Partners in UK offshore wind

MORGAN OFFSHORE WIND PROJECT: GENERATION ASSETS

Technical engagement plan appendices part 4 (Appendix D)

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Image of an offshore wind farm

www.morganandmona.com/morgan

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Prepared by:

RPS

Prepared for:

Morgan Offshore Wind Ltd.

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Appendix D: Offshore Ornithology EWG

D.1. Offshore ornithology EWG overview

Table D.1: Associated minutes from offshore ornithology EWG consultation materials.

Date	Meeting	Information provided
18 February 2022	Offshore ornithology EWG meeting 1	Meeting minutes (D.2.1) Response from the MMO regarding the meeting minutes (D.2.2) Response from Natural England regarding the meeting minutes (D.2.3) Response from JNCC regarding the meeting minutes (D.2.4)
27 May 2022	Natural England, RSPB, MMO, JNCC, TWT	Provision of technical notes outlining the Applicants approach to the offshore ornithology baseline characterisation, displacement and Collision Risk Modelling (CRM) technical reports.
13 July 2022	Offshore ornithology EWG meeting 2	Offshore Ornithology Baseline Characterisation Technical Note for the Evidence Plan Offshore Ornithology Expert Working Group (D.3.1) Response from NRW regarding the Offshore Ornithology Baseline Characterisation Technical Note (D.3.2) Response from JNCC regarding the Offshore Ornithology Baseline Characterisation Technical Note (D.3.3) Response from The Wildlife Trust regarding the Offshore Ornithology Baseline Characterisation Technical Note (D.3.4) Offshore Ornithology Displacement Assessment Technical Note for the Evidence Plan Offshore Ornithology Expert Working Group (D.3.5) Response from NRW regarding the Offshore Ornithology Displacement Assessment Technical Note (D.3.6) Offshore Ornithology Collision Risk Assessment Technical Note for the Evidence Plan Offshore Ornithology Expert Working Group (D.3.7) Response from Natural England regarding the Offshore Ornithology Collision Risk Assessment Technical Note (D.3.8) Response from Natural England regarding the Offshore Ornithology Collision Risk Assessment and Offshore Ornithology Displacement Assessment Technical Note (D.3.9) Response from JNCC regarding the Offshore Ornithology Collision Risk Assessment Technical Note and the Offshore Ornithology Displacement Assessment Technical Note (D.3.10) Response from MMO regarding the Offshore Ornithology Technical Notes (D.3.11) Meeting minutes (D.3.12) Response from JNCC regarding the meeting minutes (D.3.13)

Date	Meeting	Information provided
		Response from Natural England regarding the meeting minutes (D.3.14) Response from NRW regarding the meeting minutes (D.3.15) Advice note from Natural England regarding the HPAI and impact assessment (D.3.16)
30 November 2022	Offshore ornithology EWG meeting 3	Meeting minutes (D.4.1) Response from Natural England regarding the meeting minutes (D.4.2) Response from NRW regarding the meeting minutes (D.4.3) Response from JNCC regarding the meeting minutes (D.4.4)
23 February 2023	Offshore ornithology EWG meeting 4	Meeting minutes (D.5.1) Response from Natural England regarding the meeting minutes (D.5.2) Response from NRW regarding the meeting minutes (D.5.3) Response from JNCC regarding the meeting minutes (D.5.4) HRA Methodology update for Mona/Morgan Generation (D.5.5)
05 May 2023	RSPB, MMO, JNCC, TWT, IoM Defa	Provision of the updated methodology for offshore ornithology HRA Stage 1 screening and the ISAA.
30 June 2023	Offshore ornithology EWG meeting 5	Meeting minutes (D.6.1) Response from JNCC regarding the meeting minutes (D.6.2) Response from Natural England regarding additional actions (D.6.3) Response from Natural England regarding the meeting minutes (D.6.4) Advice to Mona/Morgan regarding EIA scale reference populations for assessment (D.6.5) Response from NRW regarding updated HRA methodology (D.6.6) Response from NRW regarding updated HRA methodology (D.6.7) Provision of Auk ID paper (D.6.8) Response from APEM regarding the Auk ID rate paper (D.6.9) Mona and Morgan Generation Power Analysis report (D.6.10) Response from NRW regarding the Mona and Morgan Generation Power Analysis (D.6.11) Response from Natural England regarding the Mona and Morgan Generation Power Analysis report (D.6.12) Natural England proposed methodology for ‘gap-filling’ the Irish Sea R4 cumulative and in-combination assessments (D.6.13)
10 July 2023	Natural England, RSPB, MMO, JNCC, TWT, IoM Defa	Provision of the technical note presenting the power analysis undertaken at the request of the EWG.
19 October 2023	Offshore ornithology EWG meeting 6	Meeting minutes (D.7.1) Response from NRW regarding the meeting minutes (D.7.2) Response from JNCC regarding the meeting minutes (D.7.3)

Date	Meeting	Information provided
08 December 2023	Offshore ornithology EWG meeting 7	Meeting minutes (D.8.1) Response from NRW regarding the meeting minutes (D.8.2) Provision of Avoidance Rates Technical Note (D.8.3) Provision of Regional Breeding Populations Technical Note (D.8.4) Provision of CEA Historical Projects Application Approach Technical Note (D.8.5)
8 March 2024	Natural England, RSPB, MMO, JNCC, TWT, IoM Defa	Presentation of final impact assessment and HRA. Discussion on remaining outstanding agreements
-	Offshore ornithology EWG agreement log	Agreement log (D.9)

Note: “EWG meeting on 08 March 2024 MoM not available ahead of TEP submission”.

D.2. Offshore ornithology EWG meeting 1

D.2.1 Meeting minutes

MINUTES OF MEETING

Security Classification: Project Internal

Partners in UK offshore wind

MOM Number	:	20220217_Morgan and Mona Ornithology EWG01	**REV. No.** :	F02
MOM Subject	:	Morgan and Mona Evidence Plan Ornithology expert working group meeting 1.		

MINUTES OF MEETING

MEETING DATE	:	18/02/2022
MEETING LOCATION	:	Microsoft Teams
RECORDED BY	:	[redacted] (RPS)
ISSUED BY	:	[redacted] (RPS)

PERSONS PRESENT:

- [redacted] – bp (GV)
- [redacted] – bp (MP)
- [redacted] – bp (WD)
- [redacted] – RPS (KL)
- [redacted] - RPS (ST)
- [redacted] – RPS (MA)
- [redacted] – RPS (LM)
- [redacted] – Natural England (AuB)
- [redacted]
- [redacted] – Natural England (RB)
- [redacted]
- [redacted] – MMO (SJ)
- [redacted]
- [redacted] -JNCC (JB)
- [redacted] – TWT (GdJC)
- [redacted]
- [redacted] – RSPB (AM)

APOLOGIES:

- [redacted] (NRW)
- [redacted] (NRW).

ITEM NO:	DISCUSSION ITEM:	Responsible party	Date
1.	**Introduction** (Presented by KL) This meeting is the first expert working group for offshore ornithology for Morgan and Mona. So far, we've held two Evidence Plan (EP) Steering Group (SG) meetings for the projects in November and December as well as the first Benthic (BE), Fish and Shell Fish (FSF) and Physical Processes (PP)		

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

	consultation scheduled for early 2023. The Mona DCO application is currently planned to be submitted in Q4 2023 and the Morgan DCO planned for Q1 2024. **Indicative export cable corridor** The Applicants anticipate that there will be two Points of Interconnection (POIs), one for Morgan on the northwest coast of England and one for Mona on the north Wales coast. At the moment the Applicants are considering a number of POI options. The decision on the location of the POI for each Project is determined by National Grid and at this time we do not know where the POI will be. Once the Applicants have clarity around this, they will present this information to the steering group (SG). The Applicants have received feedback from TCE that scoping must be carried out on the full preferred bidder areas. This is to ensure consistency between the TCE plan-level HRA and the round 4 scoping reports. The Applicants have refined down the preferred bidding area for Mona and are not currently looking to develop the northern section (the so called 'dinosaur's head'). The figure on the slides shows the area currently considered as the Mona Potential Array Area, however scoping will be undertaken on the larger Mona preferred bidder area (including the 'dinosaur head'). **Evidence Plan process** (presented by KL) The Evidence Plan (EP) process has been developed following the Planning Inspectorate and Defra guidance. The Applicants have also considered draft guidelines provided by Natural England [1]. The EP process is a mechanism for the Applicants to agree with the stakeholders what is needed to be included with the consent application and to discuss any issues or concerns. The aim is to agree as much as possible during the pre-application phase so only key issues are left for examination. The EP has historically been HRA focused however in line with recent best practice, the Applicants propose to extend this to include the EIA process for ecology topics, including designated sites such as SSSIs and MCZs. The Applicants are proposing to carry out a single EP process for both projects. The projects will have separate agreement logs to account for the differences between the projects ahead of the DCO applications. Meeting minutes will also note any differences between the projects.		
	EWG (presented by KL) The aim of the EWGs will be to discuss and where possible, agree key topics for the EIA and HRA so we are only left with key issues at examination. . The EP Template was issued to the SG early in 2021 and has been updated following receipt of comments. If there are any other comments, please let us know in writing after the meeting. The Applicants are seeking to agree the remit of the EWG. The indicative		

