DBS Offshore Wind

RWE Renewables UK Dogger Bank South (West) Limited

RWE Renewables UK Dogger Bank South (East) Limited

Dogger Bank South Offshore Wind Farms

Response to RSPB Comments on Digital Aerial Surveys

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Glossary

Term	Definition
Dogger Bank South (DBS) Offshore Wind Farms	The collective name for the two Projects, DBS East and DBS West.
Environmental Impact Assessment (EIA)	A statutory process by which certain planned projects must be assessed before a formal decision to proceed can be made. It involves the collection and consideration of environmental information, which fulfils the assessment requirements of the EIA Directive and EIA Regulations, including the publication of an Environmental Statement (ES).
Expert Topic Group (ETG)	A forum for targeted engagement with regulators and interested stakeholders through the EPP.
Habitats Regulations Assessment (HRA)	The process that determines whether or not a plan or project may have an adverse effect on the integrity of a European Site or European Offshore Marine Site.
The Applicants	The Applicants for the Projects are RWE Renewables UK Dogger Bank South (East) Limited and RWE Renewables UK Dogger Bank South (West) Limited. The Applicants are themselves jointly owned by the RWE Group of companies (51% stake) and Masdar (49% stake).
The Projects	DBS East and DBS West (collectively referred to as the Dogger Bank South Offshore Wind Farms).

Acronyms

Acronym	Definition
DAS	Digital Aerial Survey
DBS	Dogger Bank South
EIA	Environmental Impact Assessment
HRA	Habitats Regulations Appraisal
QA	Quality Assurance
RIAA	Report to Inform an Appropriate Assessment
RSPB	Royal Society for the Protection of Birds
SPA	Special Protection Area

1 Introduction

1.1 RSPB Comments on Digital Aerial Surveys

1. In their Relevant Representation [RR-049] and again in their Written Representation [REP1-087], the Royal Society for the Protection of Birds (RSPB) requested additional information be provided about several aspects of the Digital Aerial Surveys (DAS) used to define the seabird baseline dataset on which the Environmental Impact Assessment (EIA) and the Report to Inform Appropriate Assessment (RIAA) for the Dogger Bank South (DBS) Offshore Wind Farms (hereafter referred to as 'the Projects') were based.
2. Responses to these requests are provided in **Table 1-1**.

Table 1-1 Applicants' responses to RSPB comments on digital aerial surveys made in their Relevant Representation [RR-049].

RSPB Ref. [RR-049]	RSPB Comment	Applicants' Response
Para. 4.27 - 1	The RSPB are content that digital aerial surveys can provide useful data in order to provide baseline characterisation of an offshore wind farm footprint. This position is informed by the recent review carried out by a sub-group of the NatureScot Scientific Advisory Committee which made specific recommendations with regard to the presentation of results, including the full methodological detail that needs to be provided alongside the outputs. The details the Applicant has provided are scant. In particular, but not exclusively there is:	In general terms the Applicants would like to make it clear that the DAS methods used did not depart in any way from those used for the same purpose (i.e. site characterisation for EIA and Habitats Regulations Assessment (HRA) for all UK offshore wind farms over the last >10 years and have followed the statutory guidance in these matters. Each point has been responded to below.
Para. 4.27 - 2	Insufficient consideration of potential biases in the survey and analysis methods. For example these could be biases arising from both the camera system, such as imperfect detection of smaller species, or from the imperfect identification by the surveyor of the digital images. Any biases such should have been carefully described.	Thorough internal quality assurance (QA) was carried out to ensure that smaller species are detected as much as possible, and to reduce any biases. The QA process was summarised in section 2.2 of **Appendix 12-2 - Technical Appendix** [APP-105] and is expanded upon below. The first step in the QA process, referred to as Image Screening QA, reviewed percentage agreement between two sets of analysts for images identified as positive (containing at least one target of interest) and those identified as blank (not containing any targets of interest). A random sample of 20% of the survey imagery were subjected to a QA audit review, in which agreement in positive

