Morecambe Offshore Windfarm: Generation Assets

Examination Documents

Volume 9

Habitats Regulations Assessment Without Prejudice Derogation Case – Red-Throated Diver at Liverpool Bay / Bar Lerpwl SPA (Tracked)

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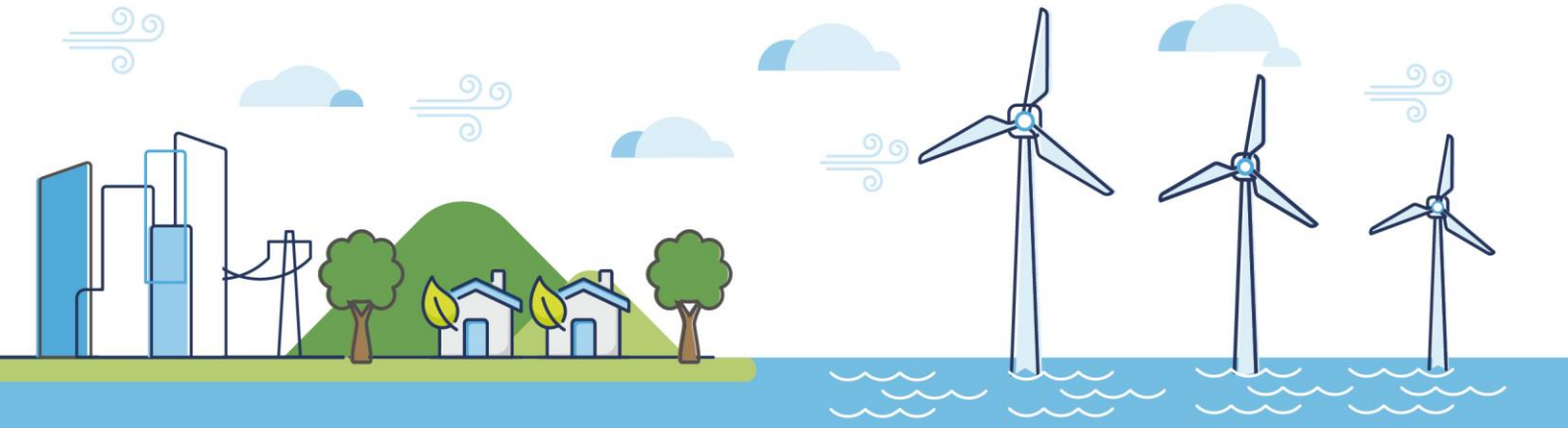

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Glossary of Acronyms

AA	Appropriate Assessment
AfL	Agreement for Lease
BEIS	Department for Business, Energy and Industrial Strategy[1]
CCC	Committee on Climate Change
CCRA	Climate Change Risk Assessment
CI	Confidence Interval
CfD	Contract for Difference
CNP	Critical National Priority
COP	Conference of the Parties
COWSC	Collaboration on Offshore Wind Strategic Compensation
cSAC	Candidate Special Area of Conservation
DCO	Development Consent Order
DECC	Department for Energy and Climate Change[1]
Defra	Department for Environment, Food and Rural Affairs
DESNZ	Department for Energy Security and Net Zero
EC	European Commission
EIA	Environmental Impact Assessment
ES	Environmental Statement
ESO	Electricity System Operator
ETG	Expert Topic Group
EU	European Union
ExA	Examining Authority
GHG	Greenhouse gas
GVA	Gross Value Added
HAT	Highest Astronomical Tide
HM	His Majesty's
HRA	Habitats Regulations Assessment
IROPI	Imperative Reasons of Overriding Public Interest

[1] The Department of Energy and Climate Change (DECC) was disbanded and merged with the Department for Business, Innovation and Skills to form the Department for Business, Energy and Industrial Strategy (BEIS) in 2016. As of February 2023, BEIS is known as the Department for Energy Security and Net Zero (DESNZ).

JNCC	Joint Nature Conservation Committee
LSE	Likely Significant Effect
LSHTM	London School of Hygiene and Tropical Medicine
MCZ	Marine Conservation Zone
MGN	Marine Guidance Note
MPA	Marine Protected Area
NASA	National Aeronautics and Space Administration
NOAA	National Oceanographic and Atmospheric Administration
NPS	National Policy Statement
ORE	Offshore Renewable Energy
OSP	Offshore substation platform
OTNR	Offshore Transmission Network Review
PEIR	Preliminary Environmental Information Report
REPD	UK Government Renewable Energy Planning Database
RIAA	Report to Inform Appropriate Assessment
SAC	Special Area of Conservation
SoS	Secretary of State
SNCB	Statutory Nature Conservation Body
SPA	Special Protection Area
SSSI	Site of Special Scientific Interest
TCE	The Crown Estate
UK	United Kingdom
UNEP-CCC	United Nations Environment Programme Copenhagen Climate Centre
WMO	World Meteorological Organisation
WTG	Wind turbine generator

Glossary of Unit Terms

GW	Gigawatt
km	kilometre
km^2	square kilometre
m	metre
m^2	square metre
MW	Megawatt

Glossary of Terminology

Applicant	Morecambe Offshore Windfarm Ltd
Critical National Priority	The UK Government's energy objectives define nationally significant low carbon infrastructure as a Critical National Priority (CNP).
European sites	Designated nature conservation sites which include the National Site Network (designated within the UK) and Natura 2000 sites (designated in any European Union (EU) country). This includes candidate Special Areas of Conservation (cSAC), Sites of Community Importance, Special Areas of Conservation (SAC), and Special Protection Areas (SPA).
Generation Assets (the Project)	Generation assets associated with the Morecambe Offshore Windfarm. This is infrastructure in connection with electricity production, namely the fixed foundation wind turbine generators (WTGs), inter-array cables, offshore substation platform(s) (OSP(s)) and possible platform link cables to connect OSP(s).
Inter-array cables	Cables which link the WTGs to each other and the OSP(s).
Landfall	Where the offshore export cables would come ashore.
Morgan and Morecambe Offshore Wind Farms: Transmission Assets	The transmission assets for the Morgan Offshore Wind Project and the Morecambe Offshore Windfarm. This includes the OSP(s)[2], interconnector cables, Morgan offshore booster station, offshore export cables, landfall site, onshore export cables, onshore substations, 400kV cables and associated grid connection infrastructure such as circuit breaker infrastructure. Also referred to in this document as the Transmission Assets, for ease of reading.
National Site Network	The network of SACs and SPAs in the UK. These were formerly referred to as European Sites, but since the UK's exit from the EU these sites no longer form part of the EU's 'Natura 2000' ecological network. The Conservation of Habitats and Species Regulations 2017 were therefore amended in 2019 to refer to the new National Site Network.
Offshore export cables	The cables which would bring electricity from the offshore substation platform(s) to the landfall.
Offshore substation platform(s)	A fixed structure located within the windfarm site, containing electrical equipment to aggregate the power from the WTGs and convert it into a more suitable form for export to shore.
Onshore export cables	The cables which would bring electricity from landfall to the onshore project substation and from the onshore project substation to a National Grid substation.

[2] At the time of writing the Environmental Statement, a decision had been taken that the offshore substation platforms (OSP(s)) would remain solely within the Generation Assets application and would not be included within the Development Consent Order (DCO) application for the Transmission Assets. This decision post-dated the Preliminary Environmental Information Report (PEIR) that was prepared for the Transmission Assets. The OSP(s) are still included in the description of the Transmission Assets for the purposes of this document as the in-combination effects assessment carried out in respect of the Generation/Transmission Assets is based on the information available from the Transmission Assets PEIR and associated Habitats Regulation documentation.

Onshore project substation	Part of an electrical transmission and distribution system. Substations transform voltage from high to low, or the reverse by means of electrical transformers.
Platform link cable	An electrical cable which links one or more OSP(s).
Wind turbine generator (WTG)	The area within which the WTGs, inter-array cables, OSP(s) and platform link cables will be present.
Windfarm site	The area within which the WTGs, inter-array cables, OSP(s) and platform link cables will be present.

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1 Introduction

1.1 Project background

1. This Without Prejudice Habitats Regulations Derogation: Provision of Evidence forms part of a set of documents that supports the Development Consent Order (DCO) application submitted by Morecambe Offshore Windfarm Ltd (the Applicant) for the Morecambe Offshore Windfarm Generation Assets (the Project).

2. Morecambe Offshore Windfarm Ltd ('the Applicant') is applying for a DCO for the Morecambe Offshore Wind Farm Generation Assets Project (hereafter 'the Project'). The Project was one of six projects selected by The Crown Estate (TCE) in its Offshore Wind Leasing Round 4 in 2021. The Agreement for Lease (AfL) for the Project was received in 2023.

3. The Project includes the Generation Assets to be located within the offshore windfarm site (wind turbine generators (WTGs), inter-array cables, offshore substation platform(s) (OSP(s)) and possible platform link cables to connect OSPs).

4. A separate DCO consent for the Morgan and Morecambe Offshore Wind Farms: Transmission Assets associated with the Morecambe Offshore Windfarm and the Morgan Offshore Wind Project Generation Assets (another proposed Round 4 windfarm to be located in the Irish Sea) would be sought, as explained below.

5. Both the Morecambe Offshore Windfarm and the Morgan Offshore Wind Project Generation Assets 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 (ESO) is responsible for conducting a Holistic Network Design Review to assess options to improve the coordination of offshore wind generation connections and transmission networks. In July 2022, the United Kingdom (UK) Government published the Pathway to 2030 Holistic Network Design documents, which set out the approach to connecting 50 Gigawatts (GW) of offshore wind to the UK electricity network (National Grid ESO, 2022). The output of this process concluded that the Morecambe Offshore Windfarm and the Morgan Offshore Wind Project Generation Assets would both connect to the National Grid at Penwortham in Lancashire, and as such the developers are working collaboratively.

6. Consequently, effects from the Transmission Assets of the Morecambe Offshore Windfarm and the Morgan Offshore Wind Project Generation Assets have been screened and assessed separately, as part of a joint Transmission Assets Environmental Impact Assessment (EIA), Habitats Regulations

Assessment (HRA) process and subsequent DCO application, submitted by Morecambe Offshore Windfarm Ltd and Morgan Offshore Wind Limited (the latter being the developer of the Morgan Offshore Wind Project Generation Assets). The separation of assessment has not impacted the conclusions drawn in the Project Report to Inform the Appropriate Assessment (RIAA) (REP1-012).

1.2 Purpose of this document

7. This document provides evidence to support a 'Without Prejudice' Stage 3 (Derogation) of the HRA Process (see **Section 3**) in relation to the red-throated diver feature of the Liverpool Bay / Bae Lerpwl Special Protection Area (SPA).

8. This document is informed by the Project RIAA. The RIAA concludes for the red-throated diver feature of the Liverpool Bay / Bae Lerpwl SPA that an adverse effect on site integrity would not occur for the Project-alone or in-combination with other plans or projects. Specifically, the increase in in-combination background mortality is predicted to be below 1%, and therefore below a threshold that would be detectable against natural variation, and the Project would have no measurable effect on the distribution of red-throated divers within Liverpool Bay SPA.

9. In addition, the Round 4 Plan Level HRA (TCE, 2022) concluded that:

   - *"When applying a 10 km buffer around the Preferred Projects, as advised by Natural England…. The densities of red-throated diver in the area of overlap (both the original and updated SPA boundaries) are below the threshold used to identify the SPA boundary based on diver density alone (Webb et al., 2006). This indicates that the area of overlap (both the original and updated SPA boundaries) is also not important for red-throated diver in the context of the SPA designation."*
   - *"The mortality associated with the number of displaced birds apportioned to this Protected Site from the Round 4 Plan is estimated to be 0.4 birds/annum. This represents 0.21% of the baseline mortality at this Protected Site. On this basis, the impact from the Round 4 Plan alone is considered to be negligible. "*
   - *"It is acknowledged that Natural England have previously advised that the current level of in-combination mortality estimated for red-throated diver at Liverpool Bay SPA represents an adverse effect on the integrity. However, Preferred Project 5 only interacts with a small area of the SPA considered important for red-throated diver (i.e. the original SPA) and displacement from Preferred Project 5 only results in a very small impact which would not be expected to make an appreciable difference to any in-*

combination impact."

10. The conclusions of the Round 4 Plan Level HRA (TCE, 2022) broadly align with the conclusions of the Project's RIAA, which predicted Project-alone mortality of 0.35 birds, and also concluded that there would be no effect on the distribution of red-throated divers within the SPA. It should be noted that the Round 4 Plan Level HRA was based on a larger site area.

11. Notwithstanding the conclusions of the project RIAA and the Round 4 Plan Level HRA, in response to feedback from Natural England to the DCO Application and an Examining Authority question (1HRA15 (PD-011)) a 'without prejudice' derogation case (this document) has been provided with respect to the red-throated diver feature of the Liverpool Bay / Bae Lerpwl SPA.

12. This approach is in accordance with the Overarching National Policy Statement for Energy (National Policy Statement (NPS) EN-1) (Department for Energy Security and Net Zero (DESNZ), 2023a), the NPS for Renewable Energy (NPS EN-3) (DESNZ, 2023b) and statements from the Secretary of State (SoS) on Offshore Windfarm Project decisions including Sheringham and Dudgeon Extension Projects, Hornsea Project Three, Hornsea Project Four, East Anglia ONE North, East Anglia TWO, Norfolk Boreas, and Norfolk Vanguard (**Section 2.2**).

13. A 'without prejudice' derogation case has also been provided for the lesser black-backed gull feature of the Morecambe Bay and Duddon Estuary SPA and Ramsar site and the Ribble and Alt Estuaries SPA and Ramsar site (REP1-014). For all sites and features assessed in the RIAA, a conclusion of no adverse effect on site integrity is reached, and there is no identified need for a 'without prejudice' derogation case.

14. This document includes the Applicant's submission in relation to:

- Legislative and Policy Context (**Section 2)**
- The HRA Process (**Section 3**)
- Alternative Solutions (**Section 4**) and information on the relevant designated site and interest features
- Imperative Reasons of Overriding Public Interest (IROPI) (**Section 5**)
- Proposed compensatory measures in respect of the red-throated diver feature of the Liverpool Bay / Bae Lerpwl SPA (**Section 6** and **Appendices 1** and **2**).

2 Legislative and policy context

2.1 Legislation

15. This section presents the international and national planning policy and legislative context which is of relevance to the Project 'without prejudice' derogation case and compensation proposals.

2.1.1 The Habitats Directive

16. The EU Directive on the Conservation of Natural Habitats and of Wild Fauna and Flora (92/43/EEC) (the Habitats Directive) provides a framework for the conservation and management of certain habitats and species in Europe. Its aim is to maintain or restore those habitats and species at a favourable conservation status and protect them from the potential adverse effects of plans and projects. The relevant provision of the Directive is the procedure for the protection of Special Areas of Conservation (SACs) (Article 6). SACs are identified and designated based on the presence of the natural habitat types listed in Annex I and populations of the species listed in Annex II.

17. The EU Directive on the Conservation of Wild Birds (2009/147/EC) (the Birds Directive) provides a framework for the conservation and management of certain wild birds in Europe and the identification and designation of SPAs.

18. The Habitats Directive and the Birds Directive provided the foundations for the UK Habitats Regulations, although they no longer form part of UK legislation. As set out in **Section 2.1.2**, in the UK, the Habitats Directive was transposed into UK legislation and implemented via the Habitats Regulations and the Marine Habitats Regulations which continue to apply as current legislation and have been amended by the Conservation of Habitats and Species (Amendment) (EU Exit) Regulations 2019, to reflect the UK's departure from the EU. This has, amongst other changes, replaced the provisions which gave a role to the European Commission (EC) in relation to derogations in certain scenarios.

19. Article 6(3) of the Habitats Directive (see **Table 2.1**) sets out the approval procedure associated with a plan or project for which there is a Likely Significant Effect (LSE) on European sites[3]. Such plans or projects are subject to an Appropriate Assessment (AA) (see **Section 3**).

[3] Designated nature conservation sites which include the National Site Network (designated within the UK) and Natura 2000 sites (designated in any European Union country). This includes candidate Special Areas of Conservation (cSAC), Sites of Community Importance, and Special Protection Areas (SPA).

20. Article 6(4) of the Habitats Directive (see **Table 2.1**) provides the HRA derogation procedure, where an adverse effect on the integrity of a habitats site cannot be ruled out as a result of a plan or project.

Table 2.1 Relevant articles

Article	Requirement
Habitats Directive Article 6(3)	"*Any plan or project not directly connected with or necessary to the management of the site but likely to have a significant effect thereon, either individually or in-combination with other plans or projects, shall be subject to appropriate assessment of its implications for the site in view of the site's conservation objectives. In the light of the conclusions of the assessment of the implications for the site and subject to the provisions of paragraph 4, the competent national authorities shall agree to the plan or project only after having ascertained that it will not adversely affect the integrity of the site concerned and, if appropriate, after having obtained the opinion of the general public*."
Habitats Directive Article 6(4)	"*If, in spite of a negative assessment of the implications for the site and in the absence of alternative solutions, a plan or project must nevertheless be carried out for imperative reasons of overriding public interest, including those of a social or economic nature, the Member State shall take all compensatory measures necessary to ensure that the overall coherence of Natura 2000 is protected. It shall inform the Commission of the compensatory measures adopted.* *Where the site concerned hosts a priority natural habitat type and/or a priority species, the only considerations which may be raised are those relating to human health or public safety, to beneficial consequences of primary importance for the environment or, further to an opinion from the Commission, to other imperative reasons of overriding public interest*."

2.1.2 UK Legislation

21. In England and Wales, the Conservation of Habitats and Species Regulations 2017 (as amended) ('the Habitats Regulations') and the Conservation of Offshore Marine Habitats and Species Regulations 2017 ('the Marine Habitats Regulations') (which applies outside of 12nm) transposed the European Habitats Directive (92/43/EEC) and Birds Directive (2009/147/EC) into UK law.

22. The Project is located outside of 12nm, so the Marine Habitats Regulations are applicable.

23. Regulation 63 of the Habitats Regulations, and Regulation 28 of the Marine Habitats Regulations, provide the requirement for AA and align with Article 6(3) of the Habitats Directive (**Table 2.2**).

24. Regulations 64 and 68 of the Habitats Regulations, and Regulations 29 and 36 of the Marine Habitats Regulations, provide the HRA derogation procedure and are aligned with the requirements of Article 6(4) of the Habitats Directive (**Table 2.2**).

25. It is noted that, in May 2021, the Environment Secretary signalled the Government's intention to reform the Habitats Regulations to ensure that legislation supports the Government's nature recovery targets. The Government convened an HRA working group and released a summary of its findings in 2022 (Department for Environment, Food and Rural Affairs (Defra), 2022a). Additionally, the Nature Recovery Green Paper: Protected Sites and Species (Defra, 2022b), which outlines the recommendations of the HRA working group and proposes changes to existing legislation, was consulted upon from March – May 2022. The Environmental Improvement Plan was published in 2023 and focuses on EIA, with reference to Environmental Outcome Reports. Reforms to improve the effectiveness of the HRA process is expected to follow, but with no details available/applicable for the Project at the time of writing.

26. The Applicant has prepared the Application for the Project based upon legislation in place at the time of the DCO Application submission.