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

	timeline of the EWG meetings is subject to change (particularly the latter meetings) but this gives stakeholders an indication of the number of meetings and expected timings to inform their resourcing over this time. Broad approach to EWGs as set out in the Ways of Working (WoW) document circulated prior to the meeting: • Information circulated to EWG minimum 2 weeks ahead of meeting. • Meeting is held with attendees prepared to comment on materials provided. • Full meeting minutes will be taken, and agreement logs will be compiled where matters are agreed, and after each meeting the minutes and agreement log will be circulated. • Minutes and agreement logs to be returned/agreed within 2 weeks following receipt, alongside written comments on documents submitted. The agreement log and meeting minutes will be ultimately be appended to the DCO application.		
3.	**Offshore ornithology** (presented by MA) The APEM aerial surveys were designed with a 10km buffer around a previous indicative array area for Mona which did not include the northern section (referred to as the 'head of the dinosaur'). As we have had feedback from TCE that we must scope on the full Mona bidding area (including the 'head of the dinosaur') the aerial surveys do not achieve a full 10km buffer. A full 10km buffer is reached to the east, west and south of Mona. The buffer for the Morgan aerial survey reaches 10km all the way round, including to the south and this overlaps with Mona therefore data can be amalgamted if necessary. This is not considered to be necessary at this stage. The justification for the 10km buffer was due to red-throated diver (RTD) (a feature of the Liverpool Bay SPA). Preliminary results over the first year of surveys for Mona recorded only three RTD, therefore it is becoming clear that due to the low numbers of RTDs recorded the Mona Potential Array Area should not be an issue for this species (noting that we have only analysed one full year's data so far). AM- Do you know what heights the APEM planes were flying at during the aerial surveys? MA- We can check this and feed back (Subsequent input from MP to say that the planefly at a 396m altitude and a speed of circa 120 knots. The images are captured at 1.5 cm ground survey distance, with a minimum coverage of 12% of the sea surface analysed). AM- Did the surveys record any RTD in the Morgan survey area? MA- We don't have the full winter data set for Morgan yet therefore we don't know number of RTD at this point. <u>Survey feedback</u>		

	Previous feedback on the survey methodology has included suggesting the use of a 10km buffer around the Morgan and Mona sites due to the proximity to the Liverpool Bay SPA which includes RTD as a qualifying feature, a species known to be sensitive to displacement from offshore wind farms. Previous consultation requested feedback on the use of LiDAR surveys to capture site-specific flight height data. However, due to lack of sufficient research, Natural England did not endorse the use of LiDAR as a method for collecting flight height data to parameterise collision risk models; as such it has not been progressed by the Applicants and flight heights will be assumed using existing literature. GV- The Morgan and Mona array boundaries put forward during TCE Round 4 process were specifically designed to be 10km from the Liverpool Bay SPAs. This was done on the basis of the MacArthur Green advice to TCE during the tendering process to reduce the development risk in the east Irish Sea. This is therefore important project specific mitigation, considered as part of the site selection process, to avoid impacts on these sensitive receptors. <u>Preliminary results</u> Based on the first 12 months of data from the Mona aerial surveys, the presentation slides present information on the key species recorded (kittiwake, guillemot, manx shearwater, and gannet). The density estimates have been calculated using the APEM design based abundance approach i.e. by averaging values from the grid cells. <u>Desk top sources</u> The presentation shows a non-exhaustive list of desk top data sources that will be used alongside the site-specific data to characterise the baseline. AM- There is a lot of available tracking data that has been done for the SPAs in the area. Oxford University has done some tracking data around Skomer and Skokholm. Swansea University have done some tracking of guillemot. Also tracking data available on gannets from Ailsa Craig and Grassholm. It is worth looking at site-specific tracking data to give context to general desktop data sources. JB – agreed that tracking datasets would be a useful dataset. MA- Yes, we will look at these. And we will consider site specific foraging ranges in the literature as well as compiled generic data. KL- If there are any more specific tracking studies please let us know. Send the reference in writing after the meeting and we will follow it up. RB- Are you looking to produce design based estimates or model based estimates to be used? MA- We are exploring the modelling option using MRSea. This option makes data easy to manipulate and use for assessments.	**AM and JB to provide a link to the specific tracking studies referenced**	15/03/2022

	RB-Are the density surfaces presented in this presentation KDE (Kernel Density Estimates)? MA-Yes, they are. RB- Have the Applicants looked at the data from the old R3 Irish Sea zone? The distribution of Manx shearwater on that project was higher than has been recorded in these site-specific surveys. Possibly the hotspots were more associated with the Irish Sea Front so may be further west. There were hot spots across multiple species also recorded in the R3 Irish Sea Zone surveys. MA- Not yet but it will be considered. KL- The Rhiannon offshore wind farm boundaries were a bit further to the west towards the Irish sea front. GV- Was involved in that project and recalled that the Manx shearwater were further west than the Morgan and Mona projects, associated with the Irish Sea Front. RB- I think this is correct, further west of these projects. JB- Will there be any consideration of impact on bird prey resources? This may extend beyond the boundary of the Morgan and Mona wind projects themselves. Particularly relevant in relation to the SPAs in the area. KL- Yes, the fish and shellfish data for the area will be analysed and detailed baseline characterisation will be undertaken. The impact assessment for the fish and shellfish topic will consider the impact of all phases of the project on fish and shellfish receptors, including those that may be bird prey resources (particularly herring and sandeels). This will feed into the ornithology assessment which will consider the impact on bird prey resource. The initial benthic site-specific surveys are indicating that neither the Morgan or Mona areas have a high suitability for sandeel habitat or herring spawning habitat, the main bird prey resources. However, these are initial results only, will full detail to be provided in the fish and shellfish technical report. JB- There are a few internal JNCC projects which might help understand the baseline e.g. diet requirement for Manx shearwater. Let us know when you start to have results from the fish and shellfish technical report. JNCC will point the Applicants towards what they have done at that point.		
4.	**Intertidal ornithology (Presented by LM)** The Applicants have commenced surveys at a number of landfalls close to potential Points of Interconnection. The Surveys commenced in Sept/Oct 2021. Comprising preliminary landfall areas, extending minimum 500 m in each direction along the coast (buffer zone). The intertidal surveys will look at birds up to 1.5km offshore from Mean High Water Spring (MHWS). Recording sectors are segregated in 500m zones in which we count birds and map the locations of individual birds as well as recording bird behaviour.		

	The frequency of 'through the tide count' over the tidal cycle varies between landfall sites, and counts go down to one every 2 hours for low usage areas. Early stakeholder comments on the methodology also request that level of baseline disturbance are accounted for. The surveys will also record the perceived effect of disturbance on bird abundance and distribution for each count. The aim of the nocturnal surveys is to determine the difference between counts in the day and night. Early indications are a similar assemblage is being recorded with a lower abundance during the night. The optical equipment for surveying during the night is limited to 400m. The Applicants are currently reviewing the data and considering the rationale for extending the survey to the end of April for sites that are within SPAs. Preliminary findings can be presented at the next EWG meeting. KL-The Applicants are currently looking at a number of landfall options in the area, although only one will be chosen for each project. In the absence of a decision by National Grid on the POI, this is , therefore, potentially redundant work, but required to maintain the programme. Once National Grid identify the POIs, the landfalls will be subject to further consultation. At this time we can't present where the potential landfall locations are. AD- Would it be possible to share the locations of the survey to check on additional sensitivities in the area from local knowledge? When will you hear from National Grid? That may be a more suitable time to discuss this. KL- The Applicants are likely to hear from National Gird in March/April. We will then know where the export cable corridor will connect, if the projects are granted a radial connection. The scoping report is planned to be submitted in April, and this will present which POI the projects will be using and a broad search area for the export cable corridor. Over the next couple of months the Applicants will be looking to refine the export cable corridor so after scoping will be the best time to discuss. AD/AB- There are also undesignated inland areas that may support birds associated with SPAs local knowledge may be useful when this information is known. KL- We are also planning to have an onshore ecology EWG, which will be arranged once the POIs for each project is known.		
5.	**Questions** MA- Worth discussing the offshore export cable corridor and the approach to characterisation of this part of the project areas. Our intention is to rely on available desktop data for the export cable corridor. There is a lot of data in the area and this approach is standard for offshore wind farm transmission assets. KL- This is an area of the Irish Sea that is well studied and there is a lot of desktop data available for baseline characterisation.		

	LB- Using the desktop study to start the assessment on export cable corridor is fine. It would be useful to know what opportunities there will be for gathering new survey data even if it is just to verify the desktop data. MA- Due to the compressed timescales, there will be limited opportunities for new surveys once the results of the OTNR and National Grid POI decision are announced. KL- Given the amount of data available and relative low risk from cable laying operation the proportionality of additional survey data would need to be considered. We can look at this once the desktop data has been fully reviewed and we know the specific data that covers the landfall and export cable corridor once these are known. LB- This sound like a sensible approach. Thinking in terms of consistency around advice in other areas and the data requirements for other projects. There will need to be an element of a risk assessment of just relying on the desktop data. MA- Up to 10km of the export cable corridor closest to the array will have been covered by the aerial seabird surveys, and the sea up to 1.5km from the coast will have been covered by the intertidal waterbird surveys. We can take the opportunity to compare our aerial and coastal survey results with the desk study data. AD- RSPB request more detail than presented in the outline in these slides to be able to provide agreement on approaches. The RSPB would not be able to agree the survey methodology without further detail, the RSPB has not been party to the discussion that have gone on previously on the survey methodology. KL- Comment from RSPB is noted, we can look at that internally. If further information is not provided after this meeting, it will be within the scoping report. AD- That's fine we can look at it at scoping.		
6.	**Next steps** (Presented by KL) Confirmation on POIs from National Grid. Scoping scheduled for April 2022. The Applicants would look for agreement on the following points following the meeting: • Agreement on the Remit and Inputs to the EWG (as set out in Section 4.4 of the Evidence Plan Template); • Agreement on Ways of Working Documents, including timescales; • Agreement on broad approach to aerial surveys; • Agreement on broad approach to landfall surveys; and • Agreement on board approach to characterisation of the export cable corridor for ornithology.	**All- to fill in agreement log to provide progress of agreement for each of the points listed.**	15/03/2022

7.	**Close of meeting**		

D.2.2 Response from the MMO regarding the meeting minutes

Marine Management Organisation

Marine Licensing
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Hampshire Court
Newcastle upon Tyne
NE4 7YH

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

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

Our reference:
ENQ/2021/00033

06 April 2022

Dear [redacted]