RSPB Ref. [RR-049]	RSPB Comment	Applicants' Response
		images should reach 90% agreement versus the main analysis of the whole survey. Where 90% agreement was not reached, a complete re-analysis of the survey data was undertaken. This consists of analysing each image from the survey again, and additional positives from the re-analysis and QA audit are included in the data. Prior to the second step in the QA process, the tagged data underwent initial data checks, which are a series of discretionary sense checks carried out by QA Analysts. No fixed metrics are associated with these checks, this step provides an additional layer of checks to ensure the tagged data is as accurate as possible. This process involves sense checking tagged images for missed targets such as images or areas containing large aggregations of birds, pods of marine mammals and anthropogenic structures. A selection of images was checked for accuracy in target duplication and a sample of blank images were also checked for potential missed targets around busy areas of the survey. The second step of the QA process, referred to as Species ID QA, reviewed species identifications. All target (snag) identifications made by Marine Wildlife Analysts were reviewed by APEM's dedicated QA team alongside additional checks on target behaviour, age, sex and flight height suitability. Lastly, all data underwent a final review by Technical Specialists before data finalisation. All analysts receive training in species identification from experienced Lead Analysts and APEM's dedicated QA team. They also have access to an in-house Image Archive Library, which is regularly updated. This comprehensive guide is compiled from previously identified individuals in aerial images and is complemented with overhead shots of preserved specimens for relevant species, providing a unique perspective on bird appearance from above. Random blank images throughout the survey are further subsampled during the tagging stage,

RSPB Ref. [RR-049]	RSPB Comment	Applicants' Response
		delivering another layer of checks, ensuring all targets of interest are accounted for. This stage is subject to QA.
Para. 4.27 - 3	There is no consideration of potential response of birds to disturbance arising from the survey e.g. from aircraft shadow. This could be behavioural responses such as flight take off rate or diving rate, that would have implications for the accuracy of the assessment.	APEM have confirmed they take care when designing digital aerial surveys to ensure that birds are not disturbed during surveys and have carried out research into achieving the best compromise between survey altitude for the best quality of imagery, taking cloud base into consideration, and minimising the potential of the aircraft causing flushing. Studies have revealed minimal impacts on bird behaviour from digital aerial surveys, for example, Komenda-Zehnder *et al.* (2003[1]) observed the behaviour of waterbirds was not significantly influenced if aeroplanes flew at 300m above ground level. Furthermore, Thaxter *et al.* (2015[2]) recommend a minimum aircraft height of 460m to avoid disturbance to birds. The surveys for this project were flown at approximately 396m as a good compromise between minimising bird disturbance and acquiring high-resolution imagery to aid in species identification. Additionally, APEM has conducted hundreds of surveys, without any evidence of flushing/birds diving or taking off. Surveys include monitoring the most sensitive species such as common scoter for census projects for Natural Resources Wales in Carmarthen Bay Special Protection Area (SPA) (APEM, 2013[3] & APEM, 2017[4]), and red-throated divers in the Outer Thames Estuary SPA, where birds were recorded behaving naturally and not being flushed. Analysis of APEM's own data provides

[1] Komenda-Zehnder S, Cevallos M, Bruderer B. 2003; Effects of disturbance by aircraft overflight on waterbirds-an experimental approach. Proceedings of the International Bird Strike Committee 26 (1): 157-168.
[2] Thaxter, C.B., Ross-Smith, V.H. and Cook, A.S.C.P. (2015) How high do birds fly? A review of current datasets and an appraisal of current methodologies for collecting flight height data: literature review. British Trust for Ornithology, BTO Research Report No. 666.
[3] Apemltd (2013) Ground and Aerial monitoring for Carmathen Bay SPA: Winter 2012/2023, Countryside Council for Wales, p1-44
[4] Apemltd (2017) Census of common scoter in Carmarthen Bay SPA: winter 2016 – 2017, Natural Recourses Wales, p1-59

