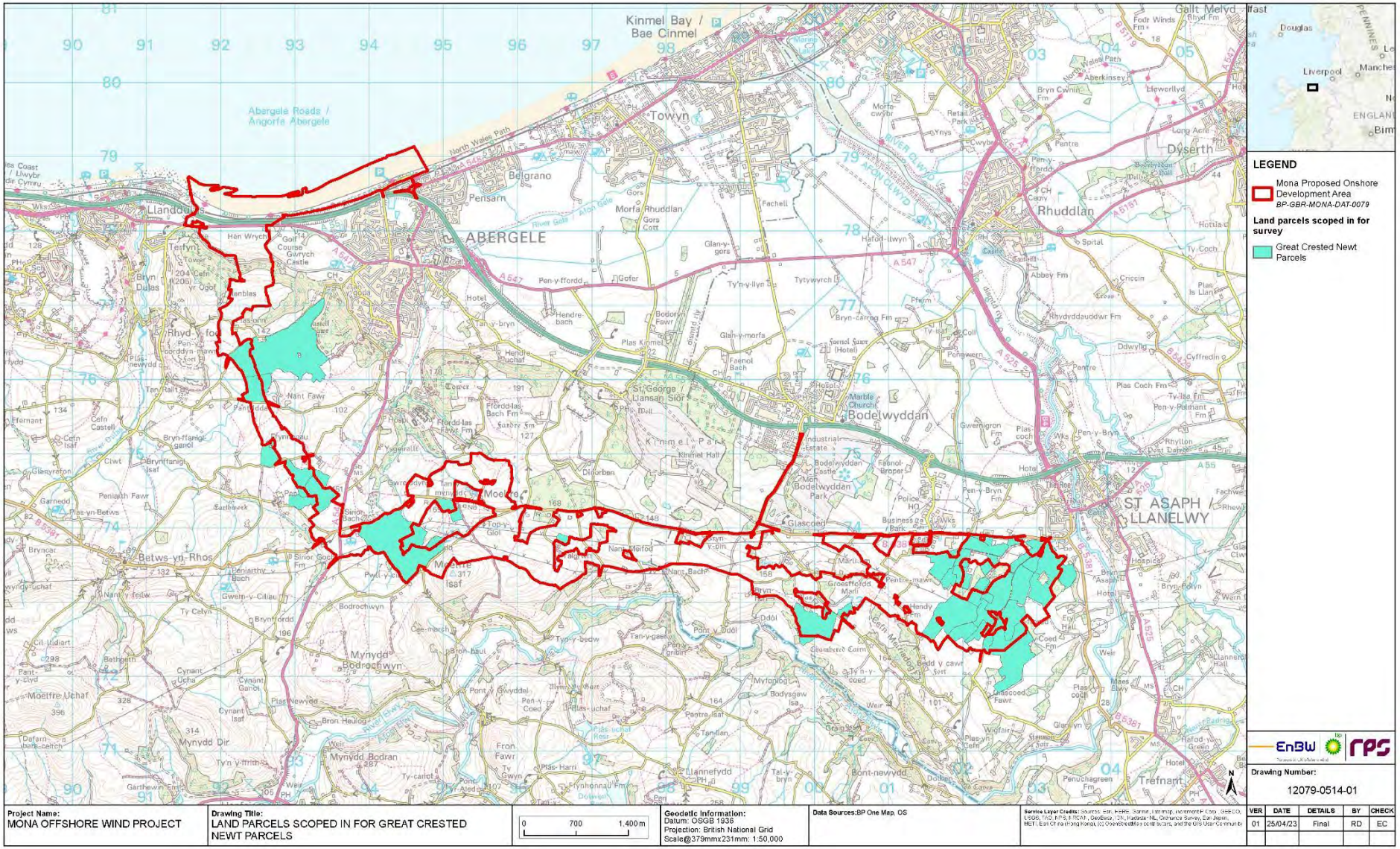

Figure 3.1: Land parcels scoped in for Great Crested Newt surveys.

E.4.7 Hazel Dormouse Survey Methodology

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MONA OFFSHORE WIND PROJECT

Hazel Dormouse Survey Methodology

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1 INTRODUCTION

1.1.1.1 To inform the Environmental Impact Assessment (EIA), ecology mitigation strategy, and consenting process for the Mona Offshore Wind Project, a series of phase 2 terrestrial ecology surveys will be undertaken, including hazel dormouse surveys, which are considered in this document.

1.1.1.2 The main objectives of the hazel dormouse surveys are to:

- Confirm presence/likely absence of hazel dormouse in the survey area; and
- Estimate population class sizes.

1.1.1.3 This document sets out the methods of hazel dormouse surveys that are proposed for the Mona Offshore Wind Project and the options for survey coverage that the Mona Offshore Wind Project would like to scope with the Expert Working Group (EWG).

2 SURVEY METHODOLOGY

2.1.1.1 The following hazel dormouse methods are proposed. Survey for hazel dormouse will be undertaken in woody habitats (e.g. woodland and hedgerows), within land parcels scoped in for dormice in the survey area. The parcels where these survey methods would be carried out is discussed in section 3.

2.1.1.2 The proposed approach will broadly follow the nest tube survey methodology developed during the South West Dormouse Project (Chanin and Woods, 2003).

2.2 Qualifications and experience

2.2.1.1 All dormouse survey work undertaken will be conducted by suitably qualified persons. The installation of nest tubes, and the undertaking of nut searches can be undertaken by unlicensed surveyors but with experience of these survey types. Checking of nest tubes will require at least one surveyor within a survey team to hold a NRW licence to 'take and disturb' hazel dormice. Assistants may only be utilised where they are working in proximity and under instruction of a licence holder at all times. When working distant from each other (including in different areas of the same survey site) all other surveyors within a survey team should be named accredited agents to the licence holder each of whom has been trained and is experienced in identification and handling of dormice.

2.3 Nest tube survey

2.3.1.1 At each site selected for nest tube survey, tubes of standard design (i.e. made from stiff double walled black plastic measuring approximately 5cm width x 5cm height x 25cm length with a small plywood tray blocking one end and projecting 5cm from the other) are to be deployed in potentially suitable habitat (as defined by the outcome of the habitat assessment).

2.3.1.2 Tubes should be deployed in clusters 15-20m apart, sampling both areas of best quality habitat and associated areas that may appear less suitable according to traditional concepts of dormouse habitat quality (e.g. hedgerows linking to areas of deciduous woodland).

2.3.1.3 The survey area will be focused on the areas and surrounding land required for the sub-station construction and associated temporary construction compounds but will also focus on where the cable corridor could bisect important hedgerows or woodland copes to ascertain if dormouse is present and a constraint to the proposed Mona Offshore Wind Project.

2.3.1.4 All tube and box locations would be mapped using the internal GIS application known as Field Maps. Where necessary, markers such as coloured string or high visibility tape should also be deployed to aid the process of locating nest tubes and boxes during subsequent visits.

2.3.1.5 During each check all nest tubes and boxes should be inspected for potential signs of use by dormouse including the following:

- presence of individuals in-situ;

- characteristic nesting material;
- presence of characteristic gnawed hazel nuts; and
- presence of droppings.

2.3.1.6 During each check, the above information will be recorded in the Arc GIS Field Maps application, alongside similar information that indicates use of nest tubes or boxes by other species (e.g. squirrel, field mouse etc.).

2.3.1.7 During each visit a record should be made in the notes section of the Arc GIS Field Maps application, detailing the number and location of any tubes or boxes that have been dislodged or interfered with since the previous survey visit.

2.3.1.8 The first survey visit should not be conducted until at least one calendar month after completion of tube or box installation in that area.

2.3.1.9 All records of dormouse and other species identified utilising nest tubes or boxes should be recorded in the Arc GIS Field Maps application. Where topography and vegetation structure may have reduced the accuracy of the location within the app, this level this information should be noted.

2.3.1.10 Where potential dormouse droppings are found that cannot be definitively identified in the field, a small sample (considered to represent droppings from a single species) should be collected and sealed in a plastic bag marked with the following details:

- date sample collected (day/month/year);
- survey location and tube/box number;
- GPS coordinates of tube/box concerned;
- suspected species; and
- surveyor name.

2.3.1.11 Dropping samples should be stored in a cool, dry place and submitted as soon as possible for DNA analysis to determine if hazel dormouse is present.

2.4 Nut searches

2.4.1.1 Nut searches will only be utilised to confirm presence and will not in the first instance be utilised to assume.

2.4.1.2 Nut searches should be conducted prior to the installation of nest tubes or boxes at any new sites.

2.4.1.3 Where nuts opened by dormice are identified during a nut search a specimen nut should be collected for future reference and sealed in a plastic bag with the following details:

- date sample collected (day/month/year);
- survey location using the Arc GIS Field Maps application;
- suspected species; and
- surveyor name.

2.4.1.4 Where dormouse presence is confirmed during the nut search any on-going or proposed nest tube/box survey at the survey site may be halted.

2.5 Survey programme and effort

2.5.1.1 Chanin and Woods (2003) defined a scoring system for nest tube and box survey based on the probability of finding dormice in a nest tube or box in any one month (see Table 2.1). Under this methodology a minimum cumulative score of 20 points must be reached to robustly determine presence/likely absence.

Table 2.1: Index of probability for finding dormouse during nest tube or box survey in any one month.

Month	Index of Probability
April	1
May	4
June	2
July	2
August	5
September	7
October	2
November	2

2.5.1.2 All nest tube or box surveys will be expected to obtain a cumulative score of 20 or above. Survey effort is determined by summing the index of probability scores from the month nest tubes or boxes are deployed to when they are removed (i.e. not just the months where the tubes are physically checked) as such nest tubes and boxes should ideally be placed out as soon as possible in the season at the required spacing and left for the duration.

2.5.1.3 All nest tubes and boxes should be checked once during August and again during September. Outside of these months checks should be conducted at least once every two months and immediately prior to removal.

2.5.1.4 Where conducted, nut searches should be carried until either (a) a confirmed nut opened by dormouse is located; or (b) until 100 nuts opened by other small mammals (i.e. not dormouse) have been found; or (c) until at least one and half hours has been spent searching.

2.5.1.5 Where access restrictions significantly constrain the period available for survey the number of tubes used should be doubled by reducing the spacing interval and thus doubling the monthly score. This will need to be highlighted as a potential limitation of survey.

2.6 Incidental records

2.6.1.1 Any sightings of non-target species (or evidence of) recorded during surveys should be reported in the separate incidental records form on the Survey 123 application.

3 SURVEY SCOPING

3.1.1.1 The Mona Offshore Wind Project would like to scope the survey methodology and coverage with the EWG, to help ensure that the data collated is sufficient to inform the ecology impact assessment and an appropriate mitigation strategy. For example, the project would like to discuss the following proposals with EWG:

3.2 Survey area

3.2.1.1 The survey would include all parcels within the Mona Proposed Onshore Development Area that have been scoped in for hazel dormouse, as shown on Figure 3.1. Only suitable habitats with connectivity to other suitable areas within each land parcel would be surveyed (e.g. woodland and hedgerows).

3.3 Survey methodology

3.3.1.1 All nest tubes and boxes should be checked once during May (if an appropriate length of time has passed since installing the tubes), once in August and again during September. Outside of these months checks should be conducted at least once every two months and immediately prior to removal.

REFERENCES

Bright, P,, Morris, P,, and Mitchell-Jones, T, (2006). Dormouse Conservation Handbook. Second Edition. English Nature, Peterborough.

Channing, P., and Woods, M. (2003) Surveying dormice using net tubes: results and experiences from the south-west dormice projects. English Nature Research Report No. 524. English Nature, Peterborough.

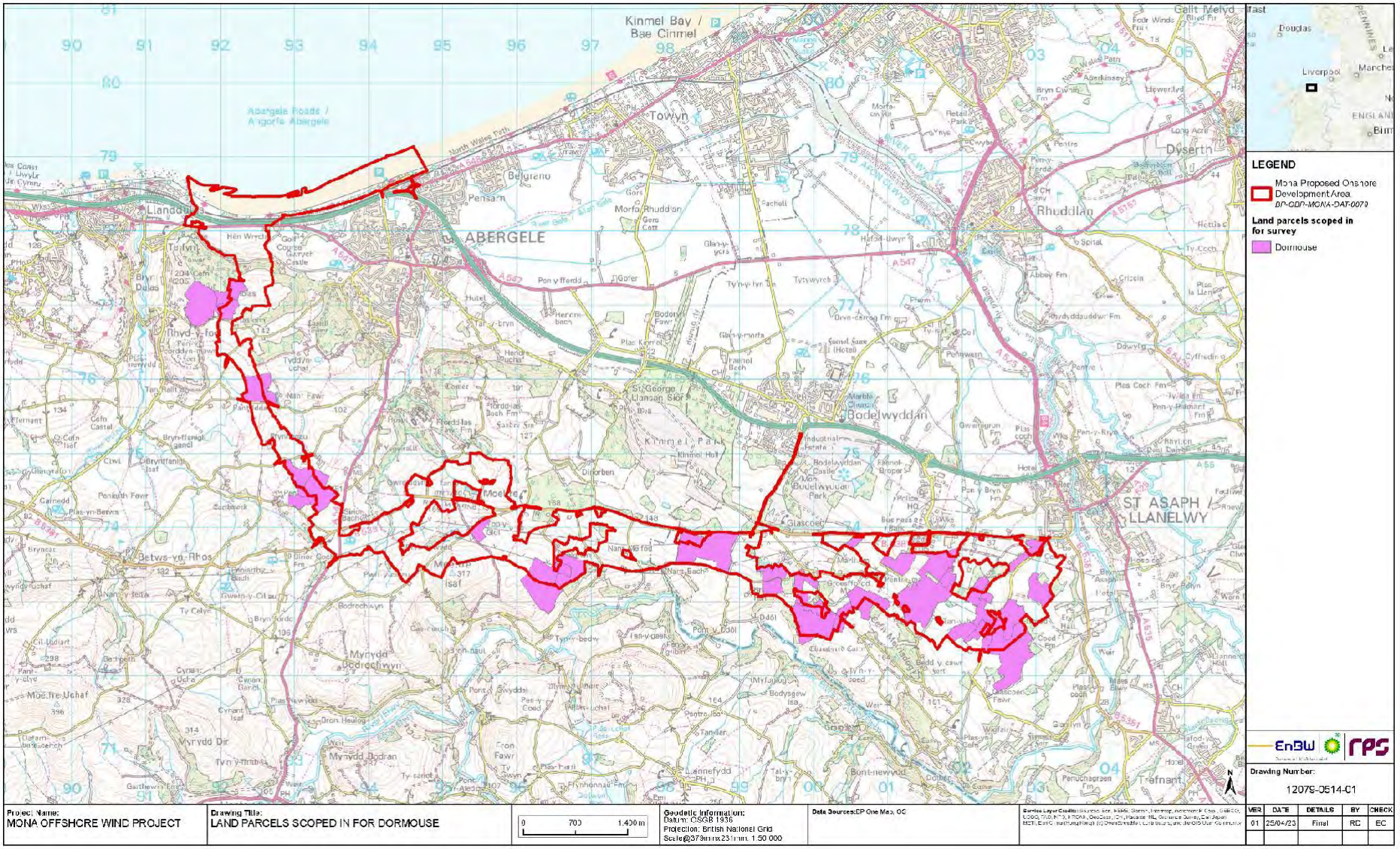

Figure 3.1: Land parcels scoped in for Hazel dormouse survey.

E.4.8 Hedgerow Survey Methodology

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Hedgerow Survey Methodology

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1 INTRODUCTION

1.1.1.1 To inform the Environmental Impact Assessment (EIA), ecology mitigation strategy, and consenting process for the Mona Offshore Wind Project, a series of phase 2 terrestrial ecology surveys will be undertaken, including hedgerow surveys, which are considered in this document.

1.1.1.2 The main objectives of the hedgerow surveys are to:

- Determine whether the hedgerows are of importance as per the Hedgerow Regulations (1997);
- Undertake a condition assessment for any hedgerows present using the most up to date Natural England's Biodiversity Metric (4.0 at the time of writing).

1.1.1.3 This document sets out the methods of hedgerow surveys that are proposed for the Mona Offshore Wind Project and the options for survey coverage that the Mona Offshore Wind Project would like to scope with the Expert Working Group (EWG).

2 SURVEY METHODOLOGY

2.1.1.1 The proposed approach will broadly follow the full definition within the Hedgerows Regulations 1997 and survey methods within the Defra Hedgerow Survey Handbook (Defra, 2007) to determine whether hedgerows are classed as important, and using the methodology detailed in the most up to date Natural England Biodiversity Metric (4.0 at the time of writing) to undertake a condition assessment of hedgerows.

2.2 Qualifications and experience

2.2.1.1 All surveyors involved in hedgerow surveys should be competent botanists experienced in undertaking hedgerow surveys.

2.3 Hedgerow Regulations Survey

2.3.1.1 Depending on length, the survey involves recording the number of woody species along at least one typical 30m section and recording associated data as detailed below.

2.3.1.2 The following is essential information that should be recorded as per Defra Hedgerow Survey Handbook (Defra, 2007):

- Hedgerow type (e.g. shrubby hedgerow with/without trees, line of trees)
- Length
- Connections with other hedgerows
- Extent of survey
- Adjacent land use
- Associated features that may be present including:
  - Bank
  - Average herbaceous vegetation height
  - Fence
  - Ditch
- Undisturbed ground and perennial herbaceous vegetation cover including:
  - Average width of undisturbed ground
  - Average width of perennial herbaceous vegetation
- Nutrient enrichment ground flora indicator species
- Recently introduced, non-native species
- Hedgerow shape
- Dimensions
- Integrity (i.e. ‘gappiness’)
- Isolated hedgerow trees

- Woody species per 30m

2.3.1.3 Details of the following should also be recorded where possible:

- Details of hedgerow management
- Ground flora species per 30m
- Veteran tree features

2.3.1.4 The start and end points of each hedgerow are to be recorded with at least an 8 figure OS grid reference using GPS.

2.3.1.5 The total number of other hedgerow connections to the hedgerow being surveyed should also be recorded, as recommended in the Defra Hedgerow Survey Handbook (Defra, 2007).

2.3.1.6 Hedgerows are to be recorded and mapped. It is helpful to map hedgerows from aerial photography in advance of survey so that survey sections and nodes can be identified.

2.3.1.7 Hedgerows will be considered ecologically 'important' if it is at least 30 years old and meets one of the following criteria:

- Contains protected species listed in part 1 of Schedule 1, Schedule 5 or Schedule 8 of the Wildlife and Countryside Act 1981
- Contains species that are endangered, vulnerable, and rare and identified in the British Red Data books
- Includes woody species, and associated features as specified in Schedule 1, Part II Criteria, paragraph 7(1) of the Hedgerows Regulations 1997. In summary, in North Wales the hedgerow must include one or more of the following
  - At least seven woody species
  - At least six woody species plus at least three associated features (detailed below)
  - At least six woody species including black poplar, large-leaved lime, small-leaved lime or wild service tree
  - At least five woody species and at least four associated features

2.3.1.8 Associated features include:

- A bank or wall for at least half the length
- A ditch for at least half the length
- Gaps over no more than 10% of the length
- At least one standard tree per 50m
- At least three ground flora woodland species as defined in Schedule 2 of the Regulations within 1m of the hedgerow

- Connections scoring four or more points, where connection with a hedgerow counts as one, and a connection with broadleaved woodland or a pond counts as two[1]
- A parallel hedge within 15m[1]

2.3.1.9 Surveys should ideally be undertaken from April to October when ground flora is more likely to be identifiable.

2.4 Condition assessment

2.4.1.1 A condition assessment of any accessible hedgerows within the site will be undertaken using the relevant Natural England condition assessment sheets and methodology for the most up to date Biodiversity Metric (4.0 at the time of writing). It is acknowledged that the Biodiversity Metric is not adopted in Wales. However, it is considered that undertaking a condition assessment of extant hedgerows may be invaluable to providing a baseline which any future net gain can be assessed against.

2.5 Incidental records

2.5.1.1 Any sightings of non-target species (or evidence of) recorded during surveys would be reported in the separate incidental records form using the internal GIS system known as Field Maps.

[1] These features do not count if a public right of way is being included in the criterion

3 SURVEY SCOPING

3.1.1.1 The Mona Offshore Wind Project would like to scope the survey methodology and coverage with the EWG, to help ensure that the data collated is sufficient to inform the ecology impact assessment and an appropriate mitigation strategy. For example, the project would like to discuss the following proposals with the EWG:

3.2 Survey Area

3.2.1.1 Hedgerow Regulations surveys will be undertaken on any hedgerows identified as being species-rich during phase 1 surveys.

3.2.1.2 Condition assessments of hedgerows will be undertaken on all accessible hedgerows identified during phase 1 surveys.

3.2.1.3 The location of land parcels scoped in for hedgerow surveys are presented in Figure 3.1 of this document below. The location of hedgerows which require hedgerow conditions assessment are presented in Figure 3.2 below.

3.3 Survey methodology

3.3.1.1 Species-rich hedgerows will be subject to surveys to determine whether the hedgerow is important as per the requirements detailed in the Hedgerow Regulations 1997.

3.3.1.2 Condition assessments of all accessible hedgerows identified during the phase 1 surveys will be undertaken using the most up to date Biodiversity Metric condition assessment and associated methods (Biodiversity Metric 4.0 at the time of writing).

REFERENCES

Department for Environment, Food and Rural Affairs (2007). Hedgerow Survey Handbook. A Standard Procedure for local surveys in the UK. Defra, London.

The Hedgerows Regulations (1997). Statutory Instrument 1997 No 1160. Her Majesty's Stationery Office.

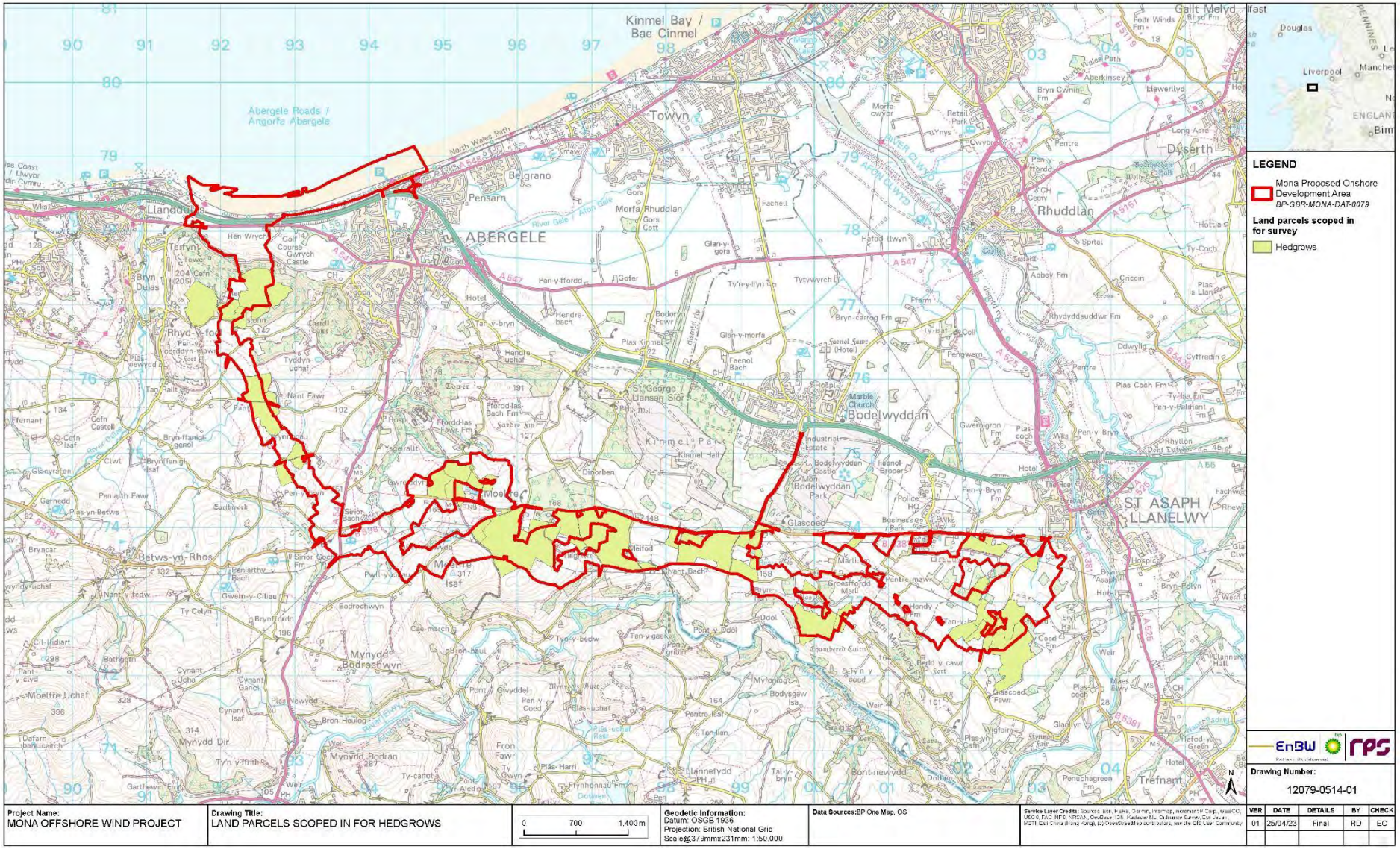

Figure 3.1: Land parcels scoped in for Hedgerow surveys.

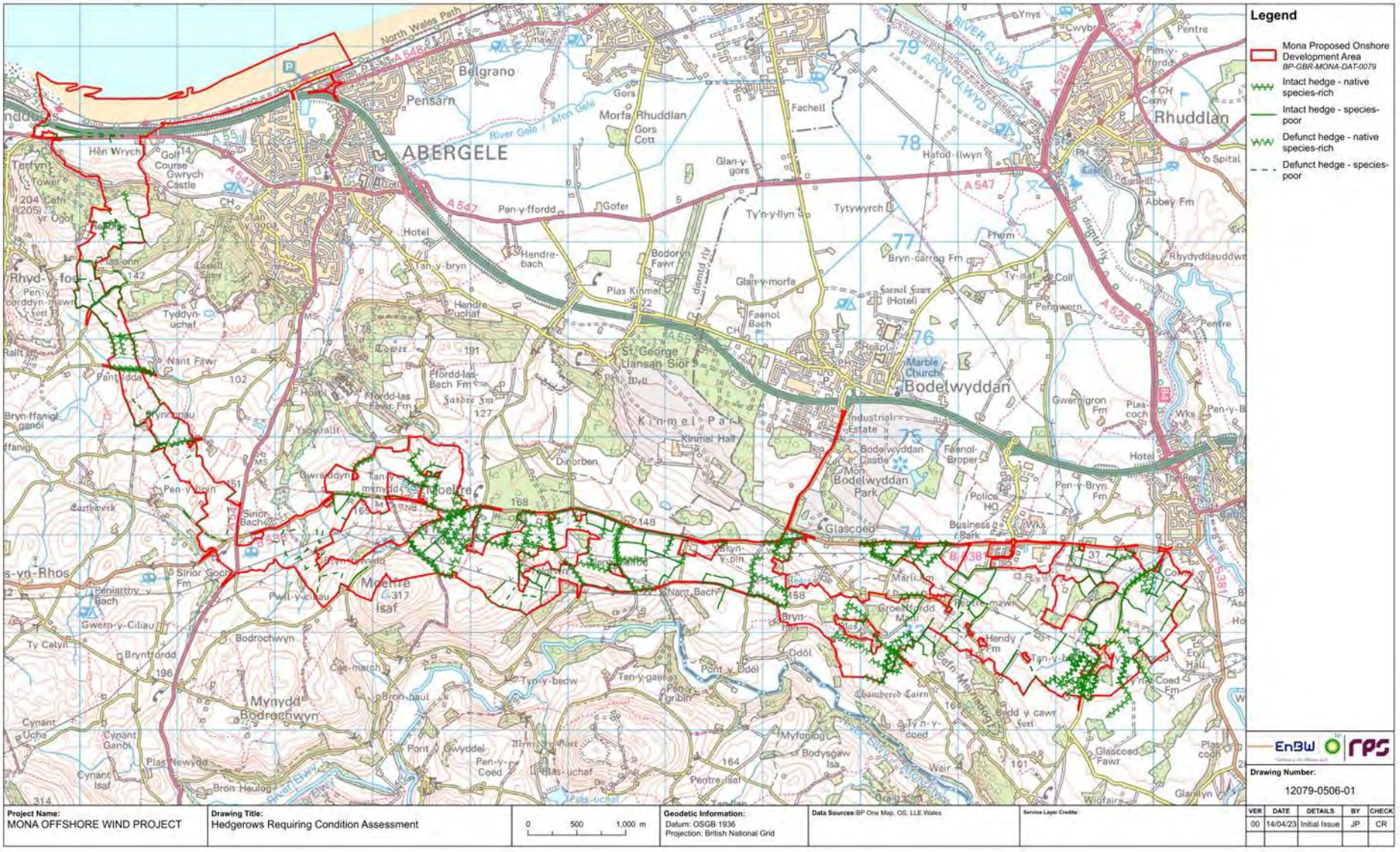

Figure 3.2: Hedgerows identified which require condition assessment.

E.4.9 NVC Survey Methodology

Partners in UK offshore wind

MONA OFFSHORE WIND PROJECT

NVC Survey Methodology

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1 INTRODUCTION

1.1.1.1 To inform the Environmental Impact Assessment (EIA), ecology mitigation strategy, and consenting process for the Mona Offshore Wind Project, a series of phase 2 terrestrial ecology surveys will be undertaken, including National Vegetation Classification (NVC) surveys, which are considered in this document.

1.1.1.2 The main objectives of the NVC surveys are to:

- Produce a comprehensive classification and description of plant communities; and
- Undertake a condition assessment of habitats present.

1.1.1.3 This document sets out the methods of NVC surveys that are proposed for the Mona Offshore Wind Project and the options for survey coverage that the project would like to scope with the Expert Working Group (EWG).

2 SURVEY METHODOLOGY

2.1.1.1 The following survey methods are proposed. The proposed approach will broadly follow the guidelines set out in Rodwell (2006).

2.2 Qualifications and experience

2.2.1.1 All surveyors involved in NVC surveys should be competent botanists experienced in undertaking NVC surveys across the range of habitats likely to be encountered. A minimum of FISC level 4 is required.

2.3 NVC survey

2.3.1.1 At each parcel identified for survey, homogenous stands of vegetation are to be identified and sampled with a minimum of five quadrats, size appropriate to the vegetation being surveyed. Quadrats are to be recorded in typical vegetation and are not required to be random or evenly spread.

2.3.1.2 Within small woodland blocks it is likely that five 50m x 50m samples cannot be taken and the whole stand can be the quadrat for canopy and understorey, but within such areas replicate 4m x 4m or 10m x 10m quadrats can be recorded for the field and ground layers and then combined.

2.3.1.3 Within each quadrat all species are to be recorded with an estimate of percentage cover/abundance using the Domin scale (1 = few individuals; 2 = some individuals; 3 = many individuals; 4 = 4% - 10%; 5 = 11% - 25%; 6 = 26% - 33%; 7 = 34% - 50%; 8 = 51% - 75%; 9 = 76% - 90%; 10 = 91% - 100%). Subsequent areas of the same vegetation within a site do not require five additional quadrats but should be sampled for consistency and at least one quadrat recorded and based on size, possibly more at the discretion of the surveyor.

2.3.1.4 The location of each quadrat should be recorded accurately on a plan and a GPS coordinate taken.

2.3.1.5 Voucher specimens should be taken for species for which identification may be contentious, including some bryophytes and lichens.

2.3.1.6 A sketch plan of the whole area surveyed should be made and a record made of physical parameters including slope and aspect where necessary to allow assessment of significant effects. Surveyors should also consider whether pH and soil depth data are required to assess effects on the vegetation.

2.3.1.7 The data collected is to be analysed to provide the ‘best’ approximation to a published NVC type.

2.3.1.8 The data recorded in the quadrats from each homogenous stand of vegetation are to be tabulated and a constancy value for each species calculated for each defined group of quadrats, as follows:

- 2.12 Scale: I = 1% - 20%. II = 21% - 40%. III = 41% - 60%. IV = 61% - 80%. V = 81% - 100%.

2.3.1.9 The tables produced will then be used to assign the vegetation types to one of the published plant community types through use of the keys provided in the

published volumes and by visual comparison of the collected data with the published data. In addition, there are also computer programs (MATCH, TABLEFIT or MAVIS) that can be used to facilitate comparison of the data sets with published data.

2.4 Condition assessment survey

2.4.1.1 A condition assessment of any habitats within the parcel should be undertaken using the Natural England condition assessment sheets and methodology for the most up to date Biodiversity Metric (4.0 at the time of writing).

2.5 Incidental records

2.5.1.1 Any sightings of non-target species (or evidence of) recorded during surveys should be reported in the separate incidental records form using the internal GIS system known as Field Maps.

2.6 Condition assessment survey

2.6.1.1 A condition assessment of any habitats within the parcel should be undertaken using the Natural England condition assessment sheets and methodology for the most up to date Biodiversity Metric (4.0 at the time of writing).

2.7 Incidental records

2.7.1.1 Any sightings of non-target species (or evidence of) recorded during surveys should be reported in the separate incidental records form using the internal GIS system known as Field Maps.

3 SURVEY SCOPING

3.1.1.1 The Mona Offshore Wind Project would like to agree this methodology and coverage with the EWG to ensure that the data collated is sufficient to inform the ecology impact assessment and an appropriate mitigation strategy. We seek to agree the following:

3.2 Survey area

3.2.1.1 The survey would include all parcels scoped in for NVC surveys within the potential corridor, as shown on Figure 3.1. Parcels have been scoped in where there were areas of potentially high-quality habitats recorded during the phase 1 surveys. This included species diverse grassland, potential for notable grassland fungi, species diverse good quality substantial wetland habitat, mature broadleaved woodland of any size, significant areas of mature mosaic of habitats of interest, and significant areas of brownfield sites of potential interest. NVC surveys will also be undertaken on the proposed substation options LSS2 and LSS7 as published in the PEIR documents.

3.3 Survey methods

3.3.1.1 NVC surveys will be undertaken on all parcels scoped in for NVC surveys within the potential corridor, as detailed above, with condition assessments undertaken for each habitat within the parcel, as per the most up to date Natural England Biodiversity Metric.

REFERENCES

Kirby, K.J., Saunders, G.R. & Whitbread, A.M. 1991. The National Vegetation Classification in nature conservation surveys. British Wildlife, 3, 70–80.

Rodwell, J.S. (2006) National Vegetation Classification: User's handbook. Joint Nature Conservation Committee. Peterborough.

Figure 3.1: Land parcels scoped in for NVC surveys.

E.4.10 Otter and Water Vole Survey Methodology

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MONA OFFSHORE WIND PROJECT

Otter and Water Vole Survey Methodology

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1 INTRODUCTION

1.1.1.1 To inform the Environmental Impact Assessment (EIA), ecology mitigation strategy, and consenting process for the Mona Offshore Wind Project, a series of phase 2 terrestrial ecology surveys will be undertaken, including otter and water vole surveys, which are considered in this document.

1.1.1.2 The main objectives of the otter and water vole surveys are to:

- Determine presence/likely absence of these species.

1.1.1.3 This document sets out the methods of otter and water vole surveys that are proposed for the Mona Offshore Wind Project and the options for survey coverage that the project would like to scope with the Expert Working Group (EWG).

2 SURVEY METHODOLOGY

2.1 Otter surveys

2.1.1.1 Survey methodology will be based on methods detailed in Chanin (2003) and Crawford (2003).

2.1.1.2 Where possible, both banks of each surveyed watercourse will be surveyed. All evidence of otter and other notable species such as mink will be recorded. This will, as a minimum, include the number and location of the following field signs:

- natal holts, holts and potential holt sites[1];
- couches;
- spraints;
- anal jelly;
- tracks/footprints;
- silt/sand heaps; and
- slides.

2.1.1.3 The following information and results will be recorded using an internal GIS system known as Field Maps:

- waterbody reference;
- signs of water vole/otter/other;
- count of signs;
- location; and
- photographs, including a site plan showing the location of any of the field signs listed above.

2.1.1.4 Terrestrial habitat within 100 m of the watercourse will be surveyed for suitable terrestrial habitat to identify potential otter breeding sites. These could include any single area of extensive concealing habitat such as woodland or scrub. These areas will be surveyed for signs of breeding activity such as well used paths, play areas, or large accumulations of spraint. Any evidence, along with its location will be included in the notes section of the otter and water vole results on Arc GIS Field Maps.

2.1.1.5 Where access restrictions allow, a total of four survey visits will be conducted at approximately three-monthly intervals (once per quarter).

2.1.1.6 Surveys will not be conducted during or following periods of heavy rainfall, as field signs will have been washed away. In general, where possible survey visits will be timed to avoid high water levels.

[1] Potential holts are defined as a tunnel with internal diameter of at least 250mm and extending 1m into the bank, or where the end is out of sight, or any cavity of similar dimensions e.g. drain pipe, log pile, under structures/bridges etc.

2.2 Water Vole survey

2.2.1.1 Water vole surveys will cover all watercourses within land parcels scoped in for this species.

2.2.1.2 The proposed approach will follow the Water Vole Conservation Handbook (Strachan et al., 2011) survey methodology.

2.2.1.3 Wherever possible, the survey will be undertaken from within the watercourse, to allow for a close search for signs of water vole.

2.2.1.4 During each survey visit the banks of each watercourse/water body (up to 2m from the edge of the water) will be inspected for signs of use by water vole including the following:

- presence of latrines;
- presence of burrows (both active and inactive);
- presence of runs;
- presence of footprints;
- presence of feeding remains;
- individual droppings; and
- sightings and/or sounds (characteristic sound entering the water) of individuals.

2.2.1.5 The location of any use of habitats by non-target species (e.g., bank vole, brown rat etc.,) will be recorded within the notes section on Arc GIS Field Maps.

2.2.1.6 For each watercourse/water body the following information will also be recorded within the photographs/notes section of Arc GIS Field Maps:

- habitat types present;
- predominant bank substrate;
- adjoining land use;
- vegetation types present and indication of abundance of each using DAFOR scale;
- disturbance at the site;
- bank profile;
- depth;
- width;
- rate of flow;
- signs of recent habitat damage; and
- sketch map of the site.

2.2.1.7 Where there is any uncertainty over water vole droppings found that cannot be definitively identified in the field, a small sample (considered to represent

droppings from a single species) will be collected and sealed in a plastic bag marked with the following details:

- date sample collected (day/month/year);
- survey location (parcel code);
- GPS coordinates;
- suspected species; and
- surveyor name.

2.2.1.8 The sample will be stored in a cool, dry place until the completion of the survey in that area. DNA analysis will subsequently be conducted if considered appropriate, that is, on those dropping samples where the survey has found no other definitive evidence of the presence of water vole within the respective survey area to help determine presence/absence.

2.2.1.9 Once field sign data have been obtained, the population size of the voles in that stretch of watercourse will be calculated. This will be based on the standard recognised method for calculating the population size, namely Morris et al. (1998).

2.2.1.10 Two survey visits will be conducted during the period mid-April to mid-June, at least one month apart. Survey will not be conducted during or following periods of heavy rainfall, as field signs will have been washed away. In general, where possible survey visits will be timed to avoid survey when water levels are high, or when any management works have recently taken place.

2.3 Incidental records

2.3.1.1 Any sightings of non-target species (or evidence of) recorded during surveys will be reported in the separate incidental records form on the Arc GIS Field Maps application.

3 SURVEY SCOPING

3.1.1.1 The Mona Offshore Wind Project would like to agree this methodology and coverage with the EWG to ensure that the data collated is sufficient to inform the ecology impact assessment and an appropriate mitigation strategy. We seek to agree the following:

3.2 Survey area

3.2.1.1 The survey area would comprise all watercourses identified as being suitable for otters and water vole during phase 1 surveys, as shown in Figure 3.1 and Figure 3.2 of this document respectively.

3.3 Survey methods

3.3.1.1 The survey methods detailed above would be undertaken on all accessible watercourses identified as being suitable for these species.

REFERENCES

Chanin P (2003) Monitoring the Otter Lutra lutra. Conserving Natura.

Crawford, A. (2003) Fourth otter survey of England. Technical Report WI-061/TR. Environment Agency, Bristol.

Morris, P., Morris, M., MacPhearson, D., Jefferies, D., Strachan, R., and Woodroff, G. (1998) Estimating numbers of water voles Arvicola terrestris: a correction to the published method. Journal of Zoology, 246, 61-62.

Strachan, R., Moorhouse, T., and Gelling, M. (2011) Water Vole Conservation Handbook – Third edition. Wildlife Conservation Research Unit, Oxford.

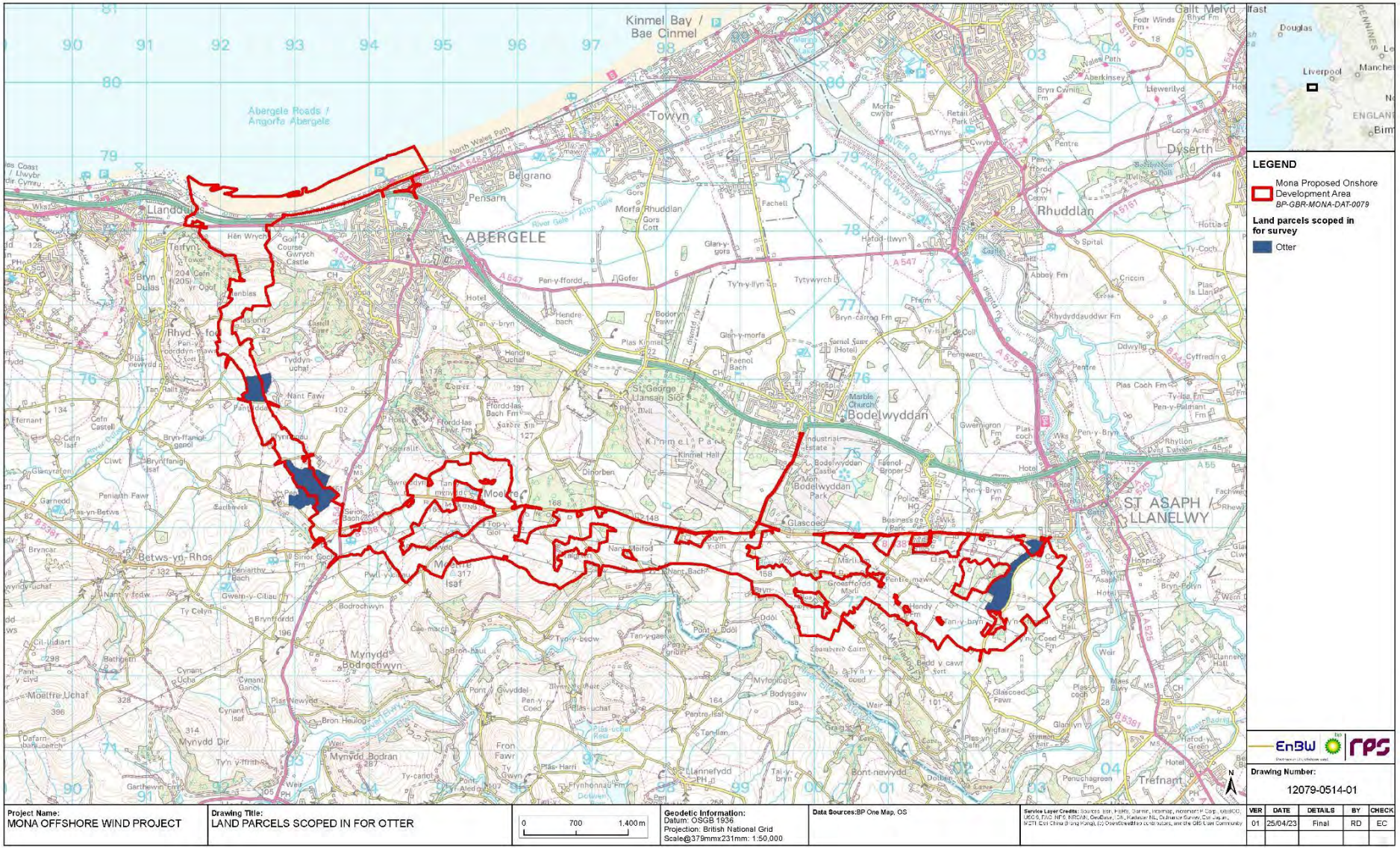

Figure 3.1: Land parcels scoped in for otter surveys.