Morgan and Mona Offshore Windfarm – Expert Topic Group Meetings

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

Comments

Shellfisheries

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

Underwater Noise

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

Benthic Ecology

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

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

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

Fisheries and Fish Biology

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

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

Coastal Processes and Physical

7. No comments at this stage.

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

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

Conclusion

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

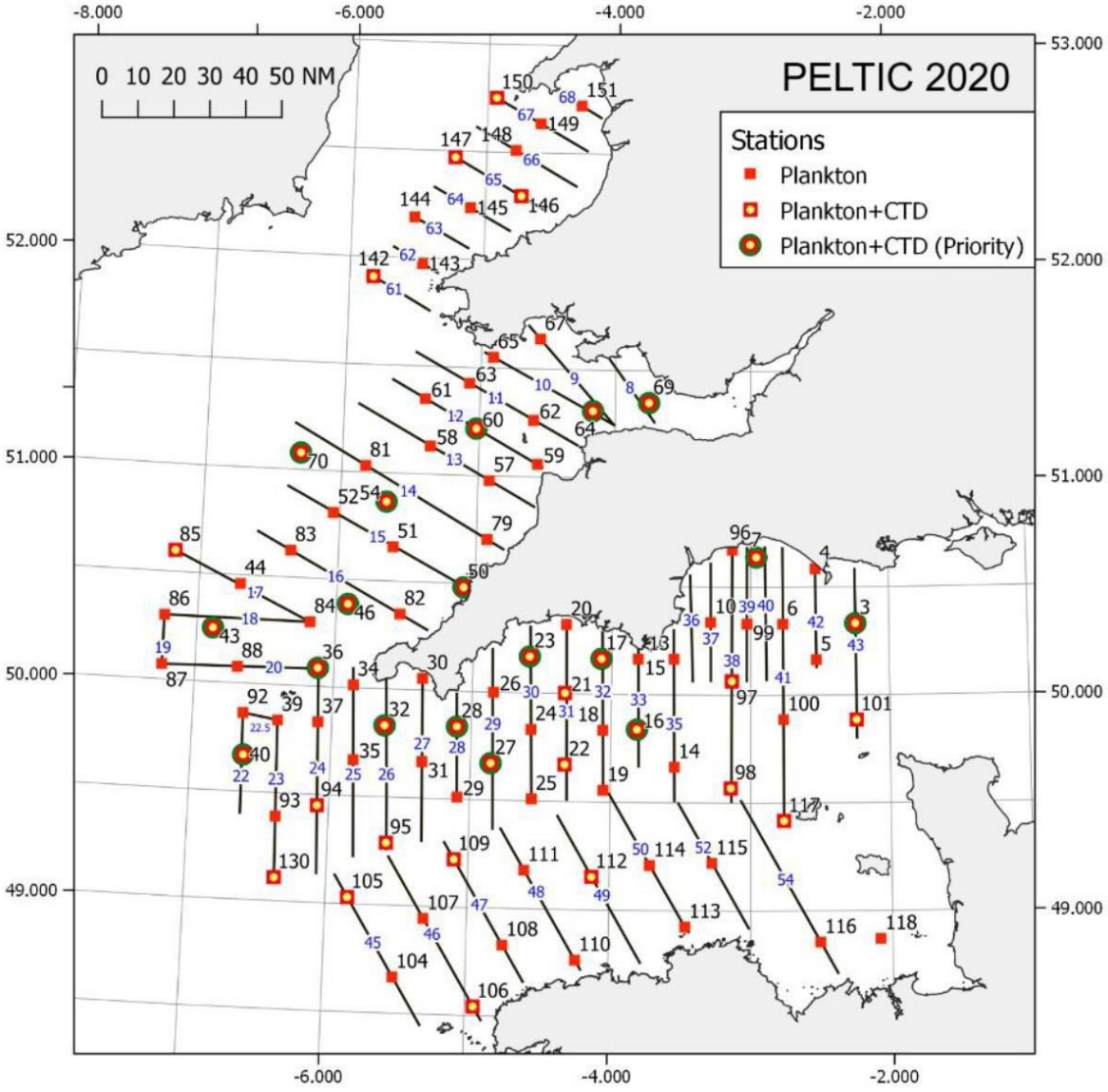
If you wish to discuss any of the points further, please don’t hesitate to contact me.

Yours sincerely,

[redacted]
Marine Licensing Case Officer

[redacted]
[redacted]

Annex 1 – Map of Survey Stations for the PELTIC survey



D.2.3 Response from Natural England regarding the meeting minutes

Date: 10 March 2022
Our ref: DAS/UDS A000566 / 381738
Your ref: Ornithology EWG01

[redacted]
BP Alternative Energy Investments Limited

c/c [redacted]
RPS/ Energy

BY EMAIL ONLY

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

[redacted]

Dear [redacted]

Discretionary Advice Service (Charged Advice) - UDS A000566
Contract Reference: BP EnBW Morgan and Mona Offshore Wind Farm
Consultation: Ornithology EWG01

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

The following advice is based upon the information presented in the Ornithology Expert Working Group (EWG) Meeting 1 (attended on 18 February 2022) and subsequent meeting notes provided on the 1st March 2022 by [redacted].

Natural England were asked to provide advice upon:

1. Agreement on the remit of the EWG;
2. Agreement on Ways of Working document;
3. Agreement on the approach to the aerial and landfall surveys;
4. Agreement on the broad approach to baseline characterisation.

1. Agreement on the remit of the EWG

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

The remit of the Offshore Ornithology as set out under 4.4 of the Evidence Plan (v F02) is appropriate and in line with Natural England's previous comments, we agree the remit as set out. We welcome the outlined timetable of future meetings as presented in Table 4.6 to enable resource planning.

We would advise that consistency is used in reference to the name of this EWG; it has been referred to as Offshore, Offshore and Coastal and simply Ornithology EWG. We recommend that Ornithology EWG would be most appropriate if discussions which include the intertidal, and potentially inland along cable corridors, ornithology aspects are to be discussed going forward.

2. Agreement on Ways of Working document

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

Natural England agrees with the Ways of Working document which aligns with previous comments in terms of timescales for review and comment provided as part of our comments on the draft Evidence

Plan (4 November 2022). As noted in the document, it may be necessary for timescales to be amended to ensure sufficient time to review and comment (e.g. large documents or multiple documents), in which case we will communicate and agree an alternative deadline.

3. Agreement on the approach to the aerial and landfall surveys

We agree with the survey method set out for the aerial surveys, as set out for the area covered and frequency of coverage, as well as the grid based design and a 12% surface analysis coverage.

Natural England agree with the survey method presented for the intertidal and nearshore waterbird surveys, which align with our previous advice (our reference 362549 and 374171, provided 25 August 2021 and 12 November 2021 respectively). As previously stated, we would welcome further discussion regarding the potential continuation of these surveys to cover May to July inclusive so as to cover any passage waders. Once there has been further refinement on the Points of Interconnection for the cables, we would welcome further discussion or update on any changes to the locations for these surveys.

As raised in the meeting, we would highlight the risk assessment based on the desk based study where surveys have not been planned, i.e. along the cable route between the array Zone of Influence and the intertidal survey areas. This risk assessment should be considered on the age of the data used. Natural England have commissioned a report using existing data to analyse the abundance and distribution of bird features of Liverpool Bay SPA, this report has not yet been published. Once it is finalised we will be able to provide a copy, this may be useful towards your desk based study although may still be limited due to age of data.

We recognise the aim to publish the Preliminary Environmental Information Report (PEIR) for formal consultation in early 2023. This would only allow for one full year of overwintering intertidal bird survey data (surveys starting in winter 2021) to be presented, and for the Morgan sites it is unlikely that the full 24 month survey effort will be completed or data analysed. Natural England highlight the risk that the additional data collection could have potential to change the conclusions, which could cause potential delays to the project. Natural England have previously advised (Natural England reference: DAS/UDS A000566 / 374171, dated 12 November 2021) that two years of survey effort is the minimum expected evidence standard for bird data, and seeks confirmation that the timetable set out for DCO submission allows for this evidence standard.

4. Agreement on the broad approach to baseline characterisation

The approach to the baseline characterisation, using site-specific data and contextualisation from wider reports and evidence, as set out in the Ornithology EWG meeting is supported. We welcome the data sources listed and again refer to the currently unpublished report, which may be of use to be incorporated to contextualise the primary data collection.

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

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

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

You can access the new SPOL site from the following links:
Environmental considerations for offshore wind and cable projects - Home (sharepoint.com) or
https://defra.sharepoint.com/sites/WorkDelivery2512/SitePages/Home.aspx

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

Additional comment

During the meeting there was a request for additional data sources, although not necessarily relevant for current work, Natural England have recently published a report regarding functionally linked habitat for Special Protection Area (SPA) waterbirds in the North West of England[1] which may be of use in future aspects of the project.

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

Yours sincerely

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

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

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

Cc [redacted]

[1] Bowland Ecology 2021. Identification of Functionally Linked Land supporting SPA waterbirds in the North West of England. NERC361. Natural England

D.2.4 Response from JNCC regarding the meeting minutes

From: [redacted]
To: [redacted]
Cc: [redacted]
Subject: RE: Morgan Mona Ornithology 1st EWG Meeting
Date: 15 March 2022 17:12:00
Attachments: image002.jpg
image003.jpg
image004.png
image005.png
image006.jpg
EOR0801_Mona_Ornithology_EWG01_Agr Log DRAFT F01_JNCC_Comments.docx
EOR0801_Morgan_Ornithology_EWG01_Agr Log DRAFT F01_JNCC_Comments.docx

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Good afternoon [redacted]

Please find attached the Mona and Morgan logs complete with JNCC comments.

As mentioned in our benthic response JNCC's role in relation to offshore renewables in English waters has been delegated to Natural England. Natural England is now authorised to exercise the JNCC's functions as a statutory consultee in respect of certain applications for offshore renewable energy installations in inshore and offshore waters (0-200nm) adjacent to England. Therefore, JNCC would not look to provide comment on the Morgan project unless we anticipate an impact on a jointly managed site (i.e a site jointly managed by ourselves and Natural England). As such JNCC have completed both the Mona and Morgan projects with respect to ornithological issues.

One of the actions on from the EWG was for JNCC to provide a link to the specific tracking studies referenced during the meeting (15/03/2022). Please see below:

Tracking studies

A summary of tracking studies carried out which may be relevant are listed below, with the lead researcher to whom correspondence should be sent in order to source tracking data.