RSPB Ref. [RR-049]	RSPB Comment	Applicants' Response
		clear evidence that their methods have not exerted any disturbance on seabirds, any shadow from the aircraft would be offset to the path of the aircraft unless the sun is directly above. If disturbance was a genuine issue APEM would have many thousands of images of birds taking off, which is known not to be the case. Results from various studies have shown there is not a consistent distance at which birds will react to overflights and that disturbance distance likely depends on multiple factors. These studies include: • Buckland, S.T., Burt, L.M., Rexstad, E.A., Mellor, M., Williams, A.E., Woodward, R. (2012) Aerial surveys of seabirds: the advent of digital methods. Journal of Applied Ecology, 49: 960-967. • Kaiser, M.J. (2004) Predicting the displacement of common scoter Melanitta nigra from benthic feeding areas due to offshore windfarms. Report to the Crowne Estate. • Komenda-Zehnder S, Cevallos M, Bruderer B. 2003; Effects of disturbance by aircraft overflight on waterbirds-an experimental approach. Proceedings of the International Bird Strike Committee 26 (1): 157-168.[1] • Gilbert, A.D., Jacques, C.N., Lancaster, J.D., Yetter, A.P. and Hagy, H.M. (2020), Disturbance Caused by Aerial Waterfowl Surveys During the Nonbreeding Season. Journal of Wildlife Management., 84: 1063-1071. https://doi.org/10.1002/jwmg.21874 • Maclean, I.M.D., Skov, H., Rehfisch, M.M. and Piper, W. (2006) Use of aerial surveys to detect bird displacement by wind farms. BTO Research Report No. 446 to COWRIE. BTO, Thetford. • Camphuysen, C.J., Fox, A.D., Leopold, M.F. (2004) Towards standardised seabirds at sea census techniques in connection with environmental impact assessments for offshore wind farms in the UK: A comparison of ship and aerial sampling for marine birds, and their applicability to offshore wind farm

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		assessments. Report commissioned by COWRIE (Collaborative Offshore Wind Research into the Environment). • Apemltd (2013) Ground and Aerial monitoring for Carmathen Bay SPA: Winter 2012/2023, Countryside Council for Wales, p1-44.[3] • Apemltd (2017) Census of common scoter in Carmarthen Bay SPA: winter 2016 – 2017, Natural Recourses Wales, p1-59.[4]
Para. 4.27 - 4	There is insufficient detail provided as to how spatial autocorrelation has been evaluated and if necessary accounted for. Spatial autocorrelation in this instance is the correlation among values of a count variable strictly attributable to their relatively close locational positions, introducing a deviation from the assumption of independent observation. The assessment should explicitly demonstrate an analysis of the data showing whether spatial auto-correlation is present or not.	This was provided in a technical note submitted to the Five Estuaries application which used the same method. During its development it was discussed in that project's Expert Topic Group with Natural England and RSPB and it was agreed to all parties satisfaction. The method used for the Projects is identical to this. Rather than repeating the same information the method details can be obtained from this document. (https://infrastructure.planninginspectorate.gov.uk/wp-content/ipc/uploads/projects/EN010115/EN010115-000275-6.5.4.11%20Design%20based%20bootstrap%20variance%20estimates.pdf) Autocorrelation analysis undertaken for the Projects was discussed with RSPB and Natural England in the Marine Ornithology Expert Topic Group held on 7th February 2023, where no objections regarding methodology were raised by attendees (see **Appendix F - Non-Statutory Consultation and Engagement** [APP-043] for a record of the minutes from this meeting).
Para. 4.27 - 5	There is no rationale provided as to why a grid rather than transect survey design has been used. Both survey designs are commonly used in the assessment of the impacts of offshore wind farms, and	Whilst transect survey designs have historically been the most widely used method of analysis due to development from visual surveys, APEM investigated the most robust methods to utilise and designed the grid survey based on the traditional quadrat ecological surveys.

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	both have strengths and weaknesses. Detail is required as to why a grid design was used for this assessment.	A grid design was chosen because it samples the survey area systematically and is less prone to missing areas of possible significance. Whereas a transect design can provide high coverage for a lower cost per unit area, it does not sample the area evenly and therefore may miss significant portions of area with important underlying environmental variables. As most transect surveys collect data from few transects, there can be much variation between transects in the numbers of individuals recorded. This reduced sample number will increase the confidence intervals in the population estimate and reduce its precision, making it more difficult to assess changes over time. Due to grid cells normally being separated by a large distance, each individual cell can be considered to be a separate and independent sample. The independence of the cells can be formally tested to ensure that there is no pseudo-replication. Grid designs thus normally have a much greater sample number, reducing variation between images and resulting in a greater confidence in the estimate and a high degree of precision. The differences between (a) a transect design and (b) a grid design on spatial distribution across the survey area is shown in the figure below.