Table 2.2 Relevant regulations

Regulation	Requirement
Regulations transposing Article 6 (3) of the Habitats Directive	
Habitats Regulations, Regulation 63	*"(1) A competent authority, before deciding to undertake, or give any consent, permission or other authorisation for, a plan or project which—* *(a) is likely to have a significant effect on a European site or a European offshore marine site (either alone or in-combination with other plans or projects), and* *(b) is not directly connected with or necessary to the management of that site,* *must make an appropriate assessment of the implications of the plan or project for that site in view of that site's conservation objectives.* *(2) A person applying for any such consent, permission or other authorisation must provide such information as the competent authority may reasonably require for the purposes of the assessment or to enable it to determine whether an appropriate assessment is required.* *(3) The competent authority must for the purposes of the assessment consult the appropriate nature conservation body and have regard to any representations made by that body within such reasonable time as the authority specifies.* *(4) It must also, if it considers it appropriate, take the opinion of the general public, and if it does so, it must take such steps for that purpose as it considers appropriate.* *(5) In the light of the conclusions of the assessment, and subject to regulation 64, the competent authority may agree to the plan or project only after having ascertained that it will not adversely affect the integrity of the European site or the European offshore marine site (as the case may be).* *(6) In considering whether a plan or project will adversely affect the integrity of the site, the competent authority must have regard to the manner in which it is proposed to be carried out or to any conditions or restrictions subject to which it proposes that the consent, permission or other authorisation should be given….* *…(8) Where a plan or project requires an appropriate assessment both under this regulation and under the Offshore Marine Conservation Regulations, the assessment required by this regulation need not identify those effects of the plan or project that are specifically attributable to that part of it that is to be carried out in*

Regulation	Requirement
	the United Kingdom, provided that an assessment made for the purpose of this regulation and the Offshore Marine Conservation Regulations assesses the effects of the plan or project as a whole."
Marine Habitats Regulations, Regulation 28	*"(1) Before deciding to undertake, or give any consent, permission or other authorisation for, a relevant plan or project, a competent authority must make an appropriate assessment of the implications of the plan or project for the site in view of that site's conservation objectives.* *(2) In paragraph (1), a "relevant plan or project" is a plan or project which—* *(a) is to be carried out on or in any part of the waters or on or in any part of the seabed or subsoil comprising the offshore marine area, or on or in relation to an offshore marine installation;* *(b) is likely to have a significant effect on a European offshore marine site or a European site (either alone or in-combination with other plans or projects); and* *(c) is not directly connected with or necessary to the management of the site.* *(3) A person applying to a competent authority for any consent, permission or other authorisation for a plan or project in the offshore marine area must provide such information as the competent authority may reasonably require—* *(a) to enable it to determine whether an assessment under paragraph (1) is required; or* *(b) for the purposes of an assessment under paragraph (1).* *(4) The competent authority must for the purposes of the assessment—* *(a) where it relates to a European offshore marine site, consult the Joint Committee;* *(b) where it relates to a European site in England, consult Natural England;…* *…(f) if it considers it appropriate, take the opinion of the general public and if it does so, take such steps for that purpose as it considers appropriate.* *(5) In the light of the conclusions of the assessment, and subject to regulation 29, the competent authority may agree to the plan or project only if it has ascertained that it will not adversely affect the integrity of the European offshore marine site or European site (as the case may be).* *(6) In considering whether a plan or project will adversely affect the integrity of a site, the competent authority must have regard to the manner in which it is proposed to be carried out and to any conditions or restrictions*

Regulation	Requirement
	subject to which the competent authority proposes that the consent, permission or other authorisation should be given."
Regulations transposing Article 6(4) of the Habitats Directive	
Habitats Regulations, Regulation 64	*"(1) If the competent authority is satisfied that, there being no alternative solutions, the plan or project must be carried out for imperative reasons of overriding public interest (which, subject to paragraph (2), may be of a social or economic nature), it may agree to the plan or project notwithstanding a negative assessment of the implications for the European site or the European offshore marine site (as the case may be).* *(2) Where the site concerned hosts a priority natural habitat type or a priority species, the reasons referred to in paragraph (1) must be either—* *(a) reasons relating to human health, public safety or beneficial consequences of primary importance to the environment; or* *(b) any other reasons which the competent authority, having due regard to the opinion of the appropriate authority, considers to be imperative reasons of overriding public interest.* *(3) Where a competent authority other than the Secretary of State or the Welsh Ministers desires to obtain the opinion of the appropriate authority as to whether reasons are to be considered imperative reasons of overriding public interest, it may submit a written request to the appropriate authority—* *(a) identifying the matter on which an opinion is sought; and* *(b) accompanied by any documents or information which may be required.* *(4) In giving its opinion as to whether the reasons are imperative reasons of overriding public interest, the appropriate authority must have regard to the national interest, and provide its opinion to the competent authority.* *(4A) Before giving its opinion as to whether the reasons are imperative reasons of overriding public interest, the appropriate authority must consult the following, and have regard to their opinion—* *(a) the Joint Nature Conservation Committee;* *(b) where the appropriate authority is the Secretary of State, the devolved administrations;*

Regulation	Requirement
	(c) where the appropriate authority is the Welsh Ministers, the Secretary of State, and the other devolved administrations; and *(d) any other person the appropriate authority considers appropriate.* *(5) Where a competent authority other than the Secretary of State or the Welsh Ministers proposes to agree to a plan or project under this regulation notwithstanding a negative assessment of the implications for the site concerned—* *(a) it must notify the appropriate authority; and* *(b) it must not agree to the plan or project before the end of the period of 21 days beginning with the day notified by the appropriate authority as that on which its notification was received, unless the appropriate authority notifies it that it may do so.* *(6) Without prejudice to any other power, the appropriate authority may give directions to the competent authority in any such case prohibiting it from agreeing to the plan or project, either indefinitely or during such period as may be specified in the direction*."
Habitats Regulations, Regulation 68	"*Where in accordance with regulation 64—* *(a) a plan or project is agreed to, notwithstanding a negative assessment of the implications for a European site or a European offshore marine site, or* *(b) a decision, or a consent, permission or other authorisation, is affirmed on review, notwithstanding such an assessment,* *the appropriate authority must secure that any necessary compensatory measures are taken to ensure that the overall coherence of Natura 2000 is protected*."
Marine Habitats Regulations, Regulation 29	*"(1) If it is satisfied that, there being no alternative solutions, the plan or project referred to in regulation 28(1) must be carried out for imperative reasons of overriding public interest (which, subject to paragraph (2), may be of a social or economic nature), the competent authority may agree to the plan or project notwithstanding a negative assessment of the implications for the site.* *(2) Where the site concerned hosts a priority natural habitat type or a priority species, the reasons referred to in paragraph (1) must be either—*

Regulation	Requirement
	(a) reasons relating to human health, public safety or beneficial consequences of primary importance to the environment; or *(b) any other imperative reasons of overriding public interest.* *(3) A competent authority other than the relevant administration may not agree to a plan or project under paragraph (1) for any reason referred to in paragraph (2)(b) unless it has had due regard to the opinion of the relevant administration in satisfying itself that there are such reasons.* *(4) Where a competent authority other than the relevant administration desires to obtain the opinion of the relevant administration as to whether reasons are to be considered imperative reasons of overriding public interest, it must submit a request to the relevant administration —* *(a) identifying the matter on which an opinion is sought; and* *(b) accompanied by any documents or information that may be required.* *(5) In giving its opinion as to whether the reasons are imperative reasons of overriding public interest, the relevant administration must have regard to the national interest, and provide its opinion to the competent authority.* *(6) Before giving its opinion as to whether the reasons are imperative reasons of overriding public interest, the relevant administration must consult the following, and have regard to their opinion—* *(a) the Joint Nature Conservation Committee;* *(b) where the relevant administration is the Secretary of State, the devolved administrations;* *(c) where the relevant administration is a devolved administration, the Secretary of State and the other devolved administrations; and* *(d) any other person the relevant administration considers appropriate.* *(7) In this regulation, "the relevant administration" means—* *(a) in relation to a plan or project relating to an activity other than one specified in regulation 55(16)—* *(i) where the plan or project is to be carried out in the Scottish offshore region, the Scottish Ministers; and* *(ii) where the plan or project is to be carried out in the Welsh offshore region, the Welsh Ministers; and*

Regulation	Requirement
	(b) in relation to a plan or project relating to an activity specified in regulation 55(16), or in any case not falling within sub-paragraph (a)(i) or (ii), the Secretary of State."
Marine Habitats Regulations, Regulation 36	*"(1) This regulation applies where, notwithstanding a negative assessment of the implications for a European offshore marine site or European site—* *(a) a plan or project is agreed to in accordance with regulation 29; or* *(b) a decision, or a consent, permission or other authorisation, is affirmed on review in accordance with regulations 29 and 34(3).* *(2) The appropriate authority must secure that any necessary compensatory measures are taken to ensure that the overall coherence of Natura 2000 is protected*."

2.2 Policy

2.2.1 National Policy Statements

27. The Overarching NPS for Energy (NPS EN-1) (DESNZ, 2023a) and NPS for Renewable Energy (NPS EN-3) (DESNZ, 2023b) outline the requirements for Applicants to provide evidence to support an HRA derogation case at the application stage, where the Statutory Nature Conservation Body (SNCB) has advised that it may not be possible to rule out an adverse effect on site integrity (**Table 2.3**).

28. The need for information to be provided at the application stage was also stated by the SoS in the Hornsea Project Three, Hornsea Four, East Anglia ONE North, East Anglia TWO, and Norfolk Boreas (Department for Business, Energy & Industrial Strategy (BEIS), 2021a) decision letters: "*in order to maintain the efficient functioning of the development consenting regime, he may not always request post-examination representations on such matters [HRA], indeed it should be assumed that he will not do so, and he may therefore make decisions on such evidence as is in front of him following his receipt of the ExA's*[4] *Report*".

29. NPS EN-1 and EN-3 highlight the urgent need to meet the UK Government's energy objectives by defining nationally significant low carbon infrastructure as a Critical National Priority (CNP). The CNP policy explains how the SoS will consider the HRA derogation case, in light of the need for CNP infrastructure projects.

Table 2.3 Relevant Policies of the NPS EN-1 and NPS EN-3

Paragraph	Policy
NPS EN-1 paragraph 4.2.11	*"Applicants must apply the mitigation hierarchy and demonstrate that it has been applied. They should also seek the advice of the appropriate Statutory Nature Conservation Bodies (SNCB) or other relevant statutory body when undertaking this process. Applicants should demonstrate that all residual impacts are those that cannot be avoided, reduced or mitigated."*
NPS EN-1 paragraph 4.2.12	*"Applicants should set out how residual impacts will be compensated for as far as possible. Applicants should also set out how any mitigation or compensation measures will be monitored, and reporting agreed to ensure success and that action is taken. Changes to measures may be needed e.g., adaptive management. The cumulative impacts of multiple developments with residual impacts should also be considered."*

[4] Examining Authority

Paragraph	Policy
NPS EN-1 paragraph 4.2.13	*"Where residual impacts relate to HRA or Marine Conservation Zone (MCZ) then the Applicant must provide a derogation case, if required, in the normal way in compliance with the relevant legislation and guidance."*
NPS EN-1 paragraph 4.2.19	*"Where, following Appropriate Assessment, CNP Infrastructure has residual adverse impacts on the integrity of sites forming part of the UK national site network, either alone or in combination with other plans or projects, the Secretary of State will consider making a derogation under the Habitats Regulations."*
NPS EN-1 paragraph 4.2.21	*"…the Secretary of State will consider the particular circumstances of any plan or project, but starting from the position that energy security and decarbonising the power sector to combat climate change:* ▪ *requires a significant number of deliverable locations for CNP Infrastructure and for each location to maximise its capacity. This NPS imposes no limit on the number of CNP infrastructure projects that may be consented. Therefore, the fact that there are other potential plans or projects in different locations that can help meet the need for CNP Infrastructure is unlikely to be treated as an alternative solution. Further, the existence of another way of developing the proposed plan or project which results in a significantly lower generation capacity is unlikely to meet the objectives and therefore be treated as an alternative solution; and* ▪ *are capable of amounting to imperative reasons of overriding public interest (IROPI) for HRAs, and, for MCZ assessments, the benefit to the public is capable of outweighing the risk of environmental damage, for CNP Infrastructure.*
NPS EN-1 paragraph 4.2.22	*"For HRAs, where an applicant has shown there are no deliverable alternative solutions, and that there are IROPI, compensatory measures must be secured by the Secretary of State as the competent authority, to offset the adverse effects to site integrity as part of a derogation."*
NPS EN-1 paragraph 4.2.23	*"The Secretary of State should be guided in considering alternative proposals by whether there is a realistic prospect of the alternative delivering the same infrastructure capacity (including energy security, climate change, and other environmental benefits) in the same timescale as the proposed development."*
NPS EN-1 paragraph 5.4.26	*"If, during the pre-application stage, the SNCB indicate that the proposed development is likely to adversely impact the integrity of habitat sites, the applicant must include with their application*

Paragraph	Policy
	such information as may reasonably be required to assess a potential derogation under the Habitats Regulations."
NPS EN-1 paragraph 5.4.27	*"If the SNCB gives such an indication at a later stage in the development consent process, the applicant must provide this information as soon as is reasonably possible and before the close of the examination. This information must include assessment of alternative solutions, a case for Imperative Reasons of Overriding Public Interest (IROPI) and appropriate environmental compensation."*
NPS EN-1 paragraph 5.4.28	*"Provision of such information will not be taken as an acceptance of adverse impacts and if an applicant disputes the likelihood of adverse impacts, it can provide this information as part of its application 'without prejudice' to the Secretary of State's final decision on the impacts of the potential development. If, in these circumstances, an applicant does not supply information required for the assessment of a potential derogation, there will be no expectation that the Secretary of State will allow the applicant the opportunity to provide such information following the examination."*
NPS EN-1 paragraph 5.4.29	*"It is vital that applicants consider the need for compensation as early as possible in the design process as 'retrofitting' compensatory measures will introduce delays and uncertainty to the consenting process."*
NPS EN-1 paragraph 5.4.30	*"Applicants should work closely at an early stage in the pre-application process with SNCB and Department for Environment, Food and Rural Affairs (Defra)/Welsh Government to develop a compensation plan for all protected sites adversely affected by the development. Applicants should engage with the relevant Local Planning Authority at an early stage regarding the proposed location of compensatory measures. Applicants should also take account of any strategic plan level compensation plans in developing project level compensation plans."*
NPS EN-1 paragraph 5.4.31	*"Before submitting an application, applicants should seek the views of the SNCB and Defra/Welsh Government as to the suitability, securability and effectiveness of the compensation plan to ensure the development will not hinder the achievement of the conservation objectives for the protected site. In cases where such views are provided, the applicant should include a copy of this information with the compensation plan in their application for further consideration by the Examining Authority."*
NPS EN-3 paragraph 2.8.265	*"With increasing deployment of offshore wind farms and offshore transmission, environmental impacts upon SACs SPAs, and Ramsar sites and MCZs (individually and as part of a network)*

Paragraph	Policy
	may not be addressed by avoidance, reduction, or mitigation alone, therefore compensatory measures (through derogation for SACs SPAs, Ramsar sites, and MCZs) may be required at a plan or project level where adverse effects on site integrity and/or on conservation objectives cannot be ruled out."
NPS EN-3 paragraph 2.8.266	*"For many receptors, the scale of offshore wind and offshore transmission developments, and potential in-combination effects, means compensation could be required and applicants must refer to the latest Defra compensation guidance when making their assessments."*
NPS EN-3 paragraph 2.8.267	*"If, during the pre-application stage, SNCBs indicate that the proposed development is likely adversely to impact a protected site, the applicant should include with their application such information as may reasonably be required to assess potential derogations under the Habitats Regulations or the Marine and Coastal Access Act 2009."*
NPS EN-3 paragraph 2.8.268	*"Where such an indication is given later in the development consent process, the applicant should share this information as soon as reasonably practical."*
NPS EN-3 paragraph 2.8.269	*"This information includes:* *assessment of alternative solutions, showing the relevant tests on alternatives have been met;* *a case showing that the relevant tests for IROPI or Measures of Equivalent Environmental Benefit have been met; and* *appropriate securable environmental compensation, which will ensure no net loss to the Marine Protected Areas (MPA) network and help ensure that the MPA target (including any interim target) set under the Environment Act 2021 targets can be met."*
NPS EN-3 paragraph 2.8.270	*"Provision of such information will not be taken as an acceptance of adverse impacts, and if applicants dispute the likelihood of adverse effects they can provide this information as part of their application, 'without prejudice' to the Secretary of State's final decision on the impacts of the potential development."*
NPS EN-3 paragraph 2.8.271	*"If, in these circumstances, an applicant does not supply information required for the assessment of a potential derogation, consent may be refused as there will be no expectation that the Secretary of State will allow the applicant the opportunity to provide such information following the examination."*
NPS EN-3 paragraph 2.8.272	*"It is vital that applicants consider the need for compensation as early as possible in the design process, as 'retrofitting' compensatory measures will introduce delays and uncertainty to the consenting process. Applicants are encouraged to include all*

Paragraph	Policy
	compensatory measures considered, with reasoning for why they have been discounted."
NPS EN-3 paragraph 2.8.273	*"Applicants should work closely at an early stage in the pre-application process with SNCBs, and Defra, in conjunction with the relevant regulators, Local Planning Authorities, National Park Authorities, landowners and other relevant stakeholders to develop a compensation plan for all protected sites adversely affected by the development."*
NPS EN-3 paragraph 2.8.274	*"Before submitting an application, applicants should seek the views of the SNCB and Defra, as to the suitability, securability and effectiveness of the compensation plan to ensure that the overall coherence of the National Site Network for the impacted SAC/SPA/MCZ feature is protected. Consultation should also take place throughout the pre-application phase with key stakeholders (e.g., via the evidence plan process and use of expert topic groups)."*
NPS EN-3 paragraph 2.8.275	*"In cases where such views are provided, the applicant should include a copy of this information with the compensation plan in their application for further consideration by the Examining Authority and Secretary of State."*
NPS EN-3 paragraph 2.8.276	*"The British Energy Security Strategy contains a commitment to introduce mechanisms to support strategic compensatory measures, to compensate for environmental impacts and reduce delays to individual projects."*
NPS EN-3 paragraph 2.8.277	*"Strategic compensation is defined as a measure or a series of measures that can be delivered at scale and/or extended timeframes, which cannot be delivered by individual offshore wind and/ or offshore transmission project developers in isolation. Any measure(s) would usually be led and delivered by a range of organisations, including Government, industry and relevant stakeholders. Strategic compensation measures would normally be identified at a plan level and applied across multiple offshore wind projects to provide ecologically meaningful compensation to designated site habitats and species adversely impacted, ensuring the coherence of the MPA network."*
NPS EN-3 paragraph 2.8.278	*"This may include central coordination for measures delivered across a series of projects or biogeographic region."*
NPS EN-3 paragraph 2.8.279	*"Applicants will be able to access tools and mechanisms to support identification of suitable compensation and facilitate delivery of strategic compensation measures where appropriate."*

Paragraph	Policy
NPS EN-3 paragraph 2.8.280	*"The government is still developing its policies on strategic compensation through the Collaboration on Offshore Wind Strategic Compensation (COWSC) programme, and guidance will be published in due course."*
NPS EN-3 paragraph 2.8.281	*"The government will work collaboratively with industry and stakeholders to develop strategic compensation for projects currently in the consenting process (where possible) as well as for future developments."*
NPS EN-3 paragraph 2.8.282	*"Not every impact for every project will initially fall within the strategic compensation proposals, so applicants should continue to discuss with SNCBs and Defra the need for site specific or strategic compensation at the earliest opportunity."*
NPS EN-3 paragraph 2.8.283	*"Applicants should also coordinate with other marine industry sectors, e.g., oil and gas, who might also need to find compensatory measures. This will ensure compensatory measures are complementary and/or take advantage of opportunities to join together to deliver strategic compensation. Applicants should demonstrate they have consulted with those industries/stakeholders who are affected by any proposed compensation measures."*

2.2.2 Consultation

30. The Applicant has undertaken consultation on potential compensation measures throughout the pre-application and examination stage. This has included:

- Offshore Ornithology Expert Topic Group (ETG) meetings with Natural England and the Royal Society for the Protection of Birds (RSPB) to discuss the impacts of the Project
- Offshore Ornithology meetings with Natural England and the RSPB to discuss the potential requirement for compensation measures
- Meetings with Defra, the RSPB and Natural England, as well as other relevant stakeholders such as landowners regarding site selection options for compensatory measures

3 Habitats Regulations Assessment Process

31. Under the Habitats Regulations and the Marine Habitats Regulations, the relevant competent authority must consider whether a plan or project has the potential to have an adverse effect on site integrity of a habitats site. HRA derogation under the above Regulations (see **Table 2.2**) can only apply after the AA has concluded that an adverse effect on site integrity cannot be ruled out.

32. The following UK Guidance addresses the regulations in the Habitats Regulations and Marine Habitats Regulations applicable to Article 6(4) of the Habitats Directive (**Table 2.2**):

- Department for Environment, Food & Rural Affairs (Defra) *et al*., (2021) HRA: protecting a European site, published February 2021
- Defra (2021a) Best practice guidance for developing compensatory measures in relation to MPA. Draft for consultation
- Natural England (2022) 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

33. **Plate 3.1** provides an outline of the sequential HRA process, as summarised below:

- Stage 1 – Screening: The process of identifying relevant European sites (when within the UK now refered to as sites within the National Site Network) and if the Project has a LSE on qualifying features (alone and in-combination)
- Stage 2 – AA: The assessment of the risk of the Project (alone or in-combination) causing an adverse effect on integrity (AEoI) for each feature screened in during Stage 1 in relation to conservation objectives
- Stage 3 and 4 – Derogation: If Stage 2 concludes there is a risk of AEoI the following are required:
  - Assessment of alternatives
  - IROPI
  - Compensatory measures

34. This HRA ‘without prejudice’ derogation document provides information relating to Stage 3 and Stage 4, albeit with a summary of the assessment

undertaken in relation to Stage 2. A RIAA for the Project is provided with the DCO Application, which supports Stages 1 and 2 of the HRA process.

35. A summary of the conclusions of the RIAA is provided in **Section 1.2**.

36. The Applicant's RIAA concludes that there would be no adverse effect on the integrity of any SPA as a result of the Project. Given the conclusions of SNCBs may not be the same as the Applicant in regard to contribution to in-combination effects, the Applicant has prepared this 'without prejudice' derogation and compensation document. It should be noted that the approach to the development of compensatory measures is the same regardless of whether they are being provided on a 'without prejudice' basis or not.