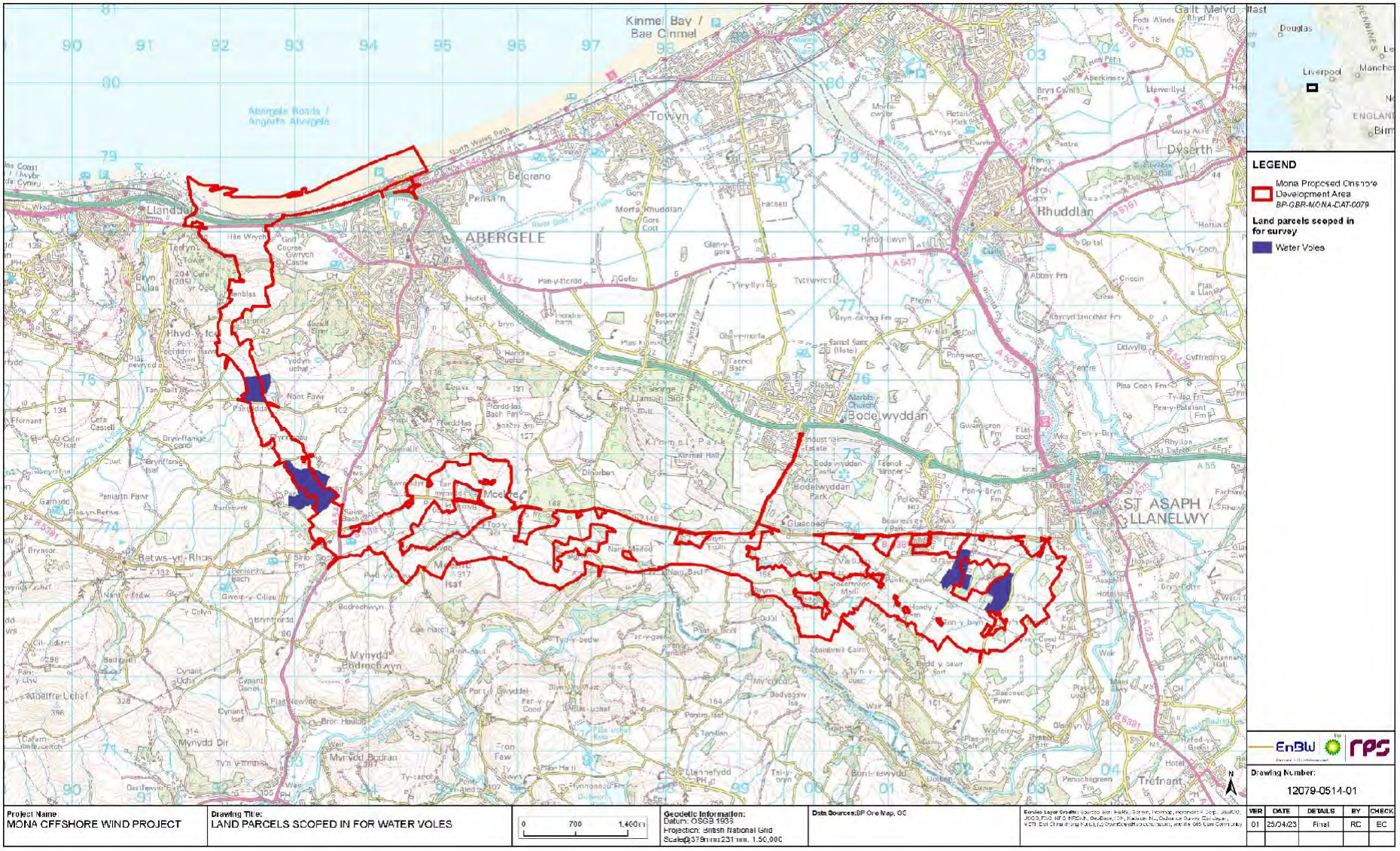

Figure 3.2: Land parcels scoped in for Water Vole surveys.

E.4.11 Reptile Survey Methodology

Partners in UK offshore wind

MONA OFFSHORE WIND PROJECT

Reptile Survey Methodology

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Figures

1 INTRODUCTION

1.1.1.1 To inform the Environmental Impact Assessment (EIA), ecology mitigation strategy, and consenting process for the Mona Offshore Wind Project, a series of phase 2 terrestrial ecology surveys will be undertaken, including reptile surveys, which are considered in this document.

1.1.1.2 The main objectives of the reptile surveys are to:

- Confirm presence / likely absence; and
- Estimate population class sizes.

1.1.1.3 This document sets out the methods of reptile surveys that are proposed for the Mona Offshore Wind Project and the options for survey coverage that the Mona Offshore Wind Project would like to scope with the Expert Working Group (EWG).

2 SURVEY METHODOLOGY

2.1.1.1 The following reptile survey methods are proposed. The proposed approach will broadly follow the guidelines set out in Froglife (1999), and Gent and Gibson (2003).

2.2 Qualifications and experience

2.2.1.1 All surveyors involved in surveying invertebrates will be experienced in the following:

- field identification of widespread reptile species and field signs (e.g. sloughs, burrows and eggs);
- assessing the potential suitability of on-site habitats for reptile species;
- determining appropriate spatial scope for survey; and
- identifying appropriate survey techniques to achieve a robust survey in a variety of habitat types.

2.2.1.2 Surveys are only anticipated to involve widespread reptile species, as such no survey licence is required.

2.3 Reptile survey

2.3.1.1 At each site selected for reptile survey, dependent on habitat suitability and both temporary and permanent impacts considered, a combination of corrugated iron and roofing felt refugia all measuring a minimum of 0.5m x 0.5m are to be placed out in areas identified as suitable habitat. At sites where the habitat assessment has identified potential for grass snake to occur surveyors should deploy an appropriate number (based on extent of suitable habitat) of larger refugia, to increase the likelihood of detecting this species.

2.3.1.2 In non-linear habitats refugia should be placed at a density of at least 100/ha or a minimum 30 mats in very small sites. In linear habitats of less than 10m in width (e.g. hedgerows, road verges etc.) refugia should be placed at a frequency of at least one every 10m of suitable habitat.

2.3.1.3 The default should be a 50:50 ratio of corrugated steel/iron to roofing felt where appropriate. Where varying from this standard a justification should be provided, based on the habitat type and target species concerned.

2.3.1.4 Given the length of the proposed cable corridor, use of the land as primarily livestock grazing the reptiles' surveys will be more target to areas which a) are likely to be impacted be permanent habitat loss (i.e., substations and associated access roads) and areas of high-quality habitat within the cable corridor. The professional judgement of the ecologist will be used when deploying refugia to ensure they are not placed in areas of high livestock use and other methods, such as visual observations of reptiles can also be used to support the survey baseline.

2.3.1.5 All refugia should be number marked using spray paint and their location recorded using an internal GIS system known as Field Maps.

2.3.1.6 Once placed out artificial refugia will be left to settle for 14 days prior to conducting the first check.

2.3.1.7 Each site containing refugia will then be checked for reptiles on the required number of occasions (see presence/likely absence survey below). Binoculars should be used to check for reptiles between refugia, as well as careful checks by lifting each refugia.

2.3.1.8 Each refugia check should be conducted during the following conditions:

- Time: conducted between 07:00 and 18:00;
- Air temperature: 10°C - 20°C;
- Wind: Still to moderate (equivalent to Beaufort 4; 13 - 17mph); and
- Rain: No or light rain only at time of survey. Surveys between periods of heavy rain (when all other conditions are suitable) are also acceptable.

2.3.1.9 During each check the surveyor should record details of all reptiles encountered during the survey, including refugia number, species, number, life stage (adult, subadult, juvenile) and when possible, sex.

2.4 Survey programme and effort

2.4.1 Presence/likely absence surveys

2.4.1.1 At all locations selected for refugia survey initially, seven visits (during suitable weather conditions) should be conducted to determine presence/likely absence.

2.4.1.2 Each visit should adhere to the weather requirements detailed in paragraph 2.11 and should be conducted during the period April to September.

2.4.1.3 Where access allows surveys should be programmed to maximise the number of visits conducted during April, May, June, and September, when weather conditions are likely to be more favourable for survey. However, visits during July and August are not precluded assuming they are conducted according to the weather requirements described above.

2.4.1.4 There should be at least 30 days between the first and last survey visits and there must be a minimum of two days between each visit.

2.4.1.5 A robust survey to determine likely absence should include at least four visits conducted during the 'optimum' survey months of April, May, June, or September. Therefore, at sites where surveys commence during July or August if no reptiles are found during the first three visits, then the remainder of visits should be delayed and conducted during September.

2.4.2 Estimating population size class

2.4.2.1 Where presence/likely absence survey confirms presence of one or more reptile species and all survey visits have been conducted during the 'optimum' survey months of April, May, June, or September (under suitable conditions) then (unless the surveyor considers it necessary) no further visits will be required.

2.4.2.2 To give a robust estimate of population size where any survey visits have been conducted during the sub-optimal months of July or August, additional visits will be required until at least seven visits (under suitable conditions) have been conducted during optimum months.

2.4.2.3 Where initial survey results suggest that a site has the potential to support a 'high' reptile population then the consultants undertaking the survey should consider the requirement for further visits to provide a robust population size class estimate.

2.4.2.4 Population size class should be assessed utilising the peak adult count for each species across all visits. These figures should be divided by the survey area in ha to give an indication of density identified within the survey, then compared with the criteria outlined in Evaluating local mitigation/translocation programmes: Maintaining best practice and lawful standards (HGBI, 1998). A summary is provided in Table 2.1: Estimating reptile population sizes.

Table 2.1: Estimating reptile population sizes

Species	Population size class	Density record
Slow worm	High	More than 100/ha
	Medium	50-100/ha
	Low	Less than 50/ha
Common lizard	High	More than 80/ha
	Medium	20-80/ha
	Low	Less than 20/ha
Grass snake	High	More than 4/ha
	Medium	2-4/ha
	Low	Less than 4/ha
Adder	High	More than 4/ha
	Medium	2-4/ha
	Low	Less than 2/ha

2.5 Incidental records

2.5.1.1 Any sightings of non-target species (or evidence of) recorded during surveys should be reported in the separate incidental records form on the Arc GIS Field Maps application.

3 SURVEY SCOPING

3.1.1.1 The Mona Offshore Wind Project would like to scope the survey methodology and coverage with EWG, to help ensure that the data collated is sufficient to inform the ecology impact assessment and an appropriate mitigation strategy. For example, the project would like to discuss the following proposals with EWG:

3.2 Survey area

3.2.1.1 The survey area would include all land parcels within the Mona Proposed Onshore Development Area that have been scoped in for reptile, as shown on Figure 3.1.

3.3 Survey methods

3.3.1.1 The survey methods detailed above would be undertaken on all accessible parcels identified as being suitable for reptiles.

REFERENCES

Froglife (1999) Reptile survey; an introduction to planning, conducting and interpreting surveys for snake and lizard conservation. Froglife Advice Sheet 10. Froglife, Halesworth.

Gent, T., and Gibson, S. (eds) (2003) Herpetofauna Workers Manual. JNCC, Peterborough.

Herpetofauna Groups of Great Britain and Ireland (1998). Evaluating local mitigation/translocation programmes. Maintaining best practice and lawful standards. HGBI, Halesworth

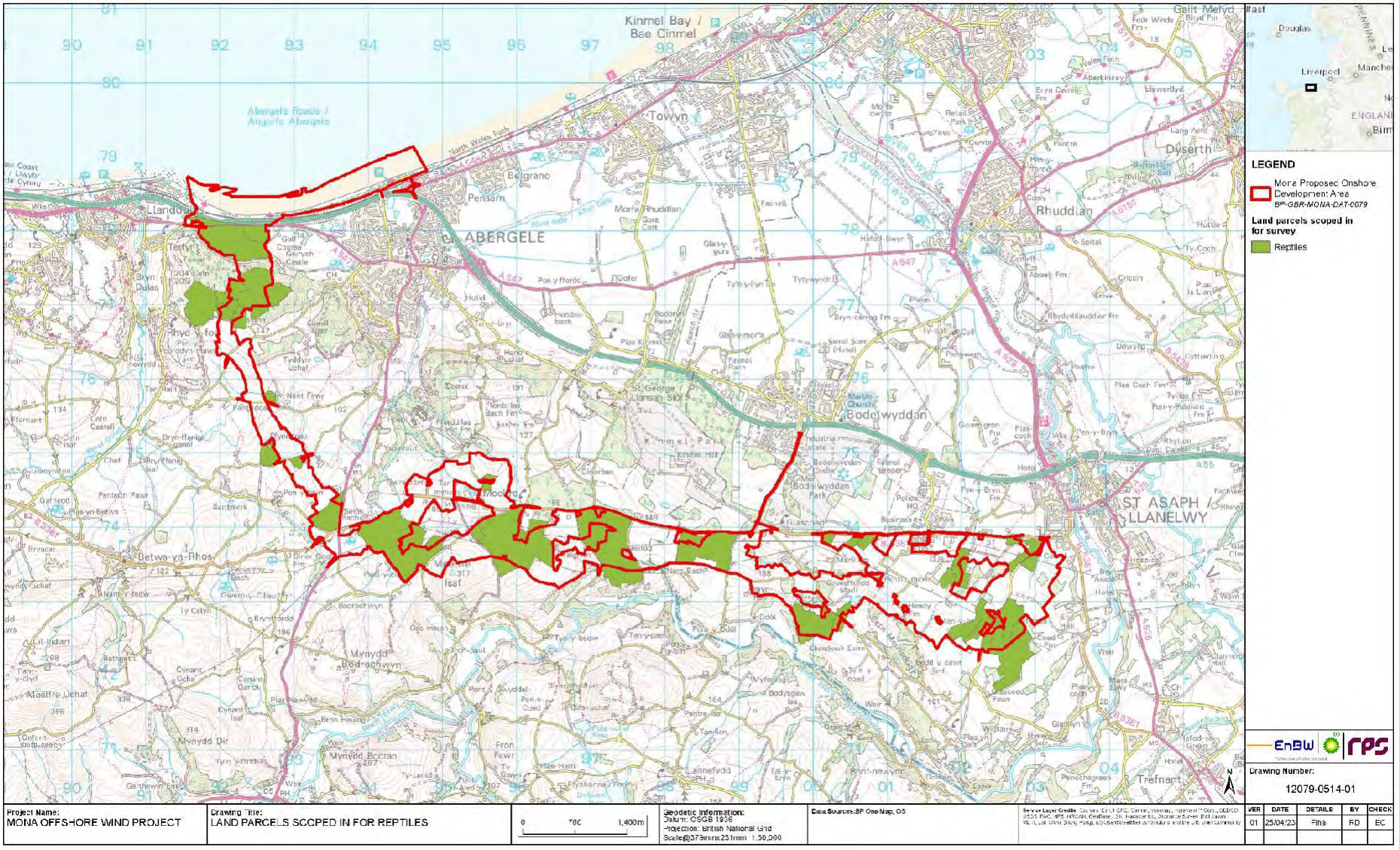

Figure 3.1: Land parcels scoped in for reptile surveys.

E.4.12 Terrestrial Invertebrates Survey Methodology

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MONA OFFSHORE WIND PROJECT

Terrestrial Invertebrates Survey Methodology

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Figures

1 INTRODUCTION

1.1.1.1 In order to inform the Environmental Impact Assessment (EIA), ecology mitigation strategy, and consenting process for the Mona Offshore Wind Project, a series of phase 2 terrestrial ecology surveys will be undertaken, including terrestrial invertebrate surveys, which are considered in this document.

1.1.1.2 The main objectives of the terrestrial invertebrate surveys are to:

- Sample and identify invertebrate species on site; and
- Classify the sites importance in relation to the invertebrate community present.

1.1.1.3 This document sets out the methods of terrestrial invertebrate surveys that are proposed for the Mona Offshore Wind Project and the options for survey coverage that the Mona Offshore Wind Project would like to scope with the Expert Working Group (EWG).

2 SURVEY METHODOLOGY

2.1.1.1 The proposed approach will broadly follow the guidelines set out in Organising surveys to Determine Site Quality for Invertebrates (English Nature, 2006). The following invertebrate survey methods are proposed.

2.2 Qualifications and experience

2.2.1.1 All surveyors involved in surveying invertebrates will be experienced in the following:

- field identification of widespread Invertebrate species and life stages (e.g. adults, larvae, eggs and exuviae);
- assessing the potential suitability of on-site habitats for widespread invertebrate species;
- determining appropriate spatial scope for survey; and
- identifying appropriate survey techniques to achieve a robust survey in a variety of habitat types.

2.2.1.2 Surveys are only anticipated to involve widespread invertebrate species, as such no survey licence is required.

2.3 Terrestrial invertebrate surveys

2.3.1 Survey programme and effort

2.3.1.1 At each site selected for terrestrial invertebrate survey, areas which are safely accessible are to be sampled using a sweep net and by general searching.

2.3.1.2 The time spend in each surveys area is to be in accordance with the size of the area and the extent of the habitat to be sampled. Magurran (2004) quotes ten samples as a minimum.

2.3.1.3 Sweep netting with a 40 cm diameter white bag net will be the main technique used. The net will be used to sweep from side to side as the surveyor paces steadily through the search area. The same net will be used to sample the foliage of any shrubs or trees within the area being surveyed.

2.3.1.4 Specimens will be extracted from the net with a pooter. When sampling is completed, or the pooter becomes too full, the contents will be killed using ethyl acetate and transferred to 30 ml soda glass tubes together with a data label.

2.3.1.5 Additional ground searching will be undertaken in areas of open, sparsely vegetated areas, by looking under rocks and other debris.

2.3.1.6 At least three surveys will be undertaken between April and October, in suitable weather. Ideal conditions for sampling invertebrates are warm, dry and sunny. Should important Biodiversity Action Plan (BAP) species be identified or important communities of invertebrates the survey effort may need to increase to six surveys.

2.3.1.7 For a robust survey it is preferable to spread visits over a long period. This will enable the collection of invertebrate groups with varying activity patterns and life stages producing more accurate sampling.

2.3.1.8 Areas of suitable habitat may be in areas where it is anticipated that there may be both health and safety and access issues that will prevent survey of all those areas of habitat identified as potentially suitable for invertebrates.

2.3.1.9 In these cases, the consultants undertaking surveys will be expected to liaise with the overseeing consultant to determine a suitable approach for these areas. It is anticipated that this will involve consideration of the following potential approaches:

- sampling of areas of similar adjacent habitat;
- visual search only; and
- risk assessment based on habitat suitability.

2.3.2 Identification

2.3.2.1 Where practical, invertebrates will be identified in the field but wherever doubt exists, one or more specimens will be collected for more detailed inspection. Where the surveyor is unable to identify any specimens, they will be submitted to relevant experts.

2.3.2.2 It is desirable that as wide a taxonomic range as possible is identified, to sample numerous ecological types (i.e. invertebrates with widely differing natural histories).

2.3.2.3 As there is a limited amount of time available for identification, it is important to name the more readily identified groups which do not require very time-consuming techniques for identification. Where possible, the following orders and families of invertebrates will be named to species:

- **Isopoda** – Woodlice;
- **Araneae** – Spiders;
- **Raphidiidae** – Snake flies;
- **Neuroptera** – Lacewings;
- **Odonata** - Dragonflies and Damselflies;
- **Orthoptera** – Grasshoppers and Crickets;
- **Dermaptera** – Earwigs;
- **Hemiptera, Auchenorrhyncha** - Froghoppers, Leafhoppers and Planthoppers (excluding females of difficult genera);
- **Hemiptera, Heteroptera** - True bugs (excluding smaller Miridae);
- **Hemiptera**, **Aphididae** – Aphids (conspicuous species only);
- **Lepidoptera** – Butterflies and Moths;
- **Coleoptera** – Beetles (all except small Aleocharine rove beetles and other very small obscure families);

- **Diptera** - True flies (except, Cecidomyiidae, Chironomidae, Ceratopogonidae, Simulidae, Phoridae**,** Sphaeroceridae, and females of some groups which are not identifiable);
- **Hymenoptera, Aculeata –** Sawflies, Ants, Wasps and Bees; and
- **Mollusca –** Slugs and Snails.

2.3.2.4 Selected specimens will be retained as vouchers.

2.3.3 Analysis

2.3.3.1 The quality of the site for invertebrates will be assessed with reference to the species found which are nationally scarce or rare by the various Natural Resources Wales Commissioned Reports published by JNCC (e.g. Falk 1991a; Falk 1991b; Hyman, 1992) and subsequently Natural Resources Wales. These reviews place all nationally scarce species into categories according to their degree of rarity and their vulnerability to extinction and are accepted as the “official” JNCC/NE designations. The more recent reports also assess taxa with reference to IUCN threat categories.

2.3.3.2 As a simple and readily comparable indication of quality, the proportion of Nationally Scarce and Red Data Book (RDB) species of the total diversity will be calculated. The same will be done just for the rarest taxa with RDB status. Depending on the habitat type, a proportion of scarce/RDB between 3-5% needs to be exceeded before it can be safely concluded that the site has some conservation significance. Very high-quality sites of national importance will have a proportion close to or exceeding 10% Nationally Scarce/RDB species.

2.3.3.3 The surveyor will compare the site and surveyed habitats with other sites of similar habitat and nature, and will be classified as one of the following:

- little/no importance;
- local/county importance;
- regional importance;
- national importance; or
- European importance.

2.3.3.4 As well as describing the communities present, any species of high interest will be reported. These could include:

- UK BAP listed species;
- Schedule 5 species; or
- threatened species.

2.3.3.5 Where these species occur, their locations and the locations of suitable habitat will be recorded.

2.4 Incidental records

2.4.1.1 Any sightings of non-target species (or evidence of) recorded during surveys will be reported in the separate incidental records form using the internal GIS system known as Field Maps.

3 SURVEY SCOPING

3.1.1.1 The Mona Offshore Wind Project would like to agree this methodology and coverage with the EWG to ensure that the data collated is sufficient to inform the ecology impact assessment and an appropriate mitigation strategy. We seek to agree the following:

3.2 Survey area

3.2.1.1 The survey will include all land parcels within the Mona Proposed Onshore Development Area that have been scoped in for invertebrates, as shown on Figure 4.1.

3.3 Survey methods

3.3.1.1 At least three surveys will be undertaken between April and October, in suitable weather. Should important Biodiversity Action Plan (BAP) species be identified or important communities of invertebrates the survey effort may need to increase to six surveys.

4 REFERENCES

Buglife (2019) Good Planning Practice for Invertebrates: Surveys. Buglife, Peterborough.

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Magurran, A.E. (2004) Measuring Biological Diversity. Blackwell Publishing, Oxford

Sutherland, W. J. (2006) Ecological Census Techniques, Second Edition. Cambridge University Press, Cambridge

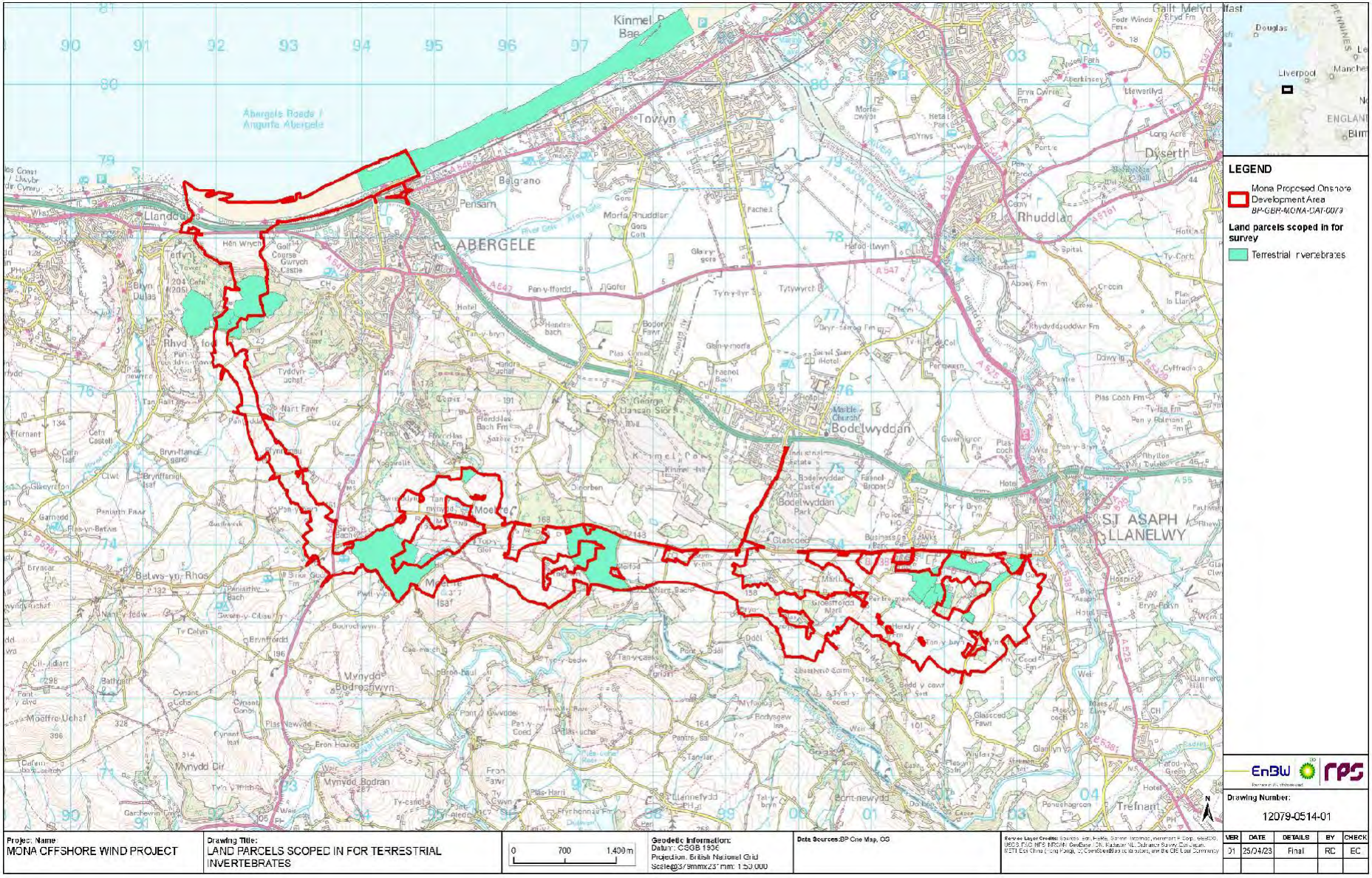

Figure 4.1: Land parcels scoped in for terrestrial invertebrate surveys.

E.4.13 White-Clawed Crayfish Survey Methodology

Partners in UK offshore wind

MONA OFFSHORE WIND PROJECT

White-Clawed Crayfish Survey Methodology

EOR0801
Mona Offshore Wind Project
April 2023

Document status

Version	Purpose of document	Authored by	Reviewed by	Approved by	Review date
Rev01	For review	RPS	RPS	RPS	28/04/2023
Rev02	For issue	RPS	RPS	RPS	02/05/2023

Contents

Figures

1 INTRODUCTION

1.1.1.1 To inform the Environmental Impact Assessment (EIA), ecology mitigation strategy, and consenting process for the Mona Offshore Wind Project, a series of phase 2 terrestrial ecology surveys will be undertaken, including white-clawed crayfish surveys, which are considered in this document.

1.1.1.2 The main objectives of the white-clawed crayfish surveys are to:

- Assess habitat suitability and condition;
- Confirm presence / absence; and
- Estimate population class sizes.

1.1.1.3 This document sets out the methods of white-clawed crayfish surveys that are proposed for the Mona Offshore Wind Project and the options for survey coverage that the Mona Offshore Wind Project would like to scope with the Expert Working Group (EWG).

2 SURVEY METHODOLOGY

2.1.1.1 The following, white-clawed crayfish survey methods are proposed.

2.2 White-clawed crayfish eDNA survey

2.2.1.1 Environmental DNA (eDNA) surveys involve collecting water samples from a stream or river.

2.2.1.2 Where possible avoid entering the watercourse and collect samples from either side of the bank, where access allows. If it is necessary to enter the watercourse, then avoid disturbing sediment during the sample collection and ensure that you implement full biosecurity protocols.

2.2.1.3 For small streams and rivers (less than 10 m wide/less than 30 cm deep) ensure that you sample in an upstream direction to avoid the collection of ancient sediment that may contain historical DNA.

2.2.1.4 For larger and/or more difficult to access watercourses sub-samples will be taken every few metres along the watercourse to get a representative sample from the site.

2.2.1.5 For larger river systems, multiple samples will be taken at multiple points (e.g. the collection of a sample every 500-100 m) within a river to ensure that populations that may be fragmented are identified.

2.2.1.6 Instructions on the eDNA sampling kit will be followed to ensure the samples are safely and effectively obtained, adhering to any biosecurity measures required. It is recommended that the filtration of at least 150 ml is obtained, with an ideal filtered volume of 400ml.

2.2.1.7 Sampling will be avoided after periods of heavy rainfall. eDNA samples will be taken between mid-April and mid-October.

2.3 Incidental records

2.3.1.1 Any sightings of non-target species (or evidence of) recorded during surveys will be reported in the separate incidental records form using an internal GIS system known as Field Maps.

3 SURVEY SCOPING

3.1.1.1 The Mona Offshore Wind Project would like to agree this methodology and coverage with the EWG to ensure that the data collated is sufficient to inform the ecology impact assessment and an appropriate mitigation strategy. We seek to agree the following:

3.2 Survey area

3.2.1.1 The survey would include all land parcels within the Mona Proposed Onshore Development Area that have been scoped in for white-clawed crayfish, as shown in Figure 3.1.

3.3 Survey methods

3.3.1.1 Should white-clawed crayfish eDNA results be returned as positive, then the scope for further surveys will be discussed with the EWG.

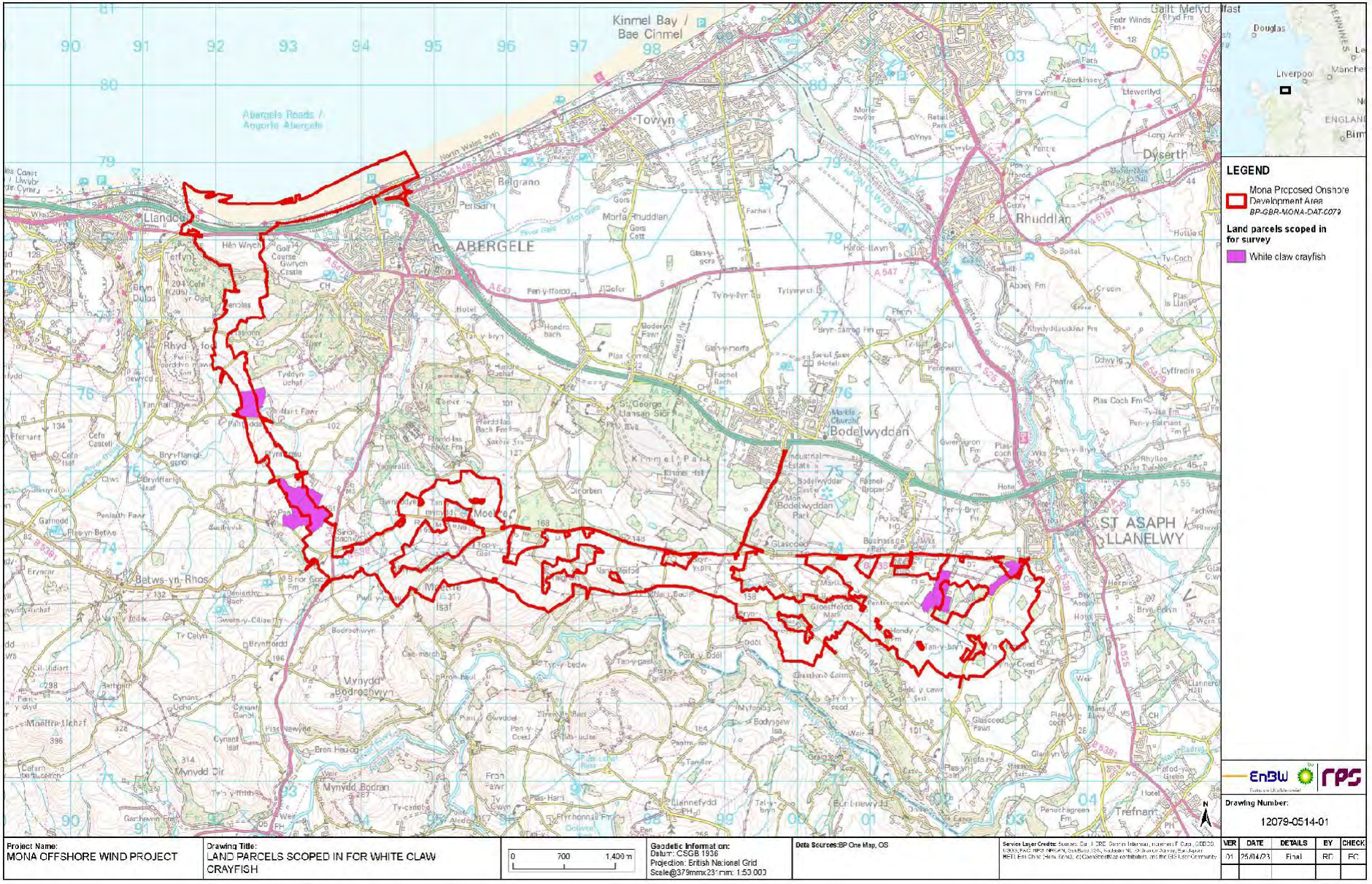

Figure 3.1: Land parcels scoped in for white-clawed crayfish surveys.

E.4.14 Site-specific surveys and contextual data background methodology at the Mona Preliminary Landfall Area and the Onshore Cable Corridor Search Area

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Site-specific surveys and contextual data background methodology at the Mona Preliminary Landfall Area and the Onshore Cable Corridor Search Area

Image of an offshore wind farm

Document status

Version	Purpose of document	Authored by	Reviewed by	Approved by	Review date
Final	Final for EWG	RPS	RPS	Bp/EnBW	19/12/2023

Prepared by:

RPS

Prepared for:

Mona Offshore Wind Ltd.

Contents

Figures

1 INTRODUCTION

1.1.1.1 bp Alternative Energy Investments Limited (bp) and Energie Baden-Württemberg AG (EnBW) have been awarded preferred bidder status for two round four offshore wind leases in the Irish Sea, including the Mona Offshore Wind Project.

1.1.1.2 In order to inform the Environmental Impact Assessment (EIA) and consenting process for the Project, a series of wintering and passage waterbird surveys started in December 2021 and are proposed to continue until June 2023 at the landfall area for the Mona Offshore W. Furthermore, breeding bird surveys and wintering walkover surveys have been carried out within the Proposed Onshore Development Area which includes the onshore cable corridor and onshore substation option locations.

1.1.1.3 This document sets out the methodology of the intertidal and nearshore 'through-the-tidal-cycle' waterbird surveys, the high-tide roost field surveys, breeding bird surveys and wintering walkover bird surveys undertaken to inform the assessment of the Mona Offshore Wind Project.

1.1.1.4 The surveys are designed to assess the use of the terrestrial habitats, intertidal and nearshore coastal habitats associated with the Landfall Area and the Proposed Onshore Development Area Area, particularly qualifying species of coastal/marine designated sites of nature conservation interest and species of conservation concern.

1.1.1.5 The findings of these surveys will be used to characterise the baseline and inform the EIA.

2 WATERBIRD SURVEY METHODOLOGY AT THE LANDFALL AREA

2.1 Intertidal and Nearshore Coastal 'Through-the-Tidal-Cycle' Waterbird Surveys

2.1.1.1 The main objectives of the surveys are to identify any areas that:

- Support significant numbers of qualifying species of the various coastal/marine designated sites
- Are of importance for large assemblages of wetland birds
- Have seasonal periods of sensitivity for wetland birds (e.g. staging posts for migratory birds or traditional feeding and roosting grounds).

2.1.2 Daytime survey

2.1.2.1 The programme comprises of a series of monthly intertidal and nearshore coastal waterbird surveys that commenced in December 2021 and is proposed to continue until June 2023 to account for the inter-annual variation and capture seasonal fluctuations (i.e. spring, autumn passage and winter).

2.1.2.2 The intertidal and nearshore coastal bird survey area comprises the Landfall Area (as shown on Figure 2-1) and extends for a minimum of 500 m in each direction along the coast from the landfall area. The survey area will remain the same throughout the survey period subject to any refinement of the landfall area, or subject to feedback from Natural Resources Wales. Any refinements will be documented and reported to Natural Resources Wales as appropriate.

2.1.2.3 The survey area is segmented into discrete count sectors, which are clearly defined on a field map. The count sectors, set up during a preliminary scoping visit, are based on local features such that the sectors can be repeatedly identified by different surveyors if necessary.

2.1.2.4 Each survey sector extends out to sea by 1.5 km from the shoreline (i.e. Mean High Water Springs (MHWS) mark or the Highest Astronomical Tide (HAT) mark). To identify the distribution of birds, the count sectors are further segregated into three distance bands from the shoreline: 0 - 500 m, 500 m - 1 km and 1 km - 1.5 km.

2.1.2.5 Counts in each sector are conducted by a surveyor at approximately monthly intervals during the survey period. During each survey the waterbird species present in each sector along the foreshore and nearshore coastal waters are counted and ascribed to one of the three distance bands. Observations of waterbird species (including the numbers of each species in a given location and behaviour) are plotted onto a field map using standard BTO species codes.

2.1.2.6 Surveys are scheduled to cover a range of times of day and different tidal conditions (high, low and mid-tides; on spring and neap tides) throughout the survey programme. If feasible, counts are made once per hour of the tidal cycle period of 12 hours (-6 to +5 relative to low tide), but as a minimum provide counts of birds in the four periods of high tide, ebb tide, low tide and flood tide.

Surveys alternate between spring (or near-spring) and neap (or near-neap) tidal states. Survey methods are based on the Core Count (high tide) and Low Tide Count methodology of the BTO/ Joint Nature Conservation Committee (JNCC)/Royal Society for the Protection of Birds (RSPB)/Wildfowl & Wetlands Trust (WWT) WeBS scheme[1]. This involves the surveyor counting or plotting birds from vantage points along the coast using binoculars and a telescope. In addition to the location and number of birds, notes are also made on their behaviour: foraging and non-foraging (e.g. roosting, loafing etc).

2.1.2.7 Field records are transferred to a Geographic Information System (GIS). This produces accurate information on the distribution of birds within the study area and enables maps to be produced so that areas of ornithological importance can be identified.

2.1.2.8 Weather conditions including wind speed (using the Beaufort Scale), cloud cover (estimated as eighths or octas of the sky), visibility and temperature are also recorded as well as sources of disturbance to birds encountered during surveys.

2.1.3 Nocturnal surveys

2.1.3.1 A programme of nocturnal surveys also commenced in December 2021 and is proposed to continue until February 2023. These are the same as the diurnal surveys except that they run on a reduced intensity and cover a reduced survey area.

2.1.3.2 Due to the more limited range of nocturnal equipment, only the first 500 m of the intertidal zone (from the MHWS/HAT mark) is surveyed. For health and safety reasons, observers carry out night work in pairs. Monthly through-the-tidal-cycle counts cover half a tidal cycle each month. This means that for each monthly survey, birds are counted during an approximate 6 hour period (instead of full tidal cycle of approximately 12 hours), with the aim of a complete count of a tidal cycle every two months. The frequency of counts is adapted to the amount bird of activity in the section. During period of high level of activity, the frequency of counts is reduced to three over a half tidal cycle (i.e. high, mid and low) whilst it is possible to conduct hourly counts during period of low level of activity. Working in pairs, one observer locates birds using a thermal monocular (e.g. Pulsar Axion XM30S or the Pulsar Quantum HD50S), whilst the second observer videos and identifies species or groups using an image-intensifying camera (or camcorder) coupled with an infra-red spotlight. This approach allows the detection and identification of most waterbird species within 300 m to 400 m from the observer's position.

2.1.3.3 Similar to diurnal surveys, the position of the birds is directly mapped using BTO codes or alternatively marked with a labelled symbol and subsequently cross referenced to a data field form. Behaviour is recorded as foraging (actively looking for food) and non-foraging. In some instances, it is not possible to identify species in situ and the observers will need to view pictures

[1] Musgrove, A., Langston, R., Baker, H. and Ward, R. (2003). Estuarine Waterbirds at Low Tide: The WeBS Low Tide Counts 1992–93 to 1988–99. WSG/BTO/WWT/RSPB/JNCC, Thetford.

or videos on a desktop/laptop to confirm identification. In addition to the avoidance of periods of strong wind, the survey is planned to avoid any types of precipitation (even slight rain) given that precipitation interferes with nocturnal recording equipment.

2.1.3.4 Any source of disturbance to the birds in each section at the time of the count is recorded under the following categories: walkers, dogs, anglers, bait diggers, shellfishers, vehicles, unpowered boats, powered boats, aircraft and 'other'. The perceived effect of disturbance on abundance and behaviour of birds in the count section is scaled according to the following categories (Table 1):

Table 1: Perceived effect of disturbance on abundance and behaviour of birds.

	Notation	Definition
Effect	W	**Weak** e.g. change in behaviour, but birds not excluded
	M	**Moderate** e.g. birds excluded from parts of the recording sector
	S	**Strong** e.g. avoidance of the recording sector

2.2 High-tide field roost (daytime only)

2.2.1.1 There is the potential for waterbirds associated with local SPAs to roost or forage in terrestrial habitats, particularly when the intertidal habitats are submerged around the high-water period. A series of high-tide waterbird surveys commenced in October 2022 in the terrestrial habitats (inland of the Preliminary Landfall Area) and are proposed to continue until April 2023 to coincide with the over-wintering and passage periods of waterbirds.

2.2.1.2 The survey area comprises of terrestrial habitats (e.g. wetland and wet grassland) located within 1.5 km of the landfall area (including a 500 m buffer zone). The survey of terrestrial habitats is conducted by a surveyor at approximately monthly intervals. During each survey the waterbird species are counted during a period of three hours either side of high-tide, with a minimum of two counts undertaken in each field identified as suitable for roosting and foraging waterbirds. Observations of waterbird species (including the numbers of each species in a given location and behaviour) are plotted onto a field map using standard BTO species codes.

2.2.1.3 The field survey recording protocol is similar to that described above for Intertidal and Nearshore Coastal 'Through-the-Tidal-Cycle' Waterbird Surveys.

Figure 2-1: Preliminary Landfall Area

3 BREEDING BIRD SURVEY WITHIN THE MONA PROPOSED ONSHORE DEVELOPMENT AREA

3.1.1.1 Prior to any breeding bird surveys taking place, the value of the Mona Proposed Onshore Development Area for breeding birds was assessed through a review of desk-based studies. Sensitive areas within the Proposed Onshore Development Area were identified from aerial photography, and the species of conservation concern/ qualifying species that may be breeding in these areas were identified.

3.1.1.2 The findings concluded that the priority habitats for breeding birds present within the Mona Proposed Onshore Development Area were:

- Saltmarsh
- Sand dunes and dune slacks
- Coastal heath
- Semi-natural coniferous woodland
- Deciduous woodland
- Riparian zones
- Ditches with reed beds
- Large ponds
- Areas of wet pasture.

3.1.1.3 In addition to these habitats, mature trees in hedgerows and suitable nesting sites in building (through a preliminary examination) were assessed with potential for breeding barn owl. Other priority areas identified were:

- Any areas with statutory protection
- The onshore substation option locations where a permanent loss of habitat would occur.

3.1.1.4 The breeding bird surveys aimed to cover priority habitats within the Mona Proposed Onshore Development Area and to assess the abundance and the distribution of breeding birds of conservation concern. The breeding bird survey method is modified from the Common Bird Census (CBC) (Gilbert *et al*. 1998)[2], which is based on a survey method known as 'Territory mapping'. A minimum of four survey visits were conducted at least 10 days apart. The position of each bird was plotted onto a field map and details of behaviour indicative of breeding, such as singing males, or birds carrying food were noted, using standard BTO behaviour notation. Results were then transferred onto Geographic Information System (GIS) software to identify and map putative territory centres.

[2] Gilbert, G., Gibbons, D.W., & Evans, J., (1998). Bird Monitoring Methods: A Manual of Techniques for Key UK Species Pelagic Publishing.

3.1.1.5 Coverage of the Mona Proposed Onshore Development Area during the 2022 breeding bird survey, was achieved through a combination of surveys from Public Rights of Way (PRoW) and private land (where access was agreed). Four visits were undertaken between April and July 2022 in areas where coverage was possible through PRoWs whilst one visit was carried out towards the end of the breeding season (June/July) on private access land. Access to private land on the Mona Proposed Onshore Development Area was not agreed in time for the start of the 2022 breeding season survey.