Gannets at Grassholm have been tracked during chick-rearing for 11 years (2006 and 2010–19) using GPS tags by the University of Exeter, with research led by [redacted].

Manx shearwater at Skomer have been tracked during incubation and chick-rearing between 2006 and 2019 using GPS tags by the University of Oxford, with research led by [redacted].

Common guillemot at Skomer have been tracked as juveniles and adults form 50 years using leg rings by the University of Sheffield, with research led by Professor Tim Birkhead.

Kind regards,

[redacted]

Offshore Industries Adviser
Marine Management Team
JNCC, Inverdee House, Baxter Street, Aberdeen, AB11 9QA

[redacted]

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

jncc.gov.uk

D.3. Offshore ornithology EWG meeting 2

D.3.1 Offshore Ornithology Baseline Characterisation Technical Note for the Evidence Plan Offshore Ornithology Expert Working Group

Partners in UK offshore wind

MORGAN AND MONA OFFSHORE WIND PROJECTS

Offshore ornithology baseline characterisation technical note for the Evidence Plan Offshore Ornithology Expert Working Group.

24 May 2022
F01

Document status

Version	Purpose of document	Authored by	Reviewed by	Approved by	Review date
F01	Final for EWG	LM/MA	KL	KL	24/05/2022

Approval for issue

[Name]	[Signature]	[Date]

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

1 OFFSHORE ORNITHOLOGY BASELINE CHARACTERISATION TECHNICAL NOTE

1.1 Background and aims

1.1.1.1 This technical note outlines the approach proposed to characterise the baseline conditions in the offshore environment for the Mona and Morgan Offshore Wind Projects. It is intended to provide the Ornithology Expert Working Group (EWG) with additional details supplementary to the Scoping reports and the Ornithology EWG consultation meeting held on 18 February 2022. Specifically, it describes the methods proposed to characterise the abundance and distribution of seabirds in the offshore ornithology study area using existing data sources and site-specific surveys. The focus is on the characterisation of the Morgan and Mona Array Areas and appropriate buffer zones around them, using desk study and site-specific aerial digital surveys.

1.1.1.2 Characterisation of the full length of the offshore cable corridors (i.e. in the intertidal areas as well as seaward of Mean Low Water Springs) is not specifically covered in this technical note, but we note the EWG advice regarding a risk assessment approach to the use of desk-based information to characterise the baseline within the offshore cable corridors and assess the potential impacts of the Morgan and Mona Offshore Wind Projects' offshore export cables. Baseline data for the intertidal areas potentially impacted by the cable landfall up to 1.5km seaward of Mean High Water Springs will be provided by bespoke coastal waterbird surveys, the method for which was agreed by Natural England following the Ornithology EWG Meeting 1, subject to consideration of extension of the surveys into the May to July period. We also highlighted that the aerial digital surveys provide data covering the 10km length of the cable corridor closest to the Morgan and Mona Array Areas, facilitating some cross-validation with desk-based data sources.

1.1.1.3 For the purpose of this technical note, the overarching term 'seabird' is used to refer to species that depend on the marine environment for survival at some point in their life cycle. Therefore, in addition to the true seabirds, seaducks and divers and grebes are also included because of their additional reliance on marine areas, especially in the non-breeding season.

1.2 Review of existing data sources

1.2.1.1 Evidence sources and existing datasets will be reviewed to define the seabird baseline conditions and support the findings of the site-specific surveys. Both scientific and grey literature will be reviewed, together with information gathered from relevant seabird tracking campaigns. A full list of the data sources reviewed and their inclusion in the baseline species accounts will be provided in the Preliminary Environmental Information Report (PEIR) and Environmental Statement. Natural England have indicated their support of the data sources listed during the Ornithology EWG Meeting 1 consultation (which will also be listed in the Scoping report) and have highlighted the forthcoming availability of a commissioned report using existing data to analyse the abundance and distribution of bird features of Liverpool bay SPA, which may be useful for the desk study and to contextualise the site-specific survey data. JNCC have also provided links to three relevant tracking studies (gannets at Grassholm; Manx shearwater at Skomer; common guillemot at Skomer) which will be included in the desk-based review, providing useful context regarding the likely connectivity between seabirds and the Morgan and Mona Offshore Wind Projects.

1.2.1.2 In addition to summarising findings from desk-based studies, we will be using the supplementary spatial data from Waggitt *et al*. (2020) and Bradbury *et al*. (2014) to produce a series of species maps showing the spatial variation in densities across seasons (breeding and non-breeding) in the Mona and Morgan offshore ornithology study areas. As the spatial coverage of both datasets overlapped with the two Morgan and Mona Offshore Wind Projects, the findings provide context and validate findings from the site-specific surveys. Using data from Waggitt *et al*. (2020) and Bradbury *et al.* (2014), average density per season will be mapped and abundance estimates produced for the Mona and Morgan Array Areas (together with associated impact buffer zones: +2km and +4km) for comparison with the site-specific aerial digital survey data (discussed below).

1.3 Site-specific surveys analysis

1.3.1.1 Aerial digital surveys for seabirds have been undertaken by APEM in each of the Morgan and Mona Offshore Wind Project's offshore ornithology study areas, which include the Morgan and Mona Array Areas plus buffer zones of up to 10km (Figure 1). A full 10km buffer has been achieved around the Morgan Array Area. There have been changes in the proposed Mona Array Area since the design of the aerial survey (it was based on the Mona Core Survey Area shown in Figure 1) therefore the buffer only extends to 4km to the north of the Mona Array Area. The surveys for each of the Morgan and Mona Offshore Wind Projects will comprise a suite of 24 monthly surveys spanning two years. Surveys for the Mona Offshore Wind Project have been completed monthly between March 2020 and February 2022. Monthly surveys for the Morgan Offshore Wind Project commenced in April 2021 and will complete in March 2023. The grid-based survey method collects data over 30% of the sea surface with analysis of images across 12% of the offshore ornithology study area (the survey area), conforming with current industry best-practice. Subsequent to the Ornithology EWG Meeting 1, Natural England and JNCC have provided agreement to the survey methods and coverage that were described during the consultation. JNCC have requested further rationale regarding the flight altitude of 396m with evidence to demonstrate that sensitive species are not disturbed by the survey aircraft; this information has been requested from the aerial survey contractor, APEM, which will be provided in subsequent consultation.

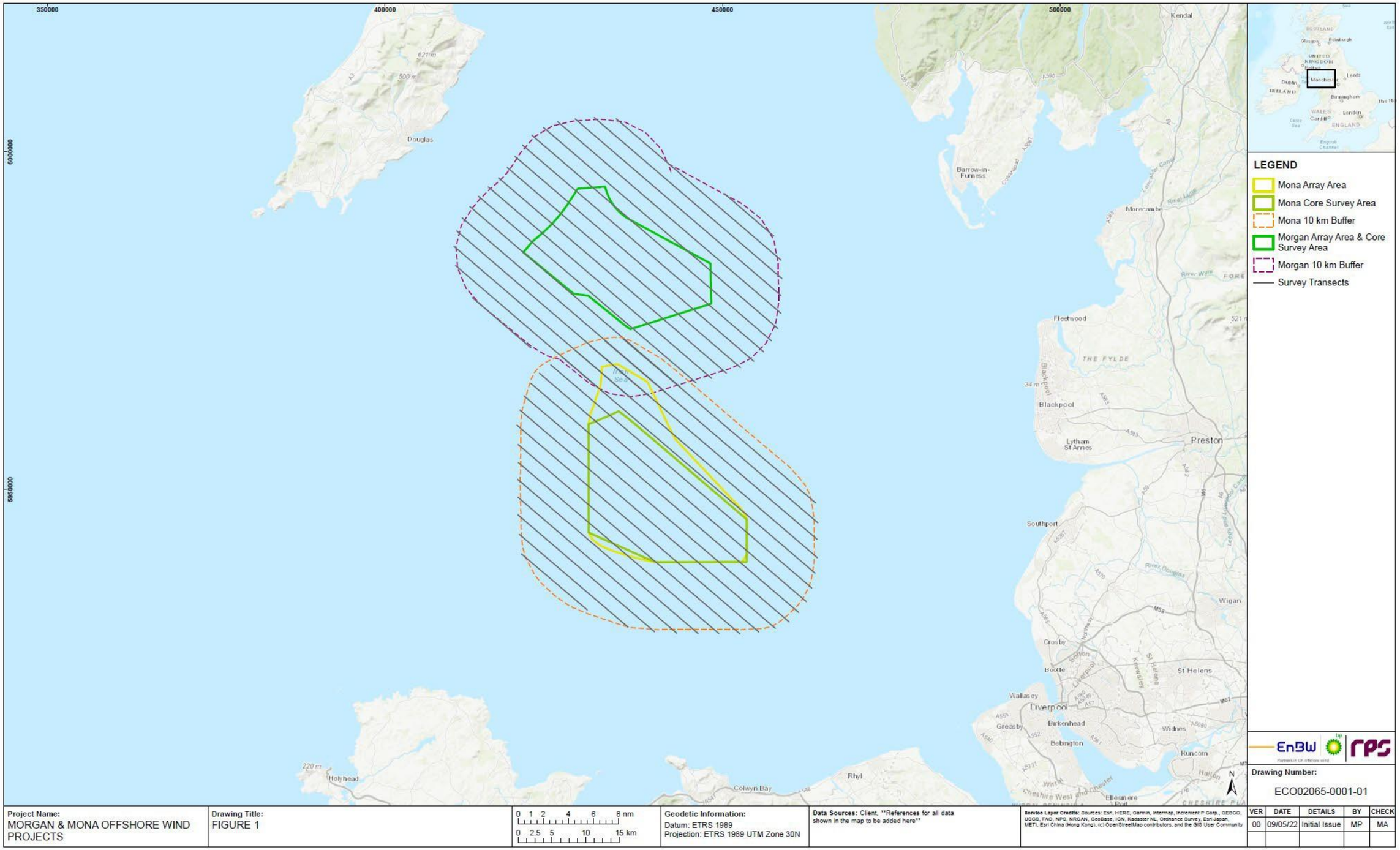

Figure 1: Aerial digital survey areas for Mona and Morgan Offshore Wind Projects

1.3.1.2 The aerial digital survey data will be analysed to provide seabird abundance estimates and densities within the appropriate areas relative to the Morgan and Mona Array Areas. Model-based and design-based estimates will be produced for seabirds with sufficient sightings to derive robust estimates. All bird behaviours (flying and sitting) will be included in this analysis.