37. Stage 3 of the HRA process entails the Assessment of Alternatives. Essentially this stage requires the Applicant to provide evidence that alternatives in terms of location, scale/size, design, methods (e.g. construction), and timing:

- do not achieve the same overall objective as the original proposal
- are not financially, legally and technically feasible
- are not less damaging to the European site and have an adverse effect on the integrity of this or any other European site

38. Stage 4 of the HRA process entails the assessment of IROPI. Primarily this stage requires the Applicant to evidence that the project is:

- Essential for public interest reasons
- Is in the public interest and benefits the public, not just private interests
- Is overriding and as such the public interest outweighs the harm, or risk of harm, to the integrity of the European site(s) being considered

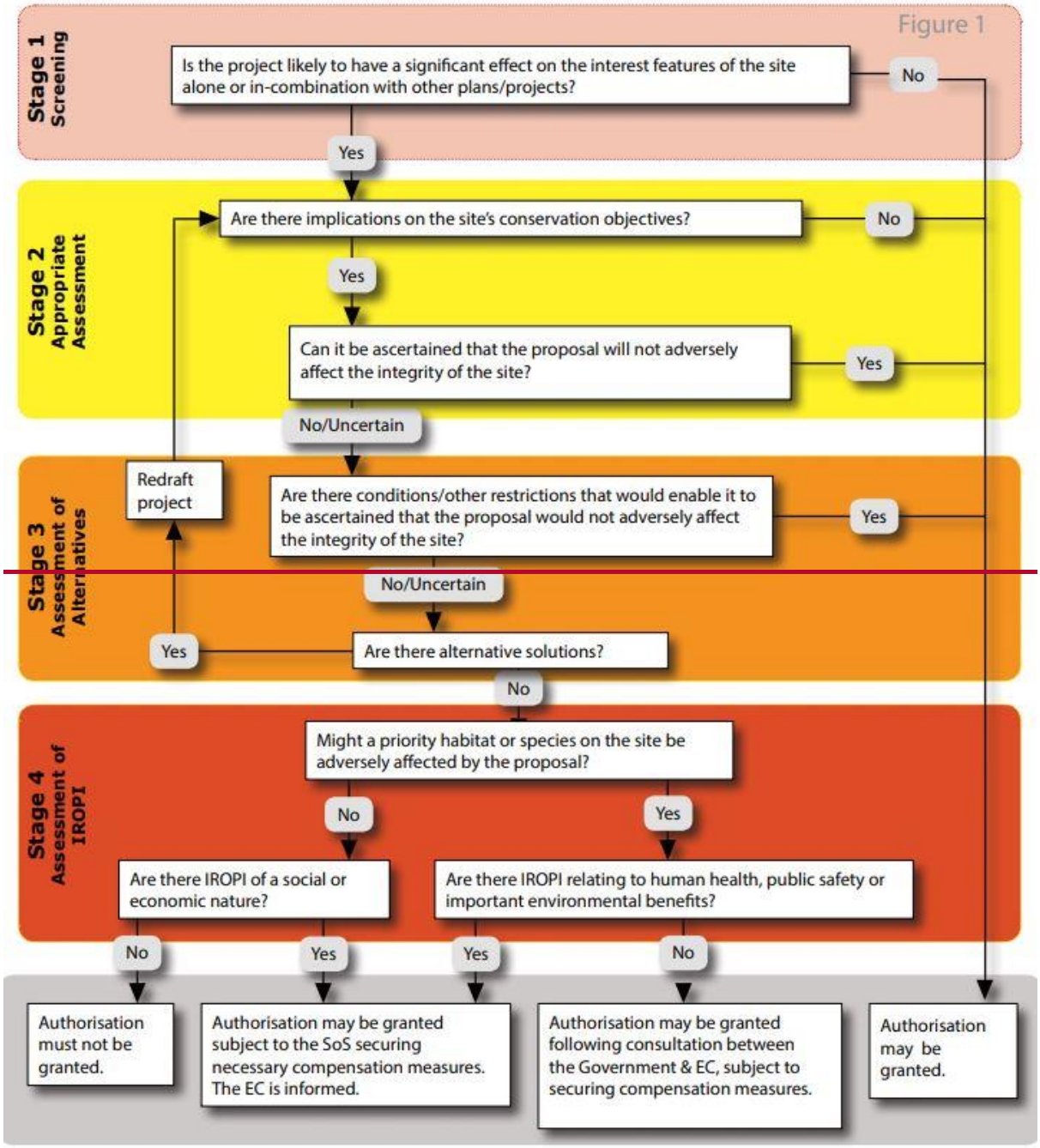
Figure 1
Stage 1 Screening
Is the project likely to have a significant effect on the interest features of the site alone or in-combination with other plans/projects?
No
Yes
Stage 2 Appropriate Assessment
Are there implications on the site's conservation objectives?
No
Yes
Can it be ascertained that the proposal will not adversely affect the integrity of the site?
Yes
No/Uncertain
Stage 3 Assessment of Alternatives
Redraft project
Are there conditions/other restrictions that would enable it to be ascertained that the proposal would not adversely affect the integrity of the site?
Yes
No/Uncertain
Yes
Are there alternative solutions?
No
Stage 4 Assessment of IROPI
Might a priority habitat or species on the site be adversely affected by the proposal?
No
Yes
Are there IROPI of a social or economic nature?
Are there IROPI relating to human health, public safety or important environmental benefits?
No
Yes
Yes
No
Authorisation must not be granted.
Authorisation may be granted subject to the SoS securing necessary compensation measures. The EC is informed.
Authorisation may be granted following consultation between the Government & EC, subject to securing compensation measures.
Authorisation may be granted.

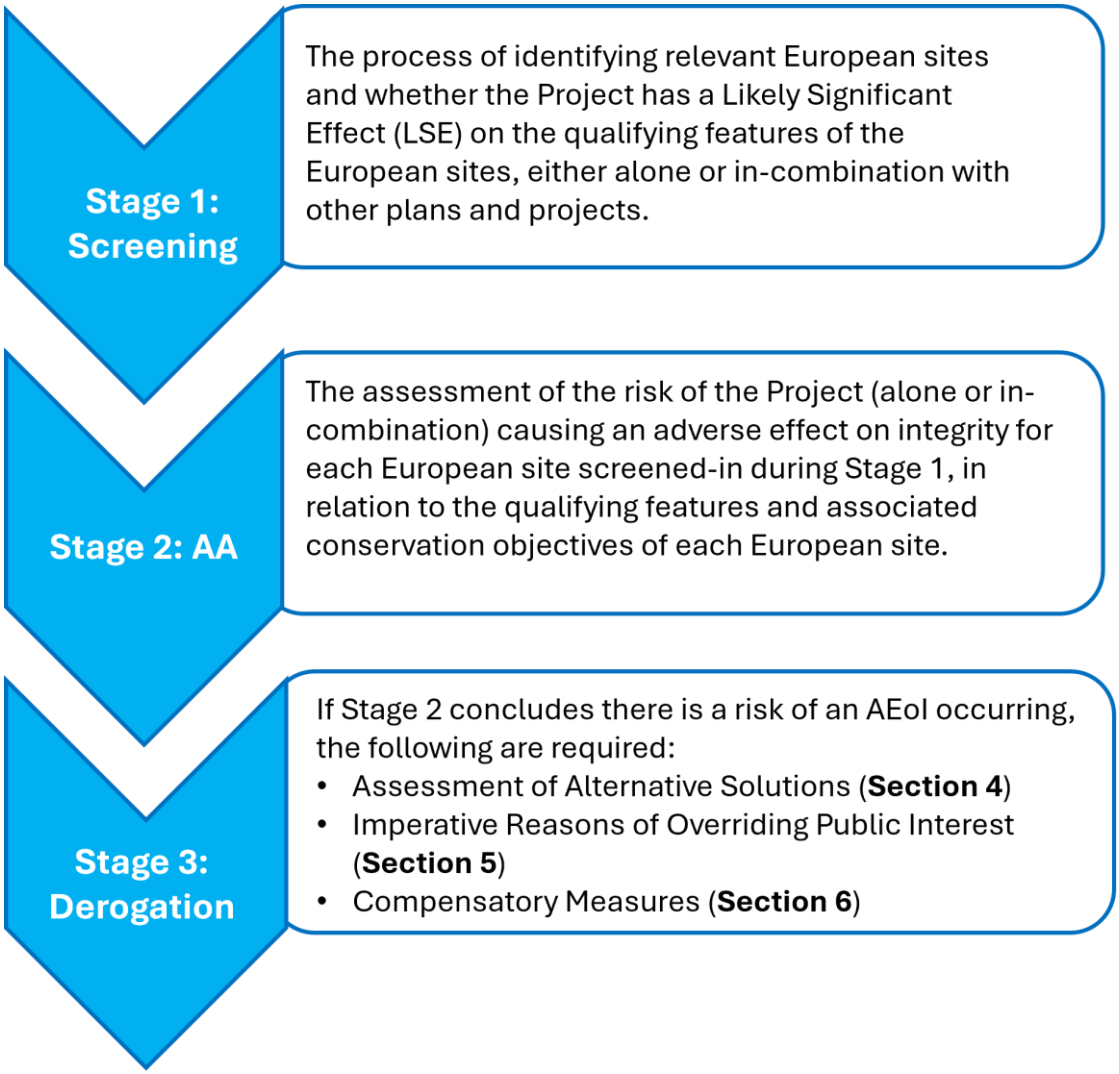

Plate 3.1 HRA process

4 Assessment of Alternative Solutions

4.1 Approach

39. This assessment applies a sequential process to the consideration of alternatives, first by identifying the objectives of the Project, then the potential harm to protected sites, followed by consideration of alternative solutions and their feasibility. Whilst it is acknowledged that the SoS need not constrain themselves solely to alternatives delivered by the Applicant, the fact that there are other potential plans or projects deliverable in different locations to meet the need for CNP Infrastructure is unlikely to be treated as an alternative solution (EN-1 paragraph 4.2.21).

40. Defra *et al*. (2021) provides guidance on the approach to the consideration of alternative solutions under the HRA derogation tests. Of relevance to an offshore windfarm array, the guidance states that the assessment of alternative solutions must consider:

- Alternative location
- Alternative size/scale
- Alternative design
- Alternative method
- Alternative timing

41. In order to assess the alternative solutions, Defra *et al.* (2021) stated:

"*An alternative solution is acceptable if it:*

achieves the same overall objective as the original proposal

is financially, legally and technically feasible

is less damaging to the European site and does not have an adverse effect on the integrity of this or any other European site"

42. It is noted that in terms of considering less damaging solutions, the Hornsea Four decision noted that alternatives are only considered where there is an appreciable reduction in predicted impacts to protected sites.

43. Defra *et al.* (2021) established that the consideration of alternative solutions need not go beyond the form of energy generation proposed, in order to deliver the objectives of renewable energy production:

"*Examples of alternatives that may not meet the original objective include a proposal that:*

offers nuclear instead of offshore wind energy"

44. The Government policy in NPS EN-1 imposes no limits on the number of CNP projects, “therefore the fact that there are other potential plans or projects deliverable in different locations to meet the need for CNP infrastructure is unlikely to be treated as an alternative solution” (paragraph 4.2.21; NPS EN-1, 2023).

45. Furthermore, the NPS EN-1 also states that “the existence of another way of developing the proposed plan or project which results in a **significantly lower generation capacity** is unlikely to meet the objectives and therefore be treated as an alternative solution” (paragraph 4.2.21; NPS EN-1, 2023).

46. It was also noted that “where an applicant has shown there are no deliverable alternative solutions, and that there are IROPI, compensatory measures must be secured by the SoS as the competent authority, to offset the adverse effects to site integrity as part of a derogation” (paragraph 4.2.22; NPS EN-1, 2023).

47. Defra (2021a) compensatory measures guidance advised that a "do nothing" option should also be considered.

48. The methodology adopted to assess alternative solutions has been developed based on former and current guidance from a range of sources, including:

- EC (2001). Assessment of plans and projects significantly affecting Natura 2000 sites: Methodological guidance on the provisions of Article 6(3) and (4) of the Habitats Directive 92/43/EEC
- EC (2011). Guidelines on the Implementation of the Birds and Habitats Directives in Estuaries and Coastal Zones; with particular attention to port development and dredging
- Defra (2012). Habitats and Wild Birds Directives: guidance on the application of Article 6(4) Alternative solutions, IROPI and compensatory measures
- EC (2012). Guidance document on Article 6(4) of the 'Habitats Directive' 92/43/EEC. Clarification of the concepts of: Alternative solutions, IROPI, compensatory measures, overall coherence, opinion of the Commission
- The Planning Inspectorate (2017). Advice Note Ten: Habitat Regulations Assessment relevant to Nationally Significant Infrastructure Projects
- EC (2018). Managing Natura 2000 sites: The provisions of Article 6 of the 'Habitats' Directive 92/43/EEC
- Defra *et al.*, (2021). HRA: protecting a European site; How a competent authority must decide if a plan or project proposal that affects a European site can go ahead

- Defra (2021a) Best practice guidance for developing compensatory measures in relation to MPAs. Draft for consultation
- Defra (2021b) Policy paper Changes to the Habitats Regulations 2017.

49. The approach to this 'without prejudice' derogation case has also been developed through consideration of UK precedents, namely:

- The Rampion OWF HRA produced by the SoS (Department for Energy and Climate Change (DECC), 2014)
- The Hornsea Project Three HRA produced by the SoS (BEIS, 2020a)
- The Hornsea Four HRA produced by the SoS (DESNZ, 2023c)
- The Norfolk Boreas HRA produced by the SoS (BEIS, 2021a)
- The East Anglia ONE North and East Anglia TWO HRA produced by the SoS (BEIS, 2022a; 2022b)
- The Norfolk Vanguard HRA produced by the SoS (BEIS, 2022c)

50. The methodology adopted herein follows the below steps, each of which is detailed and evidenced within the following subsections of this document:

- Step 1 – summarise the Project need and objectives, in order to allow the assessment (Step 3) to determine whether the alternative solution(s) achieve the same overall objective(s) – see **Section 1.1** of this document
- Step 2 – identify the risk of harm to the integrity of the relevant European site in order to allow the assessment (Step 5) to determine whether the alternative solution(s) is less damaging to the European site and does not have an adverse effect on the integrity of this or any other European site – see **Section 4.3** of this document
- Step 3 – produce a long list of potential alternative solutions and screen these in terms of whether they meet the objectives of the Project, to thereafter produce a short list of alternative solutions that meet the Project objectives – see **Section 4.4** of this document
- Step 4 – consider whether any short-listed potential alternative solutions identified in Step 3 are feasible (financially, legally and technically) – see **Section 4.5** of this document
- Step 5 – consider whether any feasible alternative solutions identified in Step 4 would have a lesser effect on the integrity of the National Site Network – see **Section 4.6** of this document

4.2 Step 1: Project Need and Objectives

4.2.1 The need for the Project

51. The key drivers underpinning the need for offshore wind power that would be met by the Project in line with National Policy (DESNZ, 2023a) are set out in full in the Planning Development Consent and Need Statement (REP1-010).

52. There is a clear and urgent need for the development of the Project since it will help to meet the decarbonisation objective and achieve the UK Government target of Net Zero emissions by 2050. Additionally, offshore wind is expected to produce more than 50GW of electricity by 2030, and the Project is positioned to contribute to this target.

53. The Project would also support the objectives on security of energy supply, sustainable development, affordability and coordination set out in the Overarching Energy NPS EN-1. With a planned generation capacity of around 480MW of renewable energy, the Project would make a substantial contribution to the achievement of national renewable energy targets towards Net Zero and to the UK's contribution to global efforts to reduce the effects of climate change.

54. The Project would provide secure, reliable and affordable renewable energy supply in the UK for over 500,000 homes. The Project would help the UK meet its Net Zero targets and significantly contribute to the economy, by providing substantial investment locally and nationally, as well as employment and new energy infrastructure during all phases of the Project. This would enhance the sustainable development of the local community.

4.2.2 Project objectives

55. The Project objectives are presented in **Table 4.1**.

Table 4.1 Project Objectives

ID	Objective	Basis for the Objective (emphasis added)
1	**Decarbonisation:** Generate around 480MW of low carbon electricity from an offshore windfarm, in support of the Net-Zero by 2050 target and UK Government ambition to deliver 50GW of offshore wind by 2030	National UK policy set out in section 2.2, *Net Zero by 2050*, of NPS EN-1 is that *"2.2.1 In June 2019 the UK became the first major economy to* ***legislate for a 2050 Net Zero Greenhouse Gases*** *('GHG') emissions target through the Climate Change Act 2008 (2050 Target Amendment) Order 2019..... In April 2021, the Government legislated for the sixth carbon budget (CB6), which* ***requires the UK to reduce GHG emissions by 78 per cent by 2035*** *compared to 1990 levels"* and that *"2.3.2 In October 2021 the Government published* ***the Net Zero Strategy****".* *On the basis of the need to deliver the* project by 2030 national policy in section 4.2 *"The critical national priority for low carbon infrastructure"* is that *"4.2.2..... Our energy security and* ***net zero ambitions will only be delivered if we can enable the development of new low carbon sources of energy at speed*** *and scale*" and that *"4.2.4 Government has therefore concluded that* ***there is a critical national priority (CNP) for the provision of nationally significant low carbon infrastructure****".*

ID	Objective	Basis for the Objective (emphasis added)
2	**Security of supply**: Provide significant electricity generation capacity within the UK to support commitments for offshore wind generation and security of supply	National UK policy set out in section 2.5, *Security of Supplies*, of NPS EN-1 is that: *"2.5.1 Given the vital role of energy to economic prosperity and social well-being, it is **important that our supplies of energy remain secure, reliable and affordable**"* and that *"2.5.6 The British Energy Security Strategy emphasises the importance of addressing our underlying vulnerability to international energy prices by **reducing our dependence on imported oil and gas**, improving energy efficiency, remaining open minded about our onshore reserves including shale gas, and **accelerating deployment of renewables,** nuclear, hydrogen, CCUS, and related network infrastructure, so as to ensure a domestic supply of clean, affordable, and secure power as we transition to net zero" and that* *"3.3.21 As part of delivering this, UK government announced in the British Energy Security Strategy an ambition to deliver up to 50 gigawatts (GW) of offshore wind by 2030".*

ID	Objective	Basis for the Objective (emphasis added)
3	**Affordability**: Maximise generation capacity at low cost to the consumer from viable developable seabed within the constraints of available sites and grid infrastructure	National UK policy set out in section 3.3, *The need for new nationally significant electricity infrastructure*, of NPS EN-1 is that: *"3.3.13 The Net Zero Strategy sets out the Government's ambition for increasing the deployment of low carbon energy infrastructure consistent with delivering our carbon budgets and the 2050 net zero target. This made clear the commitment that* ***the cost of the transition to net zero should be fair and affordable****"* and that: *"3.3.16 If demand for electricity doubles by 2050, we will need a fourfold increase in low carbon generation and significant expansion of the networks that transport power to where it is needed. In addition, we committed in the Net Zero Strategy to take action so that by 2035, all our electricity will come from low carbon sources, subject to security of supply, whilst meeting a 40-60 per cent increase in electricity demand.* ***This means that the majority of new generating capacity needs to be low carbon****"* and that *"3.3.20* ***Wind and solar are the lowest cost ways of generating electricity****, helping reduce costs and providing a clean and secure source of electricity supply (as they are not reliant on fuel for generation). Our analysis shows that a secure, reliable, affordable, net zero consistent system in 2050 is likely to be composed predominantly of wind and solar."*
4	**Coordination**: Coordinate and coexist with other activities, developers and operators to use previously developed seabed to deliver the Project and its skills, employment and investment benefits in the Local Economic Area.	National UK policy set out in section 3.3, *The need for new nationally significant electricity infrastructure*, of NPS EN-1 is that: *"3.3.71....For regions with multiple windfarms or offshore transmission projects* ***it is expected that a more coordinated approach*** *will be delivered. For these areas, this approach is likely to reduce the network infrastructure costs as well as the cumulative environmental impacts and impacts on coastal communities by installing a smaller number of larger*

ID	Objective	Basis for the Objective (emphasis added)
		connections, each taking power from multiple windfarms instead of individual point-to-point connections for each windfarm" And in section 4.1 *General Policies and Considerations* that *"4.1.5 In considering any proposed development, in particular when weighing its adverse impacts against its benefits, the Secretary of State* ***should take into account:*** ***• its potential benefits including its contribution to meeting the need for energy infrastructure, job creation, reduction of geographical disparities, environmental enhancements, and any long-term or wider benefits"*** And within section 4.2 "HRA derogations and MCZ assessments for CNP Infrastructure" that *"4.2.21 For both* ***derogations****, the Secretary of State will consider the particular circumstances of any plan or project, but starting from the position that energy security and decarbonising the power sector to combat climate change:* ***• requires a significant number of deliverable locations for CNP Infrastructure and for each location to maximise its capacity****. This* ***NPS imposes no limit on the number of CNP infrastructure projects that may be consented****. Therefore, the fact that there are* ***other potential plans or projects deliverable in different locations to meet the need for CNP Infrastructure is unlikely to be treated as an alternative solution****".* National UK policy set out in section 2.8 *Offshore Wind* of NPS EN-3 is that: "*2.8.48 Applicants are encouraged to* ***work collaboratively with those other developers and sea users on co-existence/co-location opportunities****, shared mitigation, compensation and monitoring where appropriate. Where applicable, the creation of statements of common*

ID	Objective	Basis for the Objective (emphasis added)
		ground between developers is recommended. Work is ongoing between government and industry to support effective collaboration and find solutions to facilitate to greater co-existence/co-location". National policy set out in 5.13 Socio-economic impacts of NPS EN-1 is that: *"5.13.11 The Secretary of State should consider* ***any relevant positive provisions the applicant has made or is proposing to make to mitigate impacts*** *(for example through planning obligations) and any legacy benefits that may arise as well as any options for phasing development in relation to the socio-economic impacts.* *5.13.12 The Secretary of State may wish to include a requirement that specifies the approval by the local authority of an* ***employment and skills plan detailing arrangements to promote local employment and skills development opportunities****, including apprenticeships, education, engagement with local schools and colleges and training programmes to be enacted"*

4.3 Step 2: Define the potential for harm

4.3.1 Overview

56. **Table 4.2** lists the sites and features relevant to this 'without prejudice' derogation case, and which have been considered within this assessment of alternatives. Further information on the quantification of these effects is provided in the following sections.

57. As discussed in **Section 1.2**, the RIAA concluded that an adverse effect on site integrity would not occur for the Project-alone or in-combination with other plans or projects. Specifically, the increase in in-combination background mortality is predicted to be below 1%, and therefore below a threshold that would be detectable against natural variation, and the Project would have no measurable effect on the distribution of red-throated divers within Liverpool Bay SPA. However, the conclusions of SNCBs are not the same as the Applicant with regard to the red-throated diver feature of the Liverpool Bay / Bae Lerpwl SPA.

Table 4.2 Relevant impacts

Site	Feature	Impact
Liverpool Bay / Bae Lerpwl SPA	Red-throated diver	Displacement

4.3.2 Overview of the Liverpool Bay / Bae Lerpwl SPA – red-throated diver

58. Liverpool Bay / Bae Lerpwl SPA is in the east of the Irish Sea, bordering the coastlines of north-west England and north Wales, and running as a broad arc from Morecambe Bay to the east coast of Anglesey. It is classified for the protection of red-throated diver (*Gavia stellata*), common scoter (*Melanitta nigra*), and little gull (*Hydrocoloeus minutus*) in the non-breeding season; common tern (*Sterna hirundo*) and little tern (*Sterna albifrons*) in the breeding season, and an internationally important waterbird assemblage.