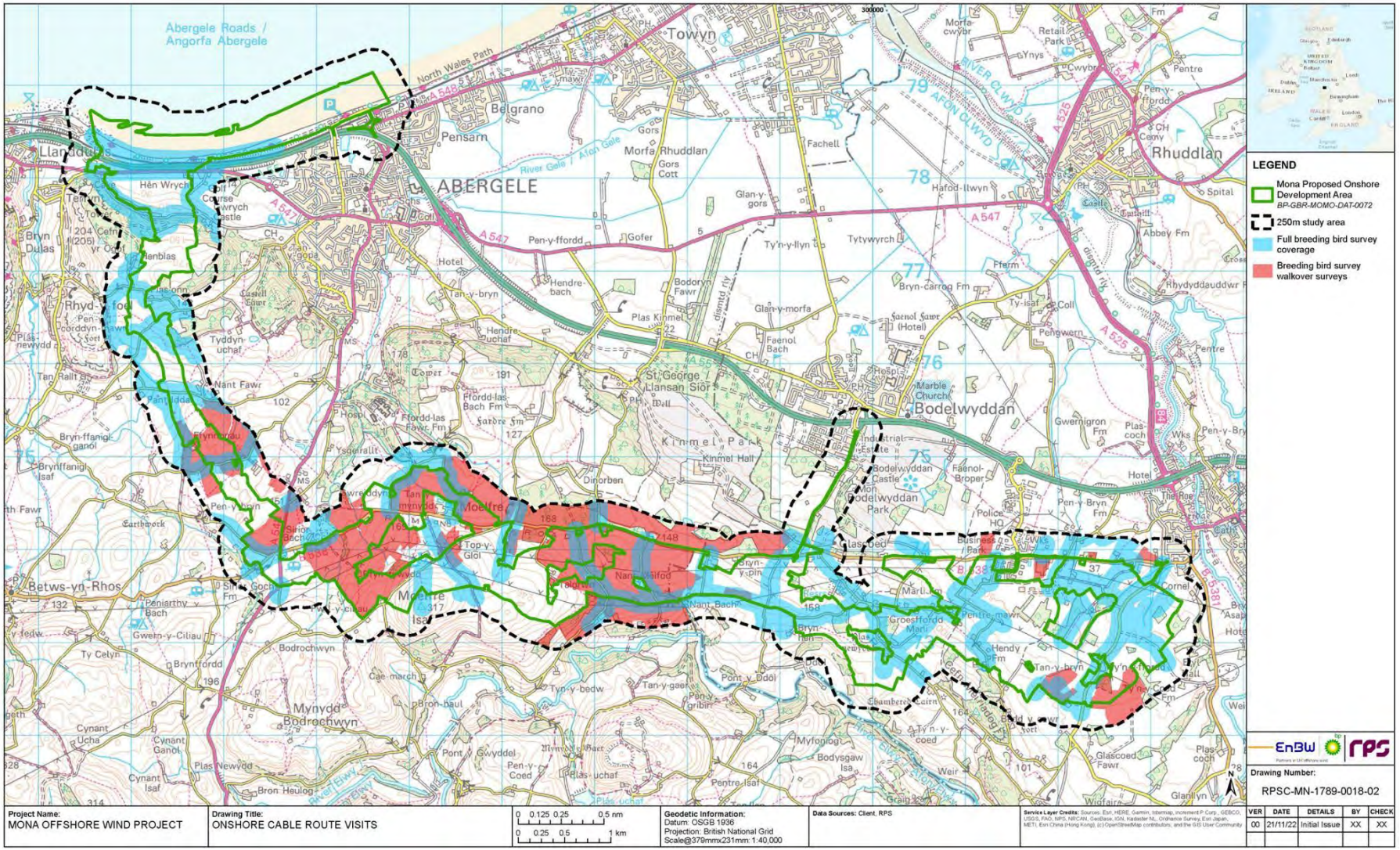


Figure 3-1: Breeding bird survey coverage

3.1.1.6 Breeding bird species of conservation concern were recorded, including species listed on Annex 1 of EU Birds Directive, species listed on Schedule 1 of the Wildlife and Countryside Act, Wales Red and Amber listed species (Johnston *et al*., 2022) and UK Red and Amber listed species (Stanbury *et al*., 2021) that may be breeding in the Mona Proposed Onshore Development Area (Figure 3-2). Birds of least conservation concern (Green-listed) which were widely present through the survey area (i.e. woodpigeon, moorhen and wren) were not recorded. Although an Amber-listed species, dunnock were not recorded in the survey area as widely distributed.

3.1.1.7 Territories were assigned following the CBC method described in Gilbert *et al*., (1998) and Bibby, *et al*., (2000)[3]. This involves the identification of clusters of registrations of birds of the same species displaying breeding characteristics (e.g., singing, alarm calling, nest building, mating) in the same general area over successive survey visits. A breeding territory is defined as at least two registrations conforming to the above criteria recorded on separate survey visits. However, for early breeders (such as common crossbill), species which are only vocal/visible during brief periods (such as lesser spotted woodpecker, or species which may lay eggs and move on (such as cuckoo), one registration of breeding behaviour was determined as adequate to assign a territory.

Figure 3-2: List of species potentially breeding and to be recorded in Mona Proposed Onshore Development Area

- Avocet
- Bittern
- Bullfinch
- Bunting, corn
- Bunting, reed
- Chough
- Common sandpiper
- Common crossbills
- Cuckoo
- Curlew
- Dotterel
- Egret, great white
- Egret, little
- Firecrest
- Flycatcher, pied
- Flycatcher, spotted
- Gadwall
- Garganey
- Godwit, black-tailed
- Kestrel
- Kingfisher
- Lapwing
- Lesser-spotted woodpecker
- Linnet
- Mallard
- Marsh harrier
- Merlin
- Nightjar
- Osprey
- Owl, barn
- Owl, short-eared
- Owl, tawny
- Oystercatcher
- Peregrine
- Pipit, meadow
- Pipit, tree
- Plover, golden
- Plover, little ringed
- Snipe
- Sparrow, house
- Sparrow, tree
- Sparrowhawk
- Spoonbill
- Starling
- Stock dove
- *Swift
- Teal
- *Tern, arctic
- *Tern, black
- *Tern, common
- *Tern, little
- *Tern, roseate
- *Tern, sandwich
- Thrush, mistle
- Thrush, song
- Tit, bearded
- Tit, marsh

[3] Bibby, C.J., Burgess, N.D., Hillis, D.M., Hill, D.A. and Mustoe, S., 2000. Bird census techniques. Elsevier.

- Goshawk
- Grebe, black-necked
- Greenfinch
- Grey partridge
- Greylag goose
- *Gull, black-headed
- *Gull, great black-backed
- *Gull, herring
- *Gull, lesser black-backed
- *Gull, little
- *Gull, mediterranean
- Hawfinch
- Hobby
- *House martin
- Plover, ringed
- Pochard
- Quail
- Red kite
- Redpoll
- Redshank
- Redstart, black
- Redstart, common
- *Rook
- Ruff
- Scaup
- Shelduck
- Shoveler
- Skylark
- Tit, willow
- Wagtail, grey
- Wagtail, yellow
- Warbler, Cetti's
- Warbler, grasshopper
- Warbler, marsh
- Warbler, willow
- Warbler, wood
- Whinchat
- Whitethroat, common
- Woodcock
- Woodlark
- Yellowhammer

*Record nesting only and ignoring flyover.

4 WINTERING WALKOVER SURVEYS ALONG THE MONA PROPOSED ONSHORE DEVELOPMENT AREA

4.1.1.1 Survey of wintering birds along the survey area comprising the Mona Proposed Onshore Development Area are aimed to establish the presence of any protected species or sensitive ornithological receptors.

4.1.1.2 The programme consists of two walkover surveys scheduled between October 2022 and April 2023, with the aim to achieve the first visit in November 2022 and the second visit in February 2023.

4.1.1.3 Survey visits are undertaken from shortly after dawn for a period of up to five hours during periods of good visibility and suitable weather conditions, i.e. avoiding persistent rain or fog, extreme temperatures and high winds. During each survey visit, an experienced ornithologist equipped with binoculars, will slowly walk a transect route coming as close as possible to all areas of the habitat.

4.1.1.4 The behaviour, location and extent of flocks and individual birds detected will be recorded using the standard BTO codes for mapping birds and bird activities (Bibby *et al*. 2000). All species will be recorded. The location of birds will be recorded directly onto a 1:7,000 scale Ordnance Survey base map.

5 CONTEXTUAL BACKGROUND DATA

5.1 WeBS Data

5.1.1.1 Where available, WeBS count data will be obtained from the BTO for the most recent high and low tide datasets which most closely corresponded to survey areas. The Wetland Bird Survey (WeBS) Report Online from the British Trust for Ornithology (BTO) reports on the latest and historical data for a site as a whole (e.g. estuary) and the data for individual WeBS sectors is available through a data request, with an associated cost for non-research projects.

5.1.1.2 WeBS counts are specifically aimed at recording the number of waterbirds which use particular wetland and coastal habitats. Core counts (high tide) are undertaken monthly and are conducted around high water on all estuaries and key wetland sites in the UK, generally on a set day each month. At this time waterbirds tend to gather at high tide roosts and counts undertaken around high water provide an estimate of the total population of birds using an area of coast.

5.1.1.3 The WeBS low tide count scheme generally records the number of waders and wildfowl that are foraging within a count sector in the intertidal and nearshore area. It aims to monitor the importance of inter-tidal feeding areas of UK estuaries and complement the information gathered by WeBS core counts. Low tide counts provide information to gauge the potential effects on waterbirds of a variety of human activities which affect the extent or value of inter-tidal habitats.

5.1.1.4 Although extremely valuable in providing historical and contextual wetland bird data for particular sites of interest, WeBS data are sometimes limited by the fact that figures cover comparatively large areas and therefore not necessarily representative of small-scale patterns of bird abundance and distribution.

5.1.1.5 The Mona Proposed Landfall is covered by the WeBS Colwyn Bay and the North Clwyd Coast site (Figure 5-1). Only the core count data was available for the Colwyn Bay and the North Clwyd Coast WeBS site and associated sectors. The WeBS aims to collate data on birds using the intertidal zone at high tide (core counts), and low tide (low tide counts).

5.1.1.6 Consequently, the WeBS data (core counts) are used to supplement the more site-specific data gathered during the intertidal and nearshore bird surveys, and to compare the representativeness of site-specific survey results.

Figure 5-1: Showing the WeBS site and the WeBS sector used for contextual data.

E.5. Onshore ecology EWG meeting 4

E.5.1 Meeting minutes

Appendix A Onshore Ecology EWG03 Meeting Minutes

Reference:	RPS_EOR0801_Mona_Onshore_Ecology_EWG04_MoM_Rev01
Meeting Name:	Mona Evidence Plan Onshore Ecology Expert Working Group (EWG) – Meeting 4
Meeting date:	19 July 2023
Meeting location:	Virtual (Microsoft Teams)

Attendees

Name	Initials	Company	Role
[redacted]	CR	RPS	Consultant
	BJ	RPS	Consultant
	LM	RPS	Consultant
	AM	RPS	Consultant
	SM	RPS	Consultant
	PRW	bp	Applicant
	KS	Conway County Borough Council (CCBC)	Statutory body
	SW	Cyfoeth Naturiol Cymru (Natural Resources Wales, NRW)	Statutory body
	NS	Cyfoeth Naturiol Cymru (Natural Resources Wales, NRW)	Statutory body
	ME	Cyfoeth Naturiol Cymru (Natural Resources Wales, NRW)	Statutory body
	SR	Royal Society for the Protection of Birds (RSPB)	Statutory body
	JW	Denbighshire County Council (DCC)	Statutory body
	MC	Amphibian and Reptile Conservation Trust (ARC)	Non-statutory body

Item	Detail	Actions	Date
	Introduction		
1	Introduction RPS provided a summary of the agenda for the Fourth Onshore Ecology EWG. This included the following items: Summary of 3rd Onshore Ecology EWG; indicative meetings programme update; update on the Mona Offshore Wind Project; onshore and intertidal ornithology; onshore ecology; key section 42 responses; and questions.		
2	Summary of 3rd Onshore Ecology EWG RPS provided a summary of the points covered during the 3rd Onshore Ecology EWG. This included project updates prior to PEIR; s42 consultation; meeting programme; survey methodologies; and approach to mitigation, including the LEMP, Outline CoCP and Biodiversity Statement. The key actions following the 3rd Onshore Ecology EWG included: EWG • review meeting minutes and agreement logs (completed); • review survey methodologies and provide feedback (completed); and • provide feedback on the proposed approach for reptile surveys (incomplete). RPS • confirm longshore drift is considered in the PEIR (complete); and • investigate HyNet project for bat survey approach (complete). ARC • provide case study for GCN/reptile habitat creation (complete). RPS provided an overview of completed and upcoming Onshore Ecology EWGs, including the dates, stakeholders and focus of previous and future meetings. ME – questioned which bodies would be attending meetings to discuss mitigation associated with the proposed onshore substations and stated that NRWs primary focus in terms of engagement would be Great Crested Newts. JW – questioned who from DCC would be attending meetings to discuss mitigation associated with the proposed onshore substations. RPS confirmed that JW would be invited from DCC.		
3	Update on the Mona Offshore Wind Project (overview) Statutory consultation for the Mona Offshore Wind Project ended 04 June 2023. Ongoing review of s42 responses, including those to be addressed as part this EWG. Ongoing technical, engineering, and environmental work. Application still expected to be submitted to PINS Q1 2024.		

Item	Detail	Actions	Date
	Refinement of the Mona Onshore Order Limits (remains indicative at this stage). Undertaking regular BRAG workshops with topic specialists and engineers. BRAG outputs are used to refine the design further in response to key design and/or environmental constraints. Outcome – selection of preferred route for onshore cable, onshore substation option and temporary and permanent access routes. Two options (Options 1 and 5) remain under consideration for access routes to the onshore substation. Both options originate from Glascoed Road to the north of the onshore substation. Option 1: approaches from the west of the onshore substation. Option 5: approaches from the north east of the onshore substation. ME – raised that there were two GCN compensation/ mitigation areas located near/ within the proposed Option 5 access route to the onshore substation, which would require consideration from the Mona Offshore Wind Project.		
4	Update on the Mona Offshore Wind Project (substation access) Option 1: Western access route to the onshore substation: This potential access route is located near to noise sensitive receptors; potential for disturbance to the Denbighshire Crematorium; longer route and greater land take when compared to Option 5: North eastern access route; requires the permanent severance of agricultural land. Option 5: North eastern access route to the onshore substation: Utilises existing construction access formerly used by Burbo Bank Offshore Wind Farm; Permanent access will utilise the existing; National Grid access from Glascoed Road; Northern section of Option 5 partially encroaches into the 15 m buffer associated with ancient woodland; Option 5 would result in the loss of individual trees and a woodland block to the south. PRW – asked Onshore Ecology EWG if there were any immediate concerns regarding the Option 5 access route to the onshore substation, including requirement to route through 15 m ancient woodland buffer. Requested a separate meeting to address any potential concerns, including mitigation/ enhancement requirements for Option 1 and 5 access routes to the onshore substation. Also stated that the Mona Offshore Wind Project has undertaken field surveys to identify and avoid veteran and category A trees within or near Option 5 access route. JW – queried what access would comprise of. RPS confirmed that access would follow a similar approach as Burbo Bank Offshore Wind Farm. In addition, also raised requirement for a 30:1 ratio for the compensation of ancient woodland associated with Option 5 access route. ME – asked if access would be temporary or permanent and emphasised importance of protecting/ retaining existing mitigation/compensation areas associated with other nearby	RPS and bp to set up meeting to discuss Option 1 and 5 access routes to onshore substation.	July 2023

Item	Detail	Actions	Date
	projects. Also requested that any baseline amphibian data is shared relevant local records centres and Cofnod and to demonstrate that if Option 5 was to go ahead, the Mona Offshore Wind Project would need to demonstrate that this is the only satisfactory alternative.		
Onshore and Intertidal Ornithology			
5	Introduction RPS provided a summary of the agenda for onshore and intertidal ornithology. This included the following items: summary of surveys undertaken; summary of survey data; mitigation and enhancement measures; Breeding Bird Protection Plan (BBPP); key issues for agreement with the onshore ecology EWG; and questions.		
6	Survey Programme RPS provided a summary of field surveys undertaken to date, including the area, methodology, frequency, and timings of intertidal waterbird surveys; breeding bird surveys; onshore and wintering passerine and raptor surveys. RPS also provided a summary of field surveys that remain outstanding, including a second year of intertidal waterbird surveys proposed from July 2023 and November 2023.		
7	Wintering passerines and raptor surveys (Year 1) Wintering passerines and raptor surveys (Year 1) identified the area is of low importance to ornithological features. One year of data considered sufficient for the assessment and intend to exclude a second year of survey. Intertidal waterbird surveys would continue until November 2023 (two years of data) to capture seasonal/inter-annual variation. Two years of survey data acquired for breeding birds along the Mona Proposed Onshore Development Area.		
8	Breeding Birds (Year 2) At least of 1,949 (79 species) were recorded within the Survey Area in the 2023 breeding season. Of the 79 species identified, 52 were recorded displaying breeding characteristics. Most breeding bird species recorded within the Survey Area were common or widespread species. However, some rarer species were recorded within the Survey Area, including: grasshopper warbler, lesser whitethroat, red kite, redstart, and spotted flycatcher. Incidental sightings of note included: honey buzzard, goshawk, peregrine, hobby, and crossbill. None of these species were considered to be nesting within the Survey Area.		
9	Intertidal Waterbirds (Year 2) The second year of surveys for intertidal waterbirds commenced in December 2022 and are due to be completed in November 2023. The interim findings for the second		

Item	Detail	Actions	Date
	year of intertidal waterbirds surveys will be presented as part of the next Onshore Ecology EWG.		
10	Mitigation measures proposed RPS provided a summary of mitigation measures adopted as part of the project, including the Outline CoCP and LEMP, which would include the BBPP. The BBPP will be prepared as part of the LEMP and will include the following measures: • Deployment of a ECoW for relevant pre-construction and construction activities; • Scrub clearance/felling/strimming to discourage nesting prior to breeding season in suitable areas (where appropriate); • Pre-commencement surveys to identify potential nesting locations of key protected or sensitive species (e.g. Schedule 1 species); and • If sensitive breeding birds are found, then a bird protection zone will be established.		
11	Issues for Agreement with EWG RPS identified the following issues which required agreement from the Onshore Ecology EWG: • Is the EWG satisfied with two years survey data for intertidal waterbirds and breeding birds? • Is the EWG satisfied with one year's survey data for the wintering passerine and raptors? • Is the EWG satisfied with the mitigation measures proposed, including the BBPP?	Onshore Ecology EWG to review meeting minutes and agreement log accordingly.	July 2023
12	Questions SR – raised concerns regarding little ringed plover and kingfisher which were identified as potential receptors in the PEIR. AM – explained that subsequent surveys identified habitat within the survey area was unsuitable for little ringer plover. SR – stated he was happy with 1 year's survey data for wintering birds on the basis that habitats within the survey area was identified as of low importance. However, requested that this information is presented to RSPB to reach informed conclusions on this point.	RPS to share survey data with RSPB for their review.	July 2023
Onshore Ecology			
13	Introduction RPS provided a summary of the agenda for onshore and intertidal ornithology. This included the following items: summary of surveys undertaken; summary of survey data; mitigation and enhancement measures; key issues for agreement with the onshore ecology EWG; Digital data sharing platform and questions.		
14	Surveys Underway		

Item	Detail	Actions	Date
	RPS provided a summary of the surveys which are underway with the interim findings presented as part of the 4th Onshore Ecology EWG. These included: • Bats - Trees: Preliminary Ground Level Roost Assessments (PGLRA), Tree Inspections and Dusk/ Dawn Surveys. • Bats - Buildings: Preliminary Roost Assessments (PRA), Buildings Inspections and Dusk/Dawn Surveys. • Bats - Activity: Bat Activity Surveys using Static Bat Monitors at multiple locations, including Kinmell Hall. • Badger: Badger Walkover Surveys to identify badger setts and requirements for monitoring. • Otter and Water Vole: Initial Walkover Surveys for signs and evidence of otter and water vole. To be followed by further Walkover Surveys. • Great Crested Newts (GCN): Habitat Suitability Index, eDNA surveys and Population Size Class Assessments. • Hazel Dormice: Setting up dormouse traps followed by visits to check traps. • Hedgerows: Hedgerow Condition Assessment and Hedgerow Regulations Survey. RPS explained that the following surveys are underway with interim findings to be presented as part the next EWG: • INNS; • Aquatic Invertebrates; • Terrestrial Invertebrates; • River Morphology; and • NVC.		
15	Bats – Trees RPS provided a summary of bat – tree survey coverage and results to date. Most land parcels with trees requiring GLRA within the survey boundary have been subject to survey. However, there are some land parcels which are yet to be subject to GLRA or where the requirement remains TBC. A total of 4475 trees have been subject to GLRA, which identified the following: 572 high potential roosts; 1535 moderate potential roosts;1349 low potential roosts; 1011 negligible potential roosts. Of these, a total of 698 trees were subject to aerial inspection, which identified 8 confirmed bat tree roosts. A further 359 trees are located within the survey area that will require aerial inspection. Of the 8 confirmed bat tree roosts identified within the survey area: • Two roosts are located within refined onshore cable corridor; • Three roosts are located within 20m of the refined onshore cable corridor; and		

Item	Detail	Actions	Date
	• Three roosts are located outside the refined onshore cable corridor. RPS provided a summary of next steps for bat – tree surveys. This includes: GLRA and aerial inspections of remaining trees (with high to moderate suitability for roosting bats) within the refined survey area; Second aerial tree inspection of trees located within the area for the proposed onshore substation; and Dusk emergence surveys on trees (with moderate/high suitability for roosting bats) that are not safe to climb or inspect from ground.		
16	Bats – Buildings RPS provided a summary of bat – building survey coverage and results to date. Several land parcels with buildings requiring initial inspections within the survey area have been subject to survey. However, there are some land parcels which are yet to be subject to initial inspections or where the requirement remains TBC. A total of 22 structures have been subject to initial building inspections (external only), which identified the following: 6 structures with high suitability for roosting bats; 7 structures with moderate suitability for roosting bats; 9 structures with low suitability for roosting bats. Of these structures, 3 are located within the refined onshore cable route and substation area and subject to PRA, which identified the following: large stone/flint wall with multiple potential roost features close to landfall – high suitability for roosting bats; small shed within the refined onshore cable route – low suitability for roosting bats; stone agricultural barn close to the area for the proposed onshore substation – high suitability for roosting bats. Any structures that may be impacted by the Mona Offshore Wind Project (with moderate or high suitability for roosting bats) will be subject to up to three dusk emergence and/or dawn re-entry surveys.		
17	Bats – Activity RPS provided a summary of bat – activity survey coverage and results to date. A total of 10 automatic static bat monitors deployed across the survey area. Data collection started in April 2023 and will remain ongoing throughout the survey season. RPS provided figures showing the location of automatic static bat monitors from April 2023 to July 2023 onwards. RPS provided tables presenting results from automatic static bat monitors for April and May 2023 (session 2). The results were grouped according to the onshore substation option the static bat monitor was located.		
18	Bats – Kinmel Hall RPS provided a summary of survey coverage at Kinmel Hall and results to date. Fixed point count survey completed on the 28 June 2023. Undertaken at six hedgerows located in		

Item	Detail	Actions	Date
	proximity to Kinmel Hall. Surveys started 15 minutes before sunset and continued for 3 hours after sunset. RPS presented figures showing the location of the six hedgerows subject to foxed point count surveys. No lesser horseshoe activity recorded at the six surveyed locations. Additional fixed point survey proposed for 19 July 2023 at the same six locations. However, FL6 will be located along the double hedgerow track slightly east of the June location, to cover two hedgerows instead of one. A third survey will be undertaken at this location in August 2023.		
19	Badger RPS provided a summary of badger survey coverage and results to date. Several land parcels requiring badger walkover surveys within the survey area have been subject to survey. However, there are some land parcels which are yet to be subject to walkover surveys or where the requirement remains TBC. RPS presented figures showing the outcome of badger surveys within the survey area, including the location of badger signs, setts and runs. Key areas of concern include active badger setts identified within the survey area. Badger walkover surveys on hold due to vegetation growth impairing views for surveys. Badger walkover surveys will re-commence again in autumn 2023 once vegetation has receded. Sett monitoring surveys of active badger setts is proposed to start autumn 2023. Monitoring surveys will comprise camera traps located at sett entrances and activity monitoring, including sand/stick traps to determine usage of sett entrances. JW – raised opportunity to utilise existing nature reserve established by DCC to fulfil requirements for badger mitigation. Also identified pole cat as a potential receptor, which may require consideration in the assessment. SM – stated that pole cat have not been specifically considered in the assessment and that these have not be recorded during the surveys undertaken to date. However, suggested that badger sett monitoring would also identify polecat if these were present within the survey area.	RPS and DCC to confirm feasibility of using existing nature reserve to fulfil mitigation requirements for badgers.	July 2023
20	Otter RPS provided a summary of otter survey coverage and results to date. All land parcels scoped in for otter have been subject to an initial walkover survey in April 2023. An additional three survey visits will be undertaken for each of the land parcels identified. Two potential holts have been identified within the survey area. One of these holts (eastern extent) is in an area that will no longer be impacted due to the refined Onshore Order Limits. The other potential holt is located within the onshore export cable corridor to the west.		

Item	Detail	Actions	Date
21	Water Vole RPS provided a summary of water vole survey coverage and results to date. Seven land parcels with the potential to support water vole were scoped in for walkover surveys for signs. All land parcels have now been subject to an initial walkover survey in April 2023. A second walkover survey for signs of water vole will be undertaken in July/August 2023. Evidence of water vole has been recorded at two locations within the survey area. One where a potential burrow was present, and one where a latrine was identified. The latrine is in an area that will not be impacted by works following refinement of the onshore order limits.		
22	Great Crested Newt RPS provided a summary of great crested newt survey coverage and results to date. A total of 41 land parcels were identified with ponds requiring eDNA surveys for GCN. To date, 14 of these land parcels have been subject to eDNA surveys to determine the presence/absence of GCN. A total of 8 ponds located within the survey area subject to eDNA surveys returned positive results for GCN. Due to access and seasonal constraints, further GCN surveys, including eDNA and population size class assessments are proposed in 2024. However, it is considered that baseline data collection to date is sufficient to inform the ES and mitigation requirements. Additional surveys to be undertaken in 2024 will be used to fulfil requirements for the relevant EPS mitigation licenses. ME – stated that did not consider missing GCN data would be material to the DCO application and happy for further GCN surveys to be undertaken in 2024. Explained that this was on the basis that sufficient existing baseline and monitoring data for GCN is available (associated with previous DCO applications such as Burbo Bank Offshore Wind Farm) to inform the assessment. Stated that Mona Offshore Wind Project would need to consider ponds which may be functionally linked (i.e. not just breeding ponds for GCN), including requirements to provide further mitigation areas to compensate for the loss of existing mitigation areas associated with other projects. JW – requested that RPS confirm that proposed mitigation areas do not conflict with sites allocated under the DCC Local Development Plan (i.e. other planning uses).		
23	Hazel Dormouse RPS provided a summary of hazel dormouse survey coverage and results to date. A total of 47 land parcels were scoped in for hazel dormouse nest tube surveys. To date, 5 land parcels have been subject to hazel dormouse nest tube surveys. None of the next tube surveys undertaken to date have recorded hazel dormouse. Only wood mouse have been recorded as part of the next tube surveys. Due to access and		

Item	Detail	Actions	Date
	seasonal constraints, further nest tube surveys are proposed in 2024. However, it is considered that baseline data collection to date is sufficient to inform the ES and mitigation requirements. Additional surveys to be undertaken in 2024 will be used to fulfil requirements for the relevant EPS mitigation licenses.		
24	Hedgerow Surveys RPS provided a summary of hedgerow surveys coverage and results to date. A total of 96 land parcels were identified with hedgerows requiring surveys. To date, 47 of these land parcels have been subject to hedgerow surveys. The hedgerow surveys have identified a number of native species rich hedgerows located within the survey area. In addition, the surveys also identified a number of species poor defunct hedgerows.		
25	Issues for Agreement with EWG RPS identified the following issues which required agreement from the Onshore Ecology EWG: • Is the EWG satisfied that baseline data collection for GCN and Hazel Dormice is sufficient to inform the ES and mitigation requirements? • Is the EWG satisfied that additional surveys can be undertaken in 2024 to fulfil requirements for the relevant EPS mitigation licenses? ME – request that RPS provide an email setting out approach to the survey and assessment of GCN and hazel dormouse, including requirements for further surveys in 2024 and ES addendum. NRW would review this and provide their official response to this approach.	Onshore Ecology EWG to review meeting minutes and agreement log accordingly. RPS to provide email setting out assessment approach for GCN and hazel dormouse for the ES.	July 2023
26	Digital Data Sharing Platform RPS presented a digital sharing platform. The digital data sharing platform presents the location and results for surveys undertaken to date. Moving forwards, this digital data sharing platform will be updated and shared at each Onshore Ecology EWG. This digital data sharing platform operates using the online ArcGIS web map, which allows users to select/de-select features of interest and view these in relation to the Mona Offshore Wind Project.	RPS to share link to Digital Data Sharing Platform.	July 2023
27	Questions ME – requested that all GCN baseline data collected to date is shared and uploaded to relevant GCN data bases. RPS confirmed that this would be undertaken once it has been through the quality review process. KS – asked if all cables will be contained within the 74 m onshore cable corridor.	RPS to share GCN data to relevant databases when available.	July 2023

Item	Detail	Actions	Date
28	Key s42 Reponses from NRW RPS provided a summary of key s42 responses from NRW. This included: • Provision of 8 m easement between the banks of watercourse and the Mona Offshore Wind Project, which may increase where otter/water vole are present. • Provision of temporary and long term habitat compensation areas for GCN, which are to be included as part of the LEMP. • Measures to prevent impacts to GCN arising from SuDS (e.g. becoming trapped) are to be included in the LEMP. • Requirement for a monitoring plan, including key performance indicators, licensing requirements, persons responsible, reporting process (Wales GCN monitoring scheme) and remedial measures. • Consideration of other solar farms and GCN mitigation areas associated with Awel y Môr Offshore Wind Farm in the assessment of cumulative effects. • Inclusion of existing baseline data associated with St Asaph Business Park and Awel y Môr Offshore Wind Farm.		
29	Key s42 Reponses from DCC RPS provided a summary of key s42 responses from DCC. This included: • The LEMP will include the proposals for the enhancement and creation of additional compensatory habitat to demonstrate overall net benefit for biodiversity. • The application will include a Biodiversity Statement, which will explain how the Mona Offshore Wind Project intends to achieve overall net benefit for biodiversity. • HDD will be used where possible to avoid potential impacts on key habitats of ecological importance (e.g. ancient woodland). However, HDD is not possible at all locations. • Provision of temporary and long term habitat compensation areas for GCN, which are to be included as part of the LEMP.		
30	Key s42 Reponses from CCC RPS provided a summary of key s42 responses from CCC. This included: • Requirement for full BS5837 'Trees in relation to design, demolition and construction' reports, including details of areas of woodland and individual trees likely to be affected by the Mona Offshore Wind Project. • Consideration of management scheme to enable restoration of the vegetated shingle beach to mitigate potential impacts on the SSSI.		
31	Key s42 Reponses from RSPB RPS provided a summary of key s42 responses from RSPB. This included:		

Item	Detail	Actions	Date
	• Despite the low frequency of Lesser Black-back identified during surveys, this species will be considered carefully as breeding colonies located in the Irish Sea require restoration to favourable conservation status.		
32	Next Steps RPS provided a summary of the next steps for the Mona Offshore Wind Project and Onshore Ecology EWG. This included: • Circulation of the Meeting Minutes and Agreement Log for the 4th Onshore Ecology EWG for comment. • Circulation of the updated Onshore Ecology Survey Methodologies with the Onshore Ecology EWG for comment. • Continuation of the onshore ecology surveys prior to the 5th Onshore Ecology EWG based on the refined Onshore Order Limits. • Ongoing refinement of the Onshore Order Limits in response to environmental and/or design constraints and s42 responses. • Identify mitigation measures for the LEMP. • Ongoing work to identify mitigation and enhancement measures at the onshore substation. Hold a meeting with stakeholders to discuss.		
33	Questions		

E.5.2 Wintering and Migratory Bird Surveys (2022/23)

Partners in UK offshore wind

MONA OFFSHORE WIND PROJECT

Wintering and migratory bird surveys (2022/23)
Technical Note

Image of an offshore wind farm

September 2023

FINAL

www.morganandmona.com/en

Document status

Version	Purpose of document	Authored by	Reviewed by	Approved by	Review date
Final	Final for EWG	RPS	RPS	bp/EnBW	15/09/2023

Prepared by:

RPS

Prepared for:

Mona Offshore Wind Ltd.

1 ONSHORE ORNITHOLOGY WINTERING AND MIGRATORY BIRDS SURVEY FINDINGS

1.1 Aim of surveys

1.1.1.1 The aim of wintering and migratory bird surveys was to characterise the distribution and abundance of birds within the Mona Onshore Order Limits to inform the Environmental Statement for the Mona Offshore Wind Project.

1.2 Study area

1.2.1.1 The area subject to wintering and migratory bird surveys ('the Mona onshore ornithology wintering and migratory birds study area') comprises the Mona Onshore Order Limits plus a 250 metre (m) buffer. The location and geographic extent of the Mona onshore ornithology wintering and migratory birds study area is presented in Appendix A of this Technical Note.

1.2.1.2 The 250 m survey buffer was included to account for bird interests that may occur adjacent, or relatively close to, the Mona Onshore Order Limits. This distance is based on potential disturbance distances for bird species (Hötker *et al*., 2006; Cutts *et al*., 2013; Goodship & Furness, 2002).

1.3 Methodology

1.3.1.1 The wintering and migratory bird surveys comprised two walkover surveys of the Mona onshore ornithology wintering and migratory birds study area undertaken between November 2022 and March 2023.

1.3.1.2 Two survey visits were completed, one in November/December 2022 and one in February/March 2023. Both survey visits were undertaken during daylight hours. In addition, walkover surveys were only conducted in weather conditions suitable for making observations, and avoided periods of heavy precipitation, strong winds (Beaufort Wind Force of 5 and above) or very poor visibility (less than 100 m).

1.3.1.3 The behaviour, location and extent of flocks and individual birds detected was recorded using the standard British Trust for Ornithology (BTO) codes for mapping birds and bird activities (Bibby *et al*., 2000). Where possible, all behaviours, sex and age were noted using standard BTO symbology.

1.3.1.4 Where land access was granted, the route came as close as possible to all habitat types present within the Mona onshore ornithology wintering and migratory birds study area. Inaccessible areas located within the Mona onshore ornithology wintering and migratory birds study area were scanned using optics where possible.

1.3.1.5 All bird species seen or heard along the route were recoded including bird species of conservation value:

- EU Birds Directive Annex I and regularly occurring migratory species;
- Schedule 1 of the Wildlife and Countryside Act;
- Section 7 species of the Environment (Wales) Act 2016;
- A qualifying interest of a nearby SPA or SSSI;
- Red or Amber-listed Birds of Conservation Concern (BOCC5) (Stanbury *et al*. 2021); and

- Red or Amber-listed Birds of Conservation Concern Wales (BOCC4 Wales) (Johnstone *et al*. 2022).

1.4 Survey dates and weather conditions

1.4.1.1 Table 1.1 contains a summary of the dates, duration and weather conditions of wintering and migratory bird surveys undertaken within the Mona onshore ornithology wintering and migratory birds study area.

Table 1.1: Wintering and migratory bird survey dates and weather conditions

Survey date	Start time	End time	Wind speed[0]	Wind direction	Rain[1]	Cloud cover[2]	Cloud height[3]	Visibility[4]	Frost[5]	Snow[6]
29/11/2022	08:40	15:25	0	-	0	4	2	2	0	0
01/12/2022	08:10	15:35	0	-	0	6	2	2	0	0
02/12/2022	08:10	15:40	2	SE	0	5	2	2	0	0
08/12/2022	08:05	15:35	1	N	2	7	2	1	0	2
09/12/2022	08:15	15:25	2	SE	4	8	2	1	0	0
12/12/2022	08:20	15:55	2	S	0	1	2	2	2	1
13/12/2022	08:20	16:05	1	SE	0	7	2	2	2	1
15/12/2022	08:25	15:50	4	SE	0	2	2	2	2	1
21/02/2023	08:35	16:00	4	SW	2	8	2	2	0	0
23/02/2023	07:30	16:15	3	SE	0	5	2	2	0	0
24/02/2023	07:30	16:15	4	NE	2	8	1	2	0	0
27/02/2023	07:30	16:10	3	NE	0	8	2	2	0	0
28/02/2023	07:30	16:05	3	NE	2	8	2	2	0	0
01/03/2023	07:30	15:30	3	NE	3	8	2	2	0	0
22/03/2023	09:07	15:30	5	W	0	1	2	-	-	-
24/03/2023	08:33	16:34	5	SW	0	6	2	-	-	-
27/03/2023	06:50	-	1	S	0	1	-	-	1	0

Survey date	Start time	End time	Wind speed[0]	Wind direction	Rain[1]	Cloud cover[2]	Cloud height[3]	Visibility[4]	Frost[5]	Snow[6]
28/03/2023	07:01	-	3	SE	1	8	2	-	0	0
29/03/2023	06:30	-	3	S	0	8	2	-	0	0
30/03/2023	06:30	14:36	2	SW	0	6	2	-	0	0

Notes

Wind speed[0]: Beaufort scale

Rain[1]: 0=none, 1=drizzle/mist, 2=light showers, 3=heavy showers, 4=heavy rain

Cloud cover[2]: Given in eighths

Cloud height[3]: 0=<150m, 1=150-500m, 2=>500m

Visibility[4]: 0=poor (<1km), 1=moderate (1-3km), 2=good (>3km)

Frost[5]: 0=none, 1=ground, 2=all day

Snow[6]: 0=none, 1=ground, 2=high ground

2 RESULTS

2.1.1.1 A total of 65 species were recorded within the Mona onshore ornithology wintering and migratory birds study area during the survey visits undertaken in winter 2022/23 (Table 2.1). Of these, 21 species were amber-listed (BOCC5 UK) and 13 species were red-listed (BOCC5 UK). In addition, 19 of the recorded species were BOCC4 Wales amber-listed species and 13 BOCC4 Wales red-listed species.

2.1.1.2 The distribution of BOCC5 UK and BOCC4 Wales red and amber-listed species are shown in Appendix A of this Technical Note.

Table 2.1: Abundance recorded during the 2022/23 surveys

[1]Mean abundance rounded up to a whole number of birds and calculated as the mean average of the first and second visit.

Taxonomic group	Species	UK BOCC5 status	BOCC4 Wales status	Number recorded visit 1	Number recorded visit 2	Mean abundance[1]
Swans, geese and ducks	Mallard	Amber	Green	3	23	13
	Teal	Amber	Amber	0	9	5
Partridges and pheasants	Pheasant	Introduced	Introduced	1	19	10
Cormorants and shags	Cormorant	Green	Green	1	0	1
Herons and storks	Grey heron	Green	Amber	1	0	1
	Little egret	Green	Green	0	1	1
Raptors	Buzzard	Green	Green	6	16	11
	Sparrowhawk	Amber	Green	1	6	4
Rails, crakes and coots	Coot	Green	Amber	0	7	4
	Moorhen	Amber	Green	1	7	4
Waders	Curlew	Red	Red	11	0	6
	Oystercatcher	Amber	Amber	3	2	3
	Snipe	Amber	Amber	8	2	5
	Woodcock	Red	Red	2	1	2
Gulls and terns	Black-headed gull	Amber	Red	72	2	37
	Common gull	Amber	Amber	77	0	39
	Great black-backed gull	Amber	Amber	1	0	2
	Herring gull	Red	Red	130	147	139
Woodpeckers	Great spotted woodpecker	Green	Green	8	8	8
Passerines	Blackbird	Green	Green	120	121	121
	Blue tit	Green	Green	31	83	57
	Bullfinch	Amber	Amber	6	23	15
	Carrion crow	Green	Green	32	79	56
	Chaffinch	Green	Amber	93	82	88
	Chiffchaff	Green	Green	0	51	26
	Coal tit	Green	Amber	1	3	2
	Collared dove	Green	Green	1	3	2
	Common crossbill	Green	Green	1	0	1
	Dunnock	Amber	Amber	26	118	72

Taxonomic group	Species	UK BOCC5 status	BOCC4 Wales status	Number recorded visit 1	Number recorded visit 2	Mean abundance[1]
	Feral pigeon	Green	Not assessed	0	27	14
	Fieldfare	Red	Amber	32	0	16
	Goldcrest	Green	Red	3	27	15
	Goldfinch	Green	Green	11	37	24
	Great tit	Green	Green	19	77	48
	Greenfinch	Red	Red	3	16	10
	Grey wagtail	Amber	Amber	0	1	1
	House martin	Red	Amber	0	5	3
	House sparrow	Red	Amber	51	111	81
	Jackdaw	Green	Green	260	173	217
	Jay	Green	Green	6	5	6
	Linnet	Red	Red	2	3	3
	Long-tailed tit	Green	Green	36	28	32
	Magpie	Green	Amber	20	121	71
	Meadow pipit	Amber	Red	31	101	66
	Mistle thrush	Red	Amber	15	18	17
	Nuthatch	Green	Green	2	7	5
	Pied wagtail	Green	Green	3	8	6
	Raven	Green	Green	6	3	5
	Redwing	Amber	Green	271	95	183
	Robin	Green	Green	50	128	89
	Rook	Amber	Red	25	44	35
	Siskin	Green	Green	0	1	1
	Skylark	Red	Amber	1	4	3
	Song thrush	Amber	Green	31	27	29
	Starling	Red	Red	343	239	291
	Stock dove	Amber	Green	9	16	13
	Stonechat	Green	Green	1	3	2
	Swallow	Green	Green	0	1	1
	Tree sparrow	Red	Red	1	0	1
	Treecreeper	Green	Green	3	2	3
	Wheatear	Amber	Amber	0	2	1
	Willow warbler	Amber	Red	0	1	1
	Woodpigeon	Amber	Green	234	124	179

Taxonomic group	Species	UK BOCC5 status	BOCC4 Wales status	Number recorded visit 1	Number recorded visit 2	Mean abundance[1]
	Wren	Amber	Green	31	66	49
	Yellowhammer	Red	Red	0	1	1

3 JUSTIFICATION

3.1.1.1 The following points provide justification for only providing one year of survey data to inform the assessment of migratory and wintering birds for the Mona Offshore Wind Project:

- The absence of species of high conservation concern (e.g., Schedule 1 species vulnerable to disturbance during the non-breeding season).
- Migratory and wintering birds identified during the surveys are characteristic of a typical bird assemblage expected to be found in the area. The wintering and migratory bird assemblage is characteristic of pastures and woodlands. Both habitats are well represented within the landscape of this part of North Wales.
- The sampling regime (two visits per season) is deemed adequate to capture the typical range of species that could occur over the wintering and migratory season.

3.1.1.2 Based on the justifications presented above, it is considered that one year of survey data is sufficient for the assessment of migratory and wintering birds for the Mona Offshore Wind Project.

3.1.1.3 Therefore, the applicant does not consider it necessary to carry out additional migratory and wintering surveys over the winter 2023/24 period for the purposes of the EIA.

3.1.1.4 As such, the applicant is seeking confirmation from relevant members of the Onshore Ecology Expert Working Group that one year of migratory and wintering bird survey data is satisfactory for the purposes of the EIA for the Mona Offshore Wind Project.

4 REFERENCES

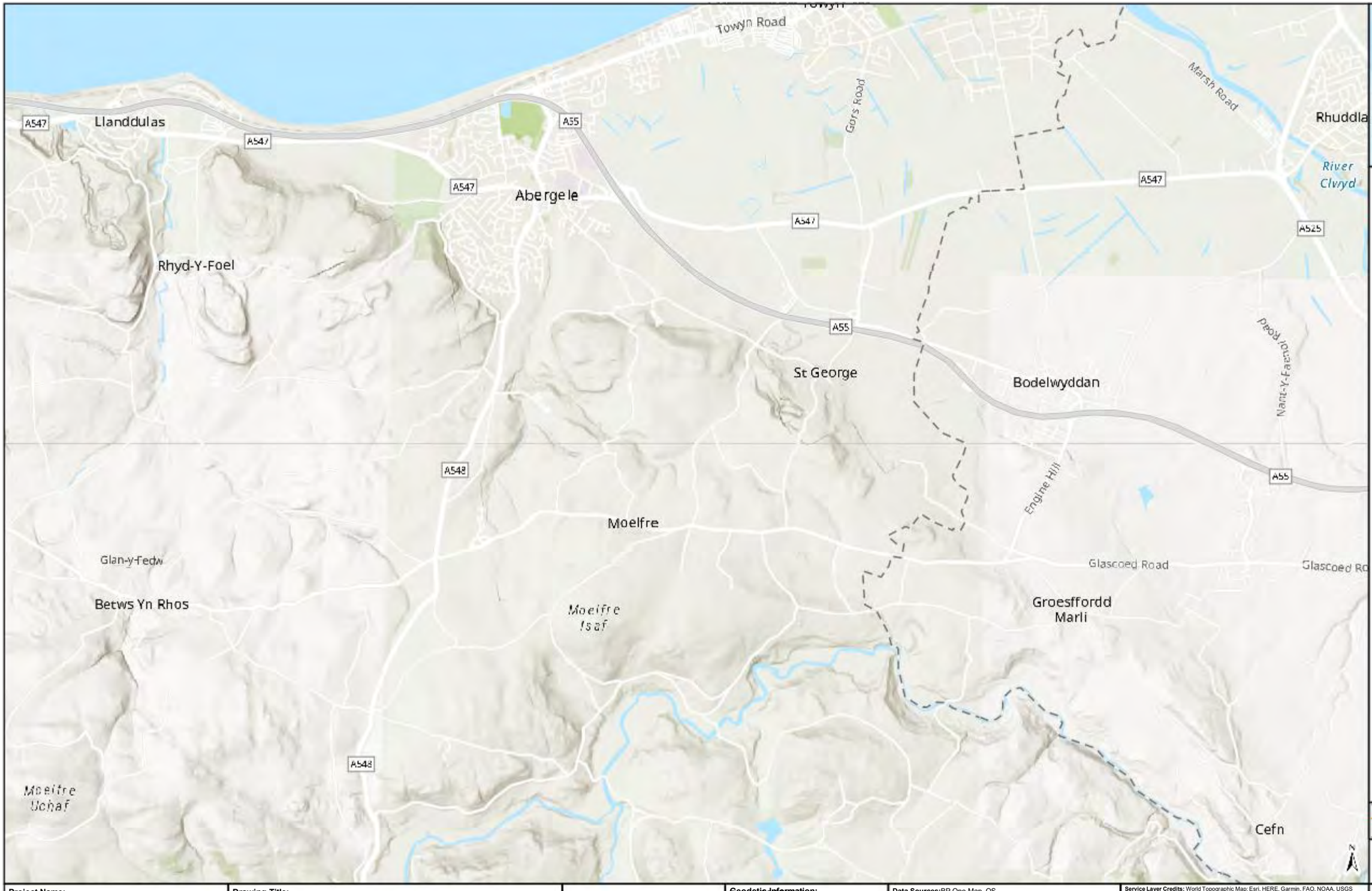
Bibby, C.J. (2000). Bird census techniques. Elsevier.