1.4 Model based estimates of abundance and densities

1.4.1.1 We propose to use the MRSea package to predict spatial density and abundance of the five most abundant seabird species (black-legged kittiwake, northern gannet, common guillemot, razorbill and Manx shearwater) across the offshore ornithology study areas or relevant impact areas (e.g. array area only, array area+2km) alongside 95% confidence intervals to provide a measure of uncertainty in the estimates. The model is not appropriate for species with low abundance, for which design-based estimates will be provided (see below).

1.4.1.2 MRSea is a modelling package executable in the R environment (R Core Team, 2021) based on the generalised additive model framework (GAM), fitting splines through 1- and 2-dimensional data (staged approach). The basic model to explain bird abundance has the following form: Species Count ~ Month + offset(log(area)), family=quasipoisson. In the first (1-dimensional) stage, the basic model will be expanded to include water depth, bathymetric slope, bathymetric aspect, and water flow direction as both linear and smoothed explanatory variables. In the second (2-dimensional) stage, the x-y coordinates will be fitted to the best model from stage 1 using SALSA, and with month as an interaction term, allowing for different density surfaces to be estimated for different months. The best models will be selected in a model selection framework using the quasi-Bayesian information criterion (QBIC). The final model for each species will be used to predict the numbers and densities of birds across an environmental grid within the offshore ornithology study area. To calculate the absolute estimate from the relative estimate, a correction factor will be applied to account for availability bias for species that spend time diving underwater. Furthermore, in the case of 'unidentified' birds recorded during the surveys, those unidentified birds will be apportioned to the individual species that make up that group by applying correction factors.

1.5 Design based estimates of abundance and densities

1.5.1.1 Design based estimates for seabird numbers and densities in each month within the relevant impact areas will be generated for all other focal species. For the five more abundant focal species, they will be compared with the MRSea estimates to provide comparison with the MRSea outputs. Design-based estimates and confidence intervals will be produced using a non-parametric bootstrapping procedure with 1,000 iterations in the R environment (R Core Team, 2021). A variance for each of the population estimates will be derived from the 1,000 iterations of the non-parametric bootstrap. Upper and lower estimates of the 95% confidence intervals will be calculated from the variability in the 1,000 values generated.

1.6 Apportioning of unidentified species

1.6.1.1 The proportion of birds that are recorded, but not identified to species level, will be apportioned to the individual species that make up that group. For example, in the case of unidentified common guillemot/razorbill (i.e. 'large auk'), they should be apportioned to common guillemot and razorbill recorded during the surveys. In accordance with best practice (Natural England, 2021a), apportioning will be based on the proportion of birds identified to species level within the same survey. The known (relative) species estimates for each survey month are increased by proportionally assigning the numbers of the unknown species groups to each of the relevant known species.

1.7 Correction factors to account for availability bias

1.7.1.1 To account for birds that may be missed during the digital aerial surveys when they are foraging beneath the water surface, the numbers of birds observed in the surveys will be divided by the proportion of time that a bird is expected to be visible at the surface. As such, it is proposed to adjust the relative numbers of birds for availability bias in the baseline characterisation report. Availability bias correction factors will only be applied to estimates of abundance of birds sitting on the sea surface and not applied to birds in flight (Natural England, 2021a). Correction factors applied to sitting common guillemots and razorbill will be based on JNCC (2013), which assumes that approximately 24% of common guillemot and 17% of razorbill are underwater when aerial imagery is captured.

1.7.1.2 The availability bias correction and apportioning of unidentified species to species converts the relative abundance/density estimates to absolute estimates for each area described.

1.8 Data presentation and interpretation

1.8.1.1 In line with the Offshore Wind Marine Environmental Assessments: Best Practice Advice for Evidence and Data Standards (Natural England, 2021b), monthly abundance estimates and densities will be presented in tabulated format for each behaviour and area (Project array area, plus 2km, 4km and 10km buffer zones or whole survey area). The abundance estimates will be discussed in the context of findings from the other existing data sources reviewed.

1.9 References

Bradbury, G., Trinder, M., Furness, B., Banks, A.N., Caldow, R.W. and Hume, D. (2014) Mapping seabird sensitivity to offshore wind farms. PloS one, 9(9), p.e106366.

Joint Nature Conservation Committee (2013) JNCC Expert Statement on Ornithological Issues for Written Representations in Respect of East Anglia ONE Offshore Windfarm by Dr Sophy Allen. Joint Nature Conservation Committee, Aberdeen.

Natural England (2021a) Offshore Wind Marine Environmental Assessments: Best Practice Advice for Evidence and Data Standards. Phase III: Expectations for data analysis and presentation at examination for offshore wind applications.

Natural England (2021b) Offshore Wind Marine Environmental Assessments: Best Practice Advice for Evidence and Data Standards. Phase I: Expectations for pre-application baseline data

for designated nature conservation and landscape receptors to support offshore wind applications.

R Core Team (2021) R: A language and environment for statistical computing. R Foundation for Statistical Computing, Vienna, Austria. URL https://www.R-project.org/.

Waggitt, J.J., Evans, P.G., Andrade, J., Banks, A.N., Boisseau, O., Bolton, M., Bradbury, G., Brereton, T., Camphuysen, C.J., Durinck, J. and Felce, T. (2020) Distribution maps of cetacean and seabird populations in the North-East Atlantic. Journal of Applied Ecology, 57(2), pp.253-269.

D.3.2 Response from NRW regarding the Offshore Ornithology Baseline Characterisation Technical Note

Morgan & Mona Offshore Wind Projects: Ornithology Expert Working Group

[redacted]
Senior Marine Advisor

8th June 2022

Introduction

This advice is provided in response to the **Offshore Ornithology Baseline Characterisation Technical Note** received via email on **24th May 2022**, for the Evidence Plan Offshore Ornithology Expert Working Group.

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

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

The recipient acknowledges that:

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

Advisors Consulted:

Marine Ornithology

Advice

Key Issues

- NRW Advisory (A) advise that further information on how the survey design has been arrived at is needed, including results of a power analysis to detect the sample size required for the analysis of aerial survey data.

- Please note that revised guidance is available for Red-Throated Diver displacement – please refer to the Joint SNCB Interim Advice On The Treatment Of Displacement For Red-Throated Diver (2022). Figure 1 of the Baseline Characterisation Technical Note appears to show a 10 km buffer around the whole site, as such, the reasons for not including survey data from a full 10 km buffer around the site(s) is unclear.

Detailed comments

Section 1.2 Review of existing data sources

NRW (A) agree that the sources described will provide useful supplementary data for the baseline characterisation. Additional supplementary data (e.g. tracking data) and information may be found in a number of other sources including:

- The outputs of the Marine Ecosystems Research Programme (https://www.marine-ecosystems.org.uk/Research_outcomes/Top_predators)
- FAME (Future of the Atlantic Marine Environment project and STAR (Seabird Tracking and Research) (https://marine.gov.scot/information/fame-star-seabird-kittiwakes-guillemots-razorbills-and-shags-tracking-projects).
- Review of Seabird Demographic Rates and Density Dependence: (https://data.jncc.gov.uk/data/897c2037-56d0-42c8-b828-02c0c9c12d13/JNCC-Report-552-REVISED-WEB.pdf)
- Wetland Bird Survey https://www.bto.org/our-science/projects/wetland-bird-survey
- Non-Estuarine Waterbird Survey https://www.bto.org/our-science/publications/research-reports/results-third-non-estuarine-waterbird-survey-including

A literature search of published research papers and reports may also provide supplementary information to the applicant.

NRW (A) advise that although the supplementary spatial data presented in Bradbury *et al*., (2014) is useful, care should be taken as it does not cover all Welsh sites.

NRW (A) advise that data collected for this project (e.g. digital aerial surveys) should be the primary data source used for the analysis, with other data used for supplementary purposes.

Section 1.3 Site-specific survey analysis

Please note that there is revised guidance available for Red-Throated Diver displacement in the Joint SNCB Interim Advice On The Treatment Of Displacement For Red-Throated Diver (2022). *Figure 1: Aerial digital survey areas for Mona and Morgan Offshore Wind Projects* appears to show a 10 km buffer around the whole site, as such, the reasons for not including survey data from a full 10 km buffer around the site(s) is unclear.

NRW (A) advise that further information on how the survey design has been arrived at is needed, including more detail on the justification for the analysis of images across 12% of the offshore ornithology study area. To determine whether survey coverage and design provide an adequate baseline characterisation, NRW (A) advise that evidence from a power analysis is used. The level of coverage required to be sufficient for baseline characterisation will depend on the nature of the area being surveyed and the abundance and distribution of receptors across the area. A power analysis should be undertaken to inform survey design and ensure that such designs maximise the probability of detecting changes in abundance and distribution through future comparison with data that may be collected post-consent. Webb *et al.,* (2014) provide some examples of power analyses applied to sampling of focal bird species within a marine Special Protection Area (SPA).

Section 1.7 Correction factors to account for availability bias

NRW (A) advise the use of the following correction factors as outlined in JNCC (2013):

- Guillemot: 1.311
- Razorbill: 1.211
- Puffin: 1.165

Section 1.8 Data presentation and interpretation

NRW (A) advise that the applicant also provides records of all species detected from aerial surveys.

References

Bradbury, G., Trinder, M., Furness, B., Banks, A.N., Caldow, R.W. and Hume, D. (2014) Mapping seabird sensitivity to offshore wind farms. PloS one, 9(9), p.e106366.

Johnston, A., Cook, A.S.C.P., Wright, L.J., Humphreys, E.M. & Burton, N.H.K. (2014) Modelling flight heights of marine birds to more accurately assess collision risk with offshore wind turbines. *Journal of Applied Ecology*, **51**: 3141.