59. The SPA lies mainly in English and Welsh territorial waters, but extends out to, and beyond 12 nautical miles at the north-west point of the existing boundary to Liverpool Bay / Bae Lerpwl SPA; hence it is a site for which Natural England, Natural Resources Wales and JNCC have a shared responsibility to provide statutory advice.

60. Liverpool Bay / Bae Lerpwl SPA was originally designated for two species (red-throated diver and common scoter) and was extended in 2017 for its non-breeding little gull population, and also for breeding little tern.

4.3.2.1 Conservation Objectives

61. The site's conservation objectives are to: 'Ensure that the integrity of the site is maintained or restored as appropriate, and ensure that the site contributes to achieving the aims of the Wild Birds Directive, by maintaining or restoring:

- *The extent and distribution of the habitats of the qualifying features*
- *The structure and function of the habitats of the qualifying features*
- *The supporting processes on which the habitats of the qualifying features rely*
- *The populations of each of the qualifying features, and*
- *The distribution of qualifying features within the site*'

4.3.2.2 Summary of the assessment of effects on red-throated diver

4.3.2.2.1 Project-alone

62. An assessment of the potential effects on red-throated diver from Liverpool Bay / Bae Lerpwl SPA is presented in section 8.4.2.1 of the RIAA (REP1-012), with additional supporting information presented in Offshore Ornithology Technical Note 3: Red-throated diver – Liverpool Bay Special Protection Area (SPA) (REP1-082). This species is considered vulnerable to disturbance, displacement and barrier effects from the windfarm array and also from construction and operational activities, including vessel traffic.

63. The Project-alone effects during the operational phase, as set out in the RIAA (REP1-012) and supporting technical note (REP1-082) were predicted as:

- The displacement of up to two red-throated divers annually within the original (pre-2017) SPA boundary, leading to mortality of 0.02 birds per annum (assuming mean density and precautionary 1% mortality of displaced birds). This would increase background mortality by 0.01% (assuming an SPA population of 1,800 individuals and background annual mortality rate of 0.233). Natural England has confirmed in its RR (RR-061) that it considers the original SPA boundary, which was designated primarily for red-throated diver, most relevant to the assessment of effects on the SPA. The displacement effect assumes that effect diminishes as distance from the windfarm array increases, and has been calculated using a 'displacement gradient' provided by Natural England to the Applicant.
- An 'area of effect' of 21.2km^2 within the original SPA boundary, representing 1.24% of the original SPA boundary. If the displacement gradient is applied to the area of effect (and noting that Natural England

does not support use of the displacement gradient for this estimation) the area of effect would be 7.25km^2, or 0.43% of the original SPA boundary.

4.3.2.2.2 In-combination

64. The in-combination effects during the operational phase, as set out in the RIAA (REP1-012) and supporting technical note (REP1-082) were predicted as:

- The displacement of up to 355 red-throated divers, leading to mortality of 3.55 birds per annum (assuming a precautionary mortality of 1%). This would increase background mortality by 0.85%.
- A total area of effect of 725km^2, equivalent to 42.55% of the original SPA boundary. It is noted that the Project contribution to the in-combination effect is reduced to 17.99km^2 (from 21.2km^2 for the Project alone effect) due to the effects from existing windfarms. If the displacement gradient is applied to the in-combination area of effect, this results in an area of 400km^2 or 23.50% of the original SPA boundary.

65. Natural England confirmed in its RR (RR-061) that its primary area of concern relates to the red-throated diver 'distribution' conservation objective, i.e. the 'area of effect'. Natural England did not raise concerns regarding the potential mortality effect, as the predicted increase in background mortality is less than 1%, and therefore unlikely to be detectable against natural background variation.

4.3.3 Relevant design parameters

66. The Project's design parameters that are of relevance to the impacts outlined above, and considered in the assessment of alternatives are:

- Windfarm site area - 87km^2
- Distance between the windfarm site boundary and Liverpool Bay / Bae Lerpwl SPA (pre-2017 boundary) – 6.6km
- Operational period – 35 years

4.4 Step 3: Long List of Alternative Solutions

4.4.1 Do Nothing Scenario

67. While the Defra (2021a) compensatory measures guidance advised that the "do nothing" option should be considered, it acknowledges this would rarely be a true alternative:

"*It is unlikely in most cases that the 'do nothing' option (i.e. no proposed activity) would be an acceptable alternative, as it would not deliver the same overall objective as 'the activity'. However, it is useful to provide a comparison*

for other alternatives and to act as a baseline against which public benefits can be assessed. Where it is most likely to be an option is where no or limited tangible public benefit can be demonstrated."

68. The “do nothing” option is also considered and ruled out in the Round 4 plan-level HRA (TCE, 2022):

“*The do nothing alternative solution would fail to meet the objectives of the Round 4 Plan and would erode the ability of the UK Government to meet its 50GW by 2030 target, achieve its ambition that over half our renewable generation capacity will be from wind by 2030 and decarbonise power generation and reduce greenhouse gas emissions by 78% by 2035.*”

69. The “do nothing” scenario would not enable the Project to contribute to the range of Government legislation and policy which promotes the importance of developing offshore windfarms. There remain significant challenges in achieving the 50GW target by 2030 and Net Zero by 2050.

70. Of particular note is the opportunity for Round 4 projects to deliver at least 8GW of offshore wind power in England and Wales and to contribute to the target of 50GW by 2030 and of Net Zero emissions by 2050. **Table 4.4** shows there was, at the time of writing, c. 14GW of operational offshore windfarms in the UK and c. 7GW in construction (UK Government Renewable Energy Planning Database (REPD), 2024). The Policy requirement in the 2011 NPS EN-1 to increase generation capacity in general, and from renewables and low carbon sources in particular, in order to reduce carbon emissions, is far from having been achieved. The 2011 NPS EN-1 set a minimum target for renewables generation to rise to 39GW by 2025, from 6GW in 2009. In fact, generation capacity had increased to only 24GW by 2022 (DESNZ, 2023d), such that achievement of 39GW of generating capacity from renewables by 2025 was almost certainly unachievable by the time of designation of the new NPS EN-1 in 2024.

71. Offshore wind generation capacity increased from 1.45GW in 2011, to 13.33GW in 2022. NPS EN-1 (DESNZ, 2023a) states that the ambition for the UK to achieve 50GW of offshore wind generation by 2030 will not be met on these rates of deployment. Even with capacity increases in 2023-24, subsequent increases in the rate of deployment will need to follow an exponentially upward curve of significant steepness if the 50GW target is to be achieved. Such rates of deployment, necessary to meet the NPS EN-1 electricity demand scenario and offshore wind ambition, would mean the maximum number of projects would need to be consented, including this Project.

72. It is also noted that in establishing the urgent need for offshore wind, the NPSs do not impose a cap, for example paragraph 3.2.4 of NPS EN-1 states: “*It is not the government’s intention in presenting any of the figures or targets in*

this NPS to propose limits on any new infrastructure that can be consented in accordance with the energy NPSs." Specifically in relation to a derogation case, NPS EN-1 explains that the starting point for SoS decision making is that energy security and decarbonising the power sector to combat climate change: "*requires a significant number of deliverable locations for CNP Infrastructure and for each location to maximise its capacity. This NPS imposes no limit on the number of CNP infrastructure projects that may be consented. Therefore, the fact that there are other potential plans or projects deliverable in different locations to meet the need for CNP Infrastructure is unlikely to be treated as an alternative solution.*"

Table 4.3 Status of UK offshore windfarms

Project Status	Number of Projects	Capacity (GW)
Operational	47	14.679
Under construction	7	7.742

Source: UK REPD 2024

73. Given the need for the Project, as set out in **Section 4.2.1** and expanded in the IROPI case (**Section 5**), the alternative of not developing an offshore windfarm would clearly not satisfy the Project objectives or NPS EN-1. The "do nothing" scenario is, therefore, not considered further.

4.4.2 Alternative offshore wind farm locations

74. As set out above, in accordance with NPS EN-1, decarbonising the power sector by 2035 requires a significant number of deliverable locations for CNP infrastructure and for each location to maximise its capacity: *"the fact that there are other potential plans or projects deliverable in different locations to meet the need for CNP Infrastructure is unlikely to be treated as an alternative solution*" (DESNZ, 2023a).

75. The 2024 DEFRA consultation on policies to inform updated guidance for MPA assessments reiterated the EN-1 statement that meeting Net Zero and delivering energy security is considered to "*require a significant number of deliverable locations for CNP infrastructure and for each location to maximise its capacity*". It states that the SoS will therefore start from the position that the fact that there are other potential plans or projects deliverable in different locations to meet the need for CNP infrastructure, or existence of another way of developing the proposed plan or project which results in a significantly lower generation capacity, is unlikely to meet the objectives and therefore be treated as an alternative solution.

76. The development of offshore wind farms in the UK is constrained by the requirement to secure an AfL from TCE. This process is undertaken through

prescribed leasing rounds in line with Marine Plans and informed by Strategic Environmental Assessment and plan-level HRA.

77. The Project was one of six projects selected by TCE in its Offshore Wind Leasing Round 4 in 2021. Subsequently, TCE undertook a plan level HRA which determined the Project would be awarded an AfL.

78. Key criteria were set by TCE's Round 4 process which influenced the site selection process of the Project. Areas of seabed that were offered by TCE were stated as the least constrained (most technically favourable) areas for offshore wind development following extensive spatial analysis and stakeholder engagement.

79. **Chapter 4 Site Selection and Assessment of Alternatives** of the ES (APP-041) describes the process that led to the identification of the Project location and the Round 4 process.

80. As described in **Paragraph 44**, the Project is defined as a CNP, of which multiple locations are needed. Further, given the constraints of the leasing process and constraints associated with the ability to safely co-exist with existing sea users, there are no feasible alternative locations that meet the Project objectives and satisfy NPS EN-1.

4.4.3 Alternative scale

81. In accordance with the approach outlined in **Section 4.1**, an assessment of alternative scale/size of development is considered in relation smaller or alternative windfarm site areas to increase distance from the Liverpool Bay / Bae Lerpwl SPA.

82. Given the clarification in the new NPS EN-1 (DESNZ, 2023a) and as described in **Paragraph 45**, a reduction in capacity is not considered as an alternative which meets the Project's objectives. The maximum number of projects will be required to achieve Net Zero and the 50GW by 2030 target.

83. Following stakeholder feedback, the Project windfarm site array area has been significantly reduced during the pre-application stage from 125km^2 to 87km^2 and includes buffer zones where wind turbines are restricted to help facilitate co-existence with other marine users.

84. Natural England's response to the DCO Application (RR-061) '*advise that every effort is made to avoid the impact on red-throated diver distribution within the 'original' SPA area. This would most effectively be delivered by committing to a red-line boundary change or structures exclusion zone to ensure no turbines are located within 10km of this area'*. Given the buffer zones required to facilitate co-existence with other users to the west of the windfarm site, a reduction of the Project's site boundary to the east to

accommodate a 10km buffer from the original SPA boundary would not meet the Project objectives in terms of the capacity of the Project, since the loss of site area to accommodate a 10km buffer would render the Project commercially unviable with insufficient remaining space to generate the required amount of electricity. The alternative scale scenario is therefore not considered further.

85. In their third written questions 3GEN2 and 3GEN3) (PD-016) and Report on Implications for European Sites (RIES) Questions RIESQ35 and RIESQ36, the Examining Authority requested the Applicant to:

- provide further explanation or evidence to support its position that the potential loss of a single WTG as result of a 7km buffer from the original Liverpool Bay SPA (or any other reduction in WTG numbers) would affect the viability of the Project.
- provide individual plans to demonstrate the impact that each of the incrementally smaller buffers from the original Liverpool Bay SPA would have on the layout and number of WTGs that could be accommodated within the site (i.e. 10km, 9km, 8km, 7km and so no buffer associated with the SPA affects the site)

~~84.~~86. The Applicant provided a detailed response within The Applicant's Responses to ExQ3 Appendix A: Response to 3GEN2 and 3GEN3 (Document Reference 9.61.1) at Deadline 5A (including the set of figures, as requested).

~~85.~~87. A reduction in the Project's site boundary would not be in accordance with EN-1 Paragraph 4.2.21 as it would not allow this leased location to "maximise its capacity" and would result in a "significantly lower generation capacity". It would therefore be unlikely to meet the Project objectives and therefore would not be capable of being treated as an alternative solution.

4.4.4 Alternative design

~~86.~~88. The proximity of the turbines within the windfarm site to the original SPA boundary is the relevant parameter for displacement effects. As such, only alternative layouts of turbines within the windfarm site could have any effect on displacement effects. As per consideration of alternative scale, a layout allowing a 10km separation from the original Liverpool Bay SPA boundary would result in a reduction in the number of potential turbine locations. It would therefore be unlikely to meet the Project objectives and therefore would not be capable of being treated as an alternative solution.

4.4.5 Alternative method

~~87.~~89. As the effects of relevance to this 'without prejudice' derogation case relate to the operation of the offshore windfarm, no alternative methods are available

beyond the scale, design and timing options considered in the preceding and following sections.

4.4.6 Alternative timing

~~88.~~90. In accordance with the approach outlined in **Section 4.1**, alternative timing options are considered.

~~89.~~91. Reducing the timing of the operation of the WTGs e.g., through seasonal restrictions, and/or reducing the operational life, would limit the ability of the Project to generate and export low carbon electricity to the National Grid. Furthermore, there is no scientific evidence that there would be an appreciable reduction in the impact to RTD. This alternative solution would, therefore, not satisfy the Project objectives (**Section 4.2.2**) and national targets and policy as directed in NPS EN-1 and is not considered further.

4.5 Step 4: Feasibility of alternative solutions

~~90.~~92. No feasible alternative options have been identified in Step 3.

4.6 Step 5: Assessment of effects of feasible alternative solutions

~~91.~~93. Step 5 is not applicable, as there are no feasible alternative solutions.

4.7 Assessment of alternative solutions conclusion

~~92.~~94. The information presented in this document demonstrates the robust assessment of alternative solutions that has been undertaken by the Applicant. The assessment followed available guidance and included a 'do nothing scenario', and alternative locations, scale, design, methodology and timing.

~~93.~~95. No feasible alternative solutions, which could host comparable scale offshore windfarms consistent with the Project objectives to meet the established needs, were identified. This conclusion aligns with TCE's Round 4 Plan Level HRA (TCE, 2022) assessment of alternatives.

5 Imperative Reasons of Overriding Public Interest

5.1 Introduction

~~94.~~96. In order to define the IROPI case for a plan or project, Defra *et al*. (2021) provided the following definitions:

- "Imperative - it's essential that it proceeds for public interest reasons

- In the public interest - it has benefits for the public, not just benefits for private interests
- Overriding - the public interest outweighs the harm, or risk of harm, to the integrity of the european site that's predicted by the appropriate assessment"

~~95.~~97. Furthermore, (BEIS, 2022c) summarised the key principles (as set out in guidance) in defining the IROPI case for the Hornsea Project Three:

- Imperative: Urgency and importance: There would usually be urgency to the objective(s) and it must be considered "indispensable" or "essential" (i.e. imperative). In practical terms, this can be evidenced where the objective falls within a framework for one or more of the following:
  - Actions or policies aiming to protect fundamental values for citizens' life (health, safety, environment)
  - Fundamental policies for the State and the Society
  - Activities of an economic or social nature, fulfilling specific obligations of public service
- Public interest: The interest must be a public rather than a solely private interest (although a private interest can coincide with delivery of a public objective)
- Long-term: The interest would generally be long-term; short-term interests are unlikely to be regarded as overriding because the conservation objectives of the Habitats and Birds Directives are long-term interests
- Overriding: The public interest of development must be greater than the public interest of conservation of the relevant habitats site(s)

~~96.~~98. It should be noted that, as stipulated by the Habitats Regulations (Regulation 64) and Marine Habitats Regulations (Regulation 29), where no priority habitats and species are present, the IROPI case needs only to consider reasons of a socio-economic nature. Given that priority habitats or species are listed under Article 1(d) and Article 1(h) of the Habitats Directive, and not the Birds Directive, these are not relevant to Liverpool Bay / Bae Lerpwl SPA.

5.2 Imperative

~~97.~~99. As discussed in **Section 4.2.1** and **4.4.1**, there is an urgent need to establish a secure, diverse, affordable and resilient energy supply and to also meet decarbonisation targets. This provides a clear and urgent need for the development of the Project, to help meet the UK Government commitment to Net Zero by 2050 and 50GW of offshore wind by 2030. The Project would

provide around 480MW of renewable energy capacity. The Project would make a substantial contribution to the achievement of national renewable energy targets towards Net Zero and to the UK's contribution to global efforts to reduce the effects of climate change, which are fundamental and priority policies for the state and the society of the UK.

5.3 Public interest

~~98.~~100. The following sections outline the essential public benefits of the Project in line with the Project's objectives.

5.3.1 Climate change benefits - Decarbonisation (Project objective 1)

~~99.~~101. UNEP Copenhagen Climate Centre (UNEP-CCC) (2021) claimed that a global temperature increase of around 2.7°C by 2050 is expected. DECC (2010) predicted that a continuation of global emission trends could lead average global temperatures to rise by up to 6°C by the end of this century. The potential impacts associated with such a global temperature rise include impacts on human health and safety.

~~100.~~102. (BEIS, 2022c)) outlined the following potential health risks resulting from climate change:

- Existing health problems become worse as temperatures increase
- Malnutrition could become more widespread as crop yields are affected by increased drought conditions, or exacerbated precipitation, in some regions, leading to reduced food production
- Warmer temperatures could increase the range over which disease-carrying insects are able to survive and thrive
- Vulnerable people will be at risk of increased heat exposure and the number of deaths due to temperature extremes is expected to increase in the future (although in the long-term there will likely be fewer health problems related to cold temperatures)
- Decreasing food production, an increase in health issues associated with climate change, and more extreme weather, will slow economic growth, making it increasingly difficult to reduce poverty

~~101.~~103. The World Meteorological Organization (WMO) reported that between 2001 and 2010 extreme weather events caused more than 370,000 deaths worldwide (including a large increase in heatwave deaths from 6,000 to 136,000) – 20% higher than the previous decade (BEIS, 2019).

~~102.~~104. In the UK, floods and droughts have had significant health impacts, including fatalities in recent years. In addition, health impacts, as a result of climate change, are likely to be more far-reaching than the immediate dangers of flooding. Climate change effects, such as flooding, have potential to impact on mental health and provide other indirect impacts, as a result of disruption to critical supplies of utilities, such as electricity and water (Health Protection Agency, 2012).

~~103.~~105. The UK Committee on Climate Change (CCC) (2017) reported that (at that time) 2016 was the hottest year on record. There have been six occasions in the 21st century that a new record high annual temperature had been set (2016 along with 2005, 2010, 2014, 2015 and 2022) (National Oceanographic and Atmospheric Administration (NOAA), 2023). At the time, 2019 was the second hottest year globally since records began in 1880 (Copernicus Climate Change service, 2020) and 2020 was tied with 2016 as the hottest year on record, globally (National Aeronautics and Space Administration (NASA), 2021). In 2024 NOAA recorded 2023 as the highest global temperature among all years in NOAA climate record (1850-2023). Other scientific organisations, including NASA and the Met office, have conducted separate analyses and also ranked 2023 as the warmest on record and NOAA have predicted a one-in-three chance that 2024 will be warmer than 2023, and a 99% chance that 2024 will rank among the top five warmest years.

~~104.~~106. Increasing global temperatures are predicted to increase frequency of extreme weather events, such as floods and droughts, and result in reduced food supplies.

~~105.~~107. The frequency and extent of extreme weather events have been increasing in the UK and globally, with heat waves becoming more frequent and longer lasting, as well as an increase in intense, heavy rainfall, causing flood events.

~~106.~~108. Should global temperatures rise by 2°C above the pre-industrial average, the UK could see a 30% decrease in river flows during ‘dry’ periods and a 5% to 20% increase in river flows during ‘wet’ periods. In addition, between 700 and 1,000 more heat-related deaths have been predicted per year in South-East England alone (BEIS, 2019).

~~107.~~109. Climate change has also been greatly affecting coastal areas in the UK in recent years.

~~108.~~110. Increased temperatures, changes to rainfall patterns, increased prevalence of agricultural pests and an increased risk of extreme weather events are also predicted to reduce the production of major food crops. This would result in an increasing gap between food demand and supply. Since trade networks have become increasingly global, the effects of extreme weather events in one part of the world will affect food supply in another. For

example, floods or droughts that damage crops in Eastern Europe, or the US, can directly affect the cost and availability of food in the UK (BEIS, 2019).

~~109.~~111. Generating and harnessing energy from low carbon, renewable sources, such as offshore wind, is one of the solutions available to substantially reduce carbon emissions and, thereby, mitigate predicted climate change impacts. The Project would make a significant contribution both to the achievement of UK decarbonisation targets and to global commitments to mitigating climate change.

~~110.~~112. The switch to renewable sources of energy also has both air quality and associated human health and safety benefits. A recent study has demonstrated the huge beneficial impacts on human health from decarbonisation, stating that "*Our estimates suggest that overall around 3.5 million or so premature deaths from air pollution worldwide could be prevented annually from phasing out fossil fuels at today's population. If all sources of air pollution from human activities could be eliminated, our estimates show that more than five million premature deaths from air pollution would be prevented annually*." (London School of Hygiene and Tropical Medicine (LSHTM), 2019).