Cutts N., Hemingway K. and Spencer J. (2013) Waterbird Disturbance Mitigation Toolkit; University of Hull. Available from: https://tide-toolbox.eu/tidetools/waterbird_disturbance_mitigation_toolkit/. Accessed August 2023.

Goodship, N.M. and Furness, R.W. (2022) Disturbance Distances Review: An updated literature review of disturbance distances of selected bird species. A report from MacArthur Green to NatureScot.

Hötker H., Thomsen K.M. and Jeromin H. (2006) Impacts on biodiversity of exploitation of renewable energy sources: the example of birds and bats - facts, gaps in knowledge, demands for further research, and ornithological guidelines for the development of renewable energy exploitation. Michael-Otto-Institut im NABU, Bergenhusen.

A.1. Appendices



LEGEND

- Mona Onshore Order Limits
- 250m buffer
- Number of birds: 1-3
- Number of birds: 4-10
- Number of birds: 11-50
- Number of birds: 50+

Project Name:
MONA OFFSHORE WIND PROJECT

Drawing Title:
Wintering Birds Survey Results Bullfinch November 2022 - March 2023 - Page: 1

0 500 1,000 m

Geodetic Information:
Datum: OSGB 1936
Projection: British National Grid
Scale@379mmx231mm: 1:40,000

Data Sources: BP One Map, OS

Service Layer Credits: World Topographic Map: Esri, HERE, Garmin, FAO, NOAA, USGS
World Hillshade: Esri, Intermap, NASA, NGA, USGS
World Topographic Map: Esri UK, Esri, HERE, Garmin, Foursquare, GeoTechnologies, Inc, METI/NASA, USGS

Drawing Number:
ECO01789-0042-01

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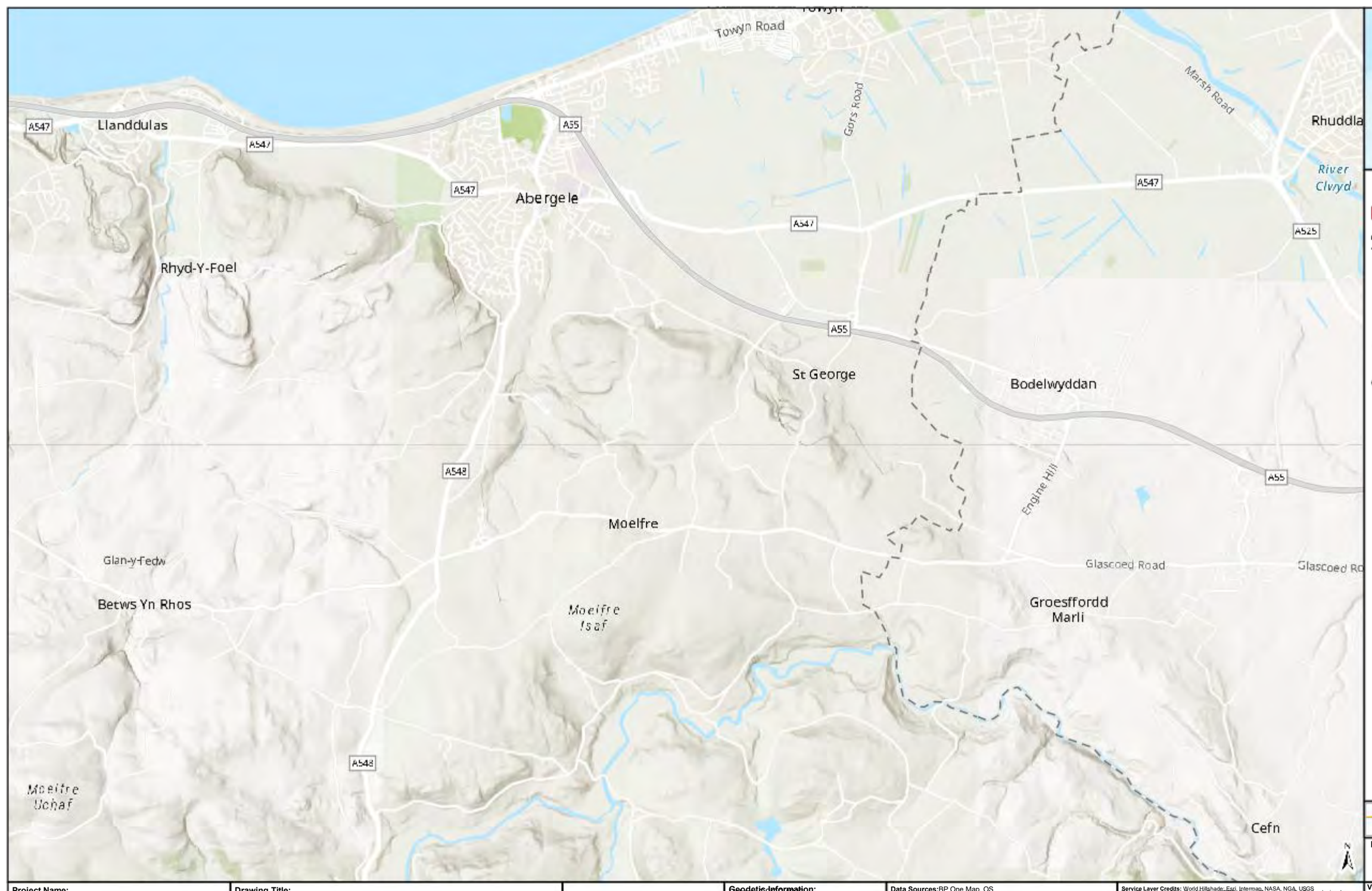

LEGEND

- Mona Onshore Order Limits
- 250m buffer
- Number of birds: 1-3
- Number of birds: 4-10
- Number of birds: 11-50
- Number of birds: 50+

Project Name:
MONA OFFSHORE WIND PROJECT

Drawing Title:
Wintering Birds Survey Results Black-headed gull
November 2022 - March 2023 - Page: 2

0 500 1,000 m

Geodetic Information:
Datum: OSGB 1936
Projection: British National Grid
Scale@379mmx231mm: 1:40,000

Data Sources: BP One Map, OS

Service Layer Credits: World Hillshade, Esri, Interman, NASA, NGA, USGS
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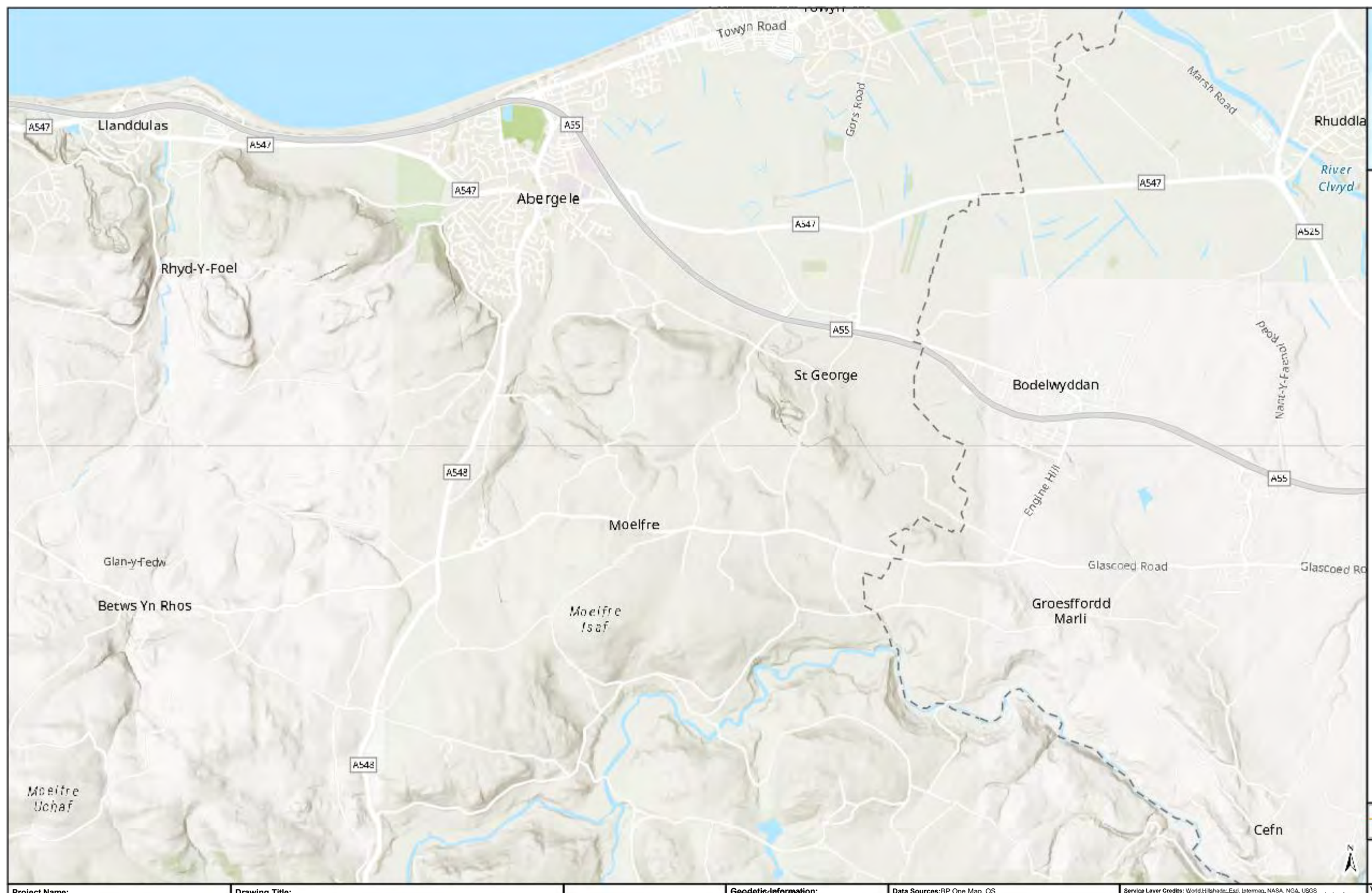

LEGEND

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- 250m buffer
- Number of birds: 1-3
- Number of birds: 4-10
- Number of birds: 11-50
- Number of birds: 50+

Project Name:
MONA OFFSHORE WIND PROJECT

Drawing Title:
Wintering Birds Survey Results Chaffinch November 2022 - March 2023 - Page: 3

0 500 1,000 m

Geodetic Information:
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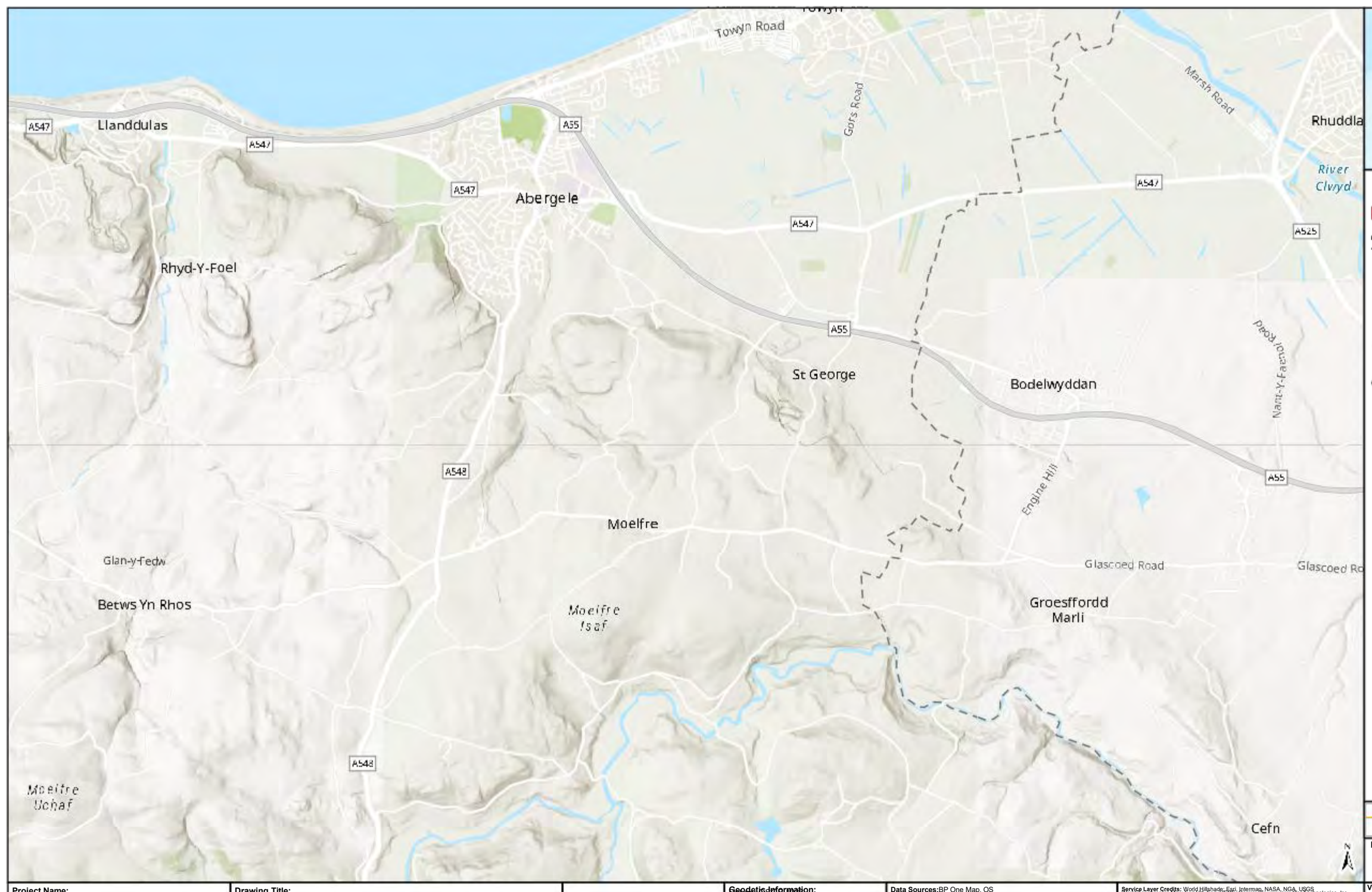

LEGEND

- Mona Onshore Order Limits
- 250m buffer
- Number of birds: 1-3
- Number of birds: 4-10
- Number of birds: 11-50
- Number of birds: 50+

Project Name:
MONA OFFSHORE WIND PROJECT

Drawing Title:
Wintering Birds Survey Results Common gull November 2022 - March 2023 - Page: 4

0 500 1,000 m

Geodetic Information:
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World Topographic Map: Esri, HERE, Garmin, FAO, NOAA

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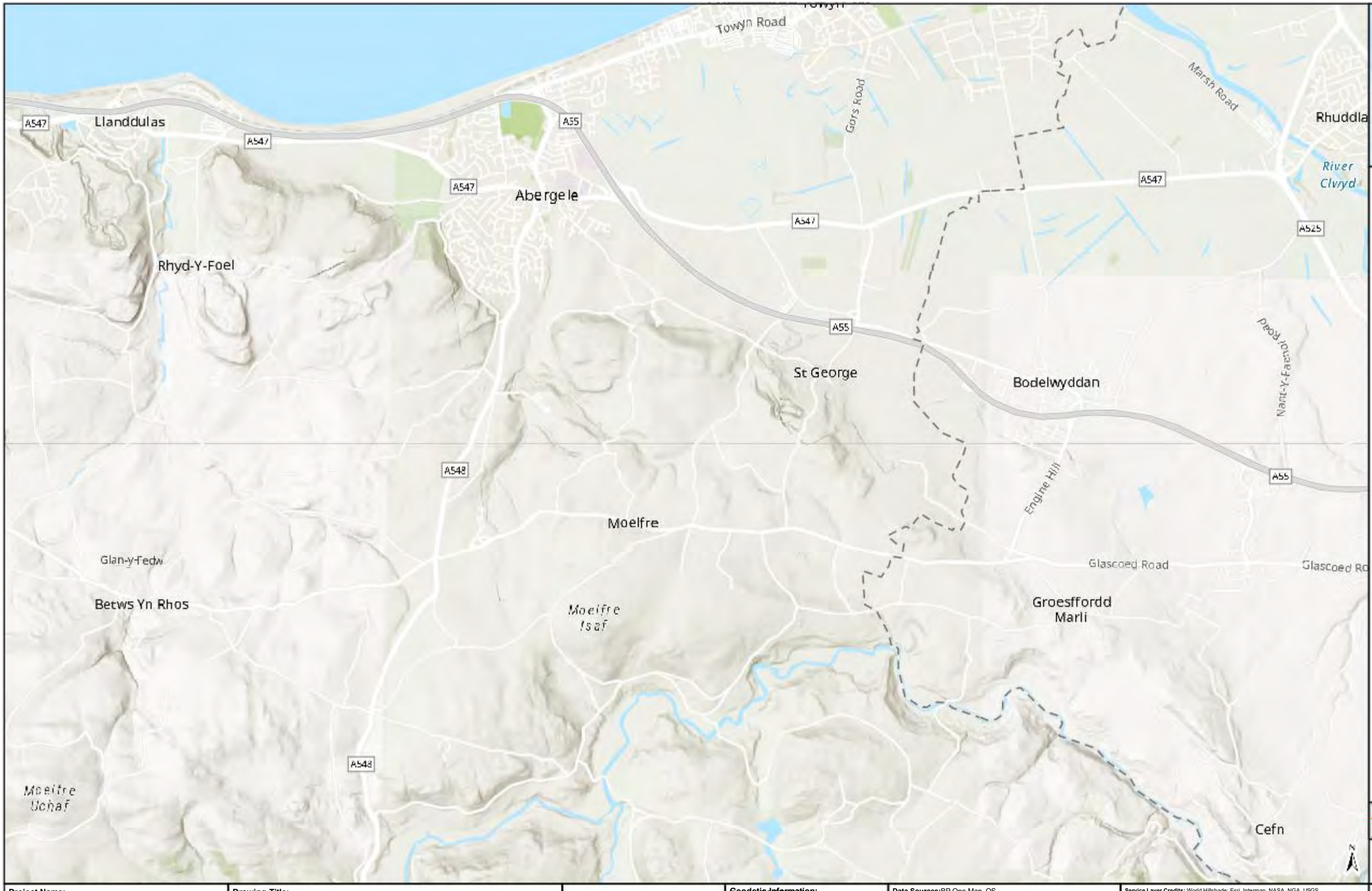

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- Number of birds: 4-10
- Number of birds: 11-50
- Number of birds: 50+

Project Name:
MONA OFFSHORE WIND PROJECT

Drawing Title:
Wintering Birds Survey Results Coot November 2022 - March 2023 - Page: 5

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Geodetic Information:
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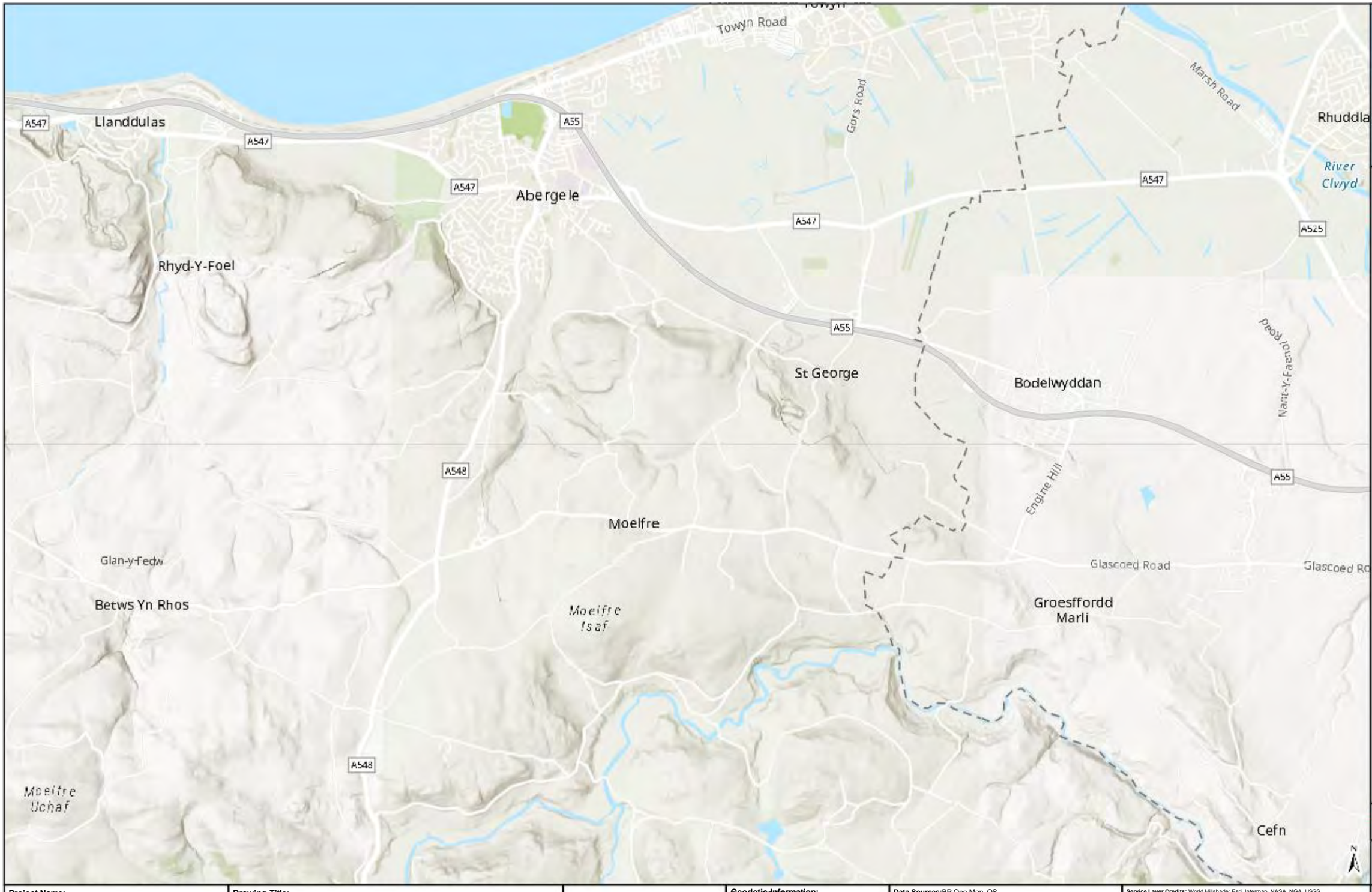

LEGEND

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- 250m buffer
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- Number of birds: 4-10
- Number of birds: 11-50
- Number of birds: 50+

Project Name:
MONA OFFSHORE WIND PROJECT

Drawing Title:
Wintering Birds Survey Results Common crossbill
November 2022 - March 2023 - Page: 6

0 500 1,000 m

Geodetic Information:
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Data Sources: BP One Map, OS

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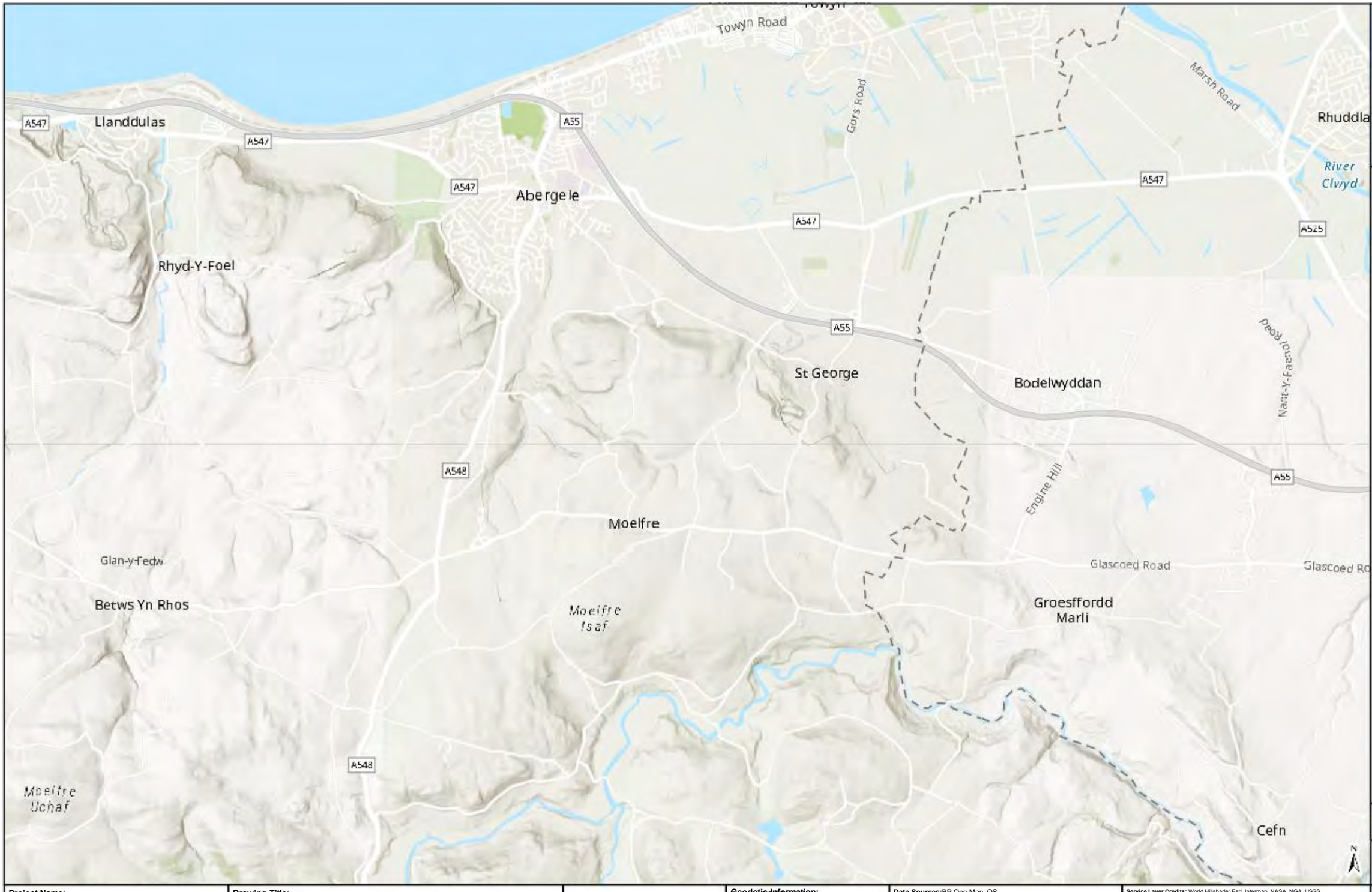

LEGEND

- Mona Onshore Order Limits
- 250m buffer
- Number of birds: 1-3
- Number of birds: 4-10
- Number of birds: 11-50
- Number of birds: 50+

Drawing Number:
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VER	DATE	DETAILS	BY	CHECK
01	07/09/23	Initial Issue	OW	AM

Project Name:
MONA OFFSHORE WIND PROJECT

Drawing Title:
Wintering Birds Survey Results Coal tit November 2022 - March 2023 - Page: 7

0 500 1,000 m

Geodetic Information:
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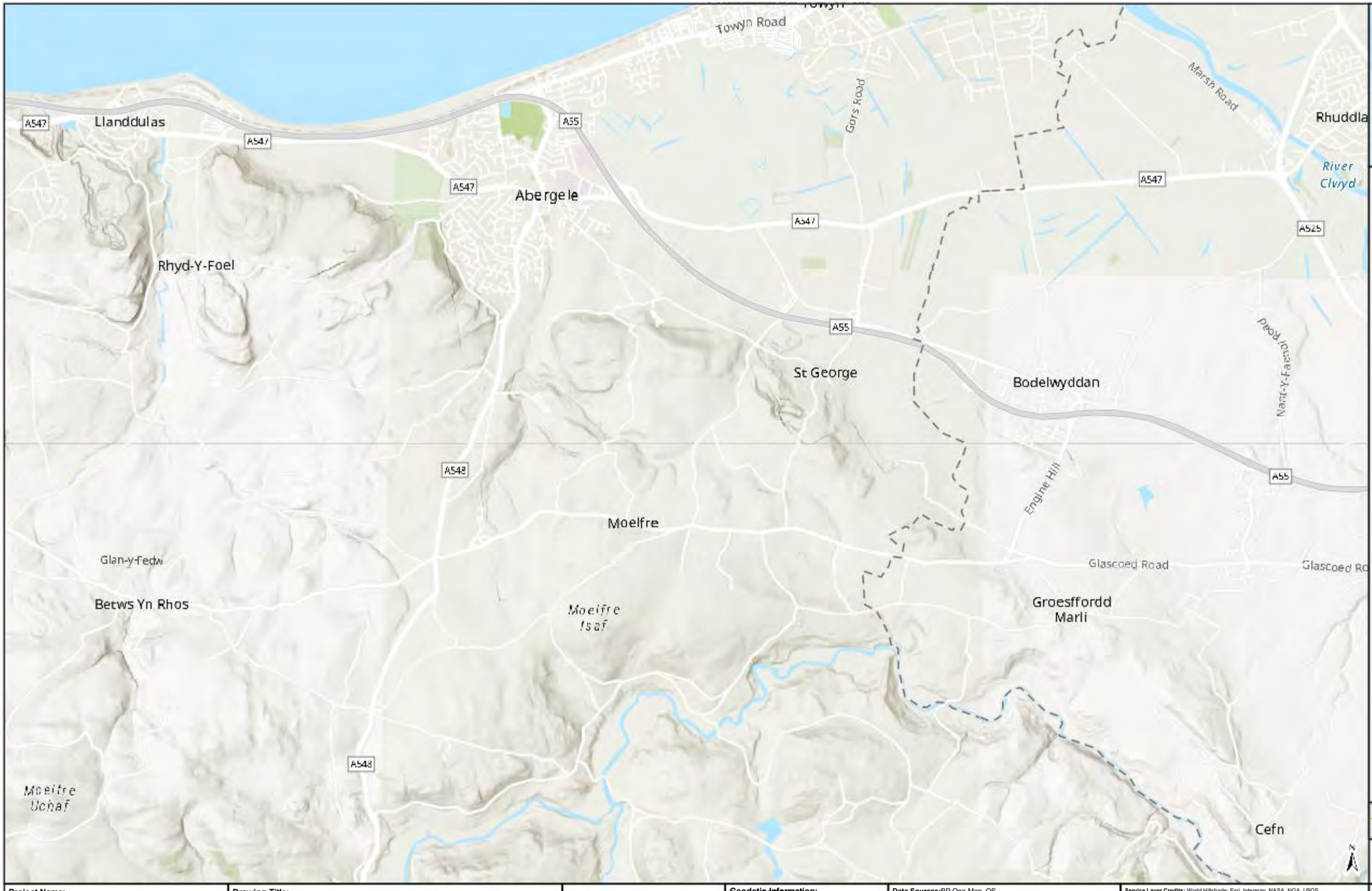

LEGEND

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- Number of birds: 4-10
- Number of birds: 11-50
- Number of birds: 50+

Project Name:
MONA OFFSHORE WIND PROJECT

Drawing Title:
Wintering Birds Survey Results Curlew November 2022 - March 2023 - Page: 8

0 500 1,000 m

Geodetic Information:
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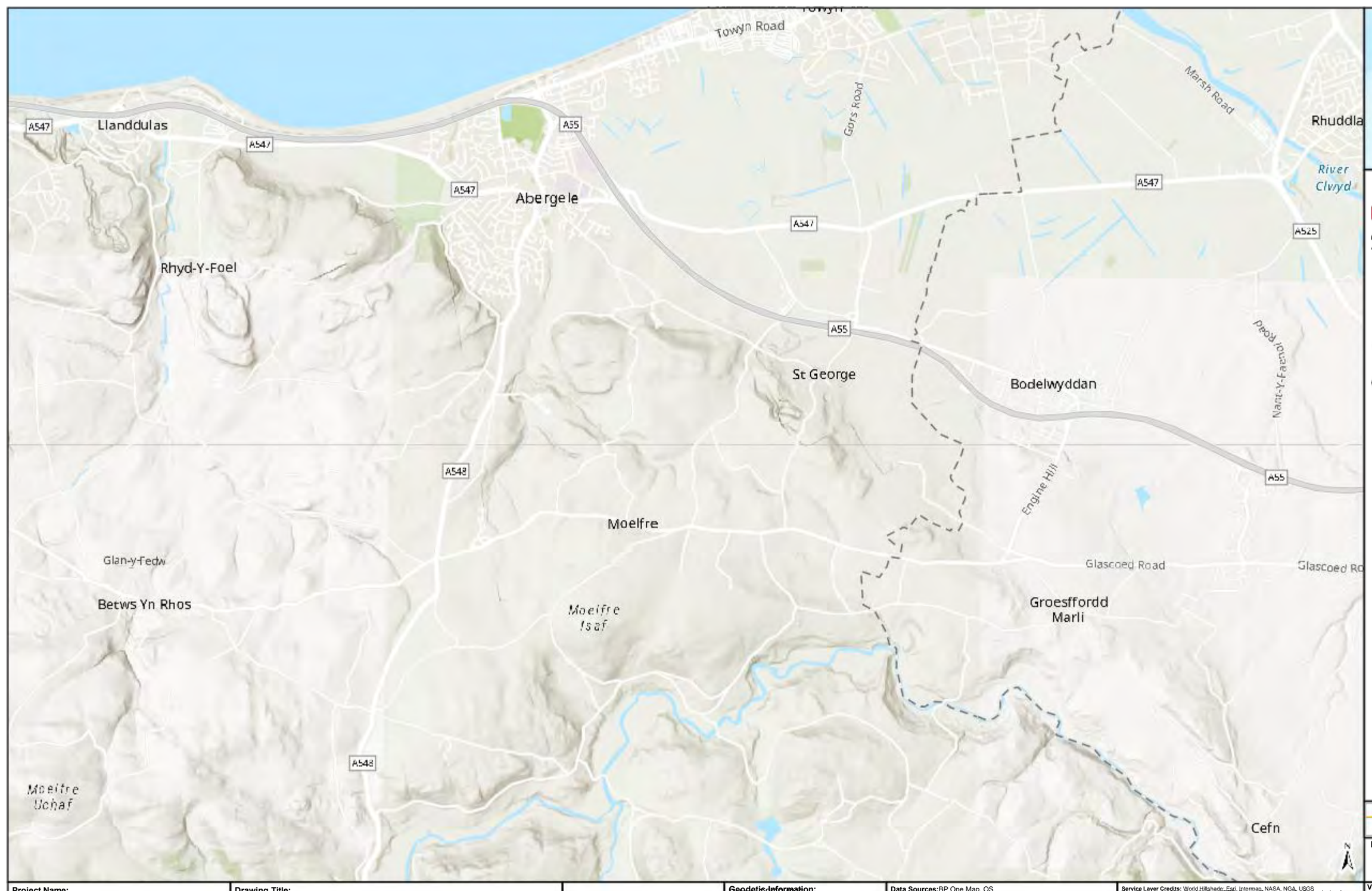

LEGEND

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- Number of birds: 4-10
- Number of birds: 11-50
- Number of birds: 50+

Project Name:
MONA OFFSHORE WIND PROJECT

Drawing Title:
Wintering Birds Survey Results Dunnock November 2022 - March 2023 - Page: 9

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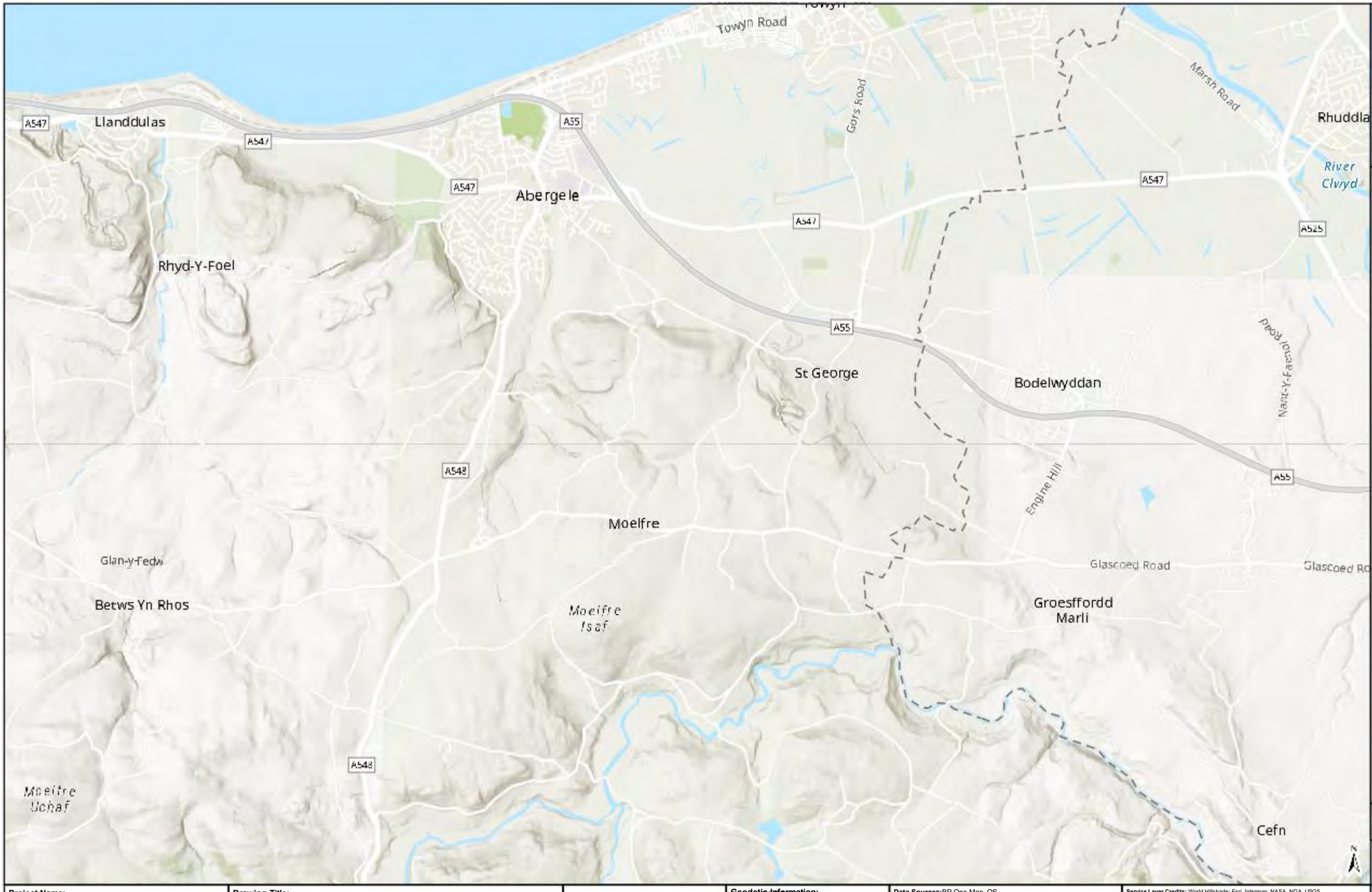

LEGEND

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- Number of birds: 1-3
- Number of birds: 4-10
- Number of birds: 11-50
- Number of birds: 50+

Project Name:
MONA OFFSHORE WIND PROJECT

Drawing Title:
Wintering Birds Survey Results Little Egret November 2022 - March 2023 - Page: 10

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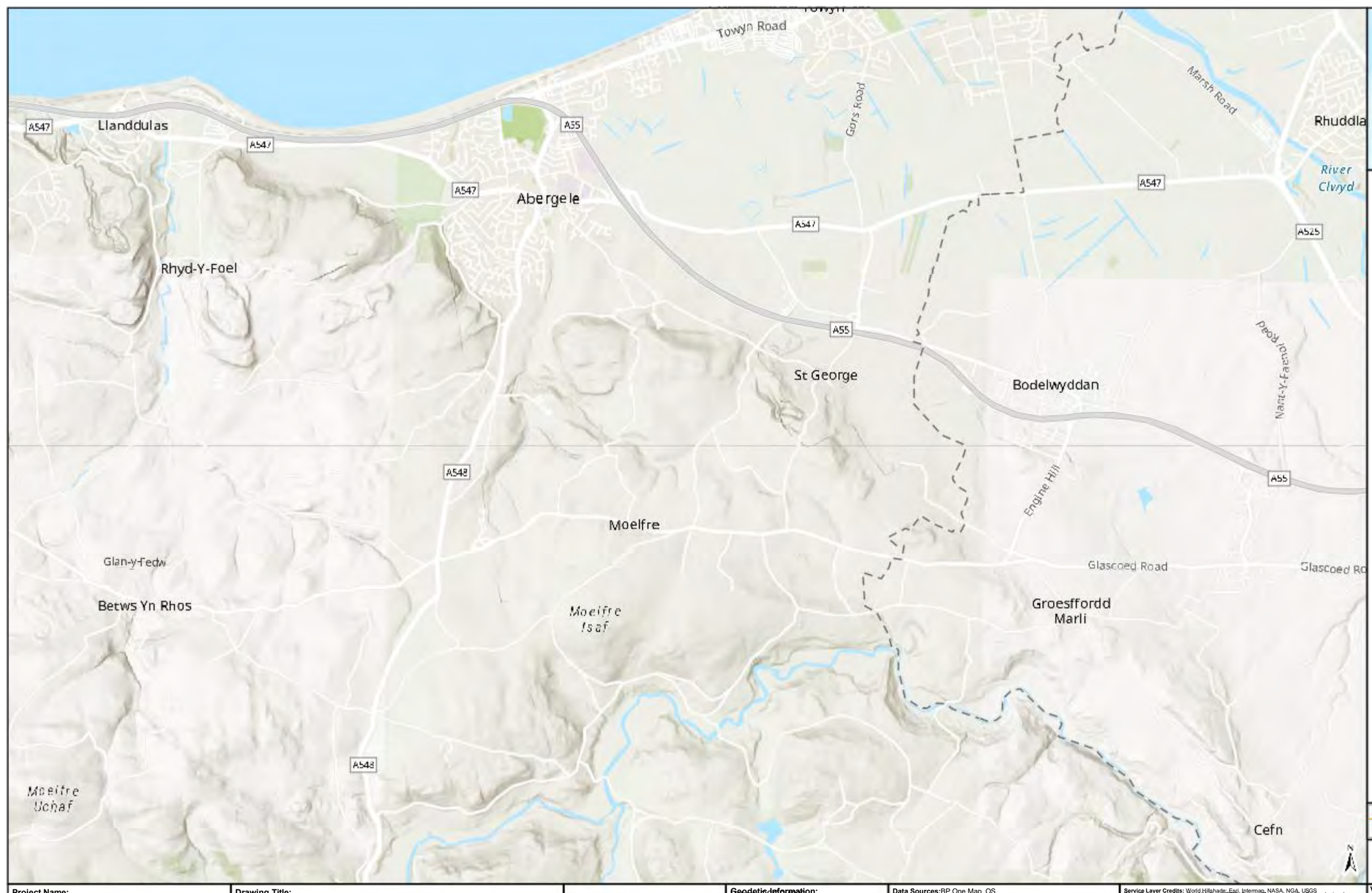

LEGEND

- Mona Onshore Order Limits
- 250m buffer
- Number of birds: 1-3
- Number of birds: 4-10
- Number of birds: 11-50
- Number of birds: 50+

Project Name:
MONA OFFSHORE WIND PROJECT

Drawing Title:
Wintering Birds Survey Results Fieldfare November 2022 - March 2023 - Page: 11

0 500 1,000 m

Geodetic Information:
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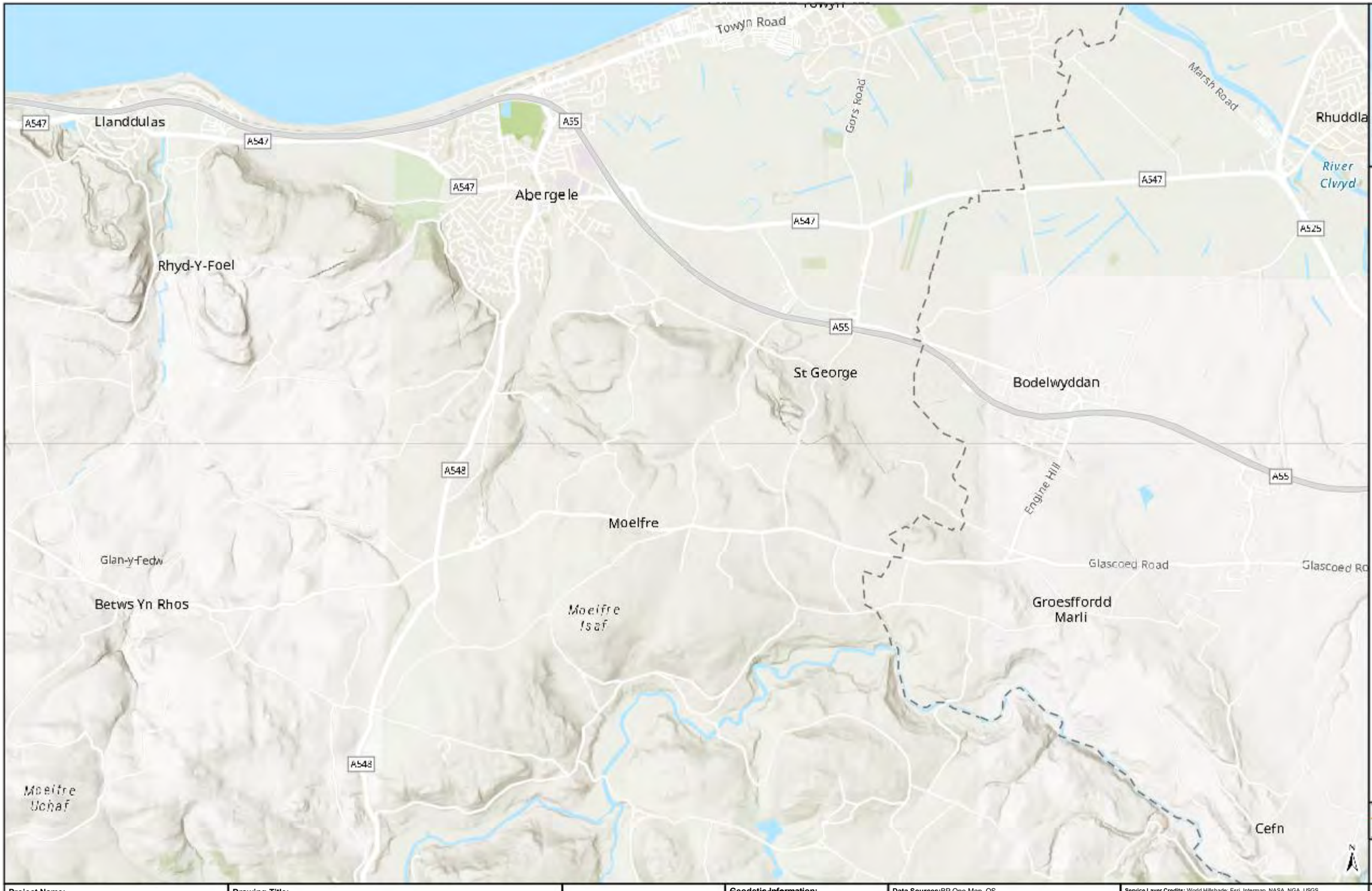