Joint Nature Conservation Committee (2013) JNCC Expert Statement on Ornithological Issues for Written Representations in Respect of East Anglia ONE Offshore Windfarm by Dr Sophy Allen. Joint Nature Conservation Committee, Aberdeen.

Joint SNCB Interim Advice On The Treatment Of Displacement For Red-Throated Diver (2022). https://data.jncc.gov.uk/data/9aecb87c-80c5-4cfb-9102-39f0228dcc9a/interim-sncb-advice-rtd-displacement-buffer.pdf

Webb, A., Bradbury, G., Burt, L. & Hexter, R. (2014). Digital aerial surveillance of inshore waterbirds in Liverpool Bay Special Protection Area. JNCC, Peterborough.

Woodward, I., Thaxter, C.B., Owen, E. & Cook, A.S.C.P. (2019) Desk-based revision of seabird foraging ranges used for HRA screening. Report by BTO for Niras and TCE. BTO Research Report No. 724. BTO, Thetford.

D.3.3 Response from JNCC regarding the Offshore Ornithology Baseline Characterisation Technical Note

Joint Nature Conservation Committee

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

Email: [redacted]

jncc.gov.uk

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

JNCC Reference: OIA-08762
Date: 7 June 2022

Dear [redacted],

Morgan and Mona Offshore Wind Projects, Offshore Ornithology Baseline Characterisation Technical Note: Version F01

Thank you for consulting JNCC on the Morgan and Mona Offshore Wind Projects, Offshore Ornithology Baseline Characterisation Technical Note (Version F01), dated 24 May 2022, which we received on 24 May 2022.

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

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

Ornithology Comments

1.2.1.2 Note that density data contained within Bradbury et al 2014 includes red-throated diver. When generating maps and abundance estimates for red-throated diver using the Bradbury et al 2014 data, we advise that this covers the Mona and Morgan Array Areas plus a 10km buffer zone to complement the spatial coverage of both the aerial surveys and the joint SNCB advice regarding red-throated diver displacement analysis.

1.4.1.1 We advise that MRSea is used to predict spatial density and abundance for the array area plus 10km buffer for each of the most abundant species (black-legged kittiwake, northern gannet, common guillemot, razorbill and Manx shearwater). There is emerging evidence that

displacement can have an effect beyond 2km to species such as guillemot, kittiwake, and gannet (Peschko et al 2020; Peschko et al 2021). In the event that sufficient robust evidence comes to light to suggest that a displacement assessment is carried out beyond 2km for some species, it would be useful to already have spatial density and abundance estimates generated.

1.4.1.2 & 1.7.1.2 Note that the apportioning of unidentified species and availability bias correction should be carried out the order of apportioning then availability correction to ensure that all unidentified species (once apportioned) are corrected for availability bias.

1.7.11 We agree with the proposed correction factors to apply to guillemot and razorbill due to availability bias. Note that an availability bias should also be applied to puffin, based on the proportion of time that puffins available at the surface as 0.8584 (Spencer 2012).

References

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(Fratercula arctica), and nest-site characteristics of alcids on Petit Manan Island, Maine, M.Sc. thesis, University of Massachusetts, Amherst. 75 p.

Please contact me with any questions regarding the above comments.

Yours sincerely,

[redacted]

Offshore Industries Adviser

Email: [redacted]

Telephone: [redacted]

D.3.4 Response from The Wildlife Trust regarding the Offshore Ornithology Baseline Characterisation Technical Note

From: [redacted]
To: [redacted]
Cc: [redacted]
Subject: RE: Morgan and Mona Offshore Wind Projects offshore ornithology technical papers
Date: 09 June 2022 10:29:13
Attachments: image002.png

CAUTION: This email originated from outside of RPS.

Hi [redacted],

I can confirm that I we have no comments on the Ornithology Baseline Characterisation Technical Note

Kind regards,
[redacted]

From: [redacted]
Sent: 08 June 2022 15:29
To: [redacted]
Cc: [redacted]
Subject: FW: Morgan and Mona Offshore Wind Projects offshore ornithology technical papers

> **CAUTION:** This email originated from outside the organisation. Do not click links or open attachments unless you recognise the sender and know the content is safe, if unsure please contact IT

Hi [redacted],

Please can you send me any comments The Wildlife Trust has on the ornithology Baseline Characterisation Technical Note for the Morgan and Mona projects or confirm if you do not have any comments.

Kind Regards,
[redacted]

D.3.5 Offshore Ornithology Displacement Assessment Technical Note for the Evidence Plan Offshore Ornithology Expert Working Group

Partners in UK offshore wind

MORGAN AND MONA OFFSHORE WIND PROJECTS

Offshore ornithology displacement assessment technical note for the Evidence Plan Offshore Ornithology Expert Working Group.

27 May 2022
F01

Document status

Version	Purpose of document	Authored by	Reviewed by	Approved by	Review date
F01	Final for EWG	LM/MA	KL	GV	26/05/22

Approval for issue

[Name]	[Signature]	[Date]

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

1 OFFSHORE ORNITHOLOGY DISPLACEMENT TECHNICAL NOTE

1.1 Background and aims

1.1.1.1 This technical note outlines the approach proposed to assess the potential impacts of displacement of seabirds for the Mona and Morgan Offshore Wind Projects. It is intended to provide the Ornithology Expert Working Group (EWG) with additional details supplementary to the Mona Offshore Wind Project Scoping Report[1] and the Mona/Morgan Ornithology EWG consultation meeting held on 18 February 2022. Specifically, it describes the methods proposed to quantify the potential impact of the displacement of seabirds from the Mona and Morgan Array Areas and appropriate buffer zones around them, using baseline data from the aerial digital surveys described in the Offshore ornithology baseline characterisation technical note (Document name: Morgan Mona_Ornithology_EWG02_Baseline Charcterisation_F01).

1.1.1.2 Displacement effects occurring along the offshore cable corridors (seaward of Mean Low Water Springs) are not specifically covered in this technical note, but we note the EWG advice regarding a risk assessment approach to the use of desk-based information to characterise the baseline within the offshore cable corridors and assess the impacts of the Projects' offshore export cables.

1.1.1.3 Disturbance as the result of activities during the construction, operational and maintenance and decommissioning phases of a wind farm has the potential to displace birds from an area of sea in which the activity is occurring. For the purpose of this assessment, displacement is defined as the reduced density of birds occurring near wind turbines, due to long-term disturbance leading to functional habitat loss (Marques *et al.* 2021). Species differ greatly in their susceptibility to disturbance. Species sensitivity to disturbance in response to offshore windfarms has been quantified by, for example, Garthe and Hüppop (2004), Furness *et al*. (2013), Bradbury *et al*. (2014) and Wade *et al.* (2016).

1.1.1.4 The Statutory Nature Conservation bodies (SNCB) have produced guidelines to assess seabird displacement associated with offshore wind farms (SNCB, 2017). The guidelines promote the use of a displacement matrix approach (i.e. representing proportions of birds potentially displaced/dying as a result of offshore wind farm development). Using the above approach, we proposed to assess the displacement effect associated with the Mona and Morgan Array Areas.

1.2 Outline of proposed approach

1.2.1.1 As sensitivity to displacement differs considerably between seabird species, we will screen and progress species for matrix stage using 'Disturbance Sensitivity' and 'Habitat Specialisation' scores from Bradbury *et al*. (2014) (expanded from Furness *et al*. 2013) as recommended by the Joint SNCB Interim Displacement Advice Note (SNCB, 2017). The assessment will be based on the overall mean seasonal peak number of birds (average of the highest seasonal vales in each year of survey) in the Mona and Morgan Array Areas with the appropriate buffer zone. Finally, we will populate displacement matrix tables based on the displacement and mortality values recommended by the SNCB (2017) and assess the displaced population against relevant population during the breeding and non-breeding season.

1.3 Screening species for displacement assessment

1.3.1.1 Seabird species that qualify under the sensitivity assessment will be progressed to the matrix table stage. We will consider the more abundant species within the Mona and Morgan offshore ornithology study areas for which there are sufficient sightings to produce robust model and/or design-based abundance estimates and have potential to contribute materially to cumulative effects. These are likely to comprise common guillemot, razorbill, northern gannet and possibly Atlantic puffin (to be confirmed; this species has been relatively scarce in the baseline surveys).

1.3.1.2 Red-throated diver and sea ducks are priority species for displacement assessment given their high sensitivity to disturbance from offshore wind farms. As part of the site selection process, a 10km buffer was applied to the Liverpool Bay Special Protection Area (SPA) to minimise impacts on offshore ornithology receptors. As a result, these species have been extremely rarely recorded in the Mona and Morgan offshore ornithology study areas and they are therefore unlikely to be subject to detailed assessment in relation to displacement from the Mona and Morgan Array Areas. These species will, however, be given consideration in relation to the installation of the offshore export cables, which coincides with part of the Liverpool Bay SPA.

1.3.1.3 Using the 'Disturbance Sensitivity' and 'Habitat Specialisation' scores from Bradbury *et al*. (2014) (expanded from Furness *et al*. (2013)), SNCB (2017) recommends that species considered more sensitive to displacement (species with scores of 3 or higher in either 'Disturbance Sensitivity' and 'Habitat Specialisation' category) should be selected in the matrix table stage. SNCB (2017) also recommends that northern gannet are taken forward to the matrix table stage (albeit with a score of 2) given that there are empirical studies demonstrating that the species is sensitive to displacement and barrier effects (Krijgsveld *et al*., 2011; Vanermen *et al*., 2013). A more recent study has also shown that northern gannet strongly avoided wind farms (Peschko *et al*., 2021).

1.4 Abundance estimates

1.4.1.1 Abundance estimates will be generated from the data collected through the programme of aerial digital surveys carried out in the Mona and Morgan offshore study areas, which extend up to 10km around the Mona and Morgan Array Areas. The full methodology is presented in the Offshore ornithology baseline characterisation technical note submitted to the Ornithology EWG as part of the Evidence Plan (Document name: Morgan Mona_Ornithology_EWG02_Baseline Charcterisation_F01).