~~111.~~113. The Project will make a significant contribution to the achievement of both the national renewable energy targets and to the UK's contribution to global efforts to reduce the effects of climate change. The Climate Change Act 2008 (2050 Target Amendment) Order 2019 set a UK target for at least a 100% reduction of GHG emissions (compared to 1990 levels) by 2050. This ambitious Net Zero target can only be met by the crucial contribution from the offshore wind industry.

~~112.~~114. The Project has a design life of approximately 35 years, after which it may be repowered (subject to the necessary approvals and in line with current legislation at that time). The Project would contribute to reaching national targets on CO_2 reduction of Net Zero GHG emissions by 2050, 50GW of offshore wind by 2030, and renewable energy production growth, with the potential to deliver around 480MW of clean, renewable energy, as also reflected in recent NPS designated under the Planning Act 2008.

5.3.2 Public electricity supply benefits – Security of supply and affordability (Project objective 2 and 3)

~~113.~~115. In addition to its contribution to offsetting carbon emissions, the Project has the potential to power over 500,000 UK homes per annum with clean, renewable and low-cost electricity.

~~114.~~116. As discussed in **Section 1.1**, decarbonisation of the UK energy supply chain and increasing electricity demand could result in a significant deficit in UK electricity supply compared with demand and, therefore, there is a clear

public benefit inherent in the creation of new electricity supply capacity, such as will be provided by the Project.

~~115.~~117. In order to help meet the targets described in the sections above, renewable energy needs to be affordable. The UK has a world leading offshore wind sector and is well placed to benefit from further investment in renewables innovation, to accelerate cost reduction. The UK Government, in partnership with the Research Councils and Innovate UK, expects to invest around £177 million to further reduce the cost of renewables, including innovation in offshore wind turbine blade technology and foundations.

~~116.~~118. Through offshore wind developer-led innovation there has been a significant reduction in the levelized cost of energy in recent years. The Clean Growth Strategy (BEIS, 2017) indicated that the costs of offshore wind have decreased significantly (50% fall between 2015 and 2022) which will help to alleviate fuel poverty (Offshore Renewable Energy (ORE) Catapult, 2017). The UK offshore wind industry achieved a 'strike price' (the minimum price developers will be paid for electricity) as low as £37.35/MWh in the Government's Contracts for Difference (CfD) auction in 2022. That price was 6% lower than the third CfD auction in 2019 and 30% lower than the lowest strike price seen in the second CfD auction in 2017. However, the CfD auction in September 2023 did not attract any bids by offshore windfarm developers, indicating that the strike price of £44/MWh was set too low for developers to be confident in achieving a return on their investment following the significant cost increases being experienced by developers in late 2022 and throughout 2023. In November 2023, the UK Government announced an increase in the maximum price that projects can receive in the next CfD auction. For fixed-bottom projects the price increased by 66% for offshore wind projects, from £44/MWh to £73/MWh to address the rising supply chain costs which have been impacting upon the commercial viability of UK offshore wind projects.

~~117.~~119. In the Clean Growth Strategy (BEIS, 2017), the UK Government set out a plan to decarbonise all sectors of the UK economy through the 2020s including innovation in the power sector and renewables. Additionally, in March 2019 the UK offshore wind sector committed to an Offshore Wind Sector Deal (BEIS, 2020b) which reinforced the aims of the UK for clean growth. The UK has a world leading offshore wind sector and is well placed to benefit from further investment in renewables innovation to accelerate cost reduction.

~~118.~~120. Despite current challenges, developers are continuing to drive relative cost reductions through technology development and new work processes. The Project will contribute to this process as it seeks to make use of the most effective new technology and to take advantage of potential cost efficiencies in the development process.

~~119.~~121. Unless renewable capacity is enhanced through the build out of projects, including the Project, it will not be possible for regulators or Government to pass on the public benefit of electricity generation cost reductions to consumers in the form of power price cuts to help them to manage the cost of living crisis. This affordability factor has been recognised in the recent Overarching Energy NPS. As set out in NPS EN-1 at paragraph 3.3.20 "*Wind and solar are the lowest cost ways of generating electricity, helping reduce costs and providing a clean and secure source of electricity supply (as they are not reliant on fuel for generation). Our analysis shows that a secure, reliable, affordable, net zero consistent system in 2050 is likely to be composed predominantly of wind and solar*."

~~120.~~122. As identified above, the Project would be able to provide significant electricity generation capacity within the UK to support commitments for offshore wind generation and security of supply and maximise generation capacity at low cost to the consumer.

5.3.3 Socio-economic benefit – Coordination (Project objective 4)

~~121.~~123. The UK Clean Growth Strategy (BEIS, 2017) recognised that actions and investments will be needed to meet the Paris Agreement commitments and that the shift to clean growth will be at the forefront of policy and economic decisions made by governments and businesses in the coming decades. This creates enormous potential economic opportunity – an estimated $13.5 trillion of public and private investment in the global energy sector alone will be required between 2015 and 2030, if the signatories to the Paris Agreement are to meet their national targets (BEIS, 2017).

~~122.~~124. In 2017, ORE Catapult undertook analysis of the UK offshore wind supply chain and estimated the current and future potential UK content of offshore wind projects as: 32% in 2017; 50% by 2020; and 65% by 2030. In the UK, the Gross Value Added (GVA) to the UK per GW installed, assuming 32% UK content, has been estimated as £1.8bn and is projected to increase to £2.9bn by 2030 – if 65% UK content can be achieved (assuming that 19GW installed capacity is reached) (ORE Catapult, 2017). It is estimated that the total (domestic and export) market for UK-provided offshore wind could exceed £10.5bn by 2050 and reach £4.9bn annually by 2030 and £8.9bn by 2050 (under a high scenario) (ORE Catapult, 2018).

~~123.~~125. According to RenewableUK's Offshore Wind Industry Investment in the UK report (RenewableUK, 2017), 48% of the total expenditure associated with UK offshore windfarms was spent in the UK in 2015. The UK content of expenditure during the development stage and operation of offshore wind projects was 73% and 75% respectively in 2015, whereas during

manufacturing and construction the UK content was 29% (RenewableUK, 2017).

~~124.~~126. The UK is positioned to continue growth in the offshore wind sector by maximising domestic energy resources and utilising the vast offshore wind resource available domestically for electricity generation. The importance of coordination with other marine users is set out in the Overarching Energy NPS EN-1 in line with the need for the expanding number of offshore wind projects to meet Net Zero targets. The UK also has a strong supply chain that continues to expand to support the growth in offshore wind.

~~125.~~127. The Green Paper: Building our Industrial Strategy (His Majesty's (HM) Government, 2017) focused on delivering affordable energy and green growth in the UK. A key commitment within the Green Paper was for the UK to become a leader in delivering clean energy technology and to support innovation in renewable energy. The aim was for:

"*the UK to be a global leader in innovation, science and research and our Industrial Strategy will help us to deliver our ambitious CO_2 reduction targets while, creating jobs and opportunities for people across the country*".

~~126.~~128. The energy sector in the UK plays a central role in the economy. Renewable energy can play a major part in boosting the economy and providing new jobs and skills. The British Energy Security Strategy (BEIS, 2022d) also sets out how Britain will accelerate homegrown power for greater energy independence.

~~127.~~129. The offshore wind industry in the UK provides important employment opportunities. The importance of maximising opportunities for the involvement of local businesses and communities in offshore wind has been highlighted as a key success factor for the wind energy sector in the UK (TCE, 2014). Low carbon businesses and their supply chain have created over 430,000 skilled jobs in the UK with 7,200 jobs directly in offshore wind (BEIS, 2020b).

~~128.~~130. RenewableUK (2017) stated: "Offshore wind has become a key part of the UK economy, creating much needed jobs not only in coastal communities like Hull, Grimsby and Great Yarmouth, but also across the country in the ever-expanding supply chain. A huge number of British companies are heavily involved in building the UK's world-leading offshore wind sector".

~~129.~~131. The UK Government's Industrial Strategy (HM Government, 2017) set out a plan to transform offshore wind generation, making it an integral part of a low-cost, low-carbon, flexible grid system and boosts the productivity and competitiveness of the UK supply chain. These are to be realised through an industry investment into the Offshore Wind Growth Partnership of up to £250m to support better, high-paying jobs right across the UK (BEIS, 2020b).

~~130.~~132. The Offshore Wind Sector Deal builds on the UK's global leadership in offshore wind, maximising the advantages for UK industry from the global shift to clean growth (BEIS, 2020b). The UK Government Ten Point Plan supports the industry's target to achieve 60% UK content by 2030. The offshore wind commitments will enable the offshore wind sector to support up to 30,000 direct jobs and 30,000 indirect jobs in ports, factories and the supply chains by 2030.

~~131.~~133. In a letter to then Prime Minister Boris Johnson, the CCC stressed that, after the COVID-19 crisis, actions towards net-zero emissions, and to limit the damages from climate change, could help rebuild the UK with a stronger economy and increased resilience (CCC, 2020). The CCC has advised the UK Government that reducing GHG emissions and adapting to climate change should be integral to any recovery package.

~~132.~~134. The Project will provide a valuable contribution to employment. During the construction of the Project it is estimated a peak of around 1,300 jobs could be created in the UK. During the operation and maintenance phase it is expected that the Project could support 80 jobs in the local economic area and 140 jobs across the UK. The Project would also contribute to the development of the supply chain and skilled workforce and their associated economic benefits. The indirect effects from employment and expenditure, such as from the workforce, would contribute to the local economy.

~~133.~~135. There would also be significant expenditure in manufacturing, services, materials and equipment. The Project has an estimated overall construction cost of £1.3 billion (2023-pricing). Operation and Maintenance amounts to around £19 million per annum, or £665 million over 35 years. In total, the GVA of the Project over the Project lifetime (35 years) is estimated make a large economic contribution at the national level (£259 million GVA across the UK) and £10 million GVA to the local economy. The Project would also support the development of the supply chain, a skilled workforce and provide employment.

~~134.~~136. Details of the anticipated expenditure and employment from the construction and operation of the Project (direct and indirect) are discussed further in **Chapter 20 Socio-economics, Tourism and Recreation** of the ES (APP-057).

5.4 Long-term

~~135.~~137. Offshore wind has a critical role in delivering long-term, cost effective, UK based low carbon electricity, as well as contributing to minimising the long-term impacts of climate change. The Project will be capable of producing low cost, clean electricity generation for the National Grid throughout its 35-year operational life, therefore providing long-term benefits.

5.5 Overriding

~~136.~~138. The relevant public interests relating to the Project must be set against the weight of the conservation interest protected by the Habitats Regulations and the Marine Habitats Regulations, having regard to the nature and extent of the harm identified to the relevant European sites features. The effects that could be identified on the European sites features of concern were as follows:

- Red-throated diver displacement effects (**Section 4.3**).

~~137.~~139. As shown in **Section 4.3**, the Project would have a minimal impact through potential disturbance, displacement of up to two red-throated divers annually within the original (pre-2017) SPA boundary, with climate change considered the strongest influence on seabird populations in coming years.

~~138.~~140. In weighing up the public interests delivered by the Project with these conservation interests, account needs to be taken of the fact that the benefits of the Project include conservation benefits for both red-throated diver and other bird species within the National Site Network.

~~139.~~141. The Project contribution to reducing the effects of climate change would have important environmental benefits which outweigh/override the effects outlined above, by contributing to a reduction in carbon emissions, a slowing of climate change and the securing of habitable environments over the longer term for a range of species within the National Site Network, including red-throated diver. It is recognised that a number of seabird species in the UK have showed declining populations since the 1990s, and that climate change is likely to be one of the main causes of these declines (Burton *et al.*, 2023). Causes of such declines are likely to include changes in prey availability, temporal changes (e.g. through temporal shifts in prey availability relative to peak energy demands) and direct impacts through exposure to extreme weather conditions. Ground-nesting species (including red-throated diver) are also at risk from increased flood risk at nesting sites (Burton *et al.*, 2023).

~~140.~~142. The Environment Improvement Plan (HM Government, 2023) recognises the effects of climate change include an increase in pests, pathogens and invasive non-native species; and knock-on impacts on the ecosystems.

~~141.~~143. Global warming places many species at risk of loss of suitable habitat and/or prey, due to changing conditions. Species may shift their geographical ranges to areas where conditions remain suitable (e.g., marine species moving further north in the UK to cooler climates), however, depending on the extent of suitable habitats/prey, there may be increased competition.

~~142.~~144. The overriding nature of the public interests engaged in this case should be evident from the suite of legislation and policy documentation, which has

been outlined in this document. The Project would deliver benefits relating to human health, public safety and beneficial consequences of primary importance for the environment. It is also clear, as set out earlier in this document, that without achieving the overriding objective of reducing carbon emissions, there is likely to be very significant species loss, including of wild birds and their prey.

~~143.~~145. It is recognised that IROPI should be considered against the risk to a designated feature(s), having regard to the nature and extent of the harm identified to relevant European sites. In its contribution to reaching Net Zero, and the associated action against climate change, the Project will provide considerable long-term environment benefits, including benefits to the individual bird species within the SPA.

~~144.~~146. Key drivers of seabird population size in western Europe are climate change (Sandvik *et al*., 2012; Frederiksen *et al*., 2004; Burthe *et al*., 2014; Macdonald *et al*., 2015; Furness, 2016; Joint Nature Conservation Committee (JNCC), 2016), and fisheries (Tasker *et al*., 2000; Frederiksen *et al*., 2004; Ratcliffe, 2004; Carroll *et al*., 2017; Sydeman *et al*., 2017). Pollutants (including oil, persistent organic pollutants, plastics), alien mammal predators at colonies, disease, and loss of nesting habitat also impact on seabird populations but are generally much less important and often more localised factors (Ratcliffe, 2004; Votier *et al*., 2005, 2008; JNCC, 2016).

~~145.~~147. Trends in seabird numbers in breeding populations are better known, and better understood, than trends in numbers at sea within particular areas. In terms of red-throated diver breeding population trends, BTO Birdfacts (2025) states: *'Breeding numbers are quite variable between years and not monitored annually by the BTO; trends are hard to assess except by intensive survey. There was a full UK survey in 1994 (935 pairs) and a repeat in 2006, by when the estimated UK breeding population had increased significantly by 34%, with stability in Shetland and Orkney but increase across the Hebrides and Scottish mainland. Complete surveys of Shetland indicated a decrease of 36% there between 1983 and 1994 and there was minor further decrease there by 2006. The full surveys indicate that Shetland held 46% of the national total of breeding pairs in 1994 and 33% in 2006, though this decrease reflects the significant increases elsewhere in Scotland rather than the small decline in Shetland. JNCC's Seabird Monitoring Programme shows that breeding numbers at sample study areas in Shetland fluctuated without long-term change during 1980-2005, with low points in 1980, 2000 and 2004. Though previously amber listed through its 'depleted' status in Europe, the species was moved to the UK green list in 2015. Wintering numbers, mostly of birds from northern Europe, peaked in 2011/12 but have since decreased and are now similar to numbers in the early 1990s.'*

~~146.~~148. Breeding numbers of many seabird species in the British Isles have been declining (Foster and Marrs, 2012; Macdonald *et al*., 2015; JNCC, 2016). In the context of these ongoing declines, the emergence of avian influenza in UK breeding seabird populations in 2022 has been a key concern. It is too early to quantify effects on populations and monitoring activities at some seabird colonies have been suspended, to reduce risks of spreading avian flu.

~~147.~~149. Nevertheless, climate change is likely to still be the strongest influence on seabird populations in coming years and decades, with anticipated deterioration in conditions for breeding and survival for most species of seabirds (Burthe *et al*., 2014; Macdonald *et al*., 2015; Capuzzo *et al*., 2018) and, therefore, further population declines are anticipated. It is, therefore, highly likely that without interventions being made, breeding numbers of most of our seabird species will continue to decline under a scenario with continuing climate change, due to increasing levels of GHGs.

~~148.~~150. In considering the overriding nature of climate change effects compared with the effects of the Project, the following key points should be borne in mind:

- The scale of the impacts predicted from the Project are minimal and the impact prediction is highly precautionary
- The overriding ecological benefits of the Project's contribution to tackling climate change are enhanced by the public benefits described in **Section 5.3** to provide clear overriding benefits of the Project.

5.6 Imperative Reasons of Overriding Public Interest Summary

~~149.~~151. The environmental and social benefits to the UK from increasing the generation of low carbon energy are clear, with the Project providing an important contribution. The Project contributes to the UK's legally binding climate change targets by helping to decarbonise the UK's energy supply, whilst contributing to the essential tasks of ensuring security of supply and providing low-cost energy for consumers, in line with the UK Government's national policies.

~~150.~~152. The Applicant considers that there is a demonstrable overriding public interest in delivering the Project, and the policy objectives it would serve, which outweighs the minimal risk (and minimal contribution made by the Project) of adverse effects (if any) on the red-throated diver feature of the Liverpool Bay / Bae Lerpwl SPA (**Section 4.2**). If the SoS concludes that an adverse effect on integrity of this site cannot be ruled out, there is a demonstrable overriding public interest in delivering the Project, and the policy objectives they would serve, that is considered to override the potential conservation interests at risk.

6 Compensatory measures

~~151.~~153. This document contains, within its appendices and annexes, the following suite of compensatory measures documents:

- **Appendix 1**: Without Prejudice Compensation proposals for Red-throated Diver (Liverpool Bay / Bae Lerpwl SPA)
  - Approach to development of red-throated diver compensation
  - Selection of compensatory measures
  - Identification of potential sites for compensation
  - Details of compensation measures and delivery roadmap
- **Appendix 2**: Letters of Support

~~152.~~154. The Applicant has also prepared an Outline Compensation Implementation and Monitoring Plan (CIMP) (Document Reference 9.38) which sets out the information that would be provided within the CIMP post-consent, in the event that compensation is required for red-throated diver as part of the DCO.

~~153.~~155. The Applicant is confident that the Project will be commercially viable in the event that the compensation requirements, as outlined in the documents above, are required to be delivered. The SoS can be satisfied that the financial viability of the Project will not be compromised by the delivery of the potential compensatory measures proposed by the Applicant.

7 Conclusions

~~154.~~156. The evidence presented in this document clearly demonstrates that there are no alternative solutions (**Section 4**) which could deliver the Project objectives (**Section 4.2.2**), in accordance with the need for the Project (**Section 4.2.1**).

~~155.~~157. In addition, there is a clear case for IROPI, underpinned by international and national policy and legislation, as outlined in **Section 5**.

~~156.~~158. **Appendices 1** and **2**, which are listed in **Section 6**, describe the proposed compensatory measures which would be deliverable and could be secured for red-throated diver (should compensation be required).

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Appendix 1: Without Prejudice Compensation proposals for Red-throated Diver (Liverpool Bay SPA)

Morecambe Offshore Windfarm: Generation Assets

Examination Documents

Volume 9

Without Prejudice Compensation proposals for Red-throated Diver (Liverpool Bay SPA) (Tracked)

Document Reference: 9.37.1.1

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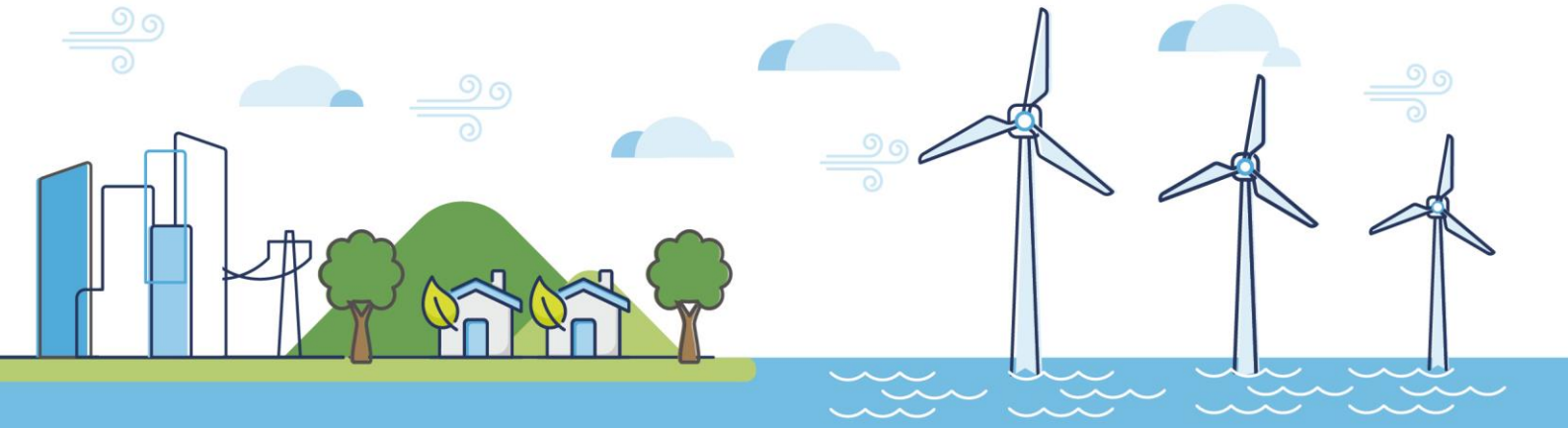

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Glossary of Acronyms

AEoI	Adverse Effect on Integrity
CIMP	Compensation Implementation and Management Plan
DCO	Development Consent Order
ExA	Examining Authority
GB	Great Britain
GBIF	Global Biodiversity Information Facility
NSN	National Site Network
OSP	Offshore substation platform
OTE	Outer Thames Estuary
OWF	Offshore windfarm
PINS	Planning Inspectorate
RIAA	Report to Inform the Appropriate Assessment
RR	Relevant Representation
RSPB	Royal Society for the Protection of Birds
RTDCSG	Red-throated diver compensation steering group
SoS	Secretary of State
SPA	Special Protection Area
WTG	Wind turbine generator

Glossary of Unit Terms

km	kilometre
km^2	square kilometre
kV	kilovolt
M	metre
MW	Megawatt

Glossary of Terminology

Applicant	Morecambe Offshore Windfarm Ltd
Application	This refers to the Applicant's application for a Development Consent Order (DCO). An application consists of a series of documents and plans which are published on the Planning Inspectorate's (PINS) website.
Environmental Net Gain (ENG)	An approach to development that aims to leave the natural environment in a measurably better state than beforehand
Generation Assets (the Project)	Generation assets associated with the Morecambe Offshore Windfarm. This is infrastructure in connection with electricity production, namely the fixed foundation wind turbine generators (WTGs), inter-array cables, offshore substation platform(s) (OSP(s)) and possible platform link cables to connect OSP(s).
Inter-array cables	Cables which link the WTGs to each other and the OSP(s).
Morgan and Morecambe Offshore Wind Farms: Transmission Assets	The transmission assets for the Morgan Offshore Wind Project Generation Assets and the Morecambe Offshore Windfarm. This includes the OSPs[1], interconnector cables, Morgan offshore booster station, offshore export cables, landfall site, onshore export cables, onshore substations, 400 kilovolts (kV) cables and associated grid connection infrastructure such as circuit breaker infrastructure. Also referred to in this Statement as the Transmission Assets, for ease of reading.
Offshore substation platform(s) (OSP(s))	A fixed structure located within the windfarm site, containing electrical equipment to aggregate the power from the WTGs and convert it into a more suitable form for export to shore.
Platform link cable	An electrical cable which links one or more OSPs.
Windfarm site	The area within which the WTGs, inter-array cables, OSP(s) and platform link cables will be present.
Wind turbine generator (WTG)	A fixed structure located within the windfarm site that converts the kinetic energy of wind into electrical energy.