LEGEND

- Mona Onshore Order Limits
- 250m buffer
- Number of birds: 1-3
- Number of birds: 4-10
- Number of birds: 11-50
- Number of birds: 50+

Drawing Number:
ECO01789-0042-01

Project Name:
MONA OFFSHORE WIND PROJECT

Drawing Title:
Wintering Birds Survey Results Great black-backed gull
November 2022 - March 2023 - Page: 12

0 500 1,000 m

Geodetic Information:
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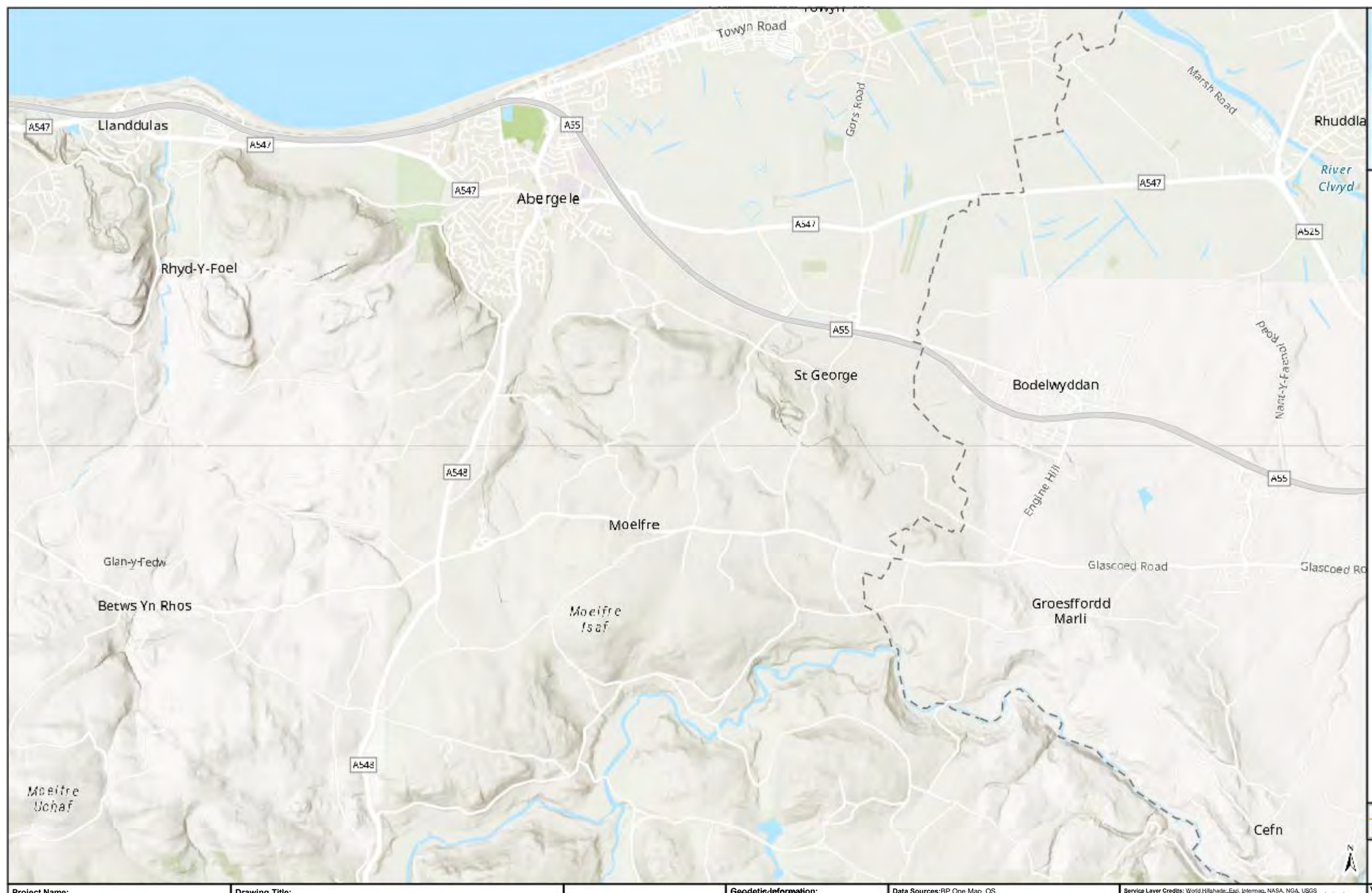

LEGEND

- Mona Onshore Order Limits
- 250m buffer
- Number of birds: 1-3
- Number of birds: 4-10
- Number of birds: 11-50
- Number of birds: 50+

Project Name:
MONA OFFSHORE WIND PROJECT

Drawing Title:
Wintering Birds Survey Results Goldcrest November 2022 - March 2023 - Page: 13

0 500 1,000 m

Geodetic Information:
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Scale@379mmx231mm: 1:40,000

Data Sources: BP One Map, OS

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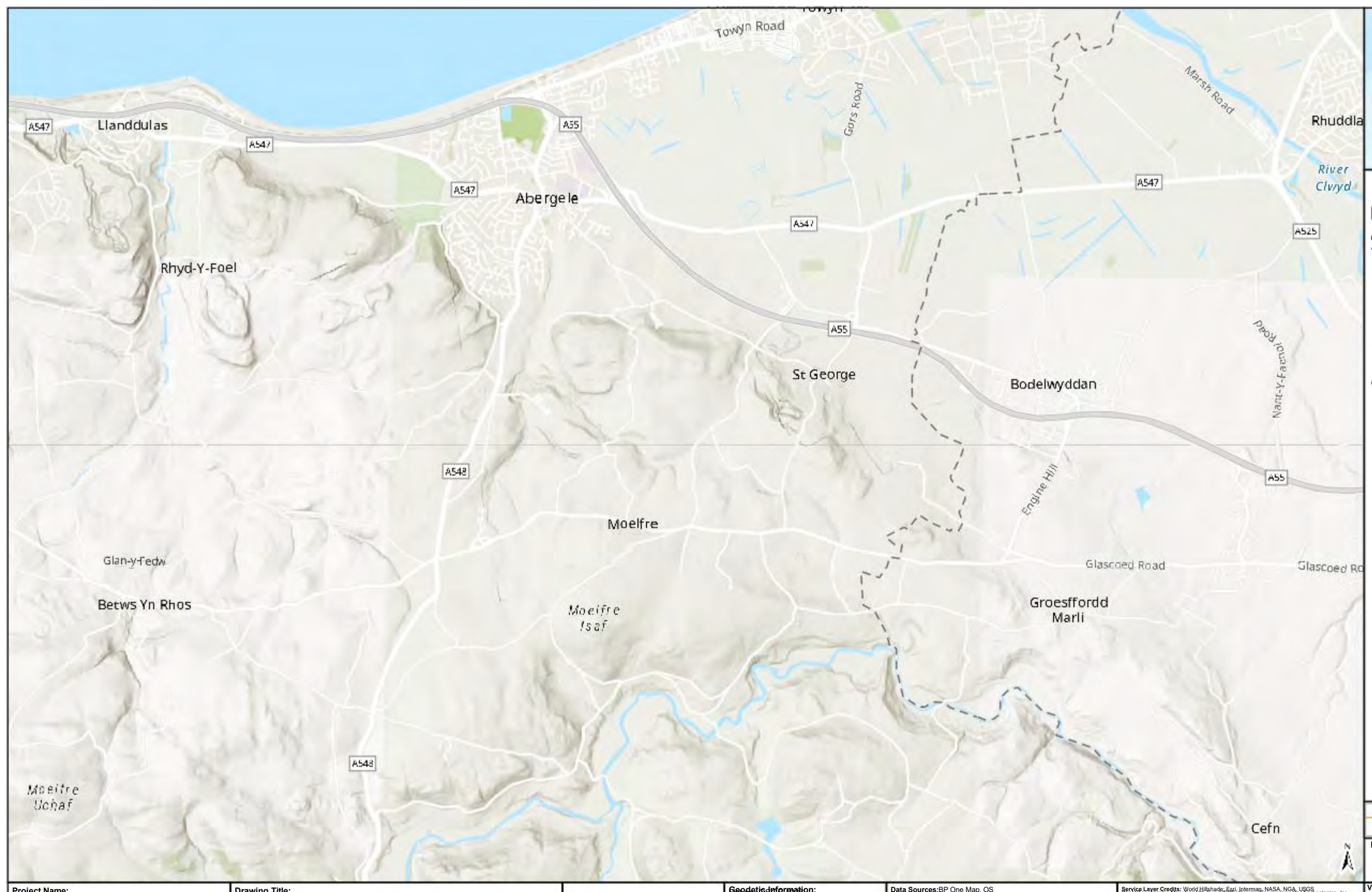

LEGEND

- Mona Onshore Order Limits
- 250m buffer
- Number of birds: 1-3
- Number of birds: 4-10
- Number of birds: 11-50
- Number of birds: 50+

Project Name:
MONA OFFSHORE WIND PROJECT

Drawing Title:
Wintering Birds Survey Results Greenfinch November 2022 - March 2023 - Page: 14

0 500 1,000 m

Geodetic Information:
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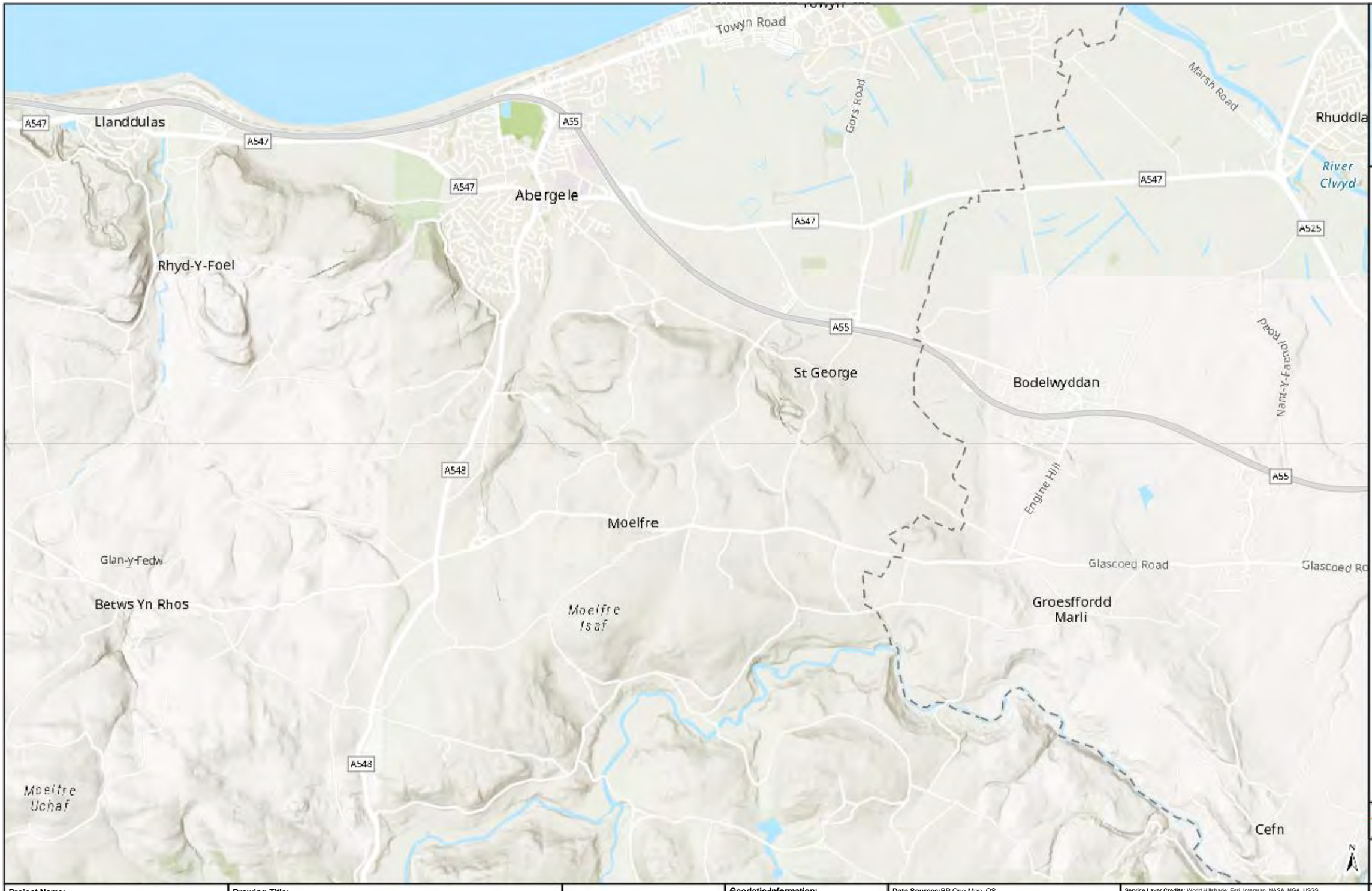

LEGEND

- Mona Onshore Order Limits
- 250m buffer
- Number of birds: 1-3
- Number of birds: 4-10
- Number of birds: 11-50
- Number of birds: 50+

Project Name:
MONA OFFSHORE WIND PROJECT

Drawing Title:
Wintering Birds Survey Results Grey heron November 2022 - March 2023 - Page: 15

0 500 1,000 m

Geodetic Information:
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World Topographic Map: Esri, HERE, Garmin, FAO, NOAA

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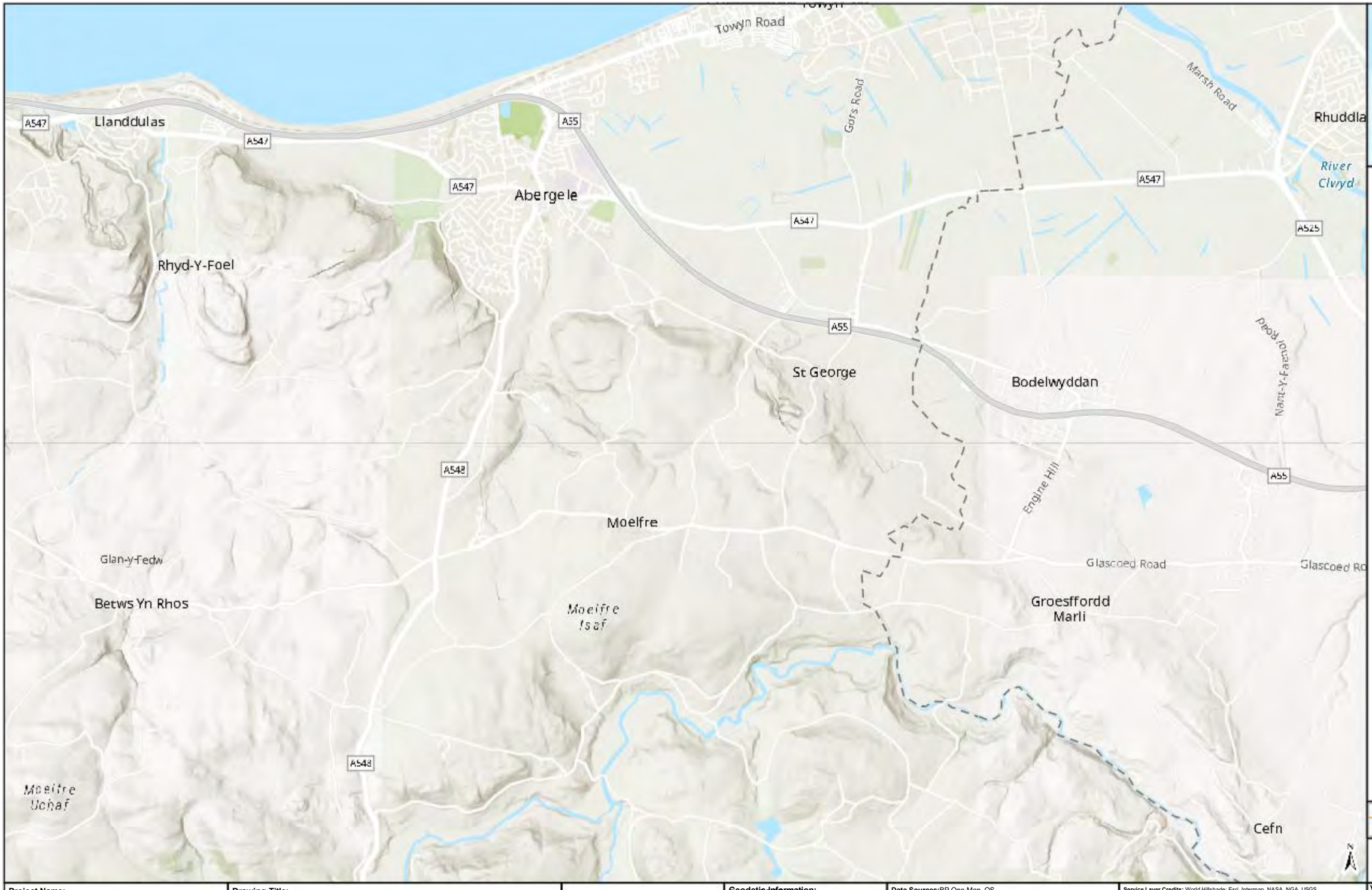

LEGEND

- Mona Onshore Order Limits
- 250m buffer
- Number of birds: 1-3
- Number of birds: 4-10
- Number of birds: 11-50
- Number of birds: 50+

Project Name:
MONA OFFSHORE WIND PROJECT

Drawing Title:
Wintering Birds Survey Results Herring Gull November 2022 - March 2023 - Page: 16

0 500 1,000 m

Geodetic Information:
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VER	DATE	DETAILS	BY	CHECK
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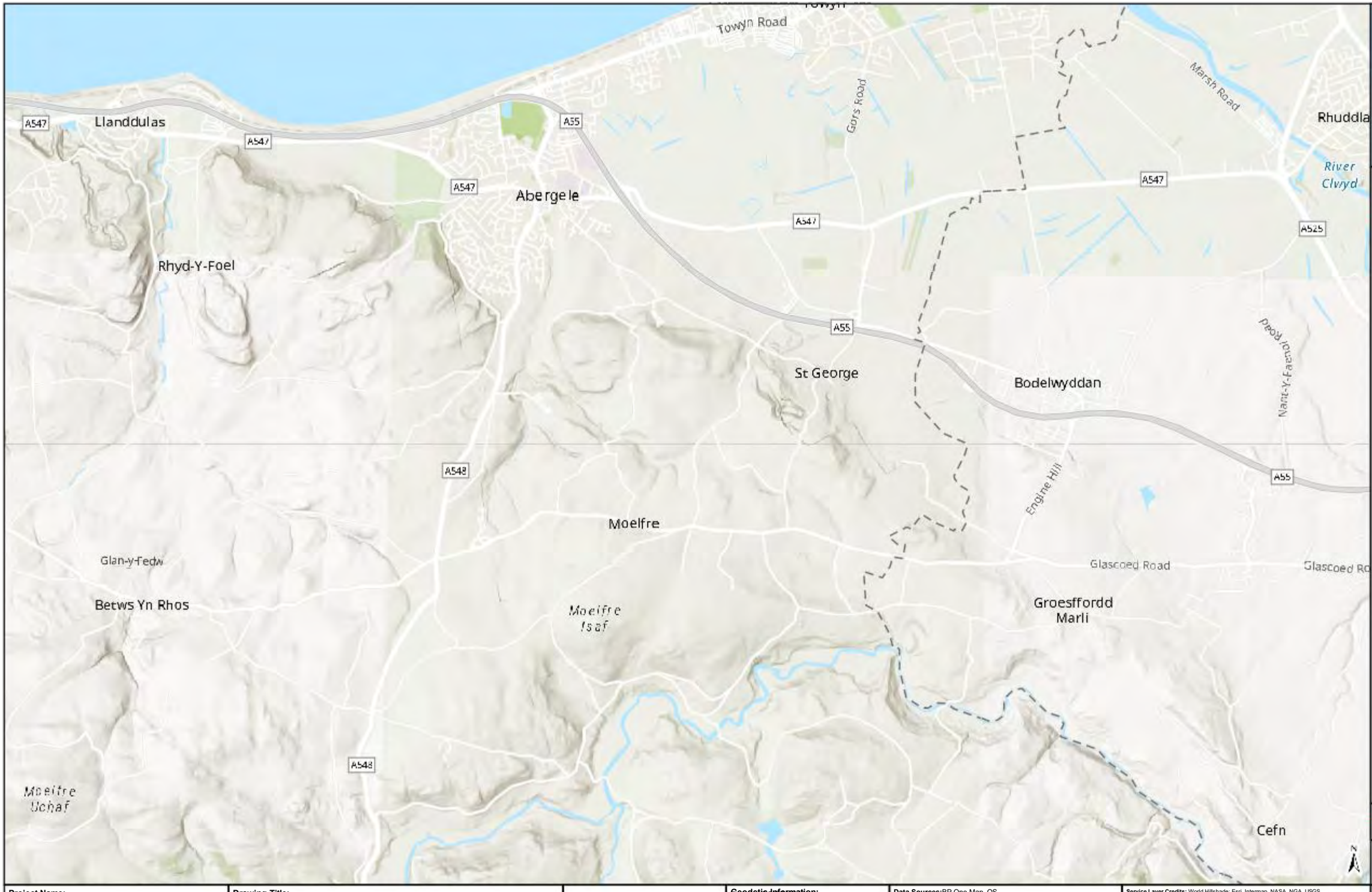


LEGEND

- Mona Onshore Order Limits
- 250m buffer
- Number of birds: 1-3
- Number of birds: 4-10
- Number of birds: 11-50
- Number of birds: 50+

Project Name:
MONA OFFSHORE WIND PROJECT

Drawing Title:
Wintering Birds Survey Results House Martin November 2022 - March 2023 - Page: 17

0 500 1,000 m

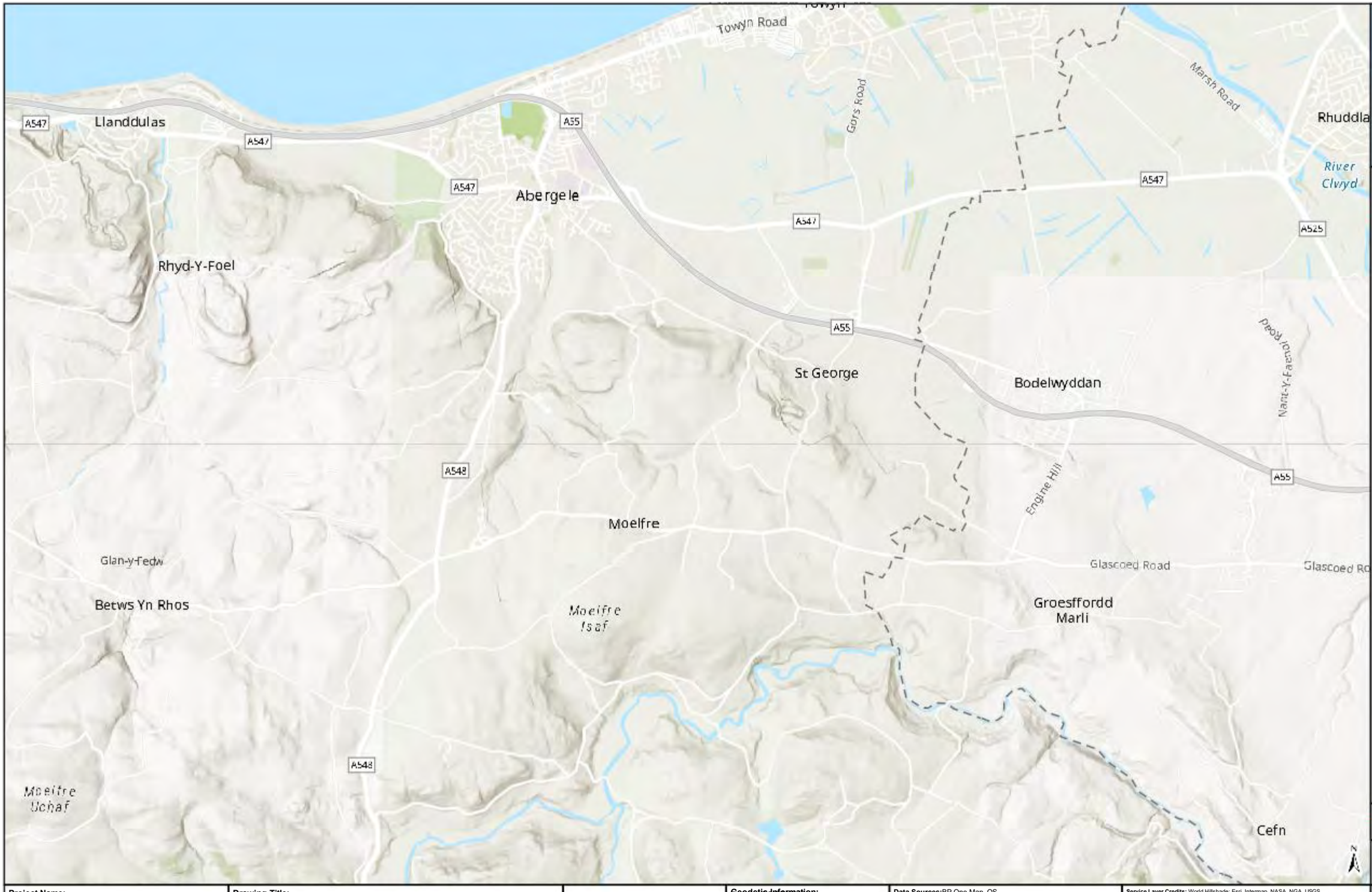
Geodetic Information:
Datum: OSGB 1936
Projection: British National Grid
Scale@379mmx231mm: 1:40,000

Data Sources: BP One Map, OS

Service Layer Credits: World Hillshade, Esri, Interman, NASA, NGA, USGS
World Topographic Map: Esri UK, Esri, HERE, Garmin, Foursquare, GeoTechnologies, Inc, METI/NASA, USGS
World Topographic Map: Esri, HERE, Garmin, FAO, NOAA

Drawing Number:
ECO01789-0042-01

VER	DATE	DETAILS	BY	CHECK
01	07/09/23	Initial Issue	OW	AM



LEGEND

- Mona Onshore Order Limits
- 250m buffer
- Number of birds: 1-3
- Number of birds: 4-10
- Number of birds: 11-50
- Number of birds: 50+

Project Name:
MONA OFFSHORE WIND PROJECT

Drawing Title:
Wintering Birds Survey Results House Sparrow November 2022 - March 2023 - Page: 18

0 500 1,000 m

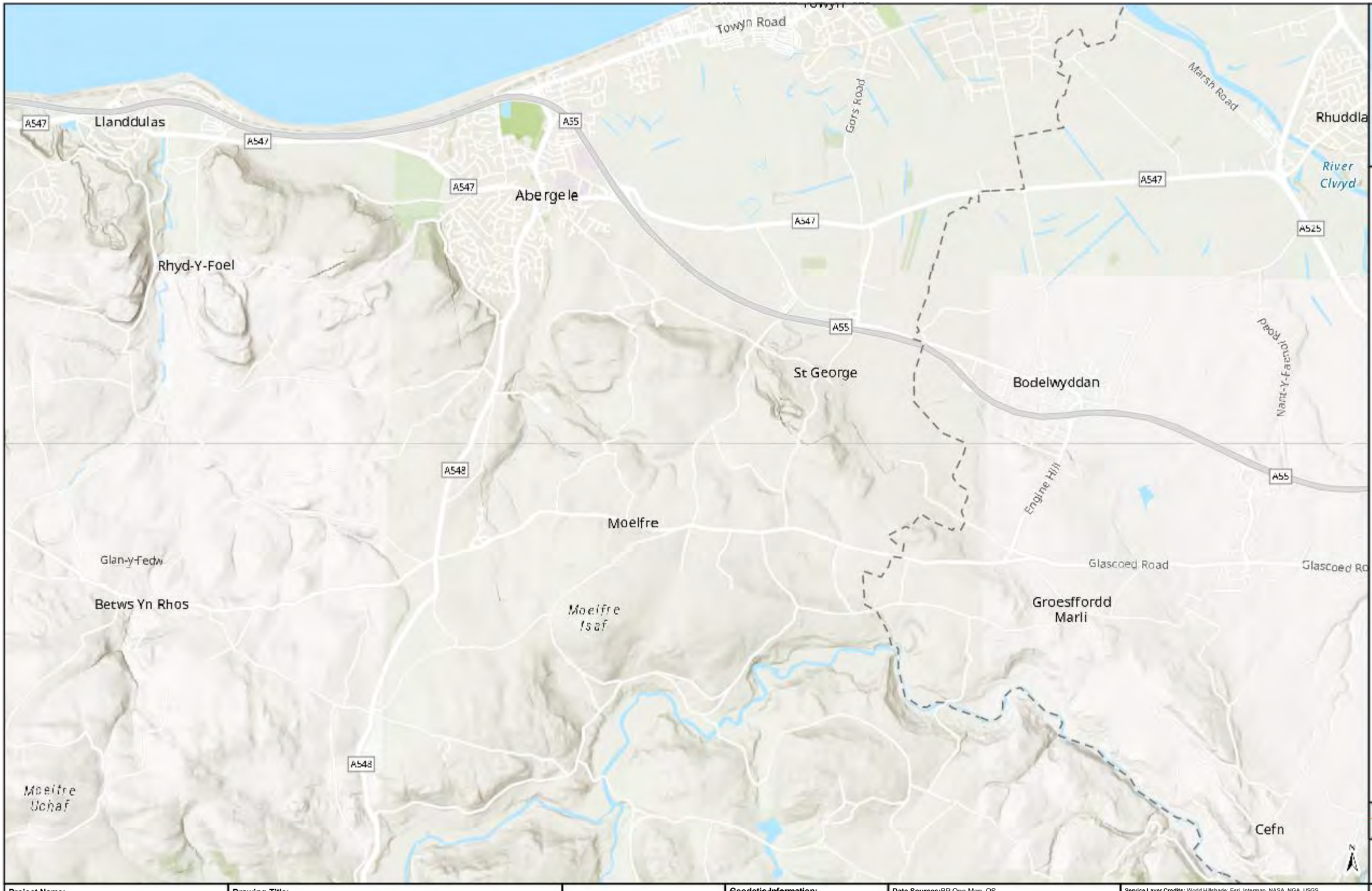
Geodetic Information:
Datum: OSGB 1936
Projection: British National Grid
Scale@379mmx231mm: 1:40,000

Data Sources: BP One Map, OS

Service Layer Credits: World Hillshade, Esri, Interman, NASA, NGA, USGS
World Topographic Map: Esri UK, Esri, HERE, Garmin, Foursquare, GeoTechnologies, Inc, METI/NASA, USGS
World Topographic Map: Esri, HERE, Garmin, FAO, NOAA

Drawing Number:
ECO01789-0042-01

VER	DATE	DETAILS	BY	CHECK
01	07/09/23	Initial Issue	OW	AM



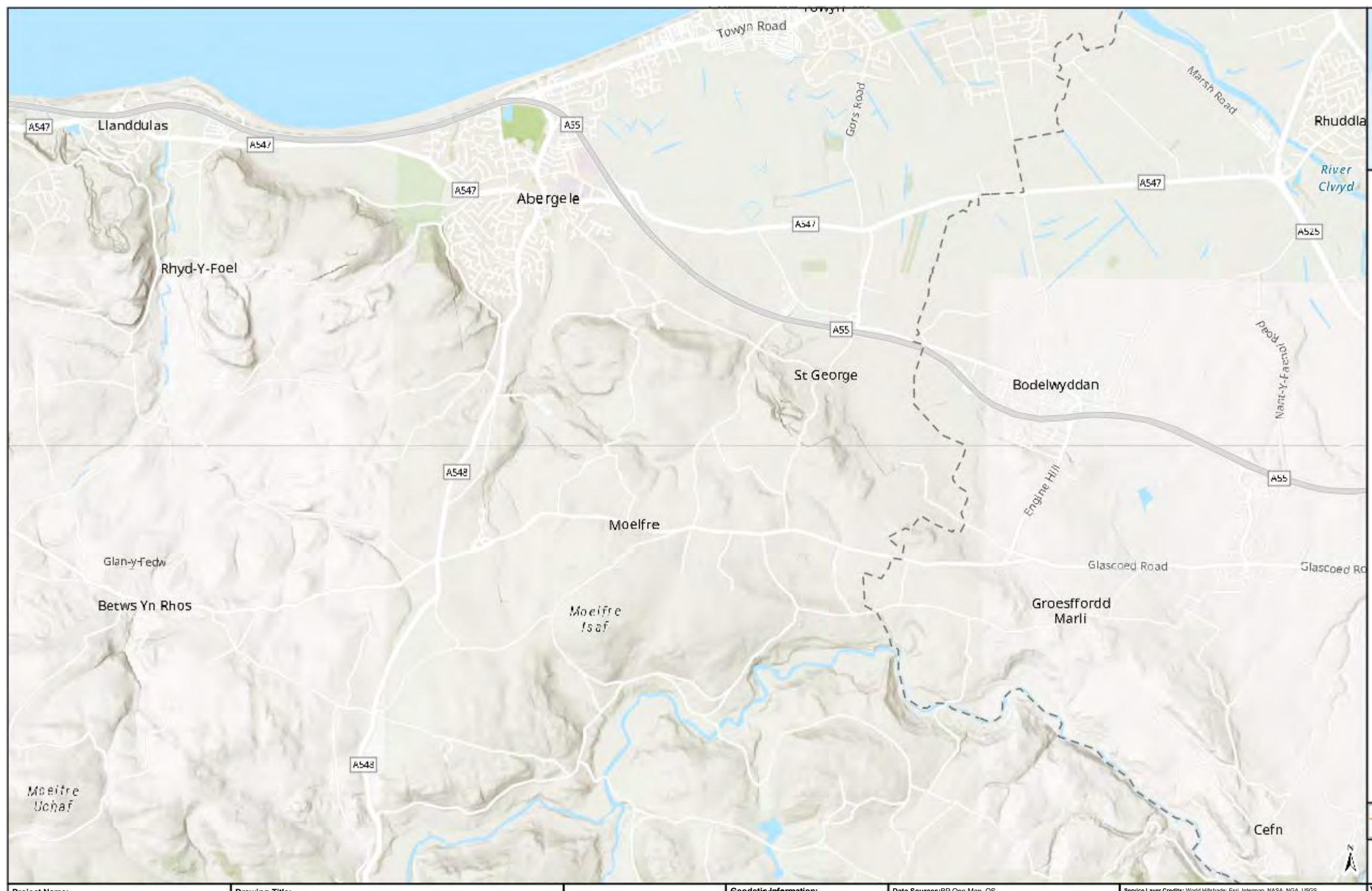
LEGEND

- Mona Onshore Order Limits
- 250m buffer
- Number of birds: 1-3
- Number of birds: 4-10
- Number of birds: 11-50
- Number of birds: 50+

Drawing Number:
ECO01789-0042-01

Project Name: MONA OFFSHORE WIND PROJECT	**Drawing Title:** Wintering Birds Survey Results Linnet November 2022 - March 2023 - Page: 19	0 500 1,000 m	**Geodetic Information:** Datum: OSGB 1936 Projection: British National Grid Scale@379mmx231mm: 1:40,000	**Data Sources:** BP One Map, OS	**Service Layer Credits:** World Hillshade, Esri, Interman, NASA, NGA, USGS World Topographic Map: Esri UK, Esri, HERE, Garmin, Foursquare, GeoTechnologies, Inc, METI/NASA, USGS World Topographic Map: Esri, HERE, Garmin, FAO, NOAA

VER	DATE	DETAILS	BY	CHECK
01	07/09/23	Initial Issue	OW	AM



LEGEND

- Mona Onshore Order Limits
- 250m buffer
- Number of birds: 1-3
- Number of birds: 4-10
- Number of birds: 11-50
- Number of birds: 50+

Project Name:
MONA OFFSHORE WIND PROJECT

Drawing Title:
Wintering Birds Survey Results Long-tailed Tit November 2022 - March 2023 - Page: 20

0 500 1,000 m

Geodetic Information:
Datum: OSGB 1936
Projection: British National Grid
Scale@379mmx231mm: 1:40,000

Data Sources: BP One Map, OS

Service Layer Credits: World Hillshade, Esri, Interman, NASA, NGA, USGS
World Topographic Map: Esri UK, Esri, HERE, Garmin, Foursquare, GeoTechnologies, Inc, METI/NASA, USGS
World Topographic Map: Esri, HERE, Garmin, FAO, NOAA

Drawing Number:
ECO01789-0042-01

VER	DATE	DETAILS	BY	CHECK
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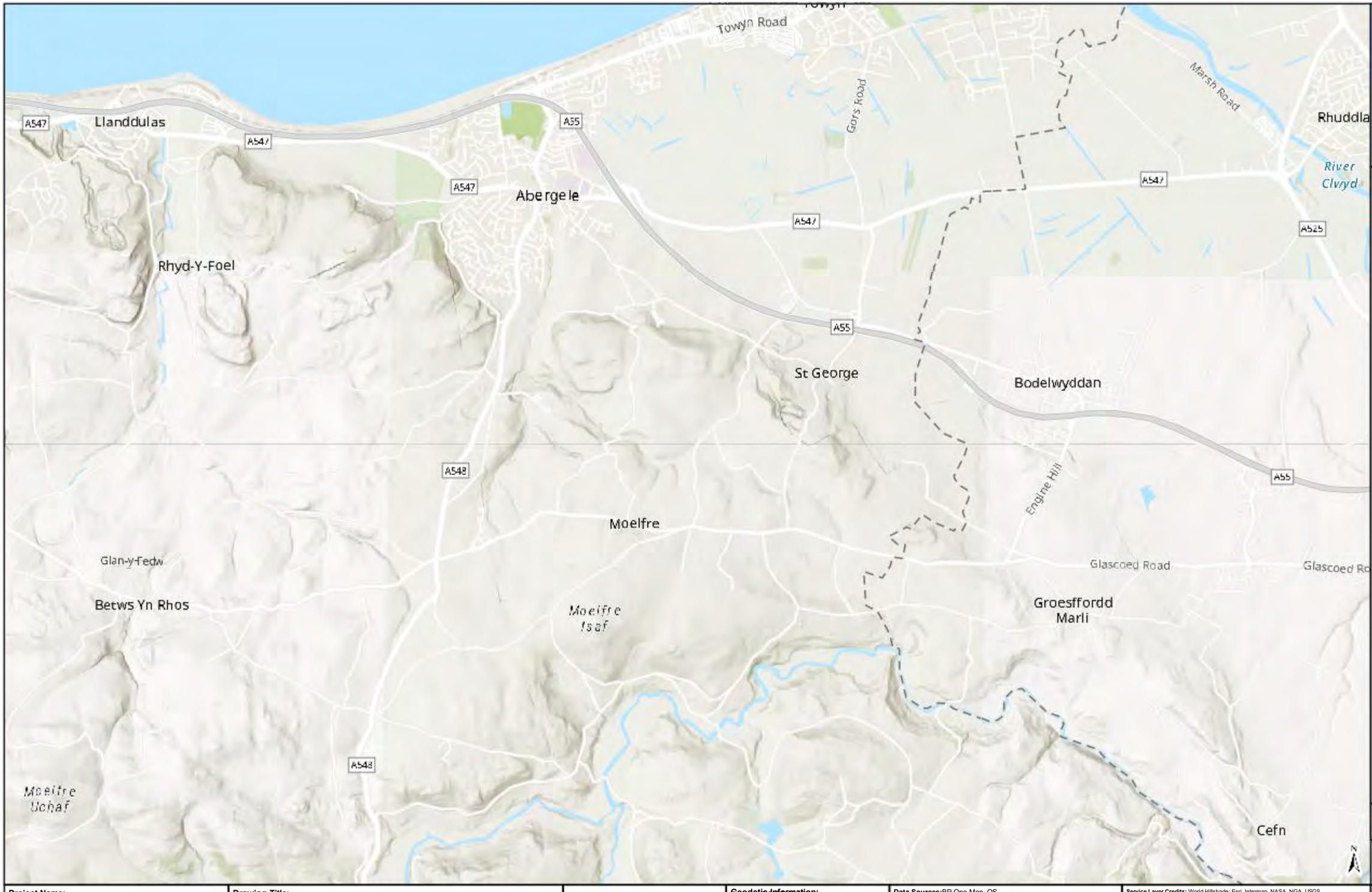


LEGEND

- Mona Onshore Order Limits
- 250m buffer
- Number of birds: 1-3
- Number of birds: 4-10
- Number of birds: 11-50
- Number of birds: 50+

Project Name:
MONA OFFSHORE WIND PROJECT

Drawing Title:
Wintering Birds Survey Results Mistle thrush November 2022 - March 2023 - Page: 21

0 500 1,000 m

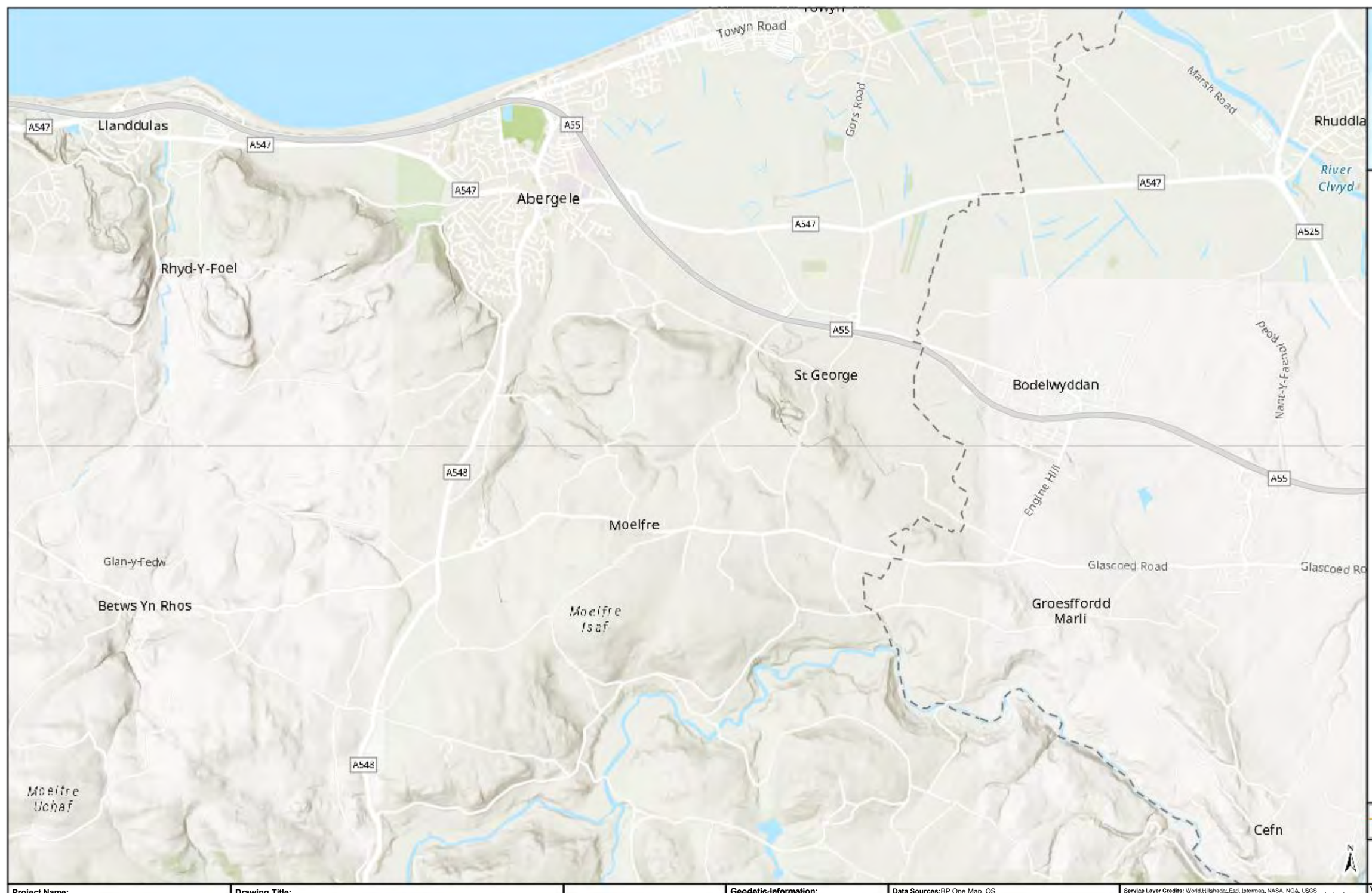
Geodetic Information:
Datum: OSGB 1936
Projection: British National Grid
Scale@379mmx231mm: 1:40,000