1.4.1.2 Mean seasonal peak population estimates of each species will be calculated to provide the number of birds at risk of displacement impacts, including upper and lower 95% confidence intervals. Seasons will be defined according to the breeding, non-

[1] https://infrastructure.planninginspectorate.gov.uk/projects/wales/mona-offshore-wind-farm/

breeding and migratory periods using seasonal divisions proposed for Biologically Defined Minimum Population Scales (BDMPS) by Furness (2015) (Table 1.1). The seasonal divisions will be adjusted as necessary to reflect local colony-specific information where it may be available.

Table 1.1: Seasonal definitions, from Furness (2015).

Species	Pre-Breeding Season/spring migration	Breeding season	Migration-free breeding season	Post Breeding Season/autumn migration	Non-breeding/winter season
Common guillemot	n/a	March – July	March – June	n/a	August – February
Razorbill	January – March	April – July	April – June	August – October	November – December
Atlantic puffin	n/a	April – early August	May-June	n/a	Mid-August – March
Northern gannet	December – March	March – September	April – August	September – November	n/a

1.4.1.3 As an example of the mean seasonal peak population calculation, for common guillemot which breeds from March to July, we will average the peak count for the breeding season in Year 1 of baseline surveys (which occurred in March) and the peak count in the breeding season of Year 2 (which occurred in April). In accordance with SNCB (2017), we will estimate displacement as affecting birds present both in flight and sitting on the water (whether foraging or loafing), having accounted for availability bias (birds that may be underwater at the time of the survey). Therefore, abundance estimates of birds recorded in flight and sitting will be combined to derive the mean seasonal peak population at risk of displacement. Where possible, data relating to age classes of each species will also be reported, although the values used in the matrices will relate to all birds.

1.4.1.4 For each of the species considered above, displacement impacts will be quantified for the population derived within each of the Mona and Morgan Array Areas plus 2km buffer. SNCBs recommend for most species a standard displacement buffer of 2km with the exception of the species groups of divers and sea ducks as they can be affected at distances over 4km (Natural England, 2021). As noted above, those species have very rarely been recorded in the offshore ornithology study area during the baseline surveys and will be screened out of detailed assessment of displacement from the Mona and Morgan Array Areas. They will be considered in relation to the installation of the offshore export cables.

1.5 Displacement and mortality rates in the matrix

1.5.1.1 Mean seasonal peak values for each relevant season will be entered into the displacement matrix. The matrix presents a range of potential displacement (each 10% interval between 10-100%) and mortality rates (1, 2, 5 and then each 10% interval up to 100%), with the potential displacement levels and mortality scenario cells then highlighted to provide appropriate values for assessment. These values require agreement with the SNCBs through the Ornithology EWG.

1.5.1.2 The likely displacement and mortality rates we propose to use for the assessment of impacts on the key species are shown in Table 1.2. These ranges are derived from the Joint SNCB Interim Displacement Advice Note (SNCB, 2017) or considering precedents from other recent offshore wind farm applications (e.g. Norfolk Vanguard, East Anglia ONE North and Hornsea Four).

Table 1.2: Displacement and mortality rates for use in the assessment.

Species	Displacement rates	Mortality rates	Source
Common guillemot	30 – 70%	1-10% (with lower end of range preferred for assessment)	SNCB (2017)
Razorbill	30 – 70%	1-10% (with lower end of range preferred for assessment)	SNCB (2017)
Atlantic puffin	30 – 70%	1-10% (with lower end of range preferred for assessment)	SNCB (2017)
Northern gannet	60 – 80%	1%	East Anglia ONE North, Hornsea 4 and Norfolk Vanguard; based on reference to Cook *et al.* (2018), Skov *et al.* (2018), Leopold *et al.* (2011) and Furness & Wade (2012)

1.6 Assessing impacts against appropriate populations

1.6.1.1 The values derived from the matrices are then related to reference population scales to determine if the level of potential additional mortality is likely to lead to population level consequences. We will follow SNCB (2017) to assess the displacement effect against the appropriate population scale.

1.6.1.2 For the breeding season, the assessment will be done against an appropriate regional population scale (covering the total colony counts within mean-maximum foraging range plus one standard deviation). Foraging ranges will be initially identified from Woodward *et al.* (2019), although colony specific information will be reviewed and used to derive appropriate foraging ranges if it is available. Species-specific mean-max (+1S.D.) foraging ranges compiled by Woodward *et al.* (2019) will be used to select the relevant colonies (SPA and non-SPA) and calculate appropriate breeding population sizes. The location of the breeding sites will be sourced from data.gov.uk (Seabird Nesting Counts (British Isles)). The latest colony counts will be sourced from the Seabird Monitoring Programme (SMP) online database (https://app.bto.org/seabirds/public/index.jsp).

1.6.1.3 Similarly, the assessment will be done against an appropriate population scale during the non-breeding season using biological populations (BDMPS) defined by Furness (2015), in accordance with SNCB guidance (2017).

1.6.1.4 The additional mortality predicted as a result of displacement will be highlighted in the context of baseline mortality in the population; baseline mortality rates will be derived

from Horswill and Robinson (2015) and consideration will be given to age classes within the populations.

1.7 References

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D.3.6 Response from NRW regarding the Offshore Ornithology Displacement Assessment Technical Note

Morgan & Mona Offshore Wind Projects: Marine Ornithology Displacement and Collision Risk Modelling

[redacted]
Senior Marine Advisor

7th July 2022

Introduction

This advice is provided in response to the Projects Morgan and Mona Displacement and Collision Risk Modelling (CRM) Technical Notes provided via email by RPS on 27/05/22.

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

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

The recipient acknowledges that:

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

Advisors Consulted:
Marine Ornithology

Advice

Key Issues

- NRW Advisory (A) would like to have sight of the survey data and/or results of modelling before we are able to conclude if further assessment is needed for displacement of any species, including Red Throated Diver and sea duck species.

- NRW (A) advise that displacement and mortality rates for all species assessed should present a full range of variability for displacement and mortality rates, following the precautionary approach.

- NRW (A) welcome further discussion between the applicant and the other SNCBs to agree the appropriate assessment methods for Manx Shearwater collision risk, and other species with activity patterns that do not align well with survey methods.

- NRW (A) note that the applicant has proposed alternative input parameters for gannet collision risk modelling. We advise that further discussion is needed between the applicant and the other SNCBs to agree appropriate assessment methods for gannet collision risk, and to account for Nocturnal Activity Factors (NAFs).

- For species which may be impacted by both collision and displacement (e.g. gannet), the impacts from both should also be considered cumulatively. The SNCBs regard the two impacts (collision and displacement) as additive and advise that they should be summed. Further information on this is available in the Joint SNCB Interim Displacement Advice Note (2022).

Detailed comments

Displacement:

- The Joint SNCB Interim Displacement Advice Note, originally published in 2017, was updated January 2022 to include reference to the Joint SNCB Interim Advice on the Treatment of Displacement for Red-Throated Diver. The 2022 version can be downloaded from https://data.jncc.gov.uk/data/9aecb87c-80c5-4cfb-9102-39f0228dcc9a/joint-sncb-interim-displacement-advice-note-2022.pdf.

- Table 1.2 in the displacement assessment technical note submitted by the applicant appears to suggest presenting only a 1% mortality rate for Northern Gannet. NRW (A) advise that displacement and mortality rates for all species assessed should present a full range of variability for displacement and mortality rates, following the precautionary approach. NRW (A) agree with the production of matrix approach tables, i.e. representing proportions of birds potentially displaced/dying as a result of the development. However, displacement assessments need to present data and predicted impacts in a way that allows the full range of uncertainty (e.g. around input data, analysis, methodology) to be understood and evaluated. There will be uncertainty around the predicted impacts in the assessments: some of this comes from natural variability and uncertainty in the input data (e.g. densities of birds at a site) and some of which is due to imperfect understanding of how systems work (e.g. effects of displacement on mortality of birds). In order to be able to

make an assessment of the significance of potential impacts on populations it is necessary to understand and, where possible, take account of this uncertainty. To account for this, NRW (A) advise that assessments of displacement should use the information on uncertainty and variability in the input parameters (e.g. bird densities, mortality and displacement rates) to allow consideration of the range of values predicted impacts may fall within, and to allow an assessment of confidence in the conclusions made regarding adverse effects on site integrity and significance of impacts for populations. NRW (A) advise that displacement matrices are presented for the mean peak bird population estimates and the upper and lower confidence limits of these. Assessments should also be conducted on range of predictions based on considering a range of mortality and displacement rates. Further advice on the ranges of displacement and mortality rates can be found in the Joint SNCB Interim Displacement Advice Note (2022). Matrices should be presented separately for the different biological periods for sensitive species, depending on when birds are present at the development site and its buffer. The overall assessment should sum the seasonal impacts to give an annual impact prediction.

- NRW (A) note that the applicant suggests that they do not need to do a detailed Red-Throated Diver assessment as the site is outside the 10 km buffer from Liverpool Bay SPA and because the species has been recorded infrequently in surveys. NRW (A) would like to have sight of the survey data and/or results of modelling before we are able to conclude if further assessment is needed for displacement of any species, including Red Throated Diver and sea duck species.

- Displacement should be assessed for construction, operation and decommissioning. NRW (A) advise that displacement during construction is assessed as 50% of the displacement during operation.

Collision

- NRW (A) agree with the use of Johnston *et al*., (2014) flight height data, as other methods of flight height collection have not been proven.

- NRW (A) note that the applicant has highlighted that baseline surveys may not provide an accurate representation of activity for species such as Manx Shearwater, which may be more active during the night, dusk and dawn. NRW (A) welcome further discussion between the applicant and the other SNCBs to agree the appropriate assessment methods for collision risk for Manx Shearwater and other species which may be affected by this issue.

- NRW (A) note that the applicant has proposed alternative input parameters for gannet collision risk modelling. NRW (A) advise that further discussion is needed between the applicant and the other SNCBs to agree appropriate assessment methods for gannet collision risk, and to account for Nocturnal Activity Factors (NAFs).