[1]At the time of writing the Environmental Statement (ES), a decision had been taken that the offshore substation platforms (OSPs) would remain solely within the Generation Assets application and would not be included within the Development Consent Order (DCO) application for the Transmission Assets. This decision post-dated the Preliminary Environmental Information Report (PEIR) that was prepared for the Transmission Assets. The OSPs are still included in the description of the Transmission Assets for the purposes of this ES as the Cumulative Effects Assessment (CEA) carried out in respect of the Generation/Transmission Assets is based on the information available from the Transmission Assets PEIR.

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1 Introduction

1.1 Background

1. This document has been prepared for the Morecambe Offshore Windfarm Generation Assets (the Project) to present 'without prejudice' compensation proposals for the red-throated diver feature of the Liverpool Bay Special Protection Area (SPA). In its Development Consent Order (DCO) submissions to the Planning Inspectorate (the Examining Authority; ExA), the Applicant (Morecambe Offshore Windfarm Ltd) presented information within a Report to Inform the Appropriate Assessment (RIAA; REP1-012) to assess the effects of the Project on this feature. The RIAA concluded that there would be no adverse effect on integrity (AEoI) in respect of the Liverpool Bay SPA red-throated diver feature, either for the Project alone or in-combination with other plans or projects.

2. In its relevant representations (RRs), Natural England stated that it did not agree with the Applicant's conclusion, and that it considered that AEoI could not be ruled out for the Project alone (RR-061). The Applicant presented additional information at Deadline 1 (Offshore Ornithology Technical Note 3: Red-throated diver – Liverpool Bay Special Protection Area; REP1-082) and Deadline 4 (Additional information to support assessment of red-throated diver feature at Liverpool Bay SPA; REP4-054) to support its position that AEoI could be concluded for the red-throated diver feature of Liverpool Bay SPA. It remains that Applicant's position that this is the case.

3. Notwithstanding this position, the Applicant has prepared this document to demonstrate that a feasible compensation scheme for red-throated diver could be delivered by the Project, in the event that the Secretary of State (SoS) does not agree with the Applicant's position at the time that the DCO submission is determined. The document sets out the compensation proposals for this feature, the method by which they have been determined, and the next steps in the event that the SoS determines that compensation for red-throated diver is required.

1.2 Purpose of this document

4. Where a plan or project is unable to demonstrate that there is no risk of an AEoI on a qualifying feature of a European Site, there is a requirement to provide 'derogation' for the potential effect. This comprises (1) an assessment of alternatives to the plan or project, (2) confirmation of Imperative Reasons of Overriding Public Interest (IROPI), and (3) provision compensatory measures. Information in respect of (1) and (2) is provided separately in Document 9.37 Habitats Regulation Assessment Without Prejudice Derogation Case – For Liverpool Bay SPA. In respect of (3), the Applicant

anticipates that, in the event the SoS is unable to reach a conclusion of no AEoI on any European site, a requirement will be included in the DCO for the submission and approval of a Compensation Plan for relevant European sites prior to the commencement of works. The Compensation Plan will confirm the compensatory measures that are required in relation to the final design of the Project. This document sets out information required for the Compensation Plan, in order that the SoS can have confidence that such a plan could be delivered, should it be required.

1.3 Consultation

5. Consultation with stakeholders, including Natural England, has been undertaken to inform the development of this document, as set out in **Table 1.1**.

Table 1.1 Summary of consultation

Consultee	Date	Summary
Natural England	28 November 2024 17 December 2024	Discussions around the development of the compensation case for red-throated diver
RSPB	10 December 2024	Discussions around the development of the compensation case for red-throated diver
Defra	17 January 2025	Discussions around the development of the compensation case for red-throated diver
Landowner meetings	29 November 2024 - present 20 December 2024 (3 meetings) 13 January 2025 17 January 2025 25 February 2025 26 February 2025 3 March 2025	Introductory emails and phone conversations with landowners including discussions on ecological criteria (not dated here). MS Teams meetings with Consents Team and landowners are detailed in 'Date' column. Outlining compensation measure requirements, assessing suitability of landholdings for red-throated diver breeding habitat, discussion on peatland restoration schemes and securing letters of support for further development of the measures.

1.4 Red-throated diver feature of Liverpool Bay SPA

6. Non-breeding red-throated diver is a qualifying feature of the SPA. Liverpool Bay supports the third largest aggregation for this species in UK offshore waters. Prior to revision of the SPA boundary in 2017, the population comprised 1,171 birds (Lawson *et al.*, 2016), which was 6.89% of the GB population. This population estimate was based on visual aerial surveys undertaken between 2004 and 2011, which identified a peak mean abundance of 1,171 individuals. Subsequently, digital aerial surveys of the SPA have been undertaken as part of monitoring of the Burbo Bank Extension OWF (HiDef, 2020). Surveys covered the period between 2011 and 2020, and the resultant monitoring report concluded that, while there was annual variation between population estimates, there was no evidence of an overall change in population size during this period. Surveys of the original SPA boundary covering the period 2015-2020 are documented in the Natural England commissioned report 440 (HiDef, 2023). These surveys primarily covered the peak winter period (January and February), with mean monthly abundance estimates of between 372 and 2,073 birds, and a mean peak count of 1,800 birds over that period. It is likely that a small number of birds also occurred within the SPA extension area, and therefore this estimate is likely to underestimate the population size for the full the SPA area (i.e. original plus extension) by a small amount. The change in recorded population size for the SPA between 2011 and 2020 (i.e. from 1,171 birds to 1,800) indicates that the population may have increased during this period, although there is some uncertainty given that survey methods differed between the two periods. Nonetheless, these results do indicate that there is no evidence of population decline. The Conservation Advice Package for Liverpool Bay SPA (Natural England *et al.*, 2022) confirmed that 1,800 birds is the population size used for the purposes of informing the conservation objectives, with a target to 'Maintain the size of the non-breeding population at a level which is at or above 1,800 individuals'.

7. The Conservation Advice Package for Liverpool Bay SPA (Natural England *et al.*, 2022) also identified that disturbance and displacement are key threats to the wintering red-throated diver population, both from shipping and offshore windfarms, but acknowledged that such effects were already occurring at the time the SPA was designated The conservation objectives for red-throated diver are set out in **Table 1.2**.

Table 1.2 Conservation Objectives for red-throated diver feature of Liverpool Bay SPA (Natural England, Natural Resources Wales and the Joint Nature Conservation Committee, 2022)

Attribute	Target
Non-breeding population: abundance	Maintain the size of the non-breeding population at a level which is at or above 1800 individuals (mean peak, 2015, 2018, 2019 & 2020).
Non-breeding population: distribution	Restore the distribution of the feature; preventing further deterioration, and where possible, reduce any existing anthropogenic influences impacting feature distribution.
Disturbance caused by human activity	Minimise the frequency, duration and/or intensity of disturbance affecting the feature so that the population, its distribution within the site, or its use of the habitat is not significantly affected
Supporting habitat: food availability and quality of prey	Maintain the distribution, abundance and availability of key food and prey items (e.g. fish) to maintain the population.
Supporting habitat: extent, distribution and quality of supporting habitat for the non-breeding season	Restore the extent, distribution and availability of suitable habitat which supports the feature; preventing further deterioration, and where possible, reduce any existing anthropogenic influences impacting the extent and quality (including water quality)

1.5 Summary of project effects

8. An assessment of the potential effects on red-throated diver from Liverpool Bay SPA is presented in section 8.4.2.1 of the RIAA (REP1-012), with additional supporting information presented in Offshore Ornithology Technical Note 3: Red-throated diver – Liverpool Bay Special Protection Area (REP1-082). This species is considered vulnerable to disturbance, displacement and barrier effects from the windfarm array and also from construction and operational activities, including vessel traffic.

9. The Project-alone effects during the operational phase, as set out in the RIAA (REP1-012) and supporting technical note (REP1-082) were predicted as:

   - The displacement of up to two red-throated divers annually within the original (pre-2017) SPA boundary, leading to mortality of 0.02 birds per annum (assuming mean density and precautionary 1% mortality of displaced birds). This would increase background mortality by 0.01% (assuming an SPA population of 1,800 individuals and background annual mortality rate of 0.233). Natural England has confirmed in its RRs (RR-061) that it considers the original SPA boundary, which was designated primarily for red-throated diver, most relevant to the assessment of effects on the SPA. The displacement effect assumes that effect diminishes as distance from the windfarm array increases, and

has been calculated using a 'displacement gradient' provided by Natural England to the Applicant.

- An 'area of effect' of 21.2km^2 within the original SPA boundary, representing 1.24% of the original SPA boundary. If the displacement gradient is applied to the area of effect (and noting that Natural England does not support use of the displacement gradient for this estimation) the area of effect would be 7.25km^2, or 0.43% of the original SPA boundary.

10. The in-combination effects during the operational phase, as set out in the RIAA (APP-027) and supporting technical note (REP1-082) were predicted as:

- The displacement of up to 355 red-throated divers, leading to mortality of 3.55 birds per annum (assuming a precautionary mortality of 1%). This would increase background mortality by 0.85%.
- A total area of effect of 725km^2, equivalent to 42.55% of the original SPA boundary. It is noted that the Project contribution to the in-combination effect is reduced to 17.99km^2 (from 21.2km^2 for the Project alone effect) due to the effects from existing windfarms. If the displacement gradient is applied to the in-combination area of effect, this results in an area of 400km^2 or 23.50% of the original SPA boundary.

11. Natural England confirmed in its RRs (RR-061) that its primary area of concern relates to the red-throated diver 'distribution' conservation objective, i.e. the 'area of effect'. Natural England did not raise concerns regarding the potential mortality effect, as the predicted increase in background mortality is less than 1%, and therefore unlikely to be detectable against natural background variation.

2 Approach to development of red-throated diver compensation

2.1 General approach

12. The Applicant has undertaken a desk-based literature review to identify potential compensation measures. This has included a review of other projects where red-throated diver compensation has been accepted (East Anglia ONE North (EA1N) and East Anglia TWO (EA2), and North Falls, the most recent project where compensation has been proposed. North Falls is considered of particular relevance in this context, as this project has recently presented 'without prejudice' compensation proposals for the red-throated diver feature of the Outer Thames Estuary SPA. Natural England has identified similar concerns (i.e. effects on the 'distribution' conservation objective) for North Falls as for the Project. Therefore, it is considered appropriate that a comparable approach (though taking into account the different locations and level of any potential effect on the potentially affected SPAs) is adopted by the Project.

13. The compensation options derived from this review have then been screened to identify the proposed measures.

2.2 Selection of compensatory measures

14. Screening of potential compensatory measures has been undertaken, based on the approach developed by the North Falls project. It is recognised that compensation measures would ideally provide like-for-like compensation within the affected SPA. However, this may not be possible for a number of reasons, and therefore Defra compensation guidance (2021, 2024) identifies a hierarchy of compensation that recognises that like-for-like compensation may not always be possible. The hierarchy, as set out in the 2021 Defra guidance, is as follows:

    - 1 – Address the same impact at same location
    - 2 – Same ecological function different location
    - 3 – Comparable ecological function same location
    - 4 – Comparable ecological function different location

15. It is recognised that for the Project there would be significant difficulty in delivering compensation within the SPA, given the nature of the effect (i.e. impacts on red-throated diver distribution). This difficulty was acknowledged by Natural England within its RRs (RR-061).

16. The screening of compensation measures is presented in **Table 2.1.** This screening follows the approach adopted by the North Falls project (MacArthur Green and RHDHV, 2024).

Table 2.1 Screening of compensation measures

Measure and Defra compensation hierarchy level	Screening and conclusion
Reducing disturbance from existing anthropogenic activity (vessels and helicopters) 1 – Address the same impact at same location	A number of studies have demonstrated the effect of ship and helicopter traffic in displacing red-throated divers during the non-breeding season. Management to reduce vessel activity in areas used by concentrations of non-breeding birds could reduce disturbance and displacement and potentially improve over-winter survival and body condition. This measure was secured as part of the EA1N and EA2 compensatory measures for red-throated diver, specifically with regard to managing the vessel activity of EA1N and EA3 which were owned by the same developer. The Applicant has considered the potential to manage vessels from other offshore wind farms, however the ecological benefit of rerouting vessels would be limited and the ability to secure agreements was highly uncertain. Management of vessels beyond other offshore wind farms would require government intervention and relates to the creation of a sanctuary area discussed further below, or would face the same challenges as discussed above regarding offshore wind farm vessels. Management of helicopter activity would also face the same challenges as being outside the control of the Project. This measure was therefore **screened out**.
Reduction in fisheries bycatch 3 – Comparable ecological function same location Or 4 – Comparable ecological function different location	The compensation for EA1N and EA2 also includes a secondary measure, involving a programme of work to investigate seabird bycatch off the East Anglian coast, and to trial measures to reduce bycatch. However, it is noted that confidence in this measure is low (MacArthur Green / Royal HaskoningDHV, 2022). Natural England (pers, comm.) has also indicated that there is uncertainty as to how much bycatch may currently be affecting this species. The Applicant is therefore not currently progressing this option. This measure was therefore **screened out**.
Closure of sandeel and sprat fisheries 4 – Comparable ecological function different location	It is recognised that a permanent closure of sandeel fisheries in Scottish and English North Sea waters was introduced in April 2024 (Defra, 2024) and that the Energy Act 2023 (Part 13, Chapter 1, Paragraph 291) provides the powers to allow this measure to be allocated as compensation in England for offshore wind projects. The process whereby sandeel closures can be used as compensation is still in development. It is also noted that the closure applies to the North Sea, and so would not have direct connectivity to Liverpool Bay SPA. Nonetheless, it could still provide compensation for the Project by enhancing the wider red-throated diver site network.

Measure and Defra compensation hierarchy level	Screening and conclusion
	At this stage, fisheries closure is not considered further as a potential compensatory measure for the Project. However, the Applicant recognises that sandeel closures could be a compensatory measure that the Secretary of State could rely on in the future to provide compensation, either for the Project alone or as part of a strategic approach to compensation. This option is not considered further by the Applicant. However, should this become available as a strategic option, the Applicant may give this further consideration. This measure was therefore **screened out**.
Enhance breeding habitat (nesting rafts and/or habitat management) 4 – Comparable ecological function different location	There is good evidence that provision of nesting rafts and habitat management can increase the breeding success of red-throated divers (see **Section 3.1.3.2**). This would result in increased numbers of juveniles recruiting into the population and in due course (the age of first breeding is three years) increased numbers of breeding adults. This could offset any adverse effects on over-winter survival as a result of displacement from OWFs during the non-breeding season. This is the primary without prejudice measure being considered by the Applicant as compensation for red-throated diver (if required). This measure has therefore been **screened in**.
Creation of 'sanctuary' or reserve areas within Liverpool Bay SPA 1 – Address the same impact at same location	Creation of marine reserves within the Outer Thames Estuary SPA was reviewed as a possible compensatory measure for the effects of offshore windfarms on red-throated divers, in MacArthur Green (2022). These reserves would offer a sanctuary from disturbance from vessel activity, fishing, recreation and other sources of human disturbance and could provide a compensatory measure directly related to disturbance effects within the SPA. Such an approach has not been considered for the Liverpool Bay SPA, and would be subject to the same difficulties as the management of vessel/helicopter activity identified above. It would also require government intervention and would therefore be a potential strategic option. At this stage, therefore, this option is not being progressed by the Applicant. However, should this become available as a strategic option, the Applicant may give this further consideration. This measure was therefore **screened out**.
Designation of additional SPAs or increase to existing SPA area designated for red-throated diver 1 – Address the same impact at same location	Natural England advised the North Falls project that any areas that meet the requirement to be designated as SPAs should have been designated, with no plans to designate additional areas identified. The Applicant also notes that the revision of the existing Liverpool Bay SPA in 2017 included significant areas around the original SPA boundary considered to be of low importance for this species. The potential to increase this SPA to benefit red-throated diver is

Measure and Defra compensation hierarchy level	Screening and conclusion
Or 2 – Same ecological function different location	therefore considered to be low. This measure is therefore not considered further, however, should this become available as a strategic option, the Applicant may give this further consideration. This measure was therefore **screened out**.
Contribution to a strategic fund Hierarchy level dependent on measure	In accordance with the Sheringham Extension Project and Dudgeon Extension Project DCO (SI 2024 No. 564, Schedule 17, Part 1 4. (2) (i)), which enables compensation to be delivered through contribution to a Strategic Compensation Fund, and guidance in the Marine Recovery Fund interim guidance (DESNZ, 2025), this option is included for the Project. However, it is recognised that compensation for red-throated diver is not yet listed on the Defra (2024b) library of measures or identified in the Marine Recovery Fund interim guidance (DESNZ, 2025). This measure has therefore been **screened in**.

17. Two measures have therefore been taken forward (Enhance breeding habitat (nesting rafts and/or habitat management) and Contribution to a strategic fund). Enhancement of breeding habitat is considered the preferred option, on the assumption that the Project would be taking the compensation measure forward alone. However, should strategic measures become available, it would be expected that this would be favoured; further information is presented in **Section 4.8**.

2.3 Location of compensatory measures

18. It is recognised that delivery of compensation within Liverpool Bay is not technically feasible (**Section 2.2**). Therefore, it is proposed that compensation is provided elsewhere to benefit the wider national site network (NSN) breeding red-throated diver population.

2.3.1 Connectivity with Liverpool Bay SPA

19. There is very limited evidence to indicate the breeding origin of red-throated divers present in the Liverpool Bay SPA. A number of studies (for example www.divertracking.com, Duckworth *et al.*, 2020, and OKill, 1994) provide information on the origins of birds present in the North Sea, but no comparable data has been identified for the Irish Sea population. Consultation with red-throated diver experts by the Applicant confirms that it is considered most likely that birds present within Liverpool Bay breed on the west coast of Scotland (including the Hebrides), Greenland and the east coast of Canada. Some birds may also breed in Orkney, Shetland and Fenno-Scandinavia.

20. It is understood that the North Falls project will likely target breeding sites in Finland or Shetland (MacArthur Green and RHDHV, 2024) for its own 'without prejudice' compensation proposals. Therefore, to minimise risk of overlap between the two projects, and taking into account the predicted connectivity, the Project has targeted the mainland north and west coasts of Scotland, and Hebrides for compensation sites. It is recognised that delivery of compensation within SPAs designated for their breeding red-throated diver populations is unlikely to be favoured by NatureScot (as indicated by its comments to the North Falls compensation proposals), the search for suitable sites has therefore been focussed on areas outside of red-throated diver SPAs. As above, however, the focus of the compensation would be to deliver benefit to the wider NSN, rather than specifically seeking to benefit birds that use Liverpool Bay SPA.

3 Selection of compensatory measures

3.1 Ecological evidence

21. The ecological evidence to support the proposed compensatory measures is presented here and reflects the information presented for the North Falls project (MacArthur Green and RHDHV, 2024).

3.1.1 Evidence that red-throated diver productivity is constrained

3.1.1.1 Average red-throated diver productivity

22. Red-throated divers start breeding at around 3 years old. They typically lay 1-2 eggs in a shallow scrape immediately adjacent to an inland waterbody (e.g. lake, pond, loch, or lochan; hereafter 'waterbody'). Incubation lasts for approximately 26 days. On hatching, the chicks usually spend the first 24 hours in the nest but after that rarely return to land, staying on the water on the breeding waterbody. They are fed on fish brought back to the breeding waterbody by both parents, either from the sea or freshwater lakes and rivers. Chicks usually fledge around age 5-6 weeks, at which point they move to the sea.

23. Red-throated divers are a long-lived species with relatively low and highly variable productivity (Erikkson & Johansson, 1997; Hulka, 2010). Comparisons of productivity are not straightforward as methods of data collection are not always identical.

24. Nest failure is highest during incubation (Hulka, 2010; Gomersall, 1986) so surveying needs to commence very early in the breeding season in order to identify early nest failure and avoid biasing productivity estimates.