Data Sources: BP One Map, OS

Service Layer Credits: World Hillshade, Esri, Interman, NASA, NGA, USGS
World Topographic Map: Esri UK, Esri, HERE, Garmin, Foursquare, GeoTechnologies, Inc, METI/NASA, USGS
World Topographic Map: Esri, HERE, Garmin, FAO, NOAA

Drawing Number:
ECO01789-0042-01

VER	DATE	DETAILS	BY	CHECK
01	07/09/23	Initial Issue	OW	AM



LEGEND

- Mona Onshore Order Limits
- 250m buffer
- Number of birds: 1-3
- Number of birds: 4-10
- Number of birds: 11-50
- Number of birds: 50+

Project Name:
MONA OFFSHORE WIND PROJECT

Drawing Title:
Wintering Birds Survey Results Mallard November 2022 - March 2023 - Page: 22

0 500 1,000 m

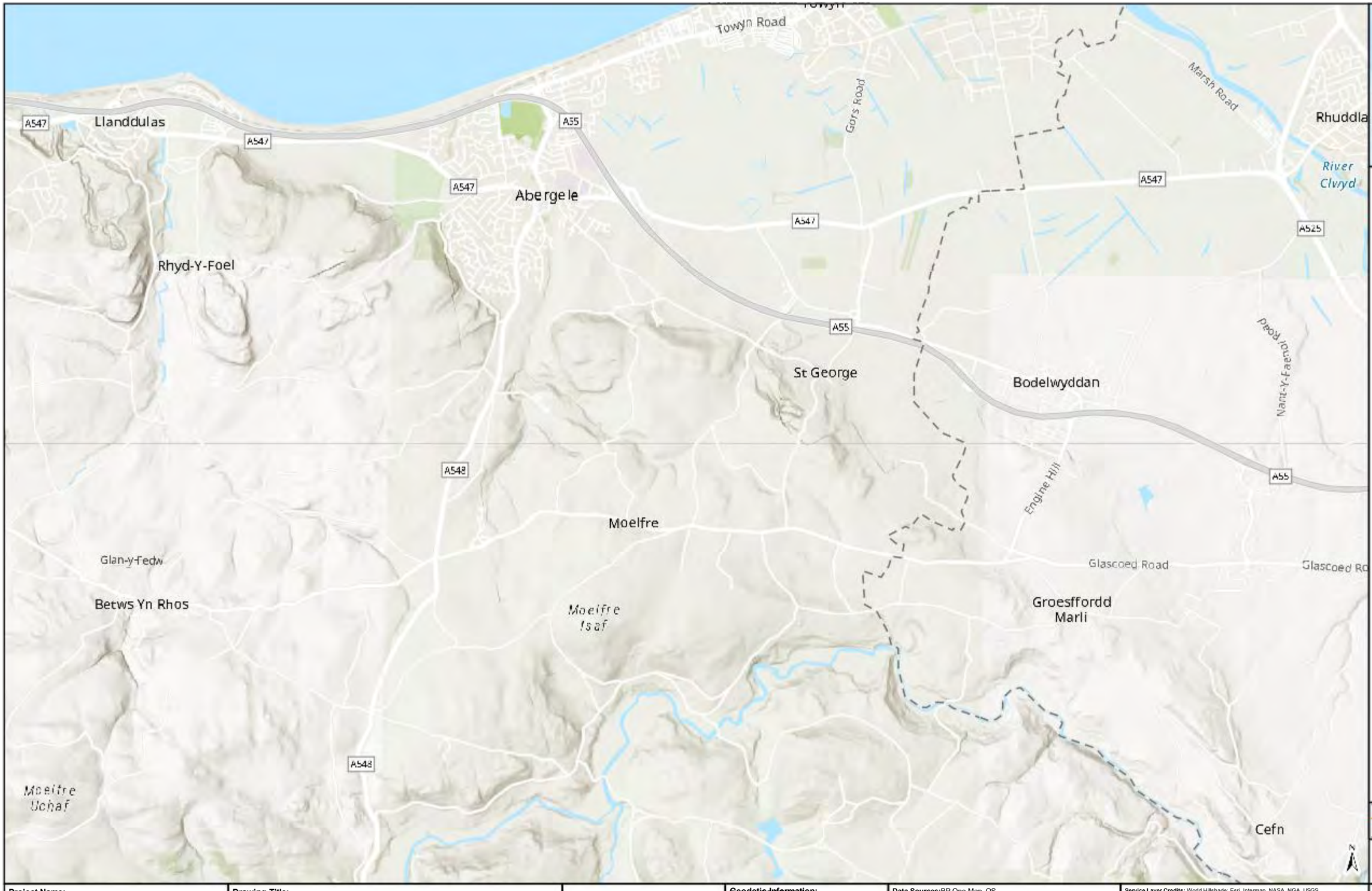
Geodetic Information:
Datum: OSGB 1936
Projection: British National Grid
Scale@379mmx231mm: 1:40,000

Data Sources: BP One Map, OS

Service Layer Credits: World Hillshade, Esri, Interman, NASA, NGA, USGS
World Topographic Map: Esri UK, Esri, HERE, Garmin, Foursquare, GeoTechnologies, Inc, METI/NASA, USGS
World Topographic Map: Esri, HERE, Garmin, FAO, NOAA

Drawing Number:
ECO01789-0042-01

VER	DATE	DETAILS	BY	CHECK
01	07/09/23	Initial Issue	OW	AM



LEGEND

- Mona Onshore Order Limits
- 250m buffer
- Number of birds: 1-3
- Number of birds: 4-10
- Number of birds: 11-50
- Number of birds: 50+

Project Name:
MONA OFFSHORE WIND PROJECT

Drawing Title:
Wintering Birds Survey Results Magpie November 2022 - March 2023 - Page: 23

0 500 1,000 m

Geodetic Information:
Datum: OSGB 1936
Projection: British National Grid
Scale@379mmx231mm: 1:40,000

Data Sources: BP One Map, OS

Service Layer Credits: World Hillshade, Esri, Interman, NASA, NGA, USGS
World Topographic Map: Esri UK, Esri, HERE, Garmin, Foursquare, GeoTechnologies, Inc, METI/NASA, USGS
World Topographic Map: Esri, HERE, Garmin, FAO, NOAA

Drawing Number:
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VER	DATE	DETAILS	BY	CHECK
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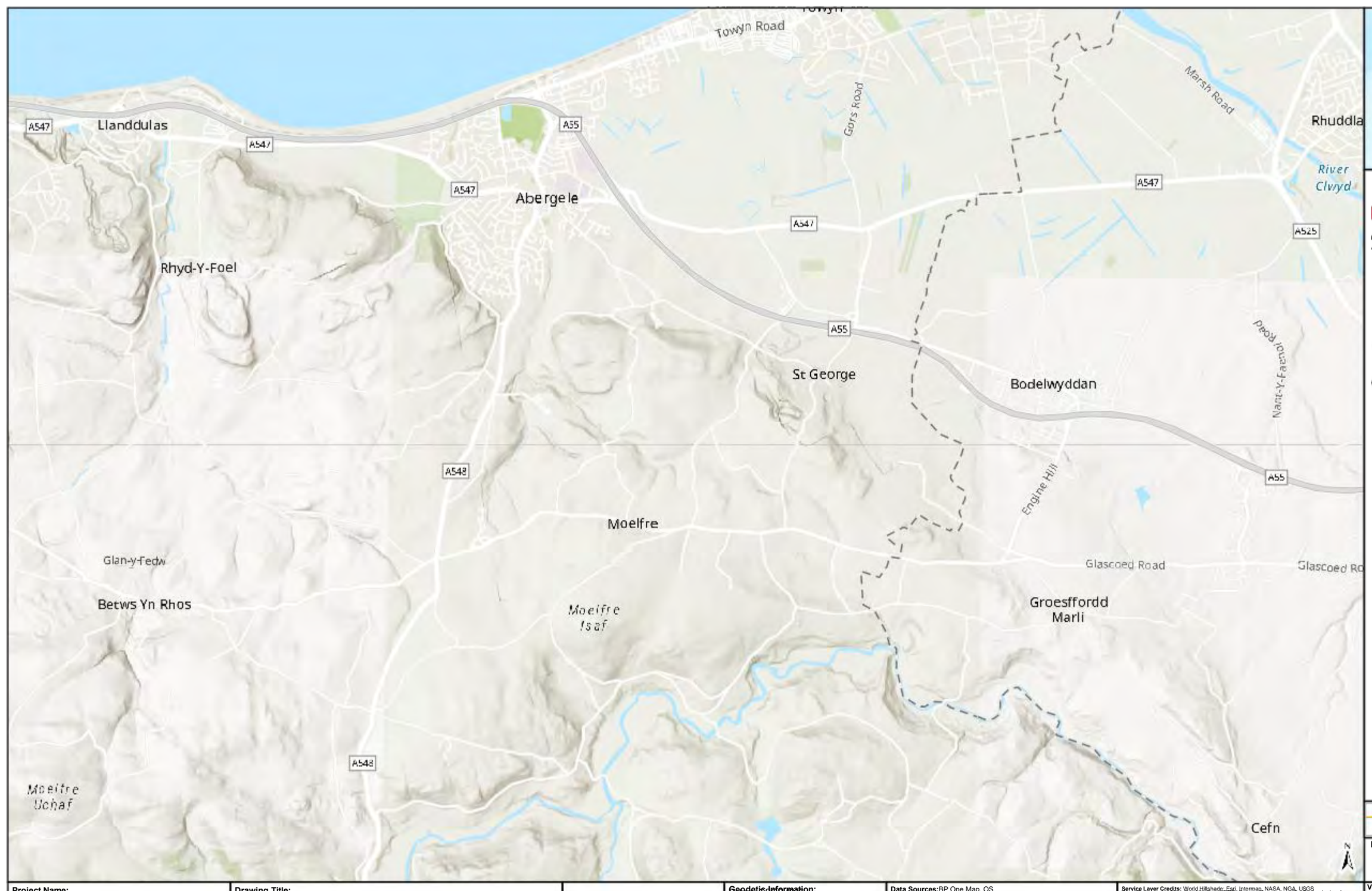


LEGEND

- Mona Onshore Order Limits
- 250m buffer
- Number of birds: 1-3
- Number of birds: 4-10
- Number of birds: 11-50
- Number of birds: 50+

Project Name:
MONA OFFSHORE WIND PROJECT

Drawing Title:
Wintering Birds Survey Results Moorhen November 2022 - March 2023 - Page: 24

0 500 1,000 m

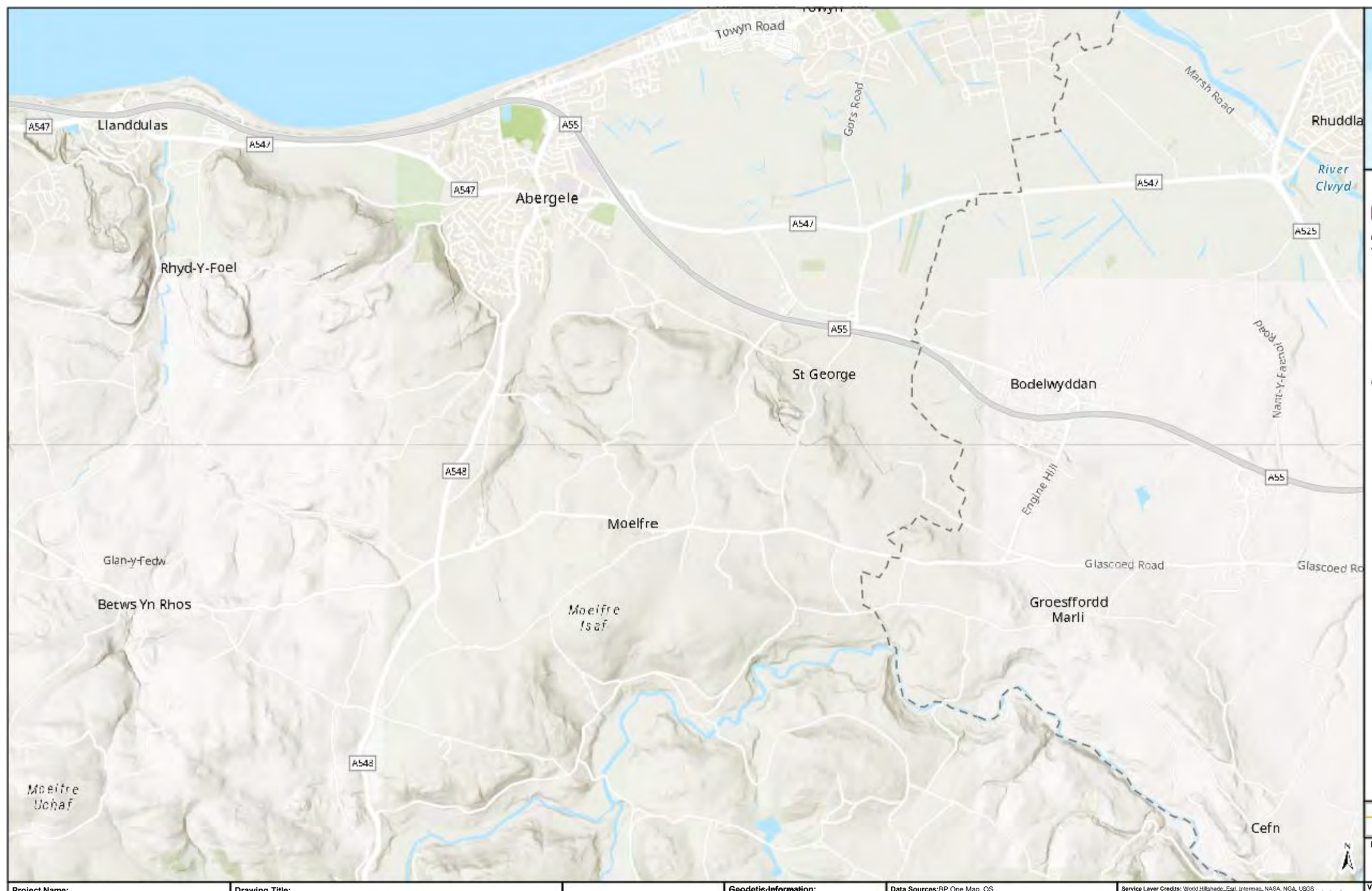
Geodetic Information:
Datum: OSGB 1936
Projection: British National Grid
Scale@379mmx231mm: 1:40,000

Data Sources: BP One Map, OS

Service Layer Credits: World Hillshade, Esri, Interman, NASA, NGA, USGS
World Topographic Map: Esri UK, Esri, HERE, Garmin, Foursquare, GeoTechnologies, Inc, METI/NASA, USGS
World Topographic Map: Esri, HERE, Garmin, FAO, NOAA

Drawing Number:
ECO01789-0042-01

VER	DATE	DETAILS	BY	CHECK
01	07/09/23	Initial Issue	OW	AM



LEGEND

- Mona Onshore Order Limits
- 250m buffer
- Number of birds: 1-3
- Number of birds: 4-10
- Number of birds: 11-50
- Number of birds: 50+

Project Name:
MONA OFFSHORE WIND PROJECT

Drawing Title:
Wintering Birds Survey Results Meadow pipit November 2022 - March 2023 - Page: 25

0 500 1,000 m

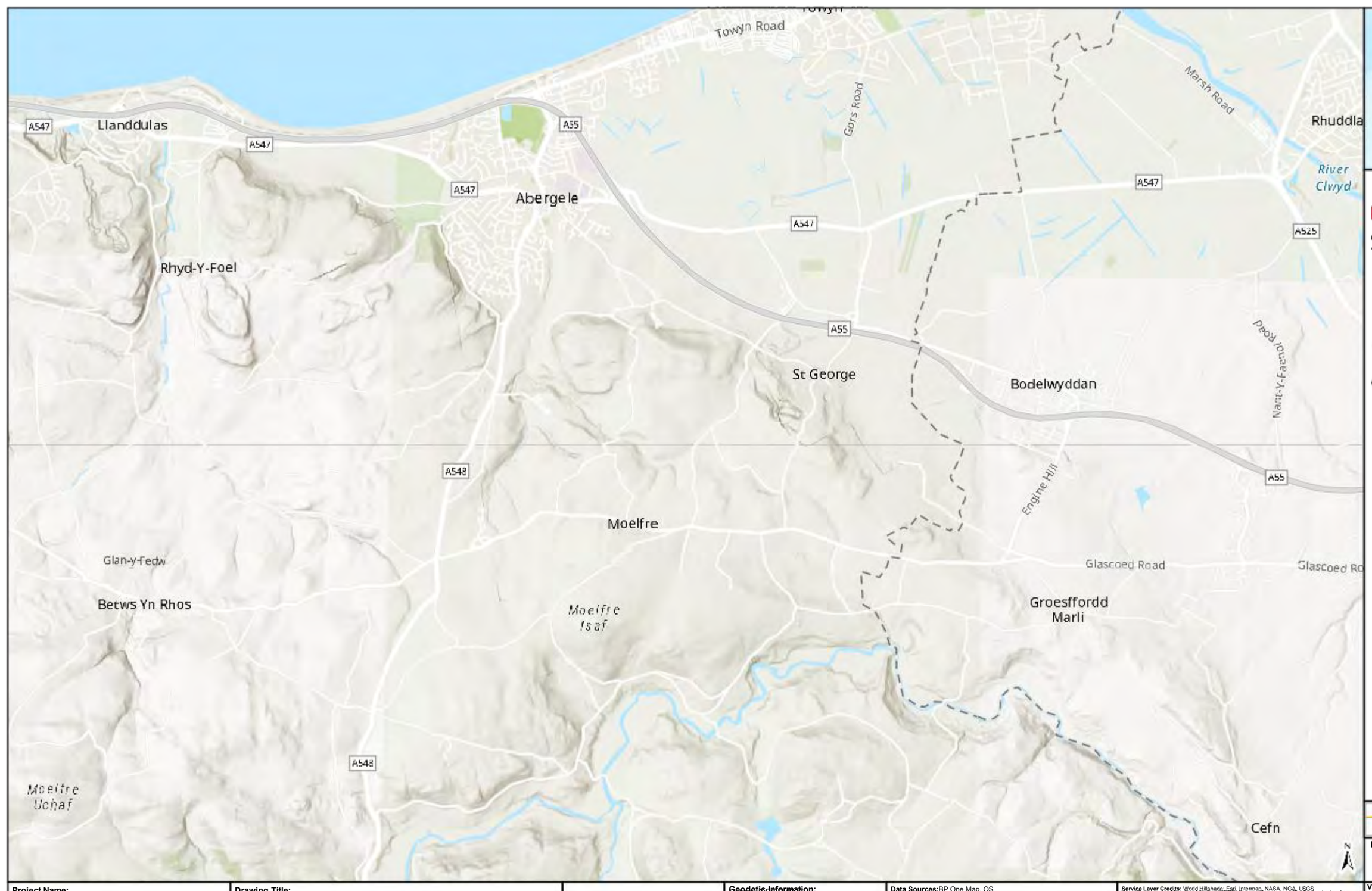
Geodetic Information:
Datum: OSGB 1936
Projection: British National Grid
Scale@379mmx231mm: 1:40,000

Data Sources: BP One Map, OS

Service Layer Credits: World Hillshade, Esri, Interman, NASA, NGA, USGS
World Topographic Map: Esri UK, Esri, HERE, Garmin, Foursquare, GeoTechnologies, Inc, METI/NASA, USGS
World Topographic Map: Esri, HERE, Garmin, FAO, NOAA

Drawing Number:
ECO01789-0042-01

VER	DATE	DETAILS	BY	CHECK
01	07/09/23	Initial Issue	OW	AM



LEGEND

- Mona Onshore Order Limits
- 250m buffer
- Number of birds: 1-3
- Number of birds: 4-10
- Number of birds: 11-50
- Number of birds: 50+

Project Name:
MONA OFFSHORE WIND PROJECT

Drawing Title:
Wintering Birds Survey Results Redwing November 2022 - March 2023 - Page: 27

0 500 1,000 m

Geodetic Information:
Datum: OSGB 1936
Projection: British National Grid
Scale@379mmx231mm: 1:40,000

Data Sources: BP One Map, OS

Service Layer Credits: World Hillshade, Esri, Interman, NASA, NGA, USGS
World Topographic Map: Esri UK, Esri, HERE, Garmin, Foursquare, GeoTechnologies, Inc, METI/NASA, USGS
World Topographic Map: Esri, HERE, Garmin, FAO, NOAA

Drawing Number:
ECO01789-0042-01

VER	DATE	DETAILS	BY	CHECK
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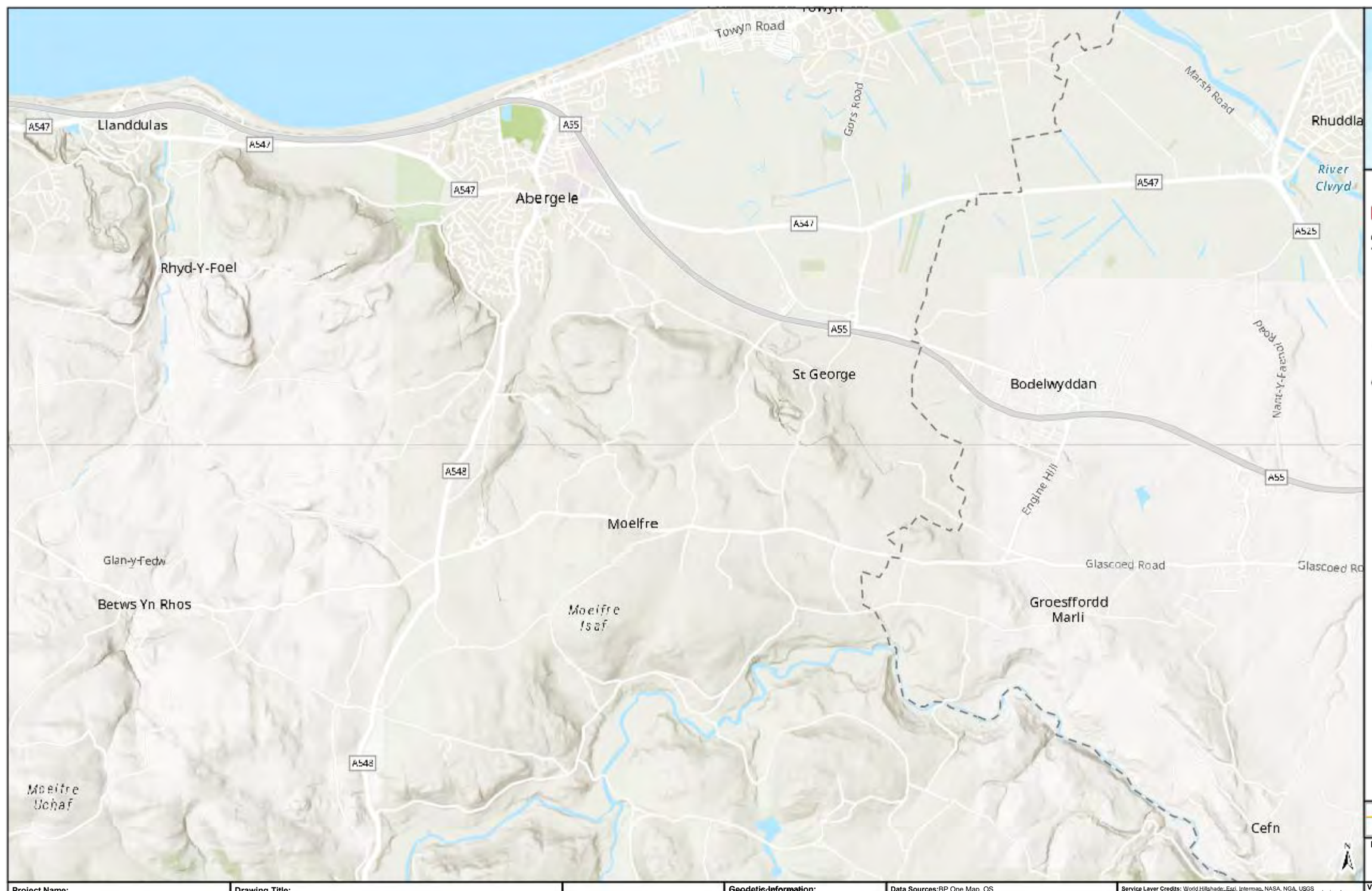

LEGEND

- Mona Onshore Order Limits
- 250m buffer
- Number of birds: 1-3
- Number of birds: 4-10
- Number of birds: 11-50
- Number of birds: 50+

Project Name:
MONA OFFSHORE WIND PROJECT

Drawing Title:
Wintering Birds Survey Results Rook November 2022 - March 2023 - Page: 28

0 500 1,000 m

Geodetic Information:
Datum: OSGB 1936
Projection: British National Grid
Scale@379mmx231mm: 1:40,000

Data Sources: BP One Map, OS

Service Layer Credits: World Hillshade, Esri, Interman, NASA, NGA, USGS
World Topographic Map: Esri UK, Esri, HERE, Garmin, Foursquare, GeoTechnologies, Inc, METI/NASA, USGS
World Topographic Map: Esri, HERE, Garmin, FAO, NOAA

Drawing Number:
ECO01789-0042-01

VER	DATE	DETAILS	BY	CHECK
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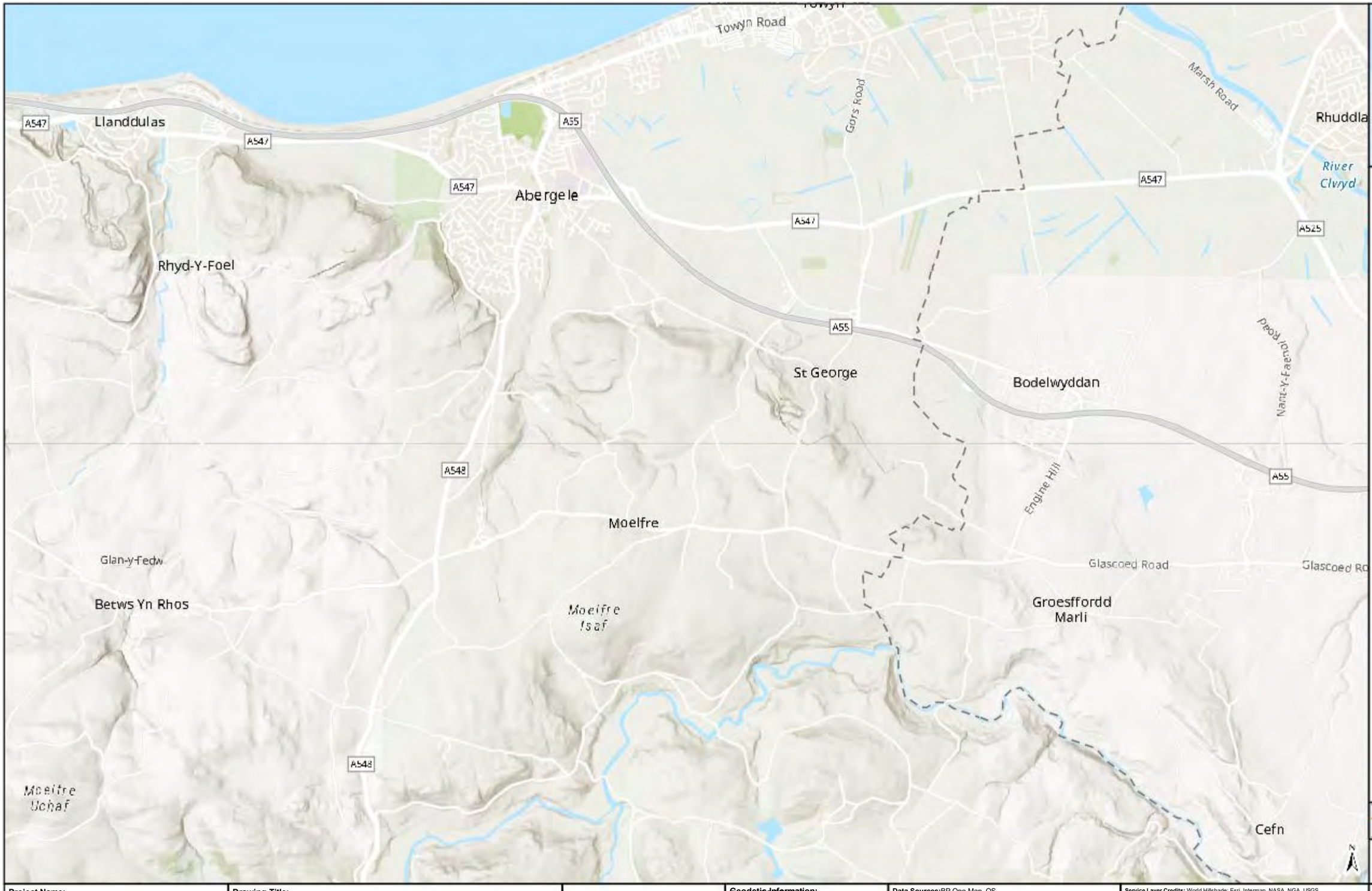

LEGEND

- Mona Onshore Order Limits
- 250m buffer
- Number of birds: 1-3
- Number of birds: 4-10
- Number of birds: 11-50
- Number of birds: 50+

Project Name:
MONA OFFSHORE WIND PROJECT

Drawing Title:
Wintering Birds Survey Results Skylark November 2022 - March 2023 - Page: 29

0 500 1,000 m

Geodetic Information:
Datum: OSGB 1936
Projection: British National Grid
Scale@379mmx231mm: 1:40,000

Data Sources: BP One Map, OS

Service Layer Credits: World Hillshade, Esri, Interman, NASA, NGA, USGS
World Topographic Map: Esri UK, Esri, HERE, Garmin, Foursquare, GeoTechnologies, Inc, METI/NASA, USGS
World Topographic Map: Esri, HERE, Garmin, FAO, NOAA

Drawing Number:
ECO01789-0042-01

VER	DATE	DETAILS	BY	CHECK
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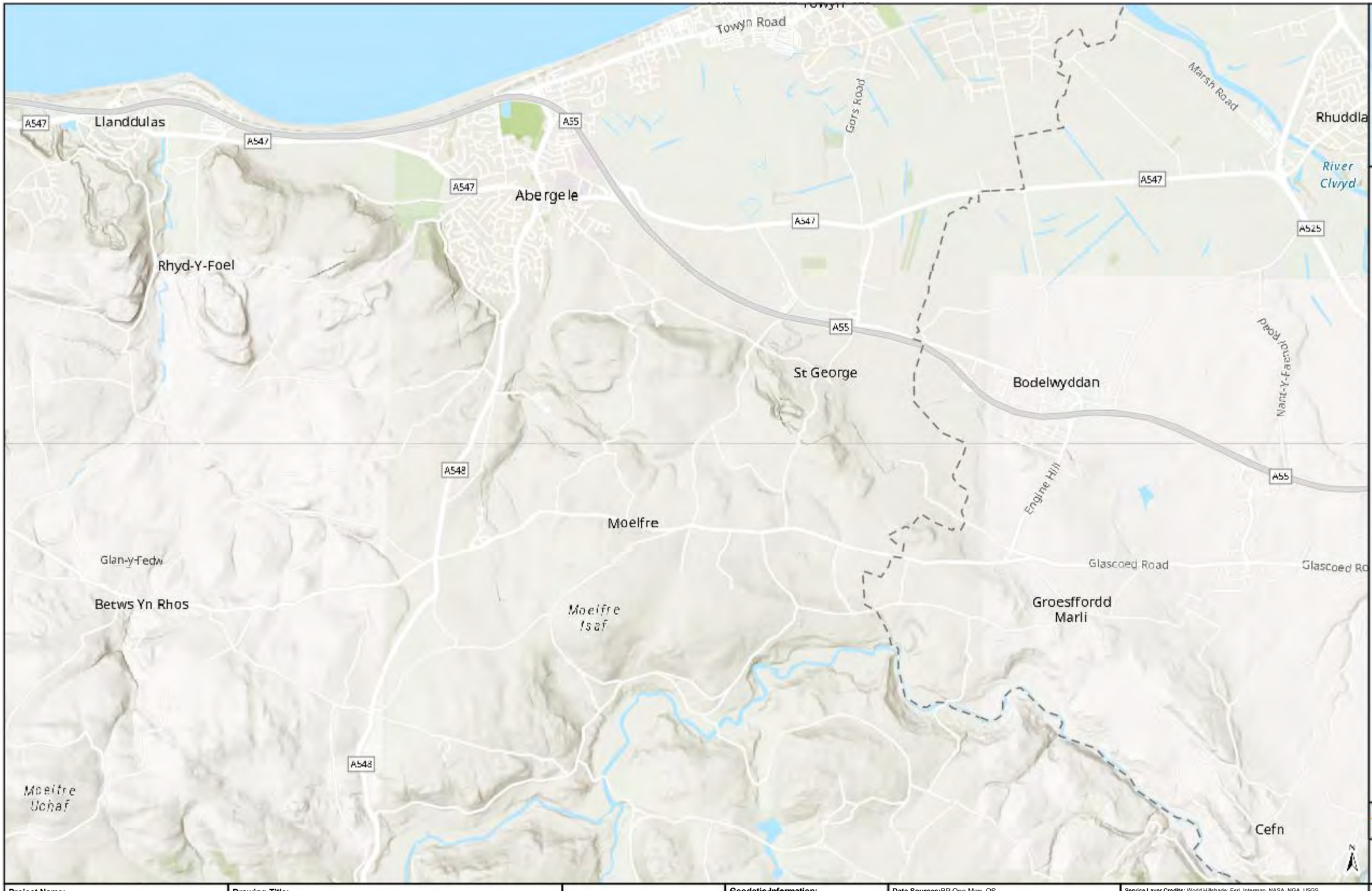

LEGEND

- Mona Onshore Order Limits
- 250m buffer
- Number of birds: 1-3
- Number of birds: 4-10
- Number of birds: 11-50
- Number of birds: 50+

Project Name:
MONA OFFSHORE WIND PROJECT

Drawing Title:
Wintering Birds Survey Results Stock Dove November 2022 - March 2023 - Page: 30

0 500 1,000 m

Geodetic Information:
Datum: OSGB 1936
Projection: British National Grid
Scale@379mmx231mm: 1:40,000

Data Sources: BP One Map, OS

Service Layer Credits: World Hillshade, Esri, Interman, NASA, NGA, USGS
World Topographic Map: Esri UK, Esri, HERE, Garmin, Foursquare, GeoTechnologies, Inc, METI/NASA, USGS
World Topographic Map: Esri, HERE, Garmin, FAO, NOAA

Drawing Number:
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VER	DATE	DETAILS	BY	CHECK
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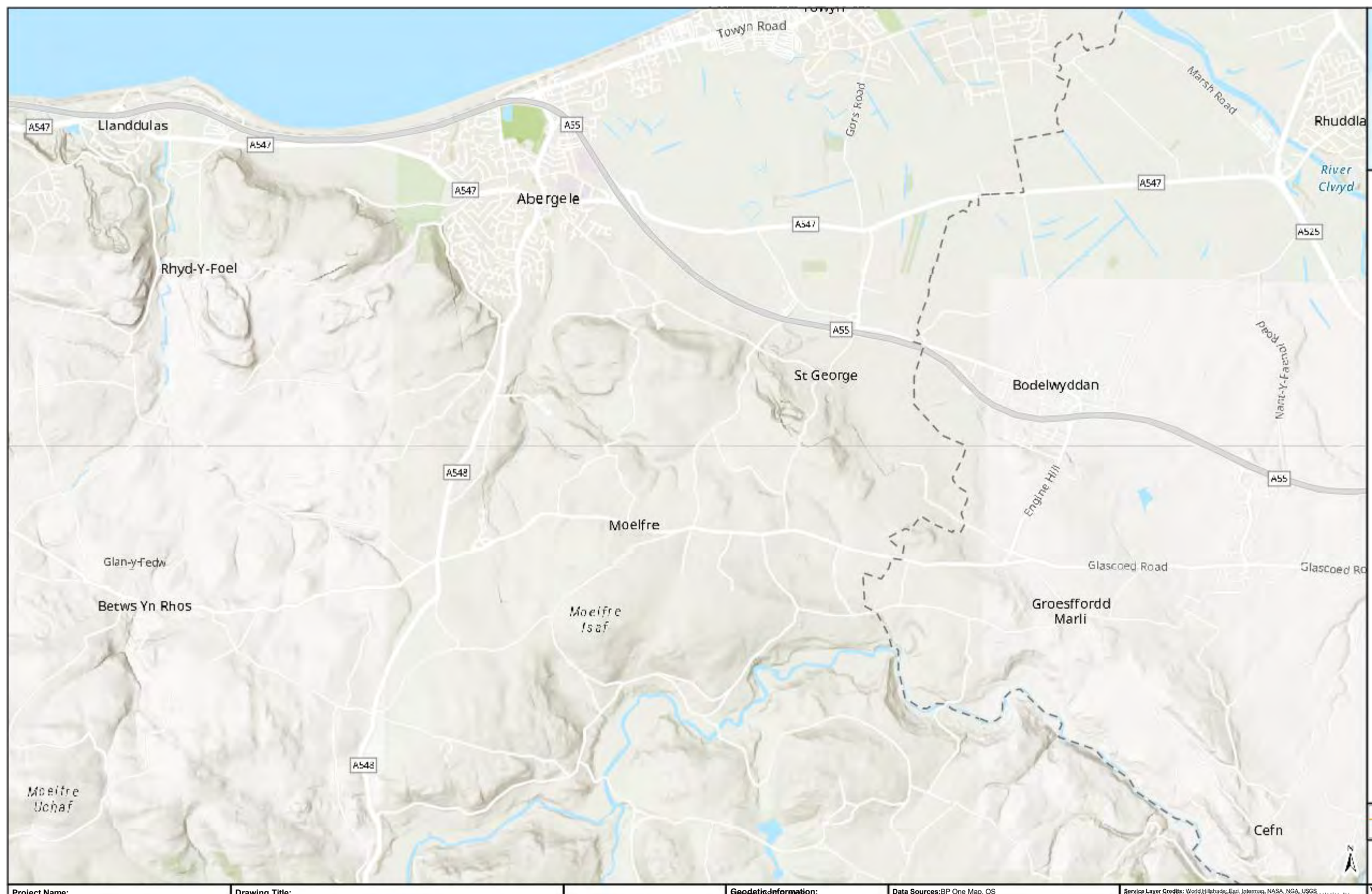

LEGEND

- Mona Onshore Order Limits
- 250m buffer
- Number of birds: 1-3
- Number of birds: 4-10
- Number of birds: 11-50
- Number of birds: 50+

Project Name:
MONA OFFSHORE WIND PROJECT

Drawing Title:
Wintering Birds Survey Results Starling November 2022 - March 2023 - Page: 31

0 500 1,000 m

Geodetic Information:
Datum: OSGB 1936
Projection: British National Grid
Scale@379mmx231mm: 1:40,000

Data Sources: BP One Map, OS

Service Layer Credits: World Hillshade, Esri, Interman, NASA, NGA, USGS
World Topographic Map: Esri UK, Esri, HERE, Garmin, Foursquare, GeoTechnologies, Inc, METI/NASA, USGS
World Topographic Map: Esri, HERE, Garmin, FAO, NOAA

Drawing Number:
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VER	DATE	DETAILS	BY	CHECK
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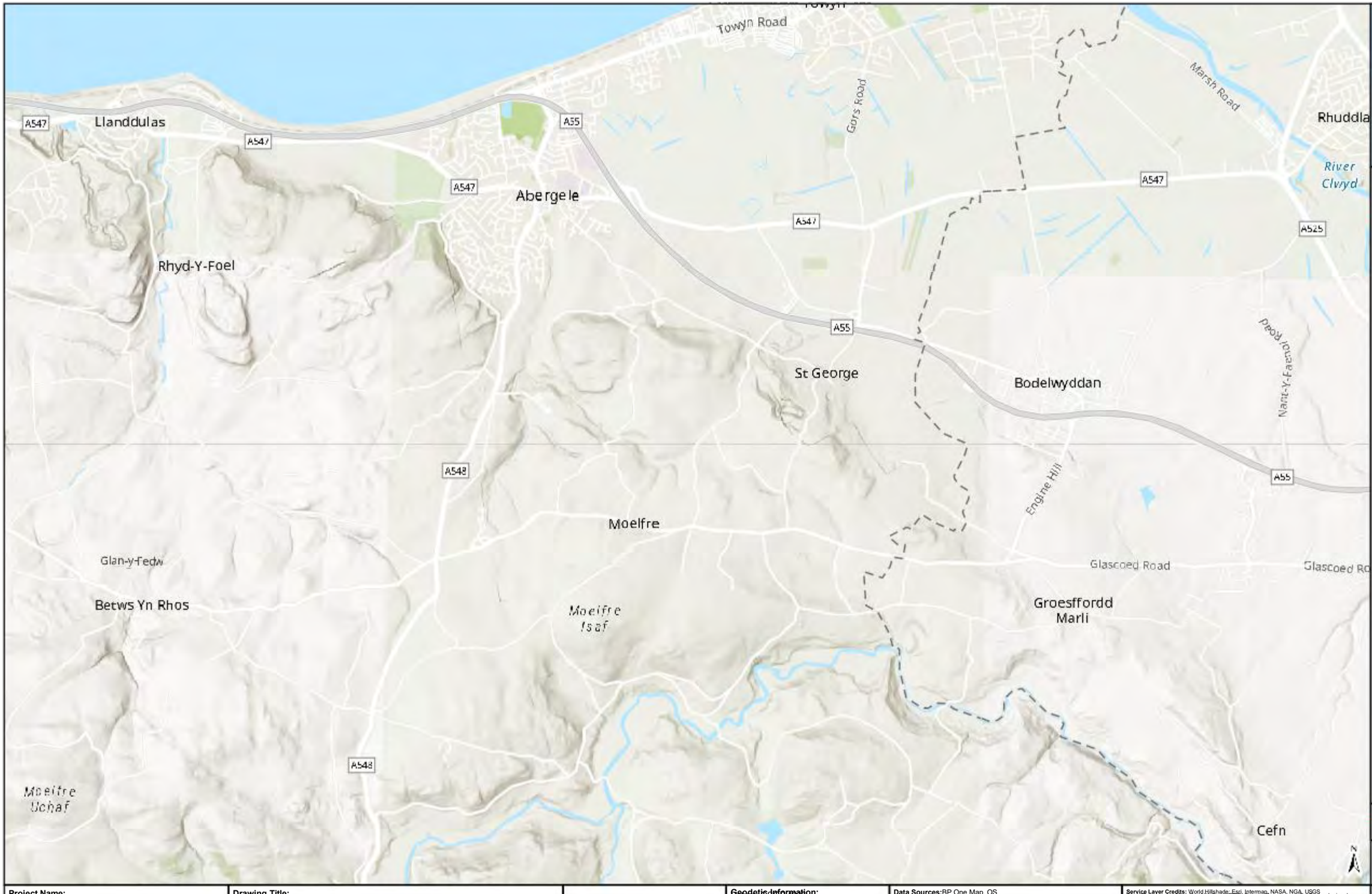

LEGEND

- Mona Onshore Order Limits
- 250m buffer
- Number of birds: 1-3
- Number of birds: 4-10
- Number of birds: 11-50
- Number of birds: 50+

Project Name:
MONA OFFSHORE WIND PROJECT

Drawing Title:
Wintering Birds Survey Results Sparrowhawk November 2022 - March 2023 - Page: 32

0 500 1,000 m

Geodetic Information:
Datum: OSGB 1936
Projection: British National Grid
Scale@379mmx231mm: 1:40,000

Data Sources: BP One Map, OS

Service Layer Credits: World Hillshade, Esri, Interman, NASA, NGA, USGS
World Topographic Map: Esri UK, Esri, HERE, Garmin, Foursquare, GeoTechnologies, Inc, METI/NASA, USGS
World Topographic Map: Esri, HERE, Garmin, FAO, NOAA