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		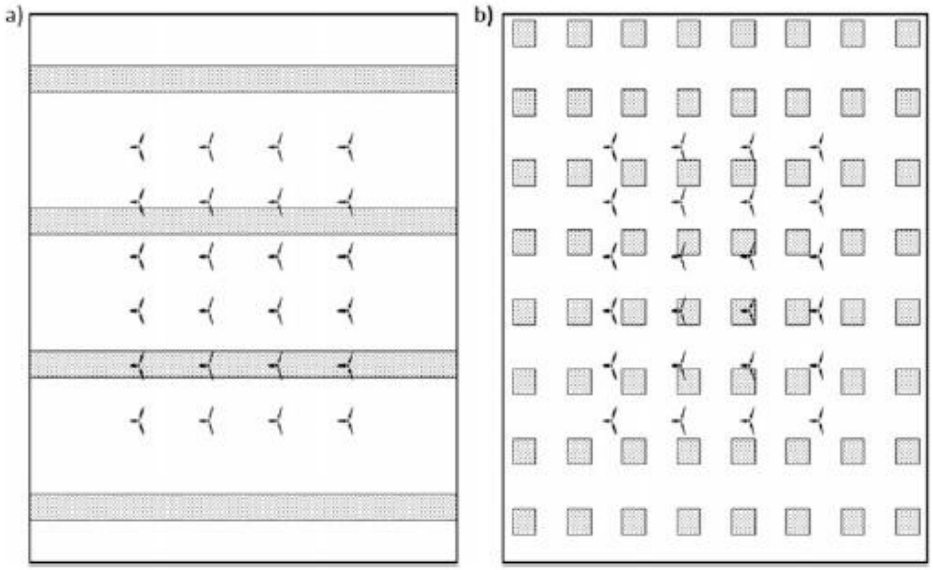
Para. 4.27 - 6	There is no detail given of any independent validation of identification and detection rates. While it is clear that this validation is carried out as part of the internal quality assurance	The Applicants can confirm that no external QA of the underlying dataset was carried out. The underlying survey methodology is in accordance with Natural England's '*Phase I: Expectations for pre-application baseline data for designated nature conservation and landscape receptors to support offshore wind applications'* best practice guidance note[5], which does not include any requirement for external

[5] Parker, J., Banks, A., Fawcett, A., Axelsson, M., Rowell, H., Allen, S., Ludgate, C., Humphrey, O., Baker, A. & Copley, V. (2022a). Offshore Wind Marine Environmental Assessments: Best Practice Advice for Evidence and Data Standards. Phase I: Expectations for pre-application baseline data for designated nature conservation and landscape receptors to support offshore wind applications. Natural England. Version 1.1. 79 pp.

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	procedures of the survey providers, no detail of any independent external quality assurance appears to have been carried out.	quality assurance to be carried out for digital aerial surveys. As detailed in the responses above, a thorough multi-stage internal quality assurance process was followed by APEM in the interpretation of collected raw data which the Applicants consider was sufficient.
Para. 4.27 - 7	No details of the timings of surveys has been provided. This detail is crucial in understanding whether the surveys have adequately captured any diel variation in bird activity.	**Table 1-2** provides the start and stop times for the surveys undertaken for the Projects.

Table 1-2 Start and stop times (GMT) for the DBS digital aerial surveys.

Month-Year	Survey Number	Start Time (GMT)	Stop Time (GMT)
Mar-21	1	10:22:06	17:12:08
Apr-21	2	10:06:07	16:30:39
May-21	3	10:04:05	13:22:14
Jun-21	4	09:15:46	12:33:43
Jul-21	5	08:50:19	15:20:44
Aug-21	6	10:00:44	13:37:15
Sep-21	7	09:06:16	12:19:10
Oct-21	8	11:56:40	15:22:56
Nov-21	9	11:10:23	14:29:27
Dec-21	10	10:15:46	13:10:59
Jan-22	11	11:25:41	14:43:30
Feb-22	12	10:23:01	13:50:56
Mar-22	13	11:00:39	14:33:08
Apr-22	14	09:46:51	13:02:21
May-22	15	12:23:45	15:25:03
Jun-22	16	09:00:55	12:32:01
Jul-22	17	09:23:59	12:45:27
Aug-22	18	13:09:51	16:08:02
Sep-22	19	12:16:33	15:24:52
Oct-22	20	09:41:26	12:44:34
Nov-22	21	09:31:13	13:00:53
Dec-22	22	10:37:44	13:51:41

Month-Year	Survey Number	Start Time (GMT)	Stop Time (GMT)
Jan-23	23	12:05:23	15:25:17
Feb-23	24	10:51:45	13:45:44

RWE Renewables UK Dogger Bank
South (West) Limited

RWE Renewables UK Dogger Bank
South (East) Limited

Windmill Business Park
Whitehill Way
Swindon
Wiltshire, SN5 6PB