25. Additionally, surveys that do not visit nesting waterbodies late in the season can assume that chicks successfully fledged, rather than failing, thereby overestimating productivity. This needs to be balanced against the risk of disturbance caused by each visit to assess breeding status. Human disturbance is known to reduce breeding success in red-throated divers and consequently, some methods of monitoring productivity can increase the risk of nest failure (Bundy, 1978). Therefore, productivity measures based on multiple nest site visits, whilst capturing the full breeding season, may cause a lower productivity (Hulka, 2010).

26. Another source of variation among estimates of productivity is the point at which a nesting attempt is classed as 'successful'. Generally, a nesting attempt that results in at least one 'large' juvenile, e.g. two-thirds the size of an adult is considered to be successful. However, Lokki & Eklof (1984) classed a nesting attempt as successful if a chick hatched and their very high estimates of productivity are probably partially due to this.

27. In Scotland, estimated red-throated diver productivity was surprisingly consistent across years and sites (**Table 3.1**). Gomersall (1986) found annual productivity of at least 0.51 chicks fledged per breeding pair across 191 nesting attempts, and a review of all field studies for Shetland gave a mean annual productivity value of 0.45/pair, based on 1,104 nesting attempts. Since no trends in the Shetland population were detected, Gomersall (1986) concluded that this productivity was sufficient to maintain a stable population in Shetland. Annual productivity in south-west mainland Scotland (Kintyre, Argyll) was found to be slightly lower at 0.34 large chicks per pair (Merrie *et al.* 1996; Dewar & Lawrence, 2023).

28. The exception to this stability across most of Scotland, was the estimate of productivity for mainland Shetland of 0.77 (Fraser *et al.* 2009). In two years (2003, 2005), productivity was at least 1.00 fledged young per breeding pair, but in another four years (2004, 2006-2008) productivity was lower, ranging from 0.54-0.75. Productivity in this part of Shetland was found to be higher than elsewhere on Shetland (Fraser, *et al.* 2009).

29. Red-throated diver productivity was generally higher in Fenno-Scandinavia and North America than Scotland, although was also highly variable (**Table 3.1**). Productivity on the Swedish Holmoarna archipelago, in the Pomeranian Sea, was more similar to Scottish productivity, at 0.35-0.41 chicks per pair per year (Lehtonen, 2016). However, caution should be used when comparing productivity estimates from these different studies due to different methodological approaches influencing productivity estimates, as explained above.

Table 3.1 Estimates of red-throated diver productivity (mean numbers of chicks fledged per pair per annum) taken from North Falls without prejudice compensation document (MacArthur Green and RHDHV, 2024)*

Productivity	Location	Year(s)	Source
0.36 - 0.51	Shetland, Scotland	1981, 1982	Gomersall (1986)
0.45	Shetland, Scotland	1918-1982	Gomersall (1986)
0.41	Unst, Shetland, Scotland	1973 + 1974	Bundy (1978)
0.77	Mainland Shetland, Scotland	2003-2008	Fraser *et al.* (2009)
0.34 (0-0.8)	Kintyre, Scotland	2016-2020	Dewar & Lawrence (2023)
0.34	Argyll, Scotland	1973-1993	Merrie *et al.* (1996)
0.76	Central Sweden	1991-2000	Dahlen & Erikkson (2002)
1.15	Southern Finland	1979-1982	Lokki & Eklof (1984)
0.65-1.04	Southern Finland	1993-2011	Nummi *et al.* (2013)
0.35	Holmoana Islands off east coast Sweden	2012-2015	Lehtonen (2016)
0.07-0.41	Holmoana Islands off east coast Sweden	2010-2015	Ollason *et al.* (2021)
0.17-1.0	Yukon-Kuskokwim Delta, Alaska	1998-2004	Rizollo *et al.* (2014)

* Note, the definition of a successful nesting attempt varied among studies and consequently productivity rates are not directly comparable

3.1.2 Factors limiting productivity

30. Red-throated diver productivity has been shown to be related to a range of factors including human disturbance, predation by mammalian and avian predators, food availability, distance to foraging areas from breeding waterbodies, fluctuating water levels in breeding waterbodies, the presence of natural islets or artificial rafts, and the size of breeding waterbodies. However, in many cases, the cause of individual nest failures is not known (Dahlen & Erikkson, 2002).

31. In a review, Hulka (2010) found the following improved breeding success: vegetation around nest site >30cm height, smaller breeding waterbodies with inflow/outflow streams rather than static pools and nests being <9km from foraging areas. In a more recent study in study in Sweden, Dahlén *et al.* (2024) found that small (<1ha) breeding pools supporting floating aquatic vegetation, surrounded by open mire and as close as possible to suitable feeding pools were the most important characteristics in determining pool occupancy and breeding success.

3.1.2.1 Food availability

32. Availability of prey will affect productivity, through both adult body condition and chick provisioning rate. If there is insufficient prey available for adults in the pre-breeding season, they may fail to attempt to breed. Reduced prey early in the breeding season could mean the adults may not be able to maintain their body condition during incubation and so abandon the eggs. As a long-lived species with low productivity, red-throated diver will tend to prioritise maintaining their own condition over their current breeding attempt, postponing breeding to another year with better conditions.

33. Chicks are fed on fish prey either from the sea or freshwater lakes and rivers. Scottish red-throated divers are dependent on lipid rich prey, such as sandeels (*Ammodytes marinus*). When prey is scarce, foraging trip duration will increase so the adults will be away from the nest for longer periods which increases the likelihood of a predator taking the eggs or chicks. Rizollo *et al.* (2014) found a combination of high fox occurrence and low lipid-rich fish prey resulted in low productivity.

3.1.2.2 Nesting waterbody size

34. Generally, red-throated divers tend to nest on the banks of small inland waterbodies. For example, in Scotland, a negative relationship has been reported between breeding success and loch size (Bundy, 1978; Gomersall, 1986; Okill & Wanless, 2011) although Hulka (2010) did not find higher breeding success on smaller lochs. In Sweden, Lehtonen (2016) reported lake area to be negatively related to breeding success. Dahlen & Erikkson (2002) found the majority of red-throated divers bred on small lakes but found no evidence of higher breeding success on larger lakes. In Scotland, lochs/lochans smaller than 1 hectare have been reported in some studies to have higher breeding success (Gomersall, 1986; Bundy, 1978), while other studies have reported higher success at even smaller lochs/lochans of 0.3 ha. In Finland, Nummi *et al.* (2013) monitored red-throated diver breeding success at waterbodies, some of which had rafts installed and others with no rafts. Waterbodies used by red-throated divers ranged in size, from very small to relatively large (0.1 - 94.5 ha). Nummi *et al.* (2013) did not report any relationship between waterbody size and breeding success.

3.1.2.3 Sudden changes in water level on breeding waterbody

35. Red-throated divers nest at the water's edge of static waterbodies, i.e. not on the banks of rivers. This is an anti-predatory mechanism, as incubating adults can slip into the water undetected when a predator approaches, which protects the eggs by reducing nest detection.

36. Water levels can change through natural processes, e.g. excessive rainfall, drought, or through water being removed, e.g. in reservoirs. In Orkney, dry periods can result in small lochs drying out both through evaporation and through peat erosion causing lochs to drain, causing nesting failure. The underlying geology and habitat affect the underlying hydrology which in turn influences the rate at which lochs drain in dry periods (Bundy, 1978; Viking Energy Partnership, 2010; Hulka, 2010). Changes in water level during incubation can either flood or strand nests, both of which may cause nest failure. However, other factors appear to affect this relationship; Hulka (2010) found nests in Shetland that were closer to the water edge had higher breeding success than those further from the water. However, Dahlen & Erikkson (2002) found no evidence of the distance from nest to water influencing breeding success in Swedish divers.

3.1.2.4 Distance from foraging areas

37. Red-throated divers breeding near the coast forage at sea, both for themselves and their chicks, whereas divers breeding further inland forage in freshwater lakes/lochs. Above a certain point, the distance to foraging areas has been shown to be negatively correlated with breeding success (Lehtonen, 2016; Erikkson & Johansson 1997).

38. In Shetland, Hulka (2010) found no relationship between breeding success and distance to the sea but all nesting lochs/lochans were relatively close to the coast. In North America, Eberl & Picman (1993) found no relationship between hatching success and distance between breeding lake and foraging waters, up to a threshold value of approximately 9km. When foraging and breeding areas were more distant, the feeding frequency of chicks decreased.

3.1.2.5 Predation

39. Predation is generally the most common ultimate cause of nest failure (Bundy 1976; Gomersall 1986; Eberl & Pieman 1993; Dahlén & Eriksson 2002; Hulka, 2010; Dewar & Lawrence, 2023; Ollason *et al.* 2021). However, determining the cause of nest failure is difficult and identifying the predator of eggs or chicks is even more challenging (Dewar & Lawrence, 2023). In Shetland, egg and chick predators include great skua (*Catharacta skua*) (Furness, 1981) with predation frequency potentially being increased in the presence of human disturbance (Bundy, 1978; Furness, 1981). Other potential predators in Shetland include hooded crow *Corvus corone cornix*, raven (*Corvus corax*), arctic skua (*Stercorarius parasiticus*), great black-backed gull (*Larus marinus*), lesser black-backed gull (*Larus fuscus*), herring gull (*Larus argentatus*), common gull (*Larus canus*) and otter (*Lutra lutra*) (Gomersall, 1986; Hulka, 2010).

40. Elsewhere in Scotland, other presumed predators of red-throated diver nests were common gull, herring gull, great black-backed gull, and possibly otter and American mink (Dewar & Lawrence, 2023; Bundy, 1978). The potential presence of American mink was highlighted by Natural England in its Deadline 4 submissions (REP4-066).

41. In Sweden, Ollason *et al.* (2021) reported red fox (*Vulpes vulpes*), common cranes (*Grus grus*) and white-tailed eagles (*Haliaeetus albicilla*) affecting red-throated diver breeding success. In North America an index of fox presence was negatively associated with red-throated diver breeding success (Rizollo *et al.* 2014).

3.1.2.6 Human disturbance

42. Red-throated divers are highly sensitive to the presence of humans and will flush from their nests readily. Human disturbance can be from fishing, bird watching, recreational watersports and walkers, particularly with dogs (Bundy, 1978; Dahlen & Erikkson 2002; Nummi *et al.* 2013). Repeated visits to red-throated diver nests by fieldworkers has also been demonstrated to reduce breeding success (Rizollo *et al.* 2014).

3.1.3 Evidence that natural islands and artificial nesting rafts can increase productivity

3.1.3.1 Natural islands

43. Breeding success was slightly higher at Swedish lakes with islands, than lakes with no islands (Dahlen & Erikkson, 2002) and divers will preferentially use islands over the shore (Eberly & Picman, 1993) but the presence of islands was not found to increase breeding success in Shetland (Gomersall, 1986). Dahlen & Erikkson (2002) suggest this might be due to the prevalence of aerial predators in Shetland.

3.1.3.2 Provision of artificial nesting rafts

44. There is good evidence for artificial nesting rafts increasing productivity in three species of diver, including red-throated diver. Productivity in common loons (great northern divers, *Gavia immer*) in North America increased following provision of rafts on lakes with fluctuating water levels and a higher human development index (de Sorbo *et al.* 2010). Hatching success increased by 69% and fledging success by 32% following provision of artificial nesting rafts for common loons, due to reduced mammalian egg predation (Piper *et al.* 2002).

45. Scottish black-throated diver productivity also increased after provision of artificial rafts, from around 0.24 to 0.35 large chicks per occupied territory (Hancock *et al.* 2000).

46. Red-throated diver productivity in Argyll increased from an average of 0.35 young per year to 0.75 young per year following provision of rafts (Merrie, 1986). The increase in productivity was thought to be due to eliminating nest flooding from fluctuating water levels and reducing impacts of human disturbance and predation by foxes and mink. Red-throated diver productivity has also been shown to increase following provision of artificial nesting rafts in Finland (Lokki & Eklof, 1984; Nummi *et al.*, 2013). Annual productivity increased from 0.98 to 1.29 chicks per pair (Lokki & Eklof, 1984). Nummi *et al.* (2013) compared red-throated diver productivity in two areas in southern Finland, one in which 10 rafts had been installed and another with no rafts. Both areas had human disturbance from dog walkers, fishing and water sports. The area with rafts showed a strong increase in productivity, averaging 1.04 juveniles per pair per year (where a juvenile was described as a chick of about 3 weeks of age). The area with no rafts maintained a lower productivity of a mean of 0.65 juveniles per pair per year. The study population that was provided with rafts also showed a strong increase in number of breeding pairs over the 15 years of the study (from one pair to 10 pairs), while the control population without rafts remained at very low numbers (Nummi *et al.* 2013).

47. Furness *et al.* (2013) estimated that red-throated diver productivity in Scotland could be increased from an average of 0.3 to 0.7 chicks per pair by providing artificial nesting rafts. This increase of 0.4 chicks per pair is similar to that found in Finland following nest provision (Nummi *et al.* 2013).

3.1.4 Evidence of the benefits of habitat management

48. As discussed in **Section 3.1.2.3**, drying out of Scottish lochs, e.g. due to peat erosion, can present a constraint on breeding success. In these circumstances, nesting rafts may be unsuitable or may require additional habitat management.

49. Noting the small size of waterbodies preferred by red-throated diver for breeding, these are particularly vulnerable to drying out in Scotland due to drainage resulting from peat erosion (Hulka, 2010). As a result of peat erosion, many lochans that were once suitable for nesting divers are now less suitable or totally unsuitable (Viking Energy Partnership, 2010).

50. Management and/or restoration of peatland (e.g. by reprofiling, damming and bunding) has been used to successfully raise groundwater and create small waterbodies (e.g. NatureScot, 2023).

51. Restoration and management of peatland lochans is being undertaken by the Viking Wind Farm, in Shetland to benefit red-throated diver, as part of the Habitat Management Plan (Viking Energy Partnership, 2010; Plantecol Ltd, 2019).

3.2 Identification of potential sites for compensation

52. **Appendix A1** presents the results of the site identification, through which a shortlist of suitable sites has been identified. In summary, the site identification comprised two stages:

- Desk-based screening of potential breeding locations (long-list)
- Review of available breeding information and expert evaluation of long-list to identify an initial short-list of suitable sites

53. Further information is provided below.

3.2.1 Desk-based site screening (long-list)

54. The long-list of potential compensation sites was determined through a geographical information system (GIS) based analysis to identify suitable lochs based on the following criteria:

- Freshwater lochs located within the broad scale red-throated breeding area, as defined by the BTO breeding atlas (Balmer *et al.*, 2013).
- Located outside of SPAs designated for breeding red-throated diver
- Loch size ≤2ha
- Loch located within 9km of the sea (including sea lochs)

55. This information was used to inform the selection of sites considered for the short-list. Note that this information was based on named lochs within the GIS dataset. The data also includes many unnamed waterbodies, and it is therefore likely that further review will identify additional suitable locations.

3.2.2 Evaluation of potential sites (short-list)

56. The long-list of potentially suitable sites was refined through review of available information on known breeding sites, and consultation with local experts. Further information on the approach to this review are provided below, with results presented in **Appendix A1**.

57. Information on the location of confirmed or likely red-throated diver breeding sites was identified through interrogation of eBird data held by the Global

Biodiversity Information Facility (GBIF)[2]. This data was filtered in two ways to obtain breeding locations:

- Records for the last five years between May and July where breeding condition was indicated in the data (possible, probable and confirmed).
- Records of red-throated divers at suitable breeding locations between May and July in at least two of the last five years.

58. Ornithology specialists with knowledge of the Scottish red-throated diver breeding population and land ownership reviewed the long-list of potential lochs to identify a short-list to be taken forward. The screening was based on ecological characteristics (as set out below) and local knowledge of known and likely breeding locations. While the screening was led by the ecological requirements for the compensation measures, the likelihood that the landowners would respond positively to enabling measures on their land was also considered, to expedite the screening process. Key factors that informed the screening were:

- The known or assumed presence of breeding red-throated diver at the loch.
- The known or assumed presence of breeding red-throated diver at other lochs within 5km.
- Suitable habitat characteristics likely to be favourable to red-throated diver (noting that size and distance to sea were applied at the long-list screening stage). Characteristics that were deemed to be positive attributes in the screening were based on information in Dahlén*et al.* (2024):
  - Located in open habitat away from significant scrub/tree cover (within at least 25m of the loch)
  - Loch has coverage of floating vegetation (e.g. pondweed) – though this may only be evident in summer
  - Through-flow of freshwater through the loch
  - Away from areas of significant anthropogenic disturbance
  - No significant barriers (such as presence of wind turbines) between breeding loch and likely feeding area(s)
- Proximity to SPAs designated for breeding red-throated diver. Lochs within such as SPAs were excluded from the search, but proximity was considered a positive (but not overriding) attribute.

[2] eBird data, via Cornell Lab of Ornithology is only made available for use for non-commercial application. However, these data were accessed via the Global Biodiversity Information Facility (GBIF), a global repository of biodiversity recording data for which eBird is a contributor, and whose data is made available under CC BY 4.0 license, that allows commercial application – for more see https://www.gbif.org/terms. Data available here - https://www.gbif.org/dataset/4fa7b334-ce0d-4e88-aaae-2e0c138d049e

59. The process of identifying suitable locations is ongoing and will continue to be developed during and after the Examination period, as required. This will include further analysis of available data, and targeted site visits to confirm loch suitability. As such the short-list is considered preliminary, and it is expected that it will be further refined (including the addition of further sites) as more information becomes available.

60. In parallel with the site evaluation, the Applicant has been in discussions with landowners to seek in-principal agreement on delivery of proposed compensation measures on their land. At present, three landowners have provided letters of support to confirm that they are able to provide such support. Discussions are also well progressed with a number of other landowners. Further details are provided in **Section 4.2** below.

4 Details of compensation measures

4.1 Delivery mechanism

61. The proposed primary compensation measure would be to increase red-throated diver productivity through provision of artificial nesting rafts. The rafts would be installed on Scottish waterbodies known to support breeding red-throated diver, and potentially also suitable freshwater lochs in close proximity to known breeding locations. This approach has been used successfully in Scotland, Scandinavia and North America, and has been demonstrated to achieve both an increase in nesting pairs and a measurable productivity increase (**Section 3.1.3**).

62. The raft design would be based on the approach described by Nummi *et al.* (2013):

- Each raft would be approximately 1m x 1m in size, comprising floats (e.g. plastic water containers) covered with vegetated peat taken from the edge of the loch. Vegetation on the raft would be expected to continue to grow.
- The top of the raft would be approximately 15cm above water level.
- The raft would be anchored to the bottom of the waterbody (e.g. with a rope attached to a heavy rock).
- The raft would be located away from the shore (ideally >25m) to minimise risk of disturbance.
- Rafts would be sited, as far as possible, in areas sheltered from the prevailing wind and also away from potential disturbance sources.

63. Habitat management will also be considered as a secondary measure (i.e. to benefit lochs where rafts are being deployed) where this has been identified as a potential limiting factor. This may include erosion repair, where this is

impacting water levels within the loch, and measures to discourage human disturbance, such as re-routeing paths away from the loch edge.

4.2 Location

64. The identification of potential compensation sites, as set out in **Sections 2.3** and **3.2**, has been focussed on potentially suitable lochs close to the northern and western Scottish mainland coast, and the Hebrides. The desk-based assessment of locations that the Applicant considers are suitable for the delivery of suitable compensation, as derived from the screening are set out in **Appendix A1** and are shown on the plans located in **Appendix B1**. In summary, these comprise:

- 1,484 sites on the 'long-list' (all lochs ≤2ha within red-throated diver breeding areas and within 9km of the sea).
- 100 lochs identified as having likely breeding red-throated diver in the last five years (Annex 1 of Appendix A1).
- 167 lochs where birds have been present at suitable breeding locations in at least two of the last five years (Annex 2 of Appendix A1).
- 440 lochs, based on expert review and local knowledge, where there is good potential for the presence of breeding red-throated diver (Annex 3 of Appendix A1).

65. Further desk- and field-based assessment is ongoing, and it is anticipated that this will identify additional suitable lochs to those presented above and in **Appendix A1** and **B1**.

66. **Table 4.1** presents details of landowners where in-principle agreement on the delivery of compensation measures within their landholding has been provided, with respective letters of support provided in **Appendix 2** to the Without Prejudice Derogation Case (Document Reference 9.37). In addition, details of landowners where active discussion on in-principal support are in progress are also presented. The Applicant is continuing to progress development and refinement of the short-list and discussions with landowners, and therefore it is expected that further suitable sites will be brought forward. Where appropriate, site visits will be undertaken in Spring/Summer 2025 to confirm loch suitability.

Table 4.1 Landowners where in-principal delivery of red-throated diver compensation has been agreed or in discussion

Site Name	Location	Approximate estate area (ha)	Number of potentially suitable lochs	Landowner agreement
[REDACTED]	Inner Hebrides	1,850	3+	Yes, letter of support provided in **Appendix 2.**
[REDACTED]	Highlands	2,700	18+	Yes, letter of support provided in **Appendix 2.**
[REDACTED]	Highlands	3,950	TBC[1]	Yes, letter of support provided in **Appendix 2.**
[REDACTED]	Highlands	4,000	TBC[1]	Yes, letter of support provided in **Appendix 2.**
[REDACTED]	Highlands	640	TBC[1]	Yes, letter of support provided in **Appendix 2.**
[REDACTED]	Argyll	6,200	10+	Yes, letter of support provided in **Appendix 2.**
[REDACTED]	Argyll	4,700	9+	Yes, letter of support provided in Appendix 2.
[REDACTED]	Jura	3,600	9+	Yes, letter of support provided in **Appendix 2.**
[REDACTED]	Highlands	TBC	TBC	Active discussion ongoing , with landowner indicating support for breeding rafts
[REDACTED]	Multiple (including Argyll)	n/a	TBC	Active discussions ongoing, with landowner indicating support for habitat enhancement measures.