Drawing Number:
ECO01789-0042-01

VER	DATE	DETAILS	BY	CHECK
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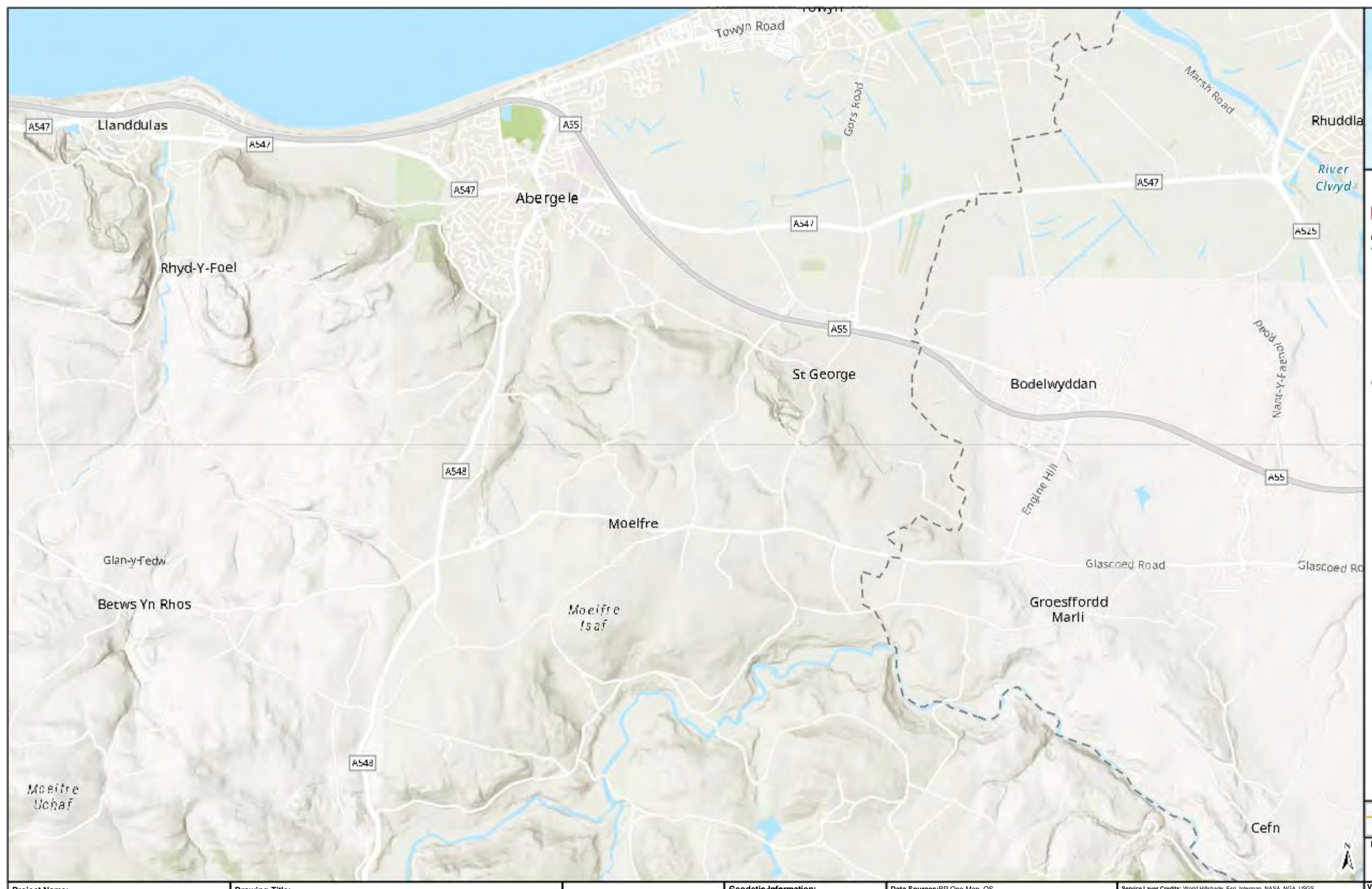

LEGEND

- Mona Onshore Order Limits
- 250m buffer
- Number of birds: 1-3
- Number of birds: 4-10
- Number of birds: 11-50
- Number of birds: 50+

Project Name:
MONA OFFSHORE WIND PROJECT

Drawing Title:
Wintering Birds Survey Results Snipe November 2022 - March 2023 - Page: 33

0 500 1,000 m

Geodetic Information:
Datum: OSGB 1936
Projection: British National Grid
Scale@379mmx231mm: 1:40,000

Data Sources: BP One Map, OS

Service Layer Credits: World Hillshade, Esri, Interman, NASA, NGA, USGS
World Topographic Map: Esri UK, Esri, HERE, Garmin, Foursquare, GeoTechnologies, Inc, METI/NASA, USGS
World Topographic Map: Esri, HERE, Garmin, FAO, NOAA

Drawing Number:
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VER	DATE	DETAILS	BY	CHECK
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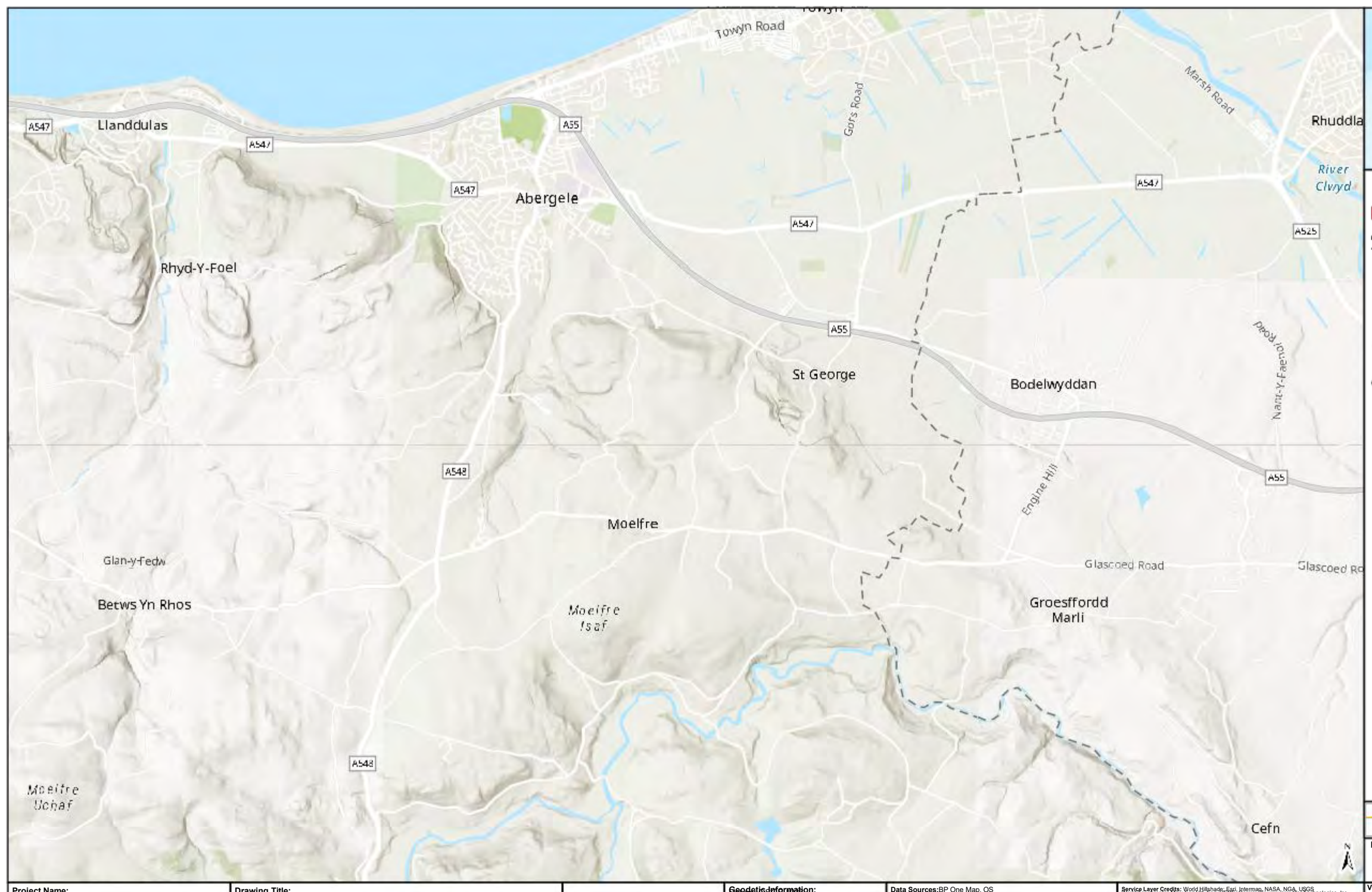

LEGEND

- Mona Onshore Order Limits
- 250m buffer
- Number of birds: 1-3
- Number of birds: 4-10
- Number of birds: 11-50
- Number of birds: 50+

Project Name:
MONA OFFSHORE WIND PROJECT

Drawing Title:
Wintering Birds Survey Results Tree sparrow November 2022 - March 2023 - Page: 35

0 500 1,000 m

Geodetic Information:
Datum: OSGB 1936
Projection: British National Grid
Scale@379mmx231mm: 1:40,000

Data Sources: BP One Map, OS

Service Layer Credits: World Hillshade, Esri, Interman, NASA, NGA, USGS
World Topographic Map: Esri UK, Esri, HERE, Garmin, Foursquare, GeoTechnologies, Inc, METI/NASA, USGS
World Topographic Map: Esri, HERE, Garmin, FAO, NOAA

Drawing Number:
ECO01789-0042-01

VER	DATE	DETAILS	BY	CHECK
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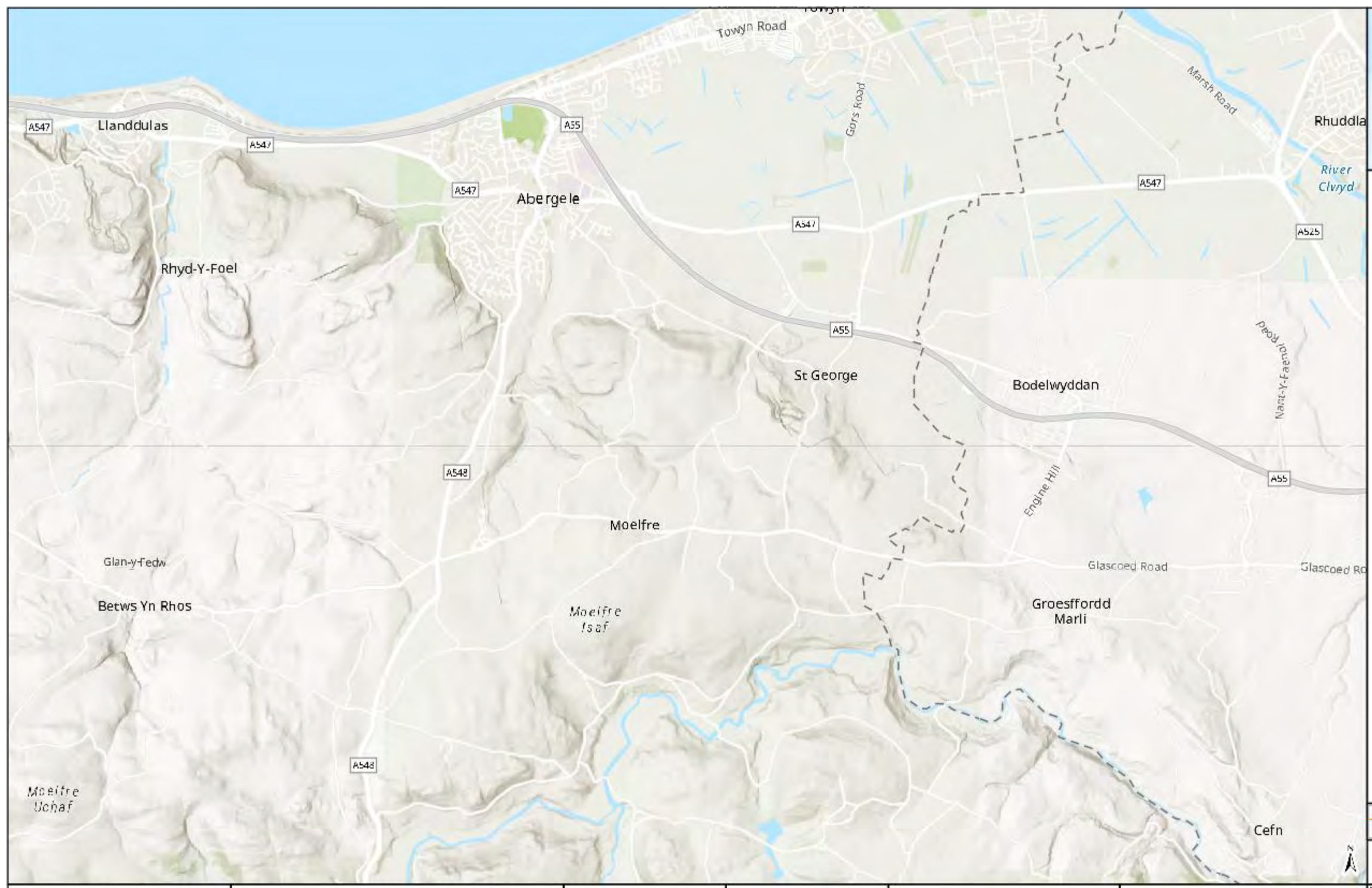

LEGEND

- Mona Onshore Order Limits
- 250m buffer
- Number of birds: 1-3
- Number of birds: 4-10
- Number of birds: 11-50
- Number of birds: 50+

Project Name:
MONA OFFSHORE WIND PROJECT

Drawing Title:
Wintering Birds Survey Results Wheatear November 2022 - March 2023 - Page: 36

0 500 1,000 m

Geodetic Information:
Datum: OSGB 1936
Projection: British National Grid
Scale@379mmx231mm: 1:40,000

Data Sources: BP One Map, OS

Service Layer Credits: World Hillshade, Esri, Interman, NASA, NGA, USGS
World Topographic Map: Esri UK, Esri, HERE, Garmin, Foursquare, GeoTechnologies, Inc, METI/NASA, USGS
World Topographic Map: Esri, HERE, Garmin, FAO, NOAA

Drawing Number:
ECO01789-0042-01

VER	DATE	DETAILS	BY	CHECK
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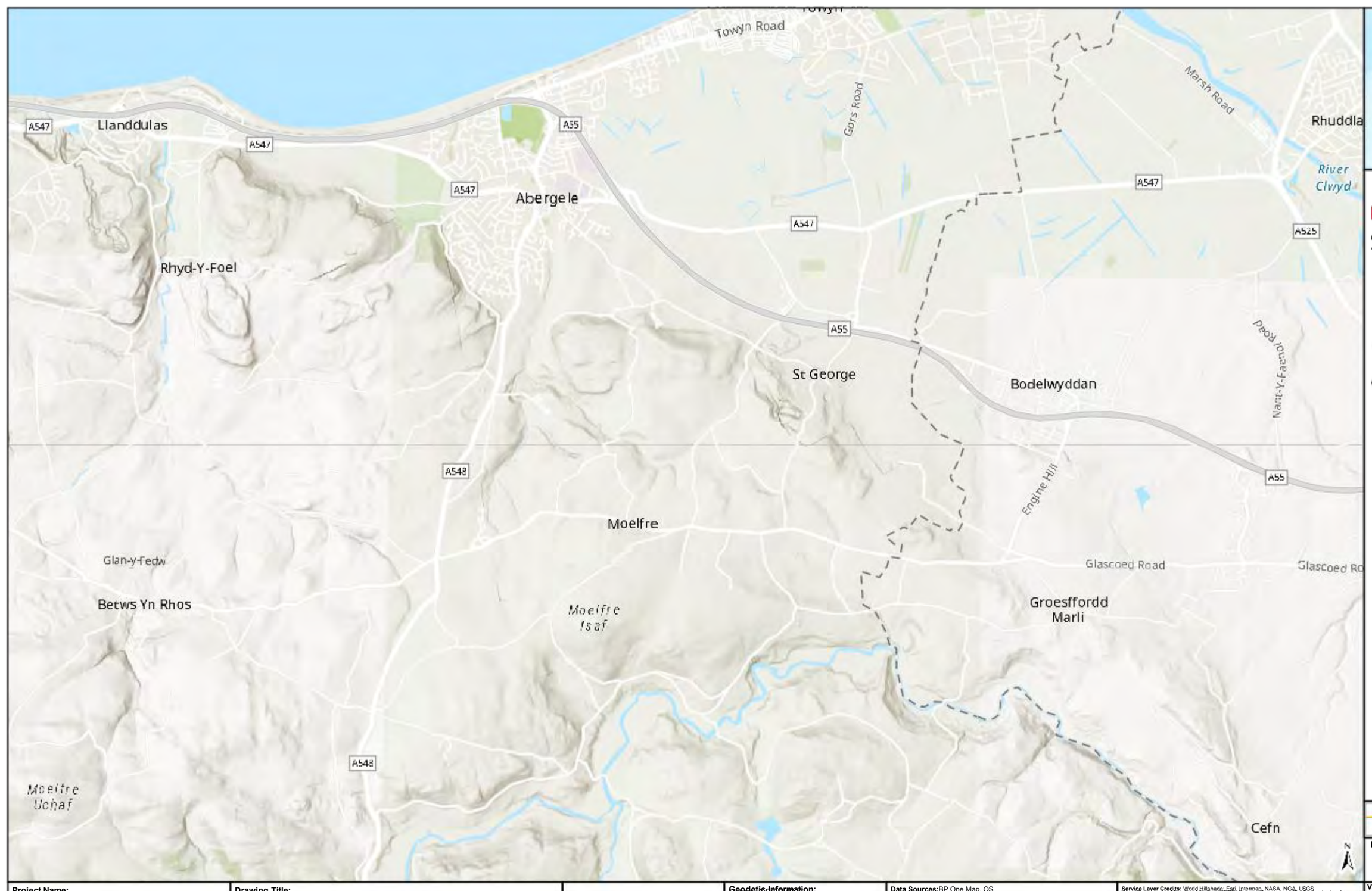

LEGEND

- Mona Onshore Order Limits
- 250m buffer
- Number of birds: 1-3
- Number of birds: 4-10
- Number of birds: 11-50
- Number of birds: 50+

Project Name:
MONA OFFSHORE WIND PROJECT

Drawing Title:
Wintering Birds Survey Results Woodcock November 2022 - March 2023 - Page: 37

0 500 1,000 m

Geodetic Information:
Datum: OSGB 1936
Projection: British National Grid
Scale@379mmx231mm: 1:40,000

Data Sources: BP One Map, OS

Service Layer Credits: World Hillshade, Esri, Interman, NASA, NGA, USGS
World Topographic Map: Esri UK, Esri, HERE, Garmin, Foursquare, GeoTechnologies, Inc, METI/NASA, USGS
World Topographic Map: Esri, HERE, Garmin, FAO, NOAA

Drawing Number:
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VER	DATE	DETAILS	BY	CHECK
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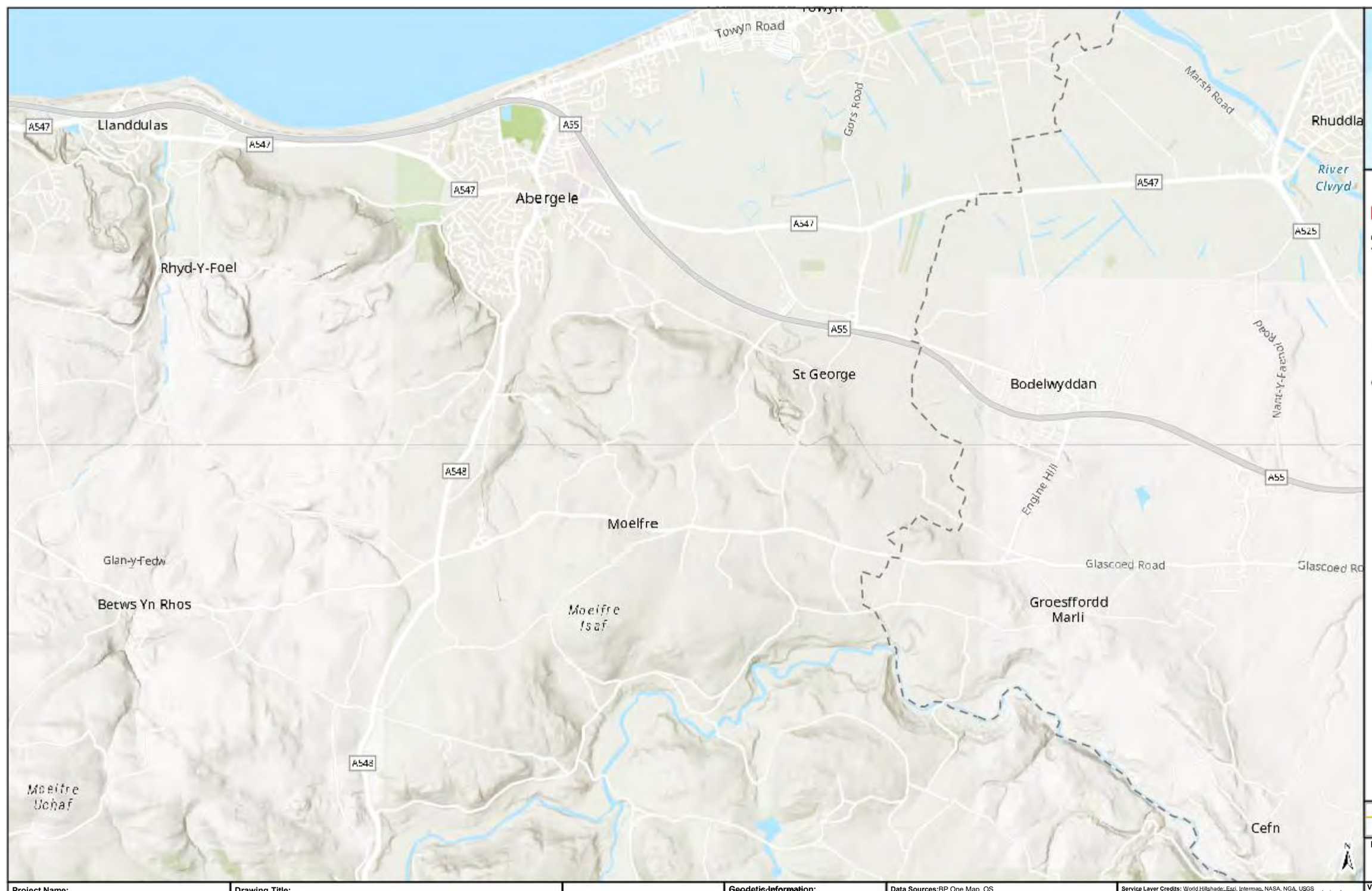

LEGEND

- Mona Onshore Order Limits
- 250m buffer
- Number of birds: 1-3
- Number of birds: 4-10
- Number of birds: 11-50
- Number of birds: 50+

Project Name:
MONA OFFSHORE WIND PROJECT

Drawing Title:
Wintering Birds Survey Results Wood pigeon November 2022 - March 2023 - Page: 38

0 500 1,000 m

Geodetic Information:
Datum: OSGB 1936
Projection: British National Grid
Scale@379mmx231mm: 1:40,000

Data Sources: BP One Map, OS

Service Layer Credits: World Hillshade, Esri, Interman, NASA, NGA, USGS
World Topographic Map: Esri UK, Esri, HERE, Garmin, Foursquare, GeoTechnologies, Inc, METI/NASA, USGS
World Topographic Map: Esri, HERE, Garmin, FAO, NOAA

Drawing Number:
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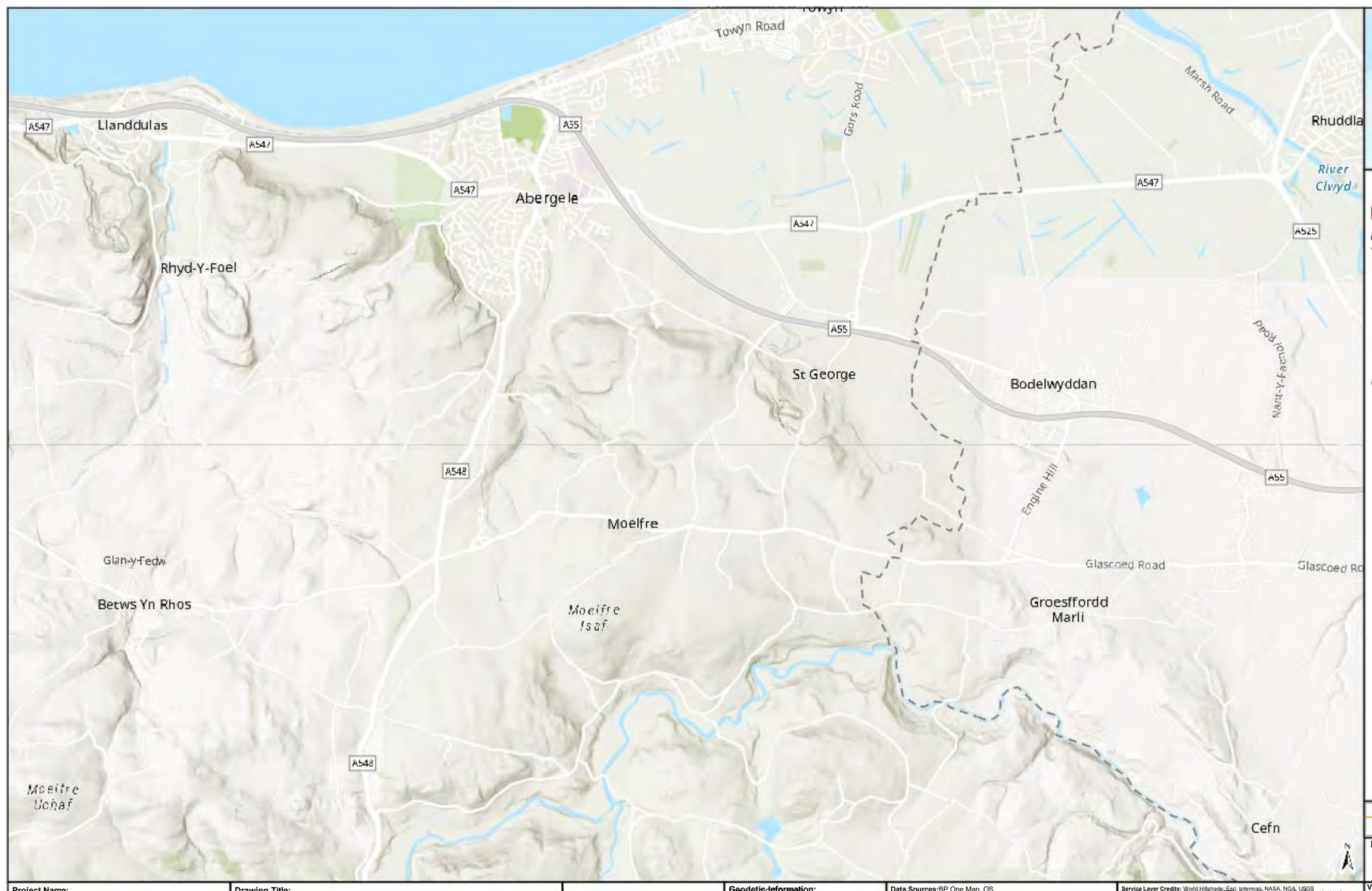


LEGEND

- Mona Onshore Order Limits
- 250m buffer
- Number of birds: 1-3
- Number of birds: 4-10
- Number of birds: 11-50
- Number of birds: 50+

Project Name:
MONA OFFSHORE WIND PROJECT

Drawing Title:
Wintering Birds Survey Results Wren November 2022 - March 2023 - Page: 39

0 500 1,000 m

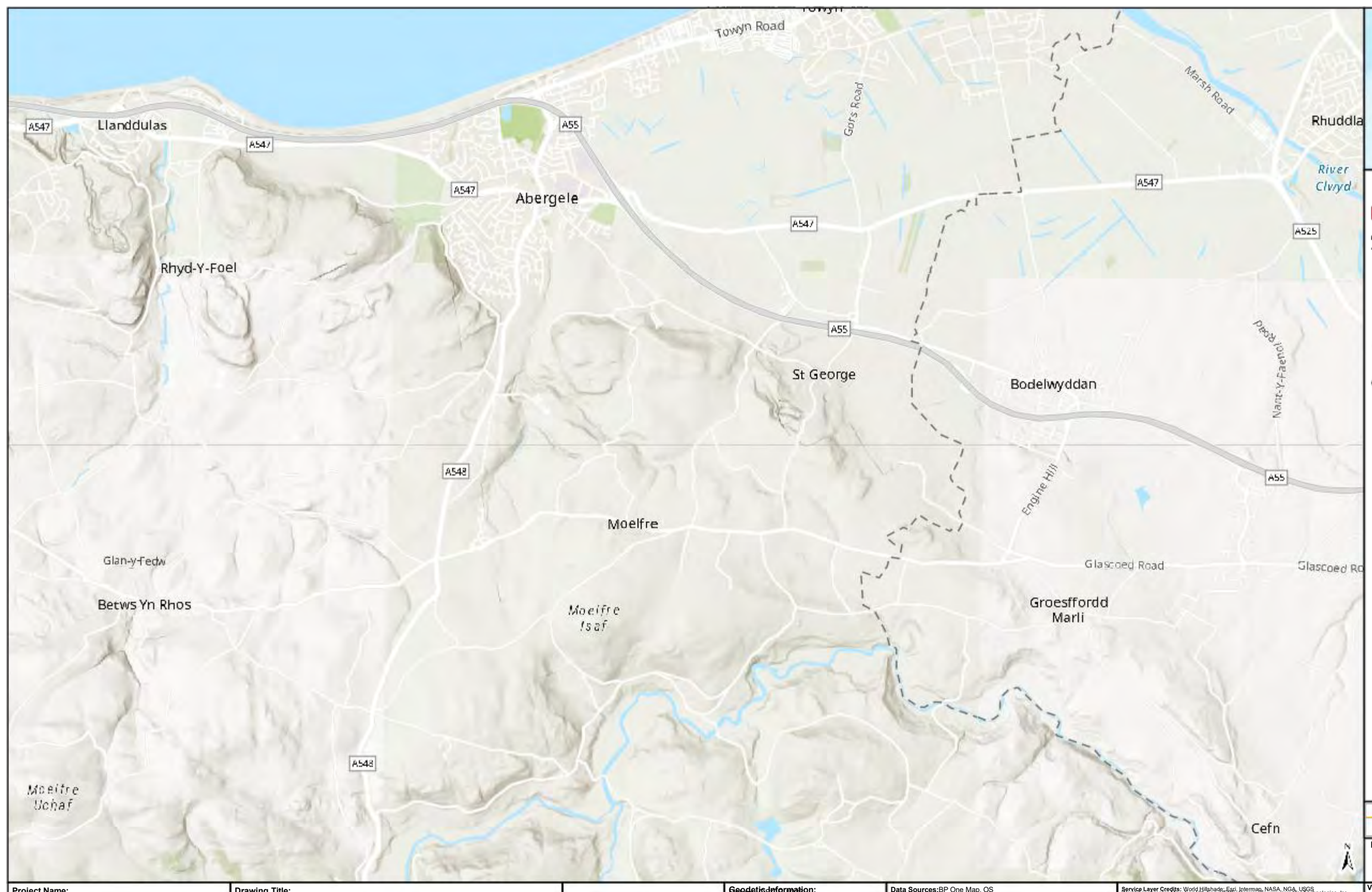
Geodetic Information:
Datum: OSGB 1936
Projection: British National Grid
Scale@379mmx231mm: 1:40,000

Data Sources: BP One Map, OS

Service Layer Credits: World Hillshade, Esri, Interman, NASA, NGA, USGS
World Topographic Map: Esri UK, Esri, HERE, Garmin, Foursquare, GeoTechnologies, Inc, METI/NASA, USGS
World Topographic Map: Esri, HERE, Garmin, FAO, NOAA

Drawing Number:
ECO01789-0042-01

VER	DATE	DETAILS	BY	CHECK
01	07/09/23	Initial Issue	OW	AM



LEGEND

- Mona Onshore Order Limits
- 250m buffer
- Number of birds: 1-3
- Number of birds: 4-10
- Number of birds: 11-50
- Number of birds: 50+

Project Name:
MONA OFFSHORE WIND PROJECT

Drawing Title:
Wintering Birds Survey Results Willow Warbler November 2022 - March 2023 - Page: 40

0 500 1,000 m

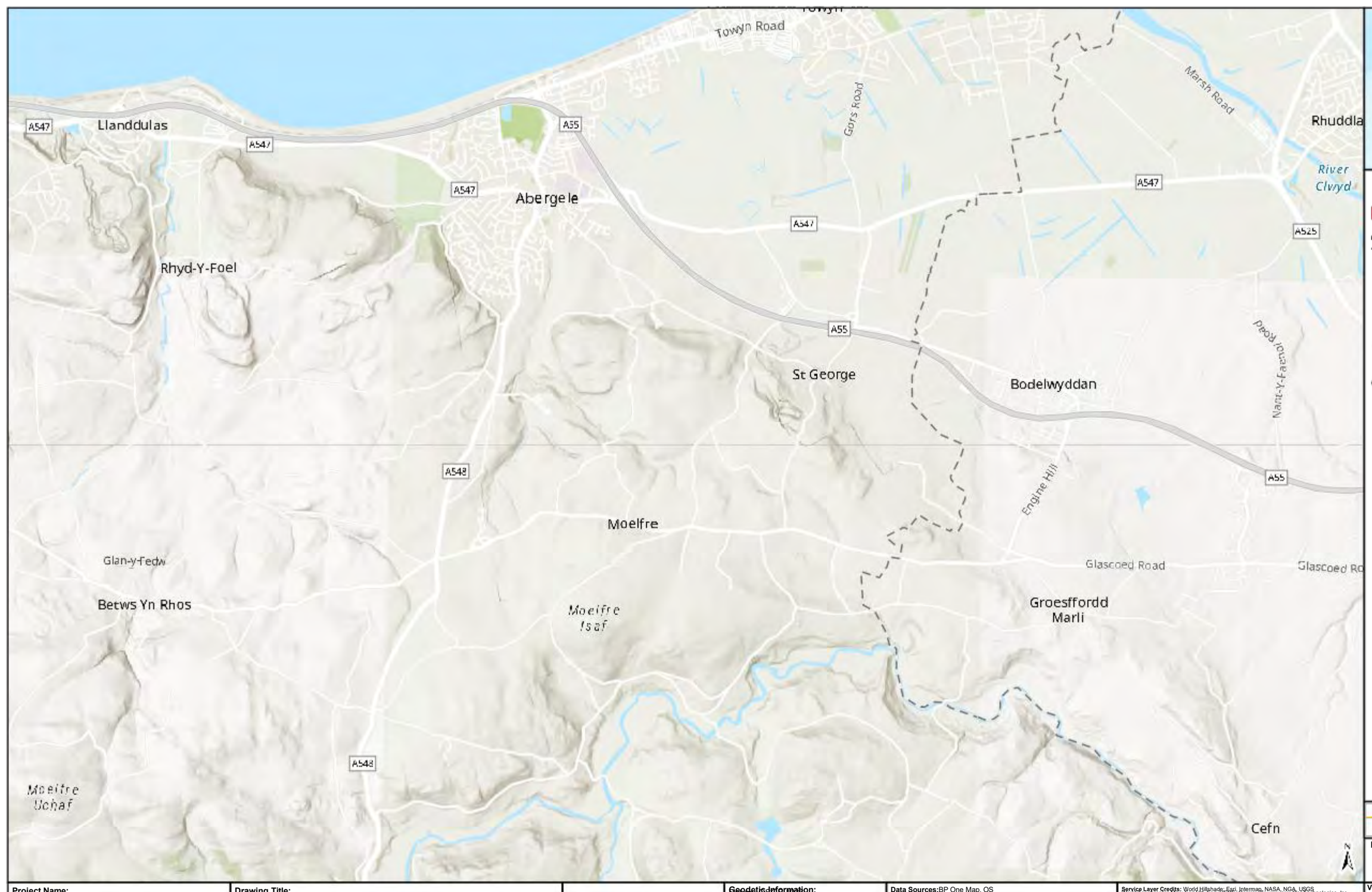
Geodetic Information:
Datum: OSGB 1936
Projection: British National Grid
Scale@379mmx231mm: 1:40,000

Data Sources: BP One Map, OS

Service Layer Credits: World Hillshade, Esri, Intermap, NASA, NGA, USGS
World Topographic Map: Esri UK, Esri, HERE, Garmin, Foursquare, GeoTechnologies, Inc, METI/NASA, USGS
World Topographic Map: Esri, HERE, Garmin, FAO, NOAA

Drawing Number:
ECO01789-0042-01

VER	DATE	DETAILS	BY	CHECK
01	07/09/23	Initial Issue	OW	AM



LEGEND

- Mona Onshore Order Limits
- 250m buffer
- Number of birds: 1-3
- Number of birds: 4-10
- Number of birds: 11-50
- Number of birds: 50+

Project Name:
MONA OFFSHORE WIND PROJECT

Drawing Title:
Wintering Birds Survey Results Yellowhammer November 2022 - March 2023 - Page: 41

0 500 1,000 m

Geodetic Information:
Datum: OSGB 1936
Projection: British National Grid
Scale@379mmx231mm: 1:40,000

Data Sources: BP One Map, OS

Service Layer Credits: World Hillshade, Esri, Interman, NASA, NGA, USGS
World Topographic Map: Esri UK, Esri, HERE, Garmin, Foursquare, GeoTechnologies, Inc, METI/NASA, USGS
World Topographic Map: Esri, HERE, Garmin, FAO, NOAA

Drawing Number:
ECO01789-0042-01

VER	DATE	DETAILS	BY	CHECK
01	07/09/23	Initial Issue	OW	AM

E.6. Onshore ecology EWG meeting 5

E.6.1 Meeting minutes

Appendix A Onshore Ecology EWG05 Meeting Minutes

Reference:	RPS_EOR0801_Mona_Onshore_Ecology_EWG05_MoM_Rev01
Meeting Name:	Mona Evidence Plan Onshore Ecology Expert Working Group (EWG) – Meeting 5
Meeting date:	04 October 2023
Meeting location:	Virtual (Microsoft Teams)

Attendees

Name	Initials	Company	Role
Introduction			
[redacted]	[redacted]	[redacted]	Consultant
	BJ	RPS	Consultant
	JC	RPS	Consultant
	FM	RPS	Consultant
	LR	RPS	Consultant
	CD	RPS	Consultant
	PRW	bp	Applicant
	PC	bp	Applicant
	JF	bp	Applicant
	KS	Conway County Borough Council (CCBC)	Statutory body
	SW	Cyfoeth Naturiol Cymru (Natural Resources Wales, NRW)	Statutory body
	NS	Cyfoeth Naturiol Cymru (Natural Resources Wales, NRW)	Statutory body
	ME	Cyfoeth Naturiol Cymru (Natural Resources Wales, NRW)	Statutory body

Name	Initials	Company	Role
[redacted]	JW	Denbighshire County Council (DCC)	Statutory body
	NMa	Welsh Government	Statutory body
	NMo	Woodland Trust	Statutory body

Meeting Minutes

Item	Detail	Actions	Date
Introduction			
1	Introduction RPS provided a summary of the agenda for the fifth Onshore Ecology EWG. This included the following items: Summary of 4th Onshore Ecology EWG; indicative meetings programme update; update on the Mona Offshore Wind Project; onshore and intertidal ornithology; onshore ecology; landscape and ecological strategy; next steps and questions.		
2	Summary of 4th Onshore Ecology EWG RPS provided a summary of the points covered during the 4th Onshore Ecology EWG. This included meeting programme; actions following 3rd onshore ecology EWG; onshore and intertidal ornithology; onshore ecology; and key section 42 responses. The key actions following the 4th Onshore Ecology EWG included: EWG • Review meeting minutes and agreement log (incomplete); • Review survey methodologies and provide feedback (incomplete); and • Review wintering and migratory survey technical note (incomplete). RPS • Share meeting minutes and agreement log from 4th Onshore Ecology EWG (complete) • Provide updated survey methodologies addressing EWG feedback (complete) • Share GCN survey data/findings with relevant databases (complete) • Share technical note for 1 year survey of wintering/migratory birds (complete) RPS provided an overview of completed and upcoming Onshore Ecology EWGs, including the dates, stakeholders and focus of previous and future meetings.		

Item	Detail	Actions	Date
3	Update on the Mona Offshore Wind Project The client provided a summary of Project updates reported during the 4th Onshore Ecology EWG, including selection of onshore cable route, onshore substation, and access routes. In addition, the client stated that refinements to the Mona Onshore Order Limits remain ongoing in response to design/environmental constraints. The client then presented figures illustrating the differences in the Mona Onshore Order Limits between the 4th Onshore Ecology EWG (July 2023) and 5th Onshore Ecology EWG (October 2023).		
4	Alterations at landfall/intertidal area The client provided a summary of the alterations to the Mona Onshore Order Limits at landfall and within the intertidal area. This included: refinement of the landfall and intertidal access areas; removal of landfall and intertidal areas where access is no longer required; reduction in the drill splay at the landfall and intertidal areas; and an exclusion zone provided around the vegetated shingle bank, including an area for welfare access. NS (NRW) – Happy with the proposed design of the Mona Onshore Order Limits at landfall and within the intertidal area on the basis that we avoid the SSSI (associated with the shingle beach). However, suggested opportunity to contribute to the shingle beach replenishment plan. KS (CCBC) – Stated that they will investigate and provide further information to the Mona Offshore Wind Project regarding the shingle beach replenishment plan.	CCBC/NRW – to provide further information regarding the shingle beach replenishment plan.	04 October 2023
5	Alterations along the onshore cable corridor The client provided a summary of the alterations to the Mona Onshore Order Limits along the onshore cable corridor. This included: reduced optionality (i.e. single onshore cable corridor) except for one location; width of onshore cable corridor reduced from approximately 100m to 74m; and identification of locations for each of the Temporary Construction Compounds (TCCs).		
6	Mitigation requirements and other engineering decisions RPS explained that the Mona Onshore Order Limits now included areas for temporary and permanent mitigation (which were explained in detailed during the onshore ecology sections of the presentation).		