- Nature Scot (2014) describes the main parameters that should be used for collision risk assessments. Due to uncertainty NRW (A) recommend the use of a wide variety of parameters. NRW (A) advise that collision risk assessments need to present data and predicted impacts in a way that allows the full range of uncertainty (e.g. around input data, analysis, methodology) to be understood and evaluated. Assessments should use the information on uncertainty and variability in the input parameters (e.g. bird densities, flight

heights, avoidance rates, nocturnal activity) to allow consideration of the range of values predicted impacts may fall within, and to allow an assessment of confidence in the conclusions made regarding adverse effects on site integrity and significance of impacts for populations. However, the current Band (2012) model cannot incorporate combined uncertainty/variation across all of these input parameters. Therefore NRW (A) advise that multiple outputs from the Band model are obtained by running it for each individual variation in bird density, or flight height, or nocturnal activity etc. and presenting these outputs. Information on the Band model (including the Excel file required to run the model) can be found under the SOSS-02 project information at: http://www.bto.org/science/wetland-and-marine/soss/projects

- NRW (A) agrees with the use of SOSSMAT (or Micropath) for collision risk modelling of non-seabird species, such as estuarine SPA features. As the applicant suggests, for migrant seabird species such as skuas or terns, which do not migrate following straight lines between a point of origin and a destination, alternative approaches are required. These can include: (1) Estimating the number of a species of bird migrating through a wind farm footprint area based on an apportionment of migrant bird numbers across a broad migratory front. This approach is largely consistent with WWT Consulting & MacArthur Green Ltd. (2014). (2) Factoring flux in by using the mean peak monthly densities from the site-specific surveys to calculate the number of passages of each species and assuming the density in any month was constantly maintained both by day and night. Whichever approach is taken, the value calculated for the number of birds potentially passing through the site should then be inputted into the CRM spreadsheet and a CRM assessment carried out for each relevant species, with the predicted mortality assessed against the baseline mortality for the relevant population.

Collision and displacement

- NRW (A) note that proposed methods for collision risk and displacement have been described in separate documents. However, NRW (A) advise that for species which may be impacted by both collision and displacement (e.g. gannet), the impacts from both should also be considered cumulatively. The SNCBs regard the two impacts (collision and displacement) as additive and advise that they should be summed. Further information on this is available in the Joint SNCB Interim Displacement Advice Note (2022).

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D.3.7 Offshore Ornithology Collision Risk Assessment Technical Note for the Evidence Plan Offshore Ornithology Expert Working Group

Partners in UK offshore wind

MORGAN AND MONA OFFSHORE WIND PROJECTS

Offshore ornithology collision risk assessment technical note for the Evidence Plan Offshore Ornithology Expert Working Group.

Image of an offshore wind farm

27 May 2022
F01

Rev00
04 April 2022

Document status

Version	Purpose of document	Authored by	Reviewed by	Approved by	Review date
F01	Final for EWG	LM/MA	KL	GV	26/05/2022

Approval for issue

[Name]	[Signature]	[Date]

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

1 OFFSHORE ORNITHOLOGY COLLISION RISK MODELLING TECHNICAL NOTE

1.1 Background and aims

1.1.1.1 This technical note outlines the approach proposed to assess the potential impacts of collision risk to seabirds for the Mona and Morgan Offshore Wind Projects. It is intended to provide the Ornithology Expert Working Group (EWG) with additional details supplementary to the Mona Offshore Wind Project Scoping Report[1] and the Mona/Morgan Ornithology EWG consultation meeting held on 18 February 2022. Specifically, it describes the methods and modelling parameters proposed to quantify the potential collision risk to seabirds from the Mona and Morgan Offshore turbine arrays using baseline data from the aerial digital surveys described in the Offshore ornithology baseline characterisation technical note (Document name: Morgan Mona_Ornithology_EWG02_Baseline Charcterisation_F01).

1.1.1.2 During the operational phase of the Mona and Morgan Offshore Wind Projects, the turning rotors may present a risk of collision for seabirds that fly within close proximity to the turbines. Stationary structures, such as the tower, nacelle or when rotors are not operating, are not expected to result in a material risk of collision. When a collision occurs between the turning rotor blade and the bird, it is assumed to result in direct mortality of the bird, which potentially could result in population level impacts. Species differ in their susceptibility to collision risk, depending on their flight behaviour and avoidance responses, and the vulnerability of their populations (Garthe and Hüppop, 2004; Furness and Wade, 2012; Wade *et al*., 2016). The structure and operation of the turbines can also affect the risk to birds, with factors such as rotor speed, blade size, pitch angle and height above the sea surface all influencing the magnitude of risk. Artificial lighting may also change the risk for some species (e.g. shearwaters and petrels), although there is little available evidence to quantify that risk.

1.1.1.3 Advice on the approach to the assessment of collision risk has been presented by Natural England (Natural England, 2021), which recommends the application of the deterministic Band Collision Risk Model (CRM; Band, 2012) to quantify the risk and estimate mortality. Details of how to apply the CRM are set out under the SOSS-02 project information[2]. We follow the established best practice approach in assessing collision risk for the Mona and Morgan Offshore Wind Projects but seek to allow for flexibility where emerging evidence becomes available that might influence the assessment. The stochastic Collison Risk Model (sCRM) (McGregor *et al.*, 2018) is not currently recommended; however, it provides a user-friendly ShinyApp interface which can be run deterministically and provides a useful audit trail of input parameters and outputs. This enables reviewers to easily assess and reproduce the results of any modelling scenario.

1.2 Outline of proposed approach

1.2.1.1 Collision risk will be quantified using the deterministic Band model approach (Band, 2012), although model runs will be carried out accounting for variation in physical parameters, avoidance rates and upper and lower confidence limits in the population estimates to provide upper and lower collision risk estimates. The collision risk models will incorporate currently recommended avoidance rates and nocturnal activity factors (Cook *et al*., 2014; SNCB, 2014), although these will be presented alongside estimates based on other rates, if emerging evidence from monitoring studies indicates any likely updates to the previously published rates. Other physical modelling parameters, including bird size, flight speed, flight type etc, will follow best practice and consistency with other recent offshore wind farm applications, such as East Anglia ONE North, Norfolk Vanguard/Boreas and Hornsea Thee/Four. The proposed parameters are set out in Table 1.1 and Table 1.2.

1.3 Screening species for collision risk assessment

1.3.1.1 A precautionary approach will be taken to include technical CRM for most species that are recorded with more than negligible frequency in the Mona and Morgan Array Areas. The suite of species recorded during the baseline surveys will be screened in or out of detailed assessment based on the species' frequency of occurrence in flight (translating to density) in the Mona and Morgan Array Areas and their reported vulnerability to collision (Garthe and Hüppop, 2004; Furness and Wade, 2012; Wade *et al*., 2016). We expect these to comprise: black-legged kittiwake, great black-backed gull, European herring gull, lesser black-backed gull, northern fulmar, Manx shearwater and northern gannet. Auk species are not considered to be vulnerable to collision risk impacts and will be excluded from the collision risk assessment.

1.4 Density estimates

1.4.1.1 Monthly density estimates of seabirds in flight within the Mona and Morgan Array Areas (the footprint with no buffers), including upper and lower 95% confidence limits, will be generated from the data collected through the programme of aerial digital surveys carried out in the Mona and Morgan offshore study areas, which extend up to 10km around the Mona and Morgan Array Areas. The full methodology is presented in the Offshore ornithology baseline characterisation technical note submitted to the Ornithology EWG as part of the Evidence Plan (Document name: Morgan Mona_Ornithology_EWG02_Baseline Charcterisation_F01).

1.4.1.2 There will be two density estimates for each calendar month as the baseline survey programme spans 24 monthly samples across two years. The input parameter for the CRM for each month will be the mean of the two corresponding months.

1.5 Flight heights and CRM option

1.5.1.1 Flight heights for CRM may take the form of simple species-specific proportions at rotor swept height, or of species-specific flight height distributions. Either can be derived from site-specific data collected during the baseline survey programme, or from 'generic' flight height distributions in published literature. We propose to use the generic flight height distributions published by Johnston *et al.* (2014a, 2014b) for CRM for the Mona and Morgan Offshore Wind Projects. The application of site-specific flight height data collected by LiDAR survey was considered at the outset of the survey

[1] https://infrastructure.planninginspectorate.gov.uk/projects/wales/mona-offshore-wind-farm/

[2] https://www.bto.org/our-science/wetland-and-marine/soss/projects

programme, but was not proceeded following consultation with Natural England. At the time of consultation, Natural England did not endorse the use of LiDAR as a method for collecting flight height data to parameterise CRMs due to the lack of an established body of scientific evidence. Other methods to collect site-specific flight height data (e.g. derived from aerial imagery) were not currently considered to be sufficiently robust or precise in their estimates and have associated issues with the application of appropriate avoidance rates.

1.5.1.2 In the absence of site-specific flight height data, the collision risk will be estimated using the Band model option 2 with the generic species-specific flight height distributions published by Johnston *et al.* (2014b). To account for levels of uncertainty in flight heights, the estimated mortality will be presented for the median values and the upper and lower confidence intervals limits of the flight height distributions. No other model options will be used.

1.5.1.3 For bird species on passage, the baseline characterisation may not provide an accurate representation of the potential level of activity through the Mona and Morgan Array Areas. Natural England (2021) recommend two different methods for seabirds and non-seabird species. For non-seabird species, we propose to use the SOSS Migration Tool (SOSS-MAT) described in the SOSS-05 project information[2]. For seabird species, the method uses either an estimate of the number of birds passing through the array area based on the proportion of birds migrating across a broader migratory front, or using flux values gained from mean-peak monthly densities derived from the baseline aerial digital surveys. The methods to apply for Mona and Morgan Offshore Wind Projects require discussion with the Ornithology EWG regarding the scope of species to include and appropriate estimation of flux.

1.5.1.4 For other species, such as Manx shearwater, the baseline surveys may not provide an accurate representation of their activity due to the diurnal timing of the surveys, while shearwaters may be more active during the dawn, dusk and nocturnal periods. There is also potential attraction to light and this needs consideration in the assessment. There is no currently available guidance for this approach, therefore we welcome further discussion with the Ornithology EWG on this topic. We will present the collision risk outputs for Manx shearwater following the standard approach