[1] These estates are located outside of the core search area, but estate staff have confirmed presence of breeding red-throated diver.

67. To date, eight landowners have confirmed in-principle support letters for the delivery of red-throated diver compensation measures, providing a minimum

of 49 suitable lochs (excluding any estates where the number of lochs is not yet known), including a number with confirmed recent breeding records. The locations of the landholdings where in-principal landowner agreement has been obtained are shown in **Appendix C1**, and letters of support provided in **Appendix 2**.

4.3 Scale of compensation

68. The Applicant proposes to provide a total of 20 compensation lochs (nesting rafts and/or habitat management), together with 20 control sites against which increase in breeding success can be monitored. This is the same number as currently proposed (without prejudice) for North Falls (MacArthur Green and RHDHV, 2024). Based on the information presented in **Sections 3.2 and 4.2**, the Applicant can confirm that sufficient suitable sites can be readily secured to deliver this scale of compensation.

69. As set out in the North Falls without prejudice compensation document (MacArthur Green and RHDHV, 2024), there is no measurable direct link between the potential effect (i.e., in the case of the Project, changes in red-throated diver distribution within Liverpool Bay SPA) and the proposed scale of compensation (i.e. increase in red-throated diver breeding success). The proposed scale of compensation has therefore been based on professional judgement. It is understood that for the North Falls Project Natural England has suggested that the scale of compensation should be revisited and that a more 'ambitious approach' should be proposed (Natural England, 2024). However, it is noted that the potential area of effect is substantially larger for North Falls than the Project (54.5km^2, compared to 17.99km^2) and closer to the respective SPA (c. 4.5km compared to c.6.5km; MacArthur Green and RHDHV (2024) and **Section 1.5**), and therefore the scale of compensation proposed by the Project is considered to be appropriately ambitious. Natural England confirmed in its Deadline 4 submissions (REP4-066) that *'the scale of measures proposed is appropriate for the Project, subject to suitable locations being identified.'*

70. Assuming an increase in productivity of 0.4 young per year for an occupied raft (Merrie, 1986; Rheinallt *et al.,* 2007; Nummi *et al.,* 2013; refer to **Section 3.1.3.2**), and that between 60% and 90% of rafts would be occupied (Nummi *et al.*, 2013; Merrie, 1996; de Sorbo *et al.,* 2010), this would indicate that provision of 20 rafts would enable between five and seven additional birds to be fledged each year. However, the Applicant proposes that the measure would include the provision of rafts on known breeding lochs combined with other suitable nearby lochs where breeding has not previously been confirmed. Evidence confirms that the latter approach can substantially increase the breeding population (Nummi *et al.*, 2013), and therefore it is

expected that significantly more birds would enter the population as the breeding population increased.

71. In addition to raft provision, the Applicant is also considering the provision of habitat enhancement measures (e.g. through support for peatland restoration) as a 'secondary' compensation measure. This would be targeted to areas known to support breeding red-throated diver to enhance suitability for this species. Although the measurable benefits of such a secondary measure are not known, it is considered that this would provide resilience to the primary compensation. Monitoring measures could be included to test the efficacy of peatland restoration schemes in increasing the local red-throated diver breeding population, subject to agreement with the relevant stakeholders.

4.4 Timing of delivery

72. Divers tend to start using artificial nesting rafts for breeding soon after they are installed. Half of rafts installed for great northern divers in North America were used in the first year and by the third year, 90% of rafts were in use (DeSorbo *et al.* 2010). Nummi *et al.,* (2013) also found rafts in Finland were used within three years of installation.

73. If the SoS deems red-throated diver compensation to be a requirement for the Project, the Applicant proposes that rafts would be installed pre-construction. Red-throated divers would be expected to start using rafts the following summer, and fledglings from these sites would contribute to the NSN in their first winter (i.e. within 12 months of raft installation).

4.5 Delivery roadmap

74. If it is determined that red-throated diver compensation is required, the next steps in delivery would be:

- Refinement of the short-list of sites to the final lochs to be taken forward to implementation.
- Consultation with stakeholders to agree the establishment of a red-throated diver compensation steering group (RTDCSG), with members potentially including landowners, Natural England, NatureScot and RSPB.
- Finalisation of legal agreements with the relevant landowner(s) to ensure delivery over the required compensation over the life of the Project.
- Submission of applications for any permission(s), as required (see **Section 4.6** below).
- Development of the Compensation Implementation and Monitoring Plan (CIMP) in line with the Outline CIMP provided (Document Reference 9.38). If compensation is required, it is expected that the CIMP would be secured through the DCO via an additional compensation schedule for

Liverpool Bay SPA (as presented in the amended draft DCO at Deadline 4) and submitted for approval by the SoS prior to construction.

- As above, the final compensation proposals would agreed with the SoS prior to implementation. The RTDCSG would review and agree the CIMP prior to submission to the SoS.
- The compensation would be implemented in accordance with the approved CIMP. Compensatory measures will be maintained for ~~the lifetime of the~~as long as any ~~Project~~WTGs remain in situ, subject to any necessary adaptive management, as below.
- Monitoring measures would be implemented, as set out in the CIMP (see **Section 4.7.1** below).
- Any variations would be in accordance with the objectives of the compensation and would be agreed with the RTDCSG prior to submission to SoS for approval. Any changes would need to ensure that compensation requirements were still met.
- Adaptive management would be adopted in the event that monitoring indicated that the compensation measures were not meeting the objectives set out in the CIMP. The process for adaptive management would be set out in the CIMP and agreed with the RTDCSG prior to implementation (see **Section 4.7.2** below).

4.6 Permits and licences

75. The following permits and/or licences may be required for implementation of the proposed compensation:

- Landowner permission. It is anticipated that this would be secured though legal agreement (e.g. lease) for the lifetime of the Project. Land purchase may also be considered.
- Statutory permits. It is considered unlikely that statutory permits (including planning consent) would be required for the deployment of rafts. The Applicant has sought to avoid locating compensation within SPAs; however, if located within a Site of Special Scientific Interest (SSSI), consent or assent from NatureScot may be required.

4.7 Monitoring, maintenance and adaptive management

4.7.1 Monitoring

76. Red-throated diver is listed under Schedule 1 of the Wildlife and Countryside Act 1981, meaning that it is protected against intentional disturbance while building a nest, or in, on or near a nest containing eggs or young; or to disturb dependent young even if not in the nest. A Licence is therefore required to:

- Disturb a Schedule 1 species during the breeding season to monitor breeding performance and ring adults or young; and/or
- Visit the nest of a Schedule 1 species during the breeding season (to record the contents only).

77. All monitoring work would therefore be undertaken by suitably experienced surveyors holding the required survey Licence.

78. Monitoring would be designed to show that productivity at the compensation sites is increased. As set out in **Section 3.1.3.2**, an increase of approximately 0.4 fledged chicks per raft would be predicted for each occupied nesting raft. Comparable monitoring of the raft and control sites (20 of each) would be undertaken to demonstrate the productivity increase. For lochs where rafts are installed, checks of the waterbody edge for evidence of breeding would also be required. In line with the North Falls project (MacArthur Green and RHDHV, 2024), monitoring would be undertaken as follows:

- At least two visits per season would be undertaken in early May and late August. The number of visits would be minimised to avoid unnecessary disturbance.
- Monitoring methods would seek to minimise disturbance as far as possible. This would be achieved through:
  - Where possible, sites would be checked at a distance with a telescope, and only approached when no evidence of nesting divers could be observed.
  - Use of remote sensing methods (e.g. temperature probes (to determine when an adult bird is sitting) and cameras) where possible.
  - Minimising the number of visits.
- For raft or island nests, a boat to visit the nest would be made (e.g. using a small inflatable that can be carried to site). No more than two visits will be made to the nest during the breeding season, to install remote sensors and retrieve them at the end of the season. All other monitoring will be from a distance using telescopes and binoculars.
- For each nesting attempt, the contents of the nest would be recorded, e.g. no eggs, number of eggs, any remains of egg shell including whether the shell suggests a chick hatched or the egg was predated. Any eggs found in nests will be floated in water to determine the stage of embryo development (O'Brien *et al.,* 2018; van Päässen *et al*., 1984). This information will help predict when eggs can be expected to hatch and when to return to check on breeding success, while avoiding disturbing adults with newly hatched young.
- During the course of the monitoring, the following would be recorded:
  a) Eggs disappeared, presumed predated;

b) Egg shell present showing evidence of predation;
c) Egg shell present showing evidence of hatching;
d) Whole eggs present but cold, presumed abandonment of the nesting attempt by parents;
e) No chicks seen on any visit;
f) Small chicks seen but not present at a later visit; and
g) Large chicks (3/4 the size of adult) present

- Productivity would be recorded as the total number of large chicks (i.e. (g) above), divided by the total number of nests with eggs.
- Red-throated divers sometimes move their flightless chicks over land from the waterbody on which they fledged to a nearby, often larger, waterbody (Hulka, 2010) so neighbouring waterbodies (within 100m) would also be checked when monitoring for diver chicks, subject to landowner access agreement.
- Red-throated divers will re-lay if a nesting attempt fails early in the breeding season. Following nest failures, the waterbody and nearby waterbodies will be visited again to look for any re-lay nests. The same methods for monitoring productivity will be used on any re-lay nesting attempts, as for first attempts.
- Other relevant information would also be recorded, such as weather, and evidence of the presence of predators.

4.7.2 Maintenance

79. Annual maintenance checks of the rafts would be undertaken prior to the commencement of each breeding season, i.e. before the end of March each year. Any required repairs or replacement would be implemented as required.

4.7.3 Adaptive management

80. In the event that measurable increase in red-throated diver productivity (when compared to control sites) was not demonstrated at the compensation sites, adaptive management measures would be introduced. This would be undertaken as advised by, and in agreement with, the RTDCSG. Annual monitoring reports would be presented to the RTDCSG, and if no increase in productivity was determined after three years (the period over which it is expected use of the rafts would become established), this would be discussed with the RTDCSG and any additional measures agreed and implemented. In establishing the need for adaptive measures, it would be important to understand the likely causes, and also any wider factors, outside of the control of the project, that may be impacting the success.

81. In the event that an increase in productivity, when compared to the control sites, was established, the RTDSCG would also review the ongoing monitoring requirements, noting the need to minimise disturbance at the nesting sites as far as possible. Once the success of the compensation was established, it would be expected that the extent of monitoring could be reduced.

82. Subject to discussion and agreement with the RTDCSG, potential adaptive management measures may include:

- Provision of 'roofs' (e.g. comprising camouflage netting over wire mesh or similar) on rafts to reduce predation (e.g. by great skua, gulls or corvids) where this is demonstrated to be an issue. In North America, rafts with roofs have increased great-northern diver productivity (de Sorbo *et al.* 2008). The 'roofs' would need to be carefully designed to ensure that they did not risk wind damage, e.g. through 'roof' design and placement of the raft in a sheltered location, as appropriate.
- Additional management/enhancement of vegetation on rafts to ensure that they provide suitable cover for RTDs, e.g. through development of *Carex* (sedge) species <30cm.
- Targeted predator monitoring and management (where this is not already in place), for species such as American mink.
- Monitoring and management of other problem species, particularly Canada goose, where these are thought to be present a competition risk on the rafts.
- Habitat management measures, for example to maintain water levels within the nesting lochs.

4.8 Strategic compensation

83. Strategic or collaborative compensation would be implemented wholly in substitution of the project led compensatory measure, at a level proportional to the effects described in **Section 1.5**; or partly in substitution, in the unlikely event the proposed compensatory measures were not able to deliver the full compensation requirement. It is recognised that Defra is considering strategic compensation options for red-throated diver, however the timescales are uncertain. The Applicant has therefore proposed project specific compensation which can be relied upon and is securable.

84. In the event that this or another strategic measure becomes available e.g. through a contribution to a Strategic Compensation Fund, this will be considered by the Applicant. A strategic financial contribution to secondary measures such as peatland restoration schemes, which could directly benefit red-throated diver breeding populations in specific locations in the west and

north of Scotland, would also be considered by the Project in discussion with the relevant SNCBs.

85. The Applicant will also seek to engage with other developers where opportunities for collaboration may exist.

5 Potential effects of proposed compensation measures

86. The Applicant has undertaken an assessment of the effects of the proposed compensation measures, should these be required, on other environmental receptors. This assessment is set out in **Table 5.1**, which includes details of how any potential adverse effects would be avoided, reduced or mitigated. The assessment confirms that there would be no likely significant residual effects on any receptors.

Table 5.1 Assessment of potential effects of the proposed compensation measures

Potential impact	Measures to avoid, reduce or mitigate	Residual effect significance
Impacts to designated sites and features Measures within designated sites or their impact zones could affect designated features.	It is expected that proposed measures would be undertaken outside of designated sites, but connectivity/indirect effects would be considered during site selection, to ensure that effects on sensitive features were avoided, for example through timing of works or other best practice measures.	No likely significant effects on designated sites.
Visual impacts Artificial rafts could adversely affect the setting and appearance of the waterbody within which they are located. Habitat management works could also result in temporary visual impacts.	Rafts would be covered in natural peat vegetation, and would therefore have a natural appearance once established. Habitat management works would result in enhancement/restoration of natural features, and are therefore likely to benefit visual appearance in the medium and long-term.	No likely significant effects on landscape and visual receptors.
Impacts on cultural heritage features Depending on location, proposed measures could impact features of cultural heritage importance.	The provision of nesting rafts and habitat management would be non-intrusive and effects would be unlikely. Final site selection would include consideration of cultural heritage assets to ensure that any such effects were avoided.	No likely significant effects on features of cultural and heritage importance.

Potential impact	Measures to avoid, reduce or mitigate	Residual effect significance
Increase to flood risk The proposed measures would not result in changes to surface water flows or ground permeability likely to affect flood risk.	No additional measures required. If necessary, final designs would be subject to a flood risk assessment to confirm conclusions.	No likely significant effects on flood risk.

6 Summary

87. The Applicant has considered a range of measures that could deliver compensation for red-throated diver. Of these measures, the provision of nesting rafts is considered the most appropriate, potentially combined with habitat management as a secondary measure. There is good evidence to demonstrate that such measures would increase breeding productivity and increase the breeding population, and hence provide additional birds into the NSN. The proposed measures have been developed following the approach set out by the North Falls offshore windfarm project (MacArthur Green and RHDHV, 2024).

88. Natural England, in its RR to the North Falls project (October 2024) has confirmed that it considers that such measures could provide effective compensation (in the comparable context of the Outer Thames Estuary (OTE) SPA) and has stated:

'*We consider that the provision of nesting rafts to improve the breeding success of RTD could be an effective measure to compensate for the Project's impacts on the non-breeding red-throated diver feature of the OTE SPA. We recognise that should this measure be implemented in Scotland, there would not necessarily be any direct benefit to the impacted population, which is thought to be drawn predominantly from birds that breed in Fennoscandia and further east to northern Russia. Furthermore, the measure would not address the disturbance and displacement (effectively felt as habitat loss) impacts of the project. Nevertheless, there would be connectivity with the United Kingdom National Site Network (UK NSN) through potential recruitment into Scottish SPAs designated for breeding RTD, and possibly also to the Scottish and English SPAs designated for non-breeding red-throated divers'.*

89. A range of suitable sites, located primarily on the west coast of Scotland and Hebrides has been identified, and confirmed support from a number of landowners established. The Applicant has identified sufficient lochs within those landholdings to meet the proposed scale of compensation, and Natural England has confirmed that the scale of proposed compensation is appropriate for the Project (REP4-066). The Applicant is therefore in a position

to provide confidence to the Secretary of State that, should it be deemed that such measures are required, effective delivery of compensation measures for red-throated diver can be secured for ~~the lifetime of the~~as long as any ~~Project~~WTGs remain in situ. In the event that strategic compensation for this species became available, this could wholly or partly substitute the Project-led measures set out in this document.

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Appendix A1: Site screening report

(ANNEXES REMOVED)

Desk Study Supporting Site Selection for Red-Throated Diver Compensation Sites in Western Scotland.

Date: 8th January 2025
Originator: Jamie Dunning
Checked: Matilda Elgood Field

Executive Summary: Skopeo Ltd. were appointed by Royal Haskoning DHV (RHDHV) to conduct a desk study to support siting of compensation sites in Western Scotland for breeding red-throated diver, *Gavia stellata*. We used surveyor guidance set out by Gilbert et al. (1998; made available via the Rare Breeding Bird Pannel here https://www.rbbp.org.uk/wp-content/uploads/2020/10/Red-throated-Diver-Gilbert-et-al.pdf) to inform the temporal scope of our study. We were provided with a long-list of sites from RHDHV that included lochs up to 2ha in size within the study area (the West coast of mainland Scotland and Western Isles) and within 9km of the coast (including sea lochs) - a threshold set to limit the search to those likely to be used by red-throated diver, which prefer small breeding lochs in close proximity to the coast. We filtered this long list in two ways: first, using publicly available citizen science data of red-throated diver presence, which we limited to the breeding period, and the last five breeding seasons (since 2020); and second, by using local ornithologists with knowledge of both the species and the broad study area, to offer a professional opinion on suitable sites. Here we provide three lists (see annexes 1-3): Annex 1 shows sites for which positive breeding condition has been recorded via the eBird repository; Annex 2 shows all sites for which red-throated diver have been reported via eBird both within the core breeding period, and more than two of the last five breeding seasons; and, Annex 3 shows all sites for which two experienced reviewers determined breeding likelihood, or strong suitability for red-throated diver breeding mitigation.

Desk Assessment Method:

eBird: The Rare Breeding Bird Panel (RBBP) has been approached for data but we have not received any to date. Available data was considered sufficient to inform the desk study, but additional RBBP data could be reviewed for future updates, if required. Instead, we accessed all red-throated diver records uploaded to eBird, a large repository of citizen science observation data. We used the statistical and data manipulation programming language, R, to filter these data, using the auk and tidyverse packages (code given in Annex 4). We excluded repeat observations at the same site at the same time and extracted the date of each observation. We filtered this subset to only include observations from between May and July, the core breeding period (as defined by Gilbert et al. 1998), and from the last five year (2019 – 2024, as no data is available for the 2025 breeding season yet). We then filtered these data further to extract those that had associated breeding condition, which is optional information provided at the at the point of submission. C1 denotes a diver was observed during the breeding period and is rarely used. C2, C3, and C4 relate to breeding probability from possible to confirmed (see box 1). We consider these sites (n = 100) to have high potential for breeding red-throated diver (Annex 1)

Box 1. Extract from eBirds basic meta-data files to explain breeding codes:

BREEDING CATEGORY – _Four categories used to describe a species' breeding status based on the 'BREEDING CODE' reported on the eBird checklist: C1 – _Observed; C2 – _Possible; C3 – _Probable; C4 – _Confirmed. In most cases, these are the default values corresponding with the breeding code reported by the observer. But in some cases, reviewers of atlas data may reinterpret a breeding category, and that reinterpretation is reported here. For instance, a tern species might be seen carrying food (typically C4 – _Confirmed), but since terns feed young away from the nesting area it would be reinterpreted as a lower breeding category. For more information on reinterpretation of breeding codes, see this document:
https://support.ebird.org/en/support/solutions/articles/48000837520

For unique sites in the eBird data for which red-throated diver were recorded in the breeding period, but breeding categories were not provided (n = 3998), we considered these to have potential in so far as divers have been present during the breeding period, and in some cases over several years (recorded within one year since 2020 = 974; two years = 161; three years = 88; four years = forty-six, and; five years = 17). We therefore dropped all sites where divers were recorded in fewer than two years of the last five to further support the potential for breeding (Annex 2). After filtering for unique long/lat coordinates (where some sites are repeated, or given under different names) we were left with 167 unique sites.
We have provided longitude and latitude data for both lists.

Surveyor Screening: As well as screen citizen science presence data, we used two surveyors in the Skopeo directory, a directory of local ornithologists, to score a list provided by RHDHV. Both ornithologists have extensive experience with red-throated diver specifically, and are local to the study area. This list included all lochs up to 2ha in size within 9km of the sea on the Scottish mainland and islands. However, the search was particularly focused on the west and north coast mainland and Hebrides. Beyond this, there were no further filters applied to extract suitability for breeding red-throated diver. Of this list of 1484 sites, our surveyors commented on 843 for which they had some local knowledge. Of these, we have included only those for which they suggested potential (440), or in cases where there is landowner interest, where there is strong potential for breeding divers, and access (8; Annex 3).

Conclusion:

Our desk study identified 70 sites with breeding evidence (from eBird study) including 29 sites with confirmed breeding (annex 1); 167 sites with potential based on presence during breeding season (but without breeding evidence) including 19 sites with birds present every year for the last 5 years (annex 2); and finally 449 sites that our surveyors identified using their local knowledge as having potential from the long list provided by RHDHV.

RHDHV will combine these data files to map suitable breeding lochs for red-throated diver at two levels: lochs with confirmed breeding divers (Annexes 1 and 3 combined) and, lochs with the potential for breeding divers but without confirmation (Annex 2). Ground-truthing in the first half of 2025 is proposed to assess habitat quality, and, survey for occupancy at breeding lochs where landowner support has been confirmed. These secondary sites with potential (but without breeding confirmation) may be useful where landowners are interested in floating rafts for breeding diver, but may require additional surveys to confirm suitability for breeding divers. We suggest that suitable follow-up monitoring should be required for all mitigation sites post-installation to confirm occupancy of nesting rafts. This may also facilitate more direct monitoring (bird ringing, or the use of passive data logging) of site fidelity, migratory ecology and individual breeding productivity.

Appendix B1: Location of potential red-throated diver breeding lochs

MORECAMBE

REDACTED

Appendix C1: Location of landholdings where in-principle landowner agreement has been obtained

MORECAMBE

REDACTED

Appendix 2: Letters of Support

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