Item	Detail	Actions	Date
	The client provided a summary of the other engineering decisions. This included the decisions to adopt Gas-insulated Switchgear (GIS) as opposed to Air-insulated Switchgear (AIS) for the onshore substation. The client explained what GIS and AIS meant in terms of design and that the GIS option resulted in a reduction of the onshore substation footprint from 125,000m2 (12.5ha) to 70,000m2 (7.0ha) and maximum height from 20m to 15m.		
7	Ancient Woodland Shapefile – DataMap Wales RPS explained that online mapping data provided on DataMap Wales indicates that the eastern access route intersects with an area of designated ancient woodland. However, site surveys indicate that there is no ancient woodland present at this location. RPS requested clarification from NRW, CCBC and DCC as to why this may be the case and how this area of ancient woodland would need to be considered. SW/ME (NRW) / JW (DCC) – stated that the relevant local planning authority is ultimately responsible for the management of ancient woodland. JW stated that provided that suitable justification is provided for why this access is required and the Mona Offshore Wind Project explain that there is no ancient woodland at this location, then DCC would be satisfied with this approach.		
Onshore and Intertidal Ornithology			
8	Introduction RPS provided a summary of the agenda for onshore and intertidal ornithology. This included the following items: summary of survey programme; survey progress to date; intertidal waterbirds; and issues for agreement with the Onshore Ecology EWG.		
9	Survey Programme RPS provided a summary of field surveys undertaken to date, including the area, methodology, frequency, and timings of intertidal waterbird surveys; breeding bird surveys; onshore and wintering passerine and raptor surveys. RPS also provided a summary of field surveys that remain outstanding, including a second year of intertidal waterbird surveys proposed from July 2023 and November 2023.		
10	Survey Progress RPS provided a summary of survey progress, including those discussed during the 4th Onshore Ecology EWG and	RPS – to provide further information to	04 October 2023

Item	Detail	Actions	Date
	explained that the key findings of surveys undertaken to date remain unchanged following refinements to the Mona Onshore Order Limits. RPS also explained that the second year of intertidal water bird surveys remain ongoing (December 2022 to November 2023) and a summary of the findings of these surveys will be reported as part of the 6th Onshore Ecology EWG in November 2023. JW (DCC) – stated that crossbills may be present within the vicinity of the Onshore Substation and questioned if these had been considered as part of the onshore and intertidal ornithology surveys. JC (RPS) – stated that the Onshore and Intertidal Ornithology Team would provide further information as to when onshore and intertidal ornithology surveys were undertaken and if/how crossbills have been considered.	DCC as to when onshore and intertidal ornithology surveys were undertaken and if/how crossbills have been considered.	
11	Issues for Agreement with Onshore Ecology EWG RPS identified the following key issues for agreement with the EWG: • Having reviewed the technical note shared on 18 September 2023, is the EWG satisfied with one year's survey data for the wintering passerine and raptors? SW (NRW) – stated that they would provide an official response to the technical note shared on 18 September 2023, including if they agree with 1 years' worth of surveys for wintering and passerine birds.	NRW – to provide official response to technical note.	04 October 2023
12	Questions – no further issues raised during the EWG.		
Onshore Ecology			
13	Introduction RPS provided a summary of the agenda for onshore ecology. This included: survey progress to date; summary of key findings; Great Crested Newt (GCN) mitigation; landscape/ecological connectivity; digital data sharing platform; key issues for agreement with the Onshore Ecology EWG; next steps; and questions.		
14	Surveys Completed RPS provided a summary of the surveys have now been completed: • Otter and Water vole: Walkover surveys for signs (1st and 2nd survey visits);		

Item	Detail	Actions	Date
	• Extended Phase 1 Habitat Survey: This included additional or repeated phase 1 habitat surveys; • National Vegetation Classification (NVC): Detailed botanical survey of plant species; • Terrestrial Invertebrates: Walkover scoping survey (sweep netting and sample analysis where required); • Aquatic Invertebrates: Walkover scoping survey, (netting and sample analysis where required); and • Fish and eel surveys: Further survey scoped out following initial inspection of watercourses.		
15	Surveys Underway RPS provided a summary of the surveys which remain underway: • Bats - Trees: Preliminary Ground Level Roost Assessments (PGLRA), Tree Inspections and Dusk/ Dawn Surveys; • Bats - Buildings: Preliminary Roost Assessments (PRA), Buildings Inspections and Dusk/Dawn Surveys; • Bats - Activity: Bat Activity Surveys using Static Bat Monitors at multiple locations, including Kinmell Hall; • Badger: Badger walkover surveys and sett monitoring; • Otter and Water Vole: Further walkover surveys for signs and evidence of otter and water vole; • Hazel Dormice: Checking dormouse tubes for presence / likely absence; • Hedgerows: Hedgerow Condition Assessment and Hedgerow Regulations Survey; and • Invasive and Non-Native Species (INNS): INNS walkover surveys/ identification and mapping.		
16	Further surveys required post-application (2024) RPS provided a summary of the surveys which were either completed for the purpose of the Environmental Statement but required further surveys post application, or remained ongoing but required further surveys post application. These included: • Great Crested Newt (GCN): eDNA, Habitat Suitability Index (HSI) and Population Size Class Assessments. • Hazel Dormouse: Continuation of checking dormouse tubes to achieve sufficient survey effort to meet presence/likely absence probability score. • Badger Monitoring: Where potential breeding sets have been identified and are likely to be impacted by permanent infrastructure (e.g. onshore substation), monitoring would be undertaken during the optimal period (January to February 2024) to assess for breeding. • Bats: Where confirmed roosts have been identified and are likely to be impacted by permanent infrastructure (e.g. onshore substation) then further surveys would be undertaken during the optimal survey window (May to September 2023).	RPS – to confirm the feasibility of completing additional surveys in time to inform the DCO decision making process.	04 October 2023

Item	Detail	Actions	Date
	RPS explained that due to existing data and monitoring programmes associated with other nearby developments, it is considered that the Mona Offshore Wind Project would have sufficient baseline data to inform the ES. RPS also explained that further surveys for GCN, dormouse, badger and bats would be undertaken and reported in subsequent addendum report to the ES. These would also be used fulfil requirements of relevant EPS licences. ME, SW (NRW) – stated that they were happy with the approach that additional surveys for GCN, dormouse, badger and bats could be completed post-application. However, this is on the basis that information is available to inform the DCO decision making process.		
17	Bat dusk/dawn emergence surveys RPS explained that Dawn/dusk emergence surveys undertaken to date have focused on key areas located around the Onshore Substation. However, due to the continuous presence of livestock in this area (throughout the summer period), surveys could not be repeated on all the trees. These include trees identified with high potential for bat roosts, which could not be climbed safely, and confirmed bat roosts, where only a single dusk/dawn survey has been undertaken. RPS also explained that extensive bat activity surveys have been undertaken via automated static detectors throughout the summer period (as described during the 4th Onshore Ecology EWG). RPS stated that further dusk/dawn emergence surveys will be undertaken post-application (where required) for roosts identified beyond the vicinity Onshore Substation. Two alternative approaches were proposed to address the requirement for additional dusk/dawn emergence surveys. These included: • Option 1: Pre-construction dawn/dusk surveys of trees/buildings to determine usage of identified bat roosts; or • Option 2: Additional dawn/dusk surveys to be undertaken post-application and reported in an ES addendum report. RPS stated that these additional surveys would also be used fulfil requirements of relevant EPS Bat Mitigation Licences. RPS asked the Onshore Ecology EWG which of the two alternative approaches described above is most appropriate given the nature of the Mona Offshore Wind Project, the mobility of bat species and how they use roosts and the sensitivity of the receiving environment.	RPS – to confirm the feasibility of completing additional surveys in time to inform the DCO decision making process.	04 October 2023

Item	Detail	Actions	Date
	ME, SW (NRW) – stated that NRWs preference would be for surveys to be completed and reported in time to inform the DCO decision making process.		
18	Key updates following the 4th Onshore Ecology EWG RPS provided a summary of the key survey findings to date following the 4th Onshore Ecology EWG. These included: • Confirmed presence of hazel dormouse within the Mona Onshore Order Limits during dormouse tubes setup/checks; • Confirmed presence of reptiles within the Mona Onshore Order Limits, including the Onshore Substation during refugia setup/checks; and • Confirmed presence of greater horseshoe bat (*Rhinolophus ferrumequinum*) identified following analysis of data from static bat monitors. Greater horseshoe bat is listed under an Annex II and IV of the Conservation of Habitats and Species (Amendment) (EU Exit) Regulations 2019.		
19	GCN Mitigation Areas RPS provided a description of the initial proposals for temporary and permanent GCN mitigation areas, which have been identified to avoid direct impacts during construction and compensate for the loss of suitable habitat associated with the Onshore Substation. RPS explained that temporary mitigation areas would be provided on three land parcels east of the Onshore Substation. The parcels currently comprise of intensively grazed areas with ponds in poor condition. RPS also explained that these temporary mitigation areas would be enhanced. The construction area would be fenced off, but the receptor area would remain open to the surrounding landscape. RPS stated that the intention was that GCN would be transferred to the temporary mitigation areas prior to construction and permanent mitigation areas would replace land previously occupied by the Temporary Construction Compounds (TCCs) and comprise pond creation, scrub, hibernacula and rough grassland. RPS proposed that on completion of construction and the establishment of the permanent mitigation areas the fencing would be removed. This will allow GCN to colonise this area, which is currently not suitable for GCN, of their own volition to prevent double handling of the same population.		
20	Draft GCN Mitigation Strategy RPS stated that The Draft GCN Mitigation Strategy, including the habitat retention, creation and enhancement		

Item	Detail	Actions	Date
	proposals will be submitted to NRW and other relevant stakeholders on the 31 October 2023 for review (this was subsequently delayed until 30 November 2023). RPS provided a summary of the information to be provided in the Draft GCN Mitigation Strategy. This included: • The nature, location, and numbers of ponds to be temporarily/permanently lost or damaged. • Further details regarding the creation of temporary and permanent mitigation areas within the Mona Onshore Order Limits, including the Onshore Substation. • Further details regarding terrestrial habitat loss, terrestrial habitat damage, terrestrial habitat creation for temporary/ permanent pond creation. • The location and geographic extent of areas requiring GCN exclusion during construction of the Mona Offshore Wind Project. RPS stated that the Draft GCN Mitigation Strategy will not include detailed design for planting and management. RPS also requested that The Mona Offshore Wind Project would like to receive stakeholder feedback on the Draft GCN Mitigation Strategy by the 30 November 2023. RPS explained that the Mona Offshore Wind Project is particularly interested to learn if stakeholders are broadly satisfied that sufficient mitigation and compensation measures have been identified prior to application (Q1 2024). The intention is to use feedback received from stakeholders to inform the GCN mitigation strategy for the purposes of the ES and DCO application for the Mona Offshore Wind Project.		
21	GCN Survey Data/ COFNOD Data Limitations RPS provided a summary of the GCN surveys undertaken to date and explained that these have been uploaded to COFNOD. However, RPS stated that the results of GCN surveys were uploaded after the initial data request was submitted to COFNOD. RPS explained that following the COFNOD data request, it was identified that GCN data associated with St Asaph Solar Farm has not been included. RPS asked the Onshore Ecology EWG if they could clarify the mechanism through which GCN records are submitted, which appears to be a separate process to COFNOD.	EWG to clarify the mechanism through which GCN records are submitted, which appears to be a separate process to COFNOD.	
22	Further GCN Surveys RPS explained that the Mona Offshore Wind Project proposes to exclude the refined onshore cable corridor from further GCN surveys for the following reasons: • Based on COFNOD and GCN survey data collected to date, the distribution of GCN is predominately focussed	EWG to provide input regarding if they agree that the onshore cable corridor can be excluded	

Item	Detail	Actions	Date
	on the Onshore Substation at St Asaph (as illustrated in the figures included on the previous slides). • TCCs located along the refined onshore cable corridor would be subject to further surveys if they were to occupy habitats that were considered suitable for supporting GCN. • Trenchless crossing techniques would be utilised where the onshore cable was required to across areas of ancient wood and hedgerows (where practicable). RPS asked the Onshore Ecology EWG if they agree that the onshore cable corridor can be excluded from further GCN surveys, and if they could they advise what would happen if GCN was identified during a Precautionary Method of Working, as all trenching works will have an Ecological Clerk of Works.	from further GCN surveys, and if they could they advise what would happen if GCN was identified during a Precautionary Method of Working.	
23	Landscape/ecological connectivity within the onshore cable corridor RPS explained that Hedgerow Regulations / Condition Assessment were used to identify important (or good quality) hedgerows within the Mona Onshore Order Limits. The intention is to enhance hedgerows to important (or good quality) by creating suitable habitat where breaks in the hedgerow occur, to improve landscape/ecological connectivity. Hedgerow enhancements are proposed at strategic locations within the Mona Onshore Order Limits. These include: • Llanddulas Limestone & Gwrych Castle Wood SSSI Enhancement: Hedgerows surrounding Llanddulas Limestone & Gwrych Castle Wood Site of Special Scientific Interest (SSSI) to improve connectivity to with the nearby areas of woodland. • Dormouse Enhancement: Hedgerows where evidence of dormouse has been identified following surveys to establish better ecological connectivity with nearby habitats. • Lesser Horseshoe Bats at Kimnel Hall: Hedgerows at Kimnel Hall to improve and strengthen links between the known lesser horseshoe bat roost located to the north of the onshore cable corridor and suitable habitat located to the south of the onshore cable corridor.		
24	Digital Data Sharing Platform RPS stated that the Digital Data Sharing Platform (previously shared as part of the 4th Onshore Ecology EWG) had been updated and was available using the links provided in the presentation.		
25	Issues for Agreement with Onshore Ecology EWG RPS identified the following key issues for agreement with the EWG:	EWG to respond to issues for agreement via	04 October 2023

Item	Detail	Actions	Date
	• In terms of the requirement for additional GCN, dormouse and badger surveys, is the Onshore Ecology EWG satisfied with the approach, whereby further surveys would be reported in an ES addendum report? • Regarding the requirement for additional bat dawn/dusk surveys, which of the following approaches does the EWG consider most appropriate: o Pre-construction dawn/dusk surveys of trees/buildings to determine usage of bat roosts; or o Additional dawn/dusk surveys to be undertaken post-application and reported in an ES addendum report. • Is this Onshore Ecology EWG satisfied with the proposals for temporary and permanent GCN mitigation areas at the Onshore Substation? • Does the Onshore Ecology EWG consider the option of excluding the refined onshore cable corridor (except TCCs) from further GCN surveys appropriate?	the agreements log.	
26	Questions – no further issues raised during the EWG		
Landscape and Ecological Strategy			
27	Landscape and Ecological Strategy RPS provided a summary of the factors that influenced the design of the Landscape and Ecological Strategy. This included: existing vegetation, including hedgerows and trees; Root Protection Zones; historic field boundaries; and other design constraints, including other proposed developments. RPS identified the other proposed developments located near the Onshore Substation have informed the landscape and ecological strategy. These included the proposed grid connection for Awel y Mor Offshore Wind Farm and the extension of the National Grid Bodelwyddan substation, including proposed overhead lines, which will form a separate planning application under Section 37 of the Electricity Act 1989. RPS then showed visualisations of the Onshore Substation design provided at PEIR and visualisations/ 3D models of the Onshore Substation design to be considered for the Environmental Statement. RPS then showed figures presenting the early design and current design of the Landscape and Ecological Strategy, including restored hedgerows, GCN ponds and areas of scrub, wildflowers, and woodland planting. RPS also stated that the Landscape and Ecological Strategy will be considered in the Design Principles Document.		
Next Steps			

Item	Detail	Actions	Date
28	RPS provided a summary of the next steps following the 5th Onshore Ecology EWG. These included: • Circulation of Meeting Minutes and Agreement Log for the 5th Onshore Ecology EWG for comment; • RPS/EWG to progress actions identified during the 5th Onshore Ecology EWG; • Continuation of onshore ecology surveys prior to 6th Onshore Ecology EWG (November 2023); • Ongoing refinement of the Onshore Order Limits in response to environmental and/or design constraints.		
29	Questions – no further issues raised during the EWG		

E.7. Onshore ecology EWG meeting 6

E.7.1 Meeting minutes

Appendix A Onshore Ecology EWG06 Meeting Minutes

Reference:	RPS_EOR0801_Mona_Onshore_Ecology_EWG06_MoM
Meeting Name:	Mona Evidence Plan Onshore Ecology Expert Working Group (EWG) – Meeting 6
Meeting date:	08 December 2023
Meeting location:	Virtual (Microsoft Teams)

Attendees

Name	Initials	Company	Role
Introduction			
[redacted]	CR	RPS	Consultant
	BJ	RPS	Consultant
	SM	RPS	Consultant
	LM	RPS	Consultant
	CD	RPS	Consultant
	PRW	bp	Applicant
	JF	bp	Applicant
	KS	Conway County Borough Council (CCBC)	Statutory body
	SW	Cyfoeth Naturiol Cymru (Natural Resources Wales, NRW)	Statutory body
	NS	Cyfoeth Naturiol Cymru (Natural Resources Wales, NRW)	Statutory body
	ME	Cyfoeth Naturiol Cymru (Natural Resources Wales, NRW)	Statutory body

Meeting Minutes

Item	Detail	Actions	Date
Introduction			
1	Introduction RPS provided a summary of the agenda for the sixth Onshore Ecology EWG. This included the following items: Summary of key points from 5th Onshore ecology EWG; Indicative meetings programme update, update on mona offshore wind project, onshore and intertidal ornithology, onshore ecology, landscape and ecology management plan (LEMP), next steps and questions.		
2	Summary of 5th Onshore Ecology EWG RPS provided a summary of the points covered during the 5th Onshore Ecology EWG. This included Meeting programme, Actions following 4th onshore ecology EWG; update on mona offshore wind project; onshore and intertidal ornithology, including survey progress and areas for agreement with EWG; onshore ecology, including survey progress, mitigation proposals and areas for agreement with EWG and LEMP, including key environmental and design constraints at the onshore substation. The key actions following the 5th Onshore Ecology EWG included: EWG • Review meeting minutes and agreement logs • Review survey methodologies and provide feedback RPS • Share meeting minutes and agreement log from 4th & 5th EWG • Provide updated survey methodologies addressing EWG feedback • Share Outline GCN Mitigation Strategy to be included in the ES RPS provided an overview of completed and upcoming Onshore Ecology EWGs, including the dates, stakeholders and focus of previous and future meetings.		
Project Update			
3	Update on the Mona Offshore Wind Project The client provided a summary of project updates reported during the 5th Onshore Ecology EWG, including refinements to landfall area, reduced optionality along the Onshore Cable Corridor, inclusion of temporary and permanent ecology/landscape mitigation areas and adoption of Gas Insulated Switchgear (GIS) for the Onshore Substation.		

Item	Detail	Actions	Date
	The client then presented figures illustrating the differences in the Mona Onshore Order Limits between the 5th Onshore Ecology EWG (October 2023) and 6th Onshore Ecology EWG (November 2023).		
4	Changes at 6th Onshore Ecology EWG: The client presented changes at the 6th Onshore Ecology EWG. This includes additional or refined areas for proposed hedgerow enhancement along the Onshore Cable Corridor. These were identified to account for recent survey findings and to improve ecological connectivity. Further information on this is provided during the onshore ecology section of this presentation. The client presented a figure to show the removal of the Western route for the permanent access roads to the Onshore Substation and the inclusion of an additional compound and storage area to the east of the eastern access route.		
5	Updates to the Outline LEMP: The client presented updates to the Outline LEMP, including the updated mitigation areas included in the LEMP and presented a figure to show these changes at the Onshore Substation site. Further information regarding development of the LEMP provided in the Ecology section of this presentation.		
Onshore and Intertidal Ornithology			
6	Updates from PEIR to ES: RPS presented updates from PEIR to ES, including: survey programme, intertidal waterbirds (year 2), Bird Protection Plan (BPP), issues for agreement with the onshore ecology EWG and questions. RPS provided an overview of the onshore and intertidal ornithology survey programme, including the type of survey, the area, methodology, frequency and completed surveys.		
7	Key findings of intertidal waterbird surveys: RPS presented the following key findings of intertidal waterbird surveys: • Common scoter present in nearshore waters during non-breeding season for year 1 and year 2. RPS presented a figure to show the distribution of common scoter recorded during the non-breeding season within the intertidal ornithology study area for year 1 and year 2 surveys combined. • Oystercatcher was the most abundant wader species present within the intertidal zone during non-breeding season for year 1 and year 2. RPS		

Item	Detail	Actions	Date
	presented a figure showing the distribution of oystercatcher in the core wintering period within the intertidal ornithology study area for year 1 and year 2 surveys combined. • Also, that there were larger numbers of wader species recorded within the intertidal zone during the year 1 survey period, compared to the year 2 winter survey period. • RPS presented figures showing the monthly peak maximum counts of common scoter and oystercatcher.		
8	Bird Protection Plan (BBP) RPS stated that a BBP will be prepared and submitted with the Environmental Statement. RPS presented the following BBP areas and provided a description for each: Ecological Clerk of Works (ECoW), timings of works, pre-construction surveys, continued assessment, Bird Protection Zones (BPZ), habitat management, dissuasion techniques and Schedule 1 species.	RPS to share Draft BPP for comment.	Following 6th Onshore Ecology EWG
9	Issues for Agreement with EWG: RPS identified the following key issues for agreement with the EWG: • Having reviewed the technical note shared on the 18 September 2023, is the EWG satisfied with one year's survey data for the wintering passerine and raptors? • Is the EWG satisfied with the general measures to be included in the BPP?	EWG to respond to issues for agreement via the agreements log.	Following 6th Onshore Ecology EWG
10	Questions		
Onshore Ecology			
11	Updates from PEIR to ES: RPS presented updates from PEIR to ES including: survey progress, summary of key findings, hedgerow enhancement, outline GCN mitigation strategy, digital data sharing platform, key issues for agreement with the onshore ecology EWG, next steps and questions.		
12	Notable survey findings since the 5th Onshore Ecology EWG (October 2023) • Bats • Great Crested Newts (GCN) • Hazel dormouse • Badgers • Terrestrial invertebrates • Aquatic invertebrates • Fish and eel • National Vegetation Classification (NVC)		

Item	Detail	Actions	Date
	• Invasive Non-Native Species (INNS).		
13	Bats tree roosts in Substation Area RPS explained that a total of 14 bat tree roosts have been identified within survey area. These comprise the following: • One roost for two unknown bats (didn't echolocate on emergence – not climbable) located within the Mona Onshore Development Area (indicated by the yellow circle) - trenchless proposed - Retained • One roost for three noctule bats (within an oak tree) is located within the area for the Onshore Substation (indicated by the green circle) - Loss • One roost for one soprano pipistrelle (within an oak tree) is located within the Temporary Construction Compound (indicated by the purple circle) - Retained (with disturbance impacts) • The remaining bat tree roosts identified were located outside the Mona Onshore Development Area. These locations were presented in a figure.		
14	Bat tree roost along Cable Corridor RPS stated that roosts identified within the cable corridor will not be directly impacted. RPS presented figures with the locations of the roosts along the cable corridor. There is a soprano pipistrelle located along an access track to the Temporary Construction Compound (TCC), but the design has been amended to avoid direct impacts to this roost.		
15	Bat activity RPS presented the details of the bat activity surveys. Automatic static bat monitors were deployed at 14 different locations across the survey area, this was presented in a figure. The locations were chosen by a combination of Habitat Suitability Modelling, Known important bat receptors (i.e. Llanddudlas Limestone & Gwrych Castle Wood). Data collection at each of these 14 locations commenced in April 2023 and were repeated twice a month until October 2023.		
16	Bat Activity Survey Results RPS presented the following notable results from the from automatic static bat monitors surveys between April to October 2023: • Survey location 14: highest average number of identifications per night (total of 2198.5 identifications per night – all species)		

Item	Detail	Actions	Date
	• Survey location 3: second highest average number of identifications per night (total of 1757.7 identifications per night – all species) • Survey locations 1/3: only locations where Greater Horseshoe (GHS) Bats recorded (0.1 identifications per night) • Survey location 5: highest average number of Lesser Horseshoe (LHS) bats recorded (24.8 identifications per night) • Overall, with respect to LHS bats there was a marked seasonal increase in activity in the autumn through all locations.		
17	Bats – Kinmel Hall RPS explained that fixed point count surveys were undertaken in June, August and September 2023 at six hedgerows near Kinmel Hall, which were presented on a figure, depicted as points FL1 to FL6. The following results are of note: • LHS activity recorded at FL1 in July 2023 and both FL1 and FL3 in September 2023. • Other species recorded include common pipistrelle, soprano pipistrelle, brown long-eared, Myotis sp., and big bats (e.g. noctule, serotine and Leisler's bats).		
18	Great Crested Newts (GCN) RPS explained that to date, none of the ponds located within the Mona Onshore Development Area subject to eDNA surveys have returned positive results for GCN. However, some ponds located within the wider Survey Area returned positive results for GCN. Where access limitations prevented surveys from taking place, GCN will be assumed to be present within suitable ponds located within the Mona Onshore Development Area. Further target presence / absence surveys are planned in 2024 to get a up to date populations class size assessment. However, as discussed during previous EWGs, sufficient baseline data (e.g. data associated with St Asaph Solar Farm) has been obtained to inform the assessment and mitigation requirements in the ES and we are assuming a good (high) population of national importance in our assessment. RPS presented a figure showing the location of the Mona Onshore Development Area and the survey area for GCN. Further figures presented showed sections along the Mona Onshore Development area and the results of the eDNA surveys, where there were no positive results for eDNA within the Mona Onshore Development Area however		

Item	Detail	Actions	Date
	some ponds in the wider survey area showed positive eDNA for GCN.		
19	Hazel Dormouse RPS explained that a total of 100 hazel dormouse surveys (setting up/ checking dormouse tubes) have been undertaken across 46 land parcels within the Survey Area. Surveys undertaken following the 5th Onshore Ecology EWG have identified additional dormouse nests located within the Mona Onshore Development Area, which was presented in a figure. The location of dormouse nests have been used to inform the areas for proposed hedgerow mitigation/enhancement. Due to access limitations (e.g. grazing cattle) further surveys are proposed in 2024 to fulfil requirements of EPS mitigation licenses. However, as discussed during previous EWGs, sufficient baseline data has been obtained to inform the assessment and mitigation requirements in the ES.		
20	Badgers RPS explained that a total of 52 badger surveys, including walkovers and sett monitoring have been undertaken across 66 land parcels within the Survey Area. Walkover surveys undertaken following the 5th Onshore Ecology EWG have identified additional active badger setts located within the Mona Onshore Development Area. In addition, to date, sett monitoring has confirmed the presence of active setts within the Mona Onshore Development Area. Due to access limitations (e.g. removal/disturbance of monitoring equipment) further surveys are proposed throughout the 2023 winter period and in 2024 to fulfil requirements of EPS mitigation licenses. However, as discussed during previous EWGs, sufficient baseline data has been obtained to inform the assessment and mitigation requirements in the ES. Figures were presented which showed the location of active setts, dung pits, foraging signs, hair, prints and other signs within the Mona Onshore Development Area.		
21	Terrestrial invertebrates RPS stated that 10 species of conservation concern have been identified within the Mona Onshore Development Area during terrestrial invertebrate surveys. These include: • Grayling (Endangered) butterfly • Small heath (Vulnerable) butterfly		

Item	Detail	Actions	Date
	• Robber fly, planthopper, ground beetle, seed bug and dung beetle (Nationally Rare species) • Leaf beetle and striped snail (Data Deficient) RPS presented a figure showing the locations of these species in the survey area.		
22	Aquatic invertebrates RPS explained that a total of 20 waterbodies and 16 watercourses have been subject to aquatic invertebrate surveys. These comprised waterbody sampling for diversity, including visual searches, sweep netting and kick sampling. No protected or notable species were identified within the Mona Onshore Development Area during the aquatic invertebrate surveys. All watercourses subject to surveys were identified as unsuitable for supporting white-clawed crayfish. Four waterbodies were identified as supporting a diverse assemblage of aquatic invertebrates (10 or more aquatic invertebrate families). Three were located beyond the Mona Onshore Development Area. One waterbody was located within the Permanent Access Route. All other waterbodies and watercourses were identified as supporting lower aquatic diversity. RPS presented a figure to show the location of the surveys and where waterbodies were scoped out.		
23	Terrestrial Invertebrates RPS presented a figure showing the presence of invertebrate species in the survey area surrounding the onshore substation. These included Robber fly, planthopper and leaf beetle. 10 species of conservation concern have been identified within the Mona Onshore Development Area during terrestrial invertebrate surveys. These include: • Grayling (Endangered) butterfly • Small heath (Vulnerable) butterfly • Robber fly, planthopper, ground beetle, seed bug and dung beetle (Nationally Rare species) • Leaf beetle and striped snail (Data Deficient).		
24	Fish and eel RPS explained that a total of 14 watercourses were subject to fish and eel surveys. Of these, four were considered suitable for supporting fish and eel. These four watercourses were subject to electric fishing to confirm the presence/ absence of protected or notable fish/eel species.		

Item	Detail	Actions	Date
	Four eels were recorded within two watercourses, which form tributaries of the Afon Dulas. Of these, only one individual eel was identified within a watercourse inside the Mona Onshore Development Area. This was presented in a figure.		
25	National Vegetation Classification (NVC) RPS explained that a total of 45 NVC surveys have been undertaken across 21 land parcels within the Survey Area. These surveys identified a total of 19 NVC plant communities. Of these, seven were located within the Mona Onshore Development Area. The most frequently recorded NVC plant community within the Mona Onshore Development Area comprised: • MG7a Lolium perenne leys and related grasslands, Lolium perenne-Trifolium repens leys; and • MG7b *Lolium perenn*e leys and related grasslands, *Lolium perenne* • Lolium perenne - Poa trivialis leys. • In addition, the NVC plant community CG7a *Festuca ovina-Hieracium pilosella-Thymus praecox/pulegioide*s grassland was identified within the Mona Onshore Development Area, which is classed as a Habitat of Principal Importance under Section 7 of the Environment (Wales) Act 2016.		
26	Invasive Non-native Species (INNS) RPS explained that Surveys for INNS were undertaken alongside NVC, extended Phase 1 Habitat and hedgerow surveys. INNS surveys identified a total of five species of INNS within the Mona Onshore Development Area which were presented on a figure, including: • Himalayan balsam • Montbretia • Rhododendron • Japanese knotweed. However, INNS surveys also identified Japanese rose within the wider survey area. In addition, INNS surveys identified Himalayan balsam within the area for the Onshore Substation. This was presented on a figure. Japanese knotweed shoots were identified along a trackway to the north of the temporary construction compounds.		

Item	Detail	Actions	Date
27	Mitigation: Bats – Noctule Roost in Substation Area RPS explained that one roost for three noctule bats (within an oak tree) is located within the area for the Onshore Substation, which will be lost. However, there is potential for translocation of the roost.		
28	Hedgerow Enhancement RPS stated that, As discussed during the 5th Onshore Ecology EWG, hedgerow enhancements are proposed to be included as part of the Mona Offshore Wind Project. These have subsequently been updated/refined in response to the findings of additional survey work undertaken between October and November 2023. These include hedgerow enhancements in areas where dormouse nests have been confirmed within the Mona Onshore Development Area. The Hedgerow Regs Assessment results and Habitat Condition Assessment were also presented. RPS presented figures to show the location and geographic extent of hedgerow enhancement areas 1 to 4.		
29	Outline GCN Mitigation Strategy RPS stated that An Outline Great Crested Newt (GCN) Mitigation Strategy will be submitted with the Environmental Statement and focuses on the following key areas: • Mitigating temporary and permanent loss of habitat suitable for GCN during construction of the Mona Offshore Wind Project • Enhancing the population of GCN within and surrounding the Mona Onshore Development Area • Describing how works requiring a mitigation licence would be undertaken, including precautionary methods of working • Future monitoring requirements for the existing and newly created ponds following construction of the Mona Offshore Wind Project. • A draft version of the Outline GCN Mitigation Strategy will be shared for comment following the 6th Onshore Ecology EWG.	RPS to submit draft outline GCN mitigation strategy for comment.	Following the 6th Onshore Ecology EWG
30	Permanent Impacts substation RPS presented a figure showing the location of permanent habitat loss – terrestrial and aquatic near the onshore substation.		
31	Outline GCN Mitigation Strategy – GCN habitat loss RPS reported that habitats suitable for supporting GCN would be permanently (e.g. Onshore Substation, and access road) and temporarily lost is approximately 7.48ha.		

Item	Detail	Actions	Date
	Habitats damaged through works (construction / earthworks/ mitigation creation areas) is approximately 12.9ha. A total of six ponds, where GCN have been confirmed (or assumed) present, are located within the Mona Onshore Development Area. Of these, two ponds would be permanently lost, and four ponds would be temporarily lost (located within area for Temporary works).		
32	Outline GCN Mitigation Strategy – GCN Capture and exclusion RPS explained that capture and exclusion of GCN is proposed across all areas impacted by works and not restricted to onshore substation, access road TCC. We have also included areas where woodland planting and biodiversity benefits are extensive due to likely presence of plant and machinery and risk / killing injury. • Areas requiring capture and exclusion of GCN would be fenced off and trapped for a 60-day period using the permeant exclusion fencing, drift fencing / and pitfall trapping /' carpet tile methods • Following construction of the Mona Offshore Wind Project, newt fencing would be removed from the works site and GCN left to re-colonise the newly created habitats if their own volition (no double handling) • A total of permanent exclusion fencing is 7239 metres • Drift fencing areas and locations to be confirmed following site visit in Jan 2024. • Capture and exclusion of GCN is proposed across all areas impacted by works and not restricted to onshore substation, access road TCC. We have also included areas where woodland planting and biodiversity benefits are extensive due to likely presence of plant and machinery and risk / killing injury. • Areas requiring capture and exclusion of GCN would be fenced off and trapped for a 60-day period using the permeant exclusion fencing, drift fencing / and pitfall trapping /' carpet tile methods • Following construction of the Mona Offshore Wind Project, newt fencing would be removed from the works site and GCN left to re-colonise the newly created habitats if their own volition (no double handling). • A total of permanent exclusion fencing is 7239 metres • Drift fencing areas and locations to be confirmed following site visit in Jan 2024.		

Item	Detail	Actions	Date
	Figures were presented to show the locations of the mona onshore development area and the areas of habitat damaged, the GCN receptor site and the GCN fencing.		
33	Outline GCN Mitigation Strategy – habitat creation and enhancement RPS explained that terrestrial and aquatic habitat suitable for GCN would be created in the areas for the TCCs and mitigation site. This includes: • 25 ponds (increase in ponds from 0.02ha of the six ponds to 0.89ha of the 25 ponds). • c.3.92 ha Wildflower meadow • c.0.58ha scrub habitats • c. 3.4ha of grassland (tussocky managed for GCN) • Hedgerow enhancements of 10, 715 metres in sub-station • Hibernacula is LP22 and LP 31 (dedicated GCN parcels) Habitat enhancement This includes 5.8 ha of woodland planting in proximity to onshore sub-station and Biodiversity Benefit (identified opportunity) – 1621 of hedgerows re-instated. A figure was presented to show the onshore development area, excavation footprint, onshore substation, GCN habitat enhancement woodland planting, GCN fencing and GCN potential enhancement biodiversity benefit. Habitat creation and enhancement • Creation of optional permanent habitats is 11.13 ha • Loss of 7.48 GCN habitat is not optimal (less than 30%) • Temporary loss of 12.89ha is not optimal (less than 20%) • Creation of 25 ponds and reinstatement/enhancement of existing ponds (if possible), increasing available aquatic habitat by 0.98 ha when compared to baseline • Ponds are key to success as they will act the stepping stones to expand GCN metapopulation range into the suitable terrestrial habitat. A figure was presented which illustrates the locations of the above.		
34	Outline GCN Mitigation Strategy – future GCN monitoring requirements RPS presented the future GCN monitoring requirements for the Mona Offshore Wind Project: • Following construction of the Mona Offshore Wind Project, existing and newly created ponds would be subject to future monitoring surveys		

Item	Detail	Actions	Date
	• Monitoring surveys (i.e. presence/absence) of the existing and created ponds would be undertaken once per year during the first 5 years of operation of the Mona Offshore Wind Project • After this 5-year period had elapsed, monitoring surveys would then be undertaken during year 7 and year 10 of operation of the Mona Offshore Wind Project. A larger figure illustrating the GCN mitigation strategy was presented.		
35	Digital Data Sharing Platform: RPS has created a digital data sharing platform, which presents the location and results for surveys undertaken to date. Moving forwards, this digital data sharing platform will be updated and shared at each Onshore Ecology EWG. This digital data sharing platform operates using the online ArcGIS web map, which allows users to select/de-select features of interest and view these in relation to the Mona Offshore Wind Project.		
36	Issues for Agreement with EWG: Is the EWG satisfied with the general measures to be included in the Outline GCN Mitigation Strategy for the Mona Offshore Wind Project ?	EWG to respond to issues for agreement via the agreements log.	January 2023
37	Questions?		
Outline Landscape and Ecology Management Plan (LEMP)			
38	Ecology RPS stated that an Outline LEMP will be submitted with the Environmental Statement and will focus on the following key areas with respect to ecology during operation of the Mona Offshore Wind Project: a) Retention and/or enhancement of high value habitats within the Mona Onshore Development Area, including woodland, hedgerows, ditches and watercourses with appropriate buffers. b) Additional planting at the Onshore Substation comprising a variety of habitats, including woodland, ponds, wildflowers, scrub and a swale. c) Ongoing management of retained and newly created habitats at the Onshore Substation to ensure overall net benefit for biodiversity. The Outline Code of Construction Practice (CoCP) will set out mitigation measures required during construction of the Mona Offshore Wind Project.		

Item	Detail	Actions	Date
39	Landscape RPS stated that an Outline LEMP will be submitted with the Environmental Statement and will focus on the following key areas with respect to landscape during operation of the Mona Offshore Wind Project: a) Retention and/or enhancement of key boundary features at the Onshore Substation, including areas of woodland and hedgerows to provide visual screening and integrate the development into the surrounding landscape b) Additional planting at the Onshore Substation, including areas of woodland to screen views of the development and mitigate impacts on the character of the surrounding landscape c) Restoring and infilling existing hedgerows at the Onshore Substation where required, to reconnect features of the landscape and provide further visual screening The Outline Code of Construction Practice (CoCP) will set out mitigation measures required during construction of the Mona Offshore Wind Project.		
40	LEMP RPS presented a comparison of two figures, one showing the baseline environment and the second showing the land with the outline LEMP, including the location of the onshore substation and mitigation strategies.		
Next Steps			
41	Next Steps RPS presented the next steps, which included: • Circulation of Meeting Minutes and Agreement Log for the 6th Onshore Ecology EWG for comment • RPS/EWG to progress actions identified during the 6th Onshore Ecology EWG • Submission of DCO application, including ES and supporting documentation by Q1 2024.	RPS to circulate meeting minutes and agreement log for the 6th Onshore Ecology EWG RPS to progress actions identified during the 6th Onshore Ecology EWG	January 2023

E.8. Onshore ecology EWG agreement log

Item	Meeting Date	Onshore Ecology EWG	Issue on which agreement is sc	Consultee	Progress of agreement in the E	Agreement?	Notes
1	16/06/2022	EWG 01	Agreement on the Remit and Inputs to the EWG (as set out in Section 4.5 of the Evidence Plan Template).	NRW	Noted	Not agreed	
				Conwy County Borough Council	No response	Not agreed	No response following EWG
				Denbighshire County Council	No response	Not agreed	No response following EWG
				RSPB	Agreed	Agreed	
2	16/06/2022	EWG 01	Agreement on Ways of Working document, including timescales.	NRW	Noted	Not agreed	
				Conwy County Borough Council	No response	Not agreed	No response following EWG
				Denbighshire County Council	No response	Not agreed	No response following EWG
				RSPB	Agreed	Agreed	
3	16/06/2022	EWG 01	Agreement on desk top data sources (listed in the EWG01 presentation) are appropriate to characterise the baseline .	NRW	Noted	Not agreed	
				Conwy County Borough Council	No response	Not agreed	No response following EWG
				Denbighshire County Council	No response	Not agreed	No response following EWG
				RSPB	Agreed	Agreed	
4	16/06/2022	EWG 01	Agreement on the approach to baseline surveys (breeding birds and Phase 1 habitat survey) as set out in the EWG 01 presentation	NRW	Noted	Not agreed	
				Conwy County Borough Council	No response	Not agreed	No response following EWG
				Denbighshire County Council	No response	Not agreed	No response following EWG
				RSPB	Agreed	Agreed	
5	08/12/2022	EWG 02	Agreement on the terrestrial ecology and intertidal birds study area as set out in the EWG02 presentation.	NRW	Noted	Not agreed	
				Conwy County Borough Council	Agreed	Agreed	
				Denbighshire County Council	No response	Not agreed	No response following EWG
				RSPB	Agreed	Agreed	
6	08/12/2022	EWG 02	Agreement that the following approach is appropriate: - the Onshore Ecology chapter of the PEIR will include assumptions on the presence/absence of protected species based on desk based analysis and extended Phase 1 Habitat surveys;	NRW	Noted	Not agreed	
				Conwy County Borough Council	Agreed	Agreed	
				Denbighshire County Council	No response	Not agreed	No response following EWG
				RSPB	Agreed	Agreed	
7	24/04/2023	EWG 03	Agreement that population size class assessment surveys for GCN do not have to be undertaken for ponds subject to ongoing monitoring (e.g. St Asaph, Gwynt Y Mor and Burbo Bank ponds) or ponds that have been surveyed within the last 2 years (by the time of the application).	NRW	In agreement on the basis that the extant surveys are carried in	Agreed with caveats	
				Conwy County Borough Council	Agreed	Agreed	
				Denbighshire County Council	No response	Not agreed	No response following EWG
				RSPB	Agreed	Agreed	
				ARC	No response	Not agreed	
8	24/04/2023	EWG 03	Survey methodologies will be agreed with the Onshore Ecology EWGs: the survey methodologies for intertidal birds and Great Crested Newts were agreed with NRW via email correspondence in November and March 2022 respectively. Methodologies submitted for agreement following EWG03 are as follows: Aquatic invertebrates survey	NRW	Bats - Paragraph 1.1.1.2. We	Agreed with caveats	
				Conwy County Borough Council	Agreed	Agreed with caveats	At 800% zoom I am unable t to interpret hedgerow classification
				Denbighshire County Council	No response	Not agreed	No response following EWG
				RSPB	Agreed	Agreed	
				ARC	No response	Not agreed	No response following EWG but did provide case study for
9	24/04/2003	EWG 03	Agreement that the proposed approach for sharing protected survey findings via Field Maps (as presented in EWG03) is appropriate.	NRW	Noted and agree	Agreed	
				Conwy County Borough Council	Agreed	Agreed with caveats	Could final geopackage/ shape files be shared when survey
				Denbighshire County Council	No response	Not agreed	No response following EWG
				RSPB	Agreed	Agreed	
				ARC	No response	Not agreed	No response following EWG but did provide case study for
10	19/07/2023	EWG 04	Is the EWG satisfied with two years survey data for intertidal waterbirds and breeding birds?	NRW	TBC	TBC	TBC
				Conwy County Borough Council	TBC	TBC	TBC
				Denbighshire County Council	TBC	TBC	TBC
				RSPB	TBC	TBC	TBC
				ARC	TBC	TBC	TBC
11	19/07/2023	EWG 04	Is the EWG satisfied with one year's survey data for the wintering passerine and raptors?	NRW	TBC	TBC	TBC
				Conwy County Borough Council	TBC	TBC	TBC
				Denbighshire County Council	TBC	TBC	TBC
				RSPB	TBC	TBC	TBC
				ARC	TBC	TBC	TBC
12	19/07/2023	EWG 04	Is the EWG satisfied with the mitigation measures proposed, including the BBPP?	NRW	TBC	TBC	TBC
				Conwy County Borough Council	TBC	TBC	TBC
				Denbighshire County Council	TBC	TBC	TBC
				RSPB	TBC	TBC	TBC
				ARC	TBC	TBC	TBC
13	19/07/2023	EWG 04	Is the EWG satisfied that badger sett monitoring would be used to identify polecat if these were present within the survey area.	NRW	TBC	TBC	TBC
				Conwy County Borough Council	TBC	TBC	TBC
				Denbighshire County Council	TBC	TBC	TBC
				RSPB	TBC	TBC	TBC
				ARC	TBC	TBC	TBC
13	19/07/2023	EWG 04	Is the EWG satisfied with the approach to assessment of GCN, including the requirement for further surveys in 2024 and ES addendum?	NRW	TBC	TBC	TBC
				Conwy County Borough Council	TBC	TBC	TBC
				Denbighshire County Council	TBC	TBC	TBC
				RSPB	TBC	TBC	TBC
				ARC	TBC	TBC	TBC
13	19/07/2023	EWG 04	Is the EWG satisfied with the approach to assessment of hazel	NRW	TBC	TBC	TBC

			dormouse, including the requirement for further surveys in 2024 and ES addendum?	Conwy County Borough Council	TBC	TBC	TBC
				Denbighshire County Council	TBC	TBC	TBC
				RSPB	TBC	TBC	TBC
				ARC	TBC	TBC	TBC
14	04/10/2023	EWG 05	Having reviewed the technical note shared on 18 September 2023, is the EWG satisfied with one year's survey data for the wintering passerine and raptors?	NRW	TBC	TBC	TBC
				Conwy County Borough Council	TBC	TBC	TBC
				Denbighshire County Council	TBC	TBC	TBC
				Welsh Government	TBC	TBC	TBC
				Woodland Trust	TBC	TBC	TBC
				RSPB	TBC	TBC	TBC
				ARC	TBC	TBC	TBC
15	04/10/2023	EWG 05	Is the EWG satisfied that additional dawn/dusk surveys can be undertaken post-application and reported in an ES addendum report.	NRW	TBC	TBC	TBC
				Conwy County Borough Council	TBC	TBC	TBC
				Denbighshire County Council	TBC	TBC	TBC
				Welsh Government	TBC	TBC	TBC
				Woodland Trust	TBC	TBC	TBC
				RSPB	TBC	TBC	TBC
				ARC	TBC	TBC	TBC
16	04/10/2023	EWG 05	Is the EWG happy to review the Draft GCN Mitigation Strategy on the 31 October 2023 and provide feedback to RPS by 30 November 2023 ?	NRW	TBC	TBC	TBC
				Conwy County Borough Council	TBC	TBC	TBC
				Denbighshire County Council	TBC	TBC	TBC
				Welsh Government	TBC	TBC	TBC
				Woodland Trust	TBC	TBC	TBC
				RSPB	TBC	TBC	TBC
				ARC	TBC	TBC	TBC
17	04/10/2023	EWG 05	Does the EWG agree that the onshore cable corridor can be excluded from further GCN surveys, and if they could they advise what would happen if GCN was identified during a Precautionary Method of Working, as all trenching works will have an Ecological Clerk of Works.	NRW	TBC	TBC	TBC
				Conwy County Borough Council	TBC	TBC	TBC
				Denbighshire County Council	TBC	TBC	TBC
				Welsh Government	TBC	TBC	TBC
				Woodland Trust	TBC	TBC	TBC
				RSPB	TBC	TBC	TBC
				ARC	TBC	TBC	TBC
18	04/10/2023	EWG 05	Does the EWG agree the approach that additional GCN, dormouse and badger surveys could be undertaken post application and reported in an ES addendum report?	NRW	TBC	TBC	TBC
				Conwy County Borough Council	TBC	TBC	TBC
				Denbighshire County Council	TBC	TBC	TBC
				Welsh Government	TBC	TBC	TBC
				Woodland Trust	TBC	TBC	TBC
				RSPB	TBC	TBC	TBC
				ARC	TBC	TBC	TBC
19	04/10/2023	EWG 05	Is this Onshore Ecology EWG satisfied with the initial proposals for temporary and permanent GCN mitigation areas at the Onshore Substation?	NRW	TBC	TBC	TBC
				Conwy County Borough Council	TBC	TBC	TBC
				Denbighshire County Council	TBC	TBC	TBC
				Welsh Government	TBC	TBC	TBC
				Woodland Trust	TBC	TBC	TBC
				RSPB	TBC	TBC	TBC
				ARC	TBC	TBC	TBC
20	08/12/2023	EWG 06	Having reviewed the technical note shared on the 18 September 2023, is the EWG satisfied with one year's survey data for the wintering passerine and raptors?	NRW	TBC	TBC	TBC
				Conwy County Borough Council	TBC	TBC	TBC
				Denbighshire County Council	TBC	TBC	TBC
				Welsh Government	TBC	TBC	TBC
				Woodland Trust	TBC	TBC	TBC
				RSPB	TBC	TBC	TBC
				ARC	TBC	TBC	TBC
21	08/12/2023	EWG 06	Is the EWG satisfied with the general measures to be included in the BPP?	NRW	TBC	TBC	TBC
				Conwy County Borough Council	TBC	TBC	TBC
				Denbighshire County Council	TBC	TBC	TBC
				Welsh Government	TBC	TBC	TBC
				Woodland Trust	TBC	TBC	TBC
				RSPB	TBC	TBC	TBC
				ARC	TBC	TBC	TBC
22	08/12/2023	EWG 06	Is the EWG satisfied with the general measures to be included in the Outline GCN Mitigation Strategy for the Mona Offshore Wind Project ?	NRW	TBC	TBC	TBC
				Conwy County Borough Council	TBC	TBC	TBC
				Denbighshire County Council	TBC	TBC	TBC
				Welsh Government	TBC	TBC	TBC
				Woodland Trust	TBC	TBC	TBC
				RSPB	TBC	TBC	TBC
				ARC	TBC	TBC	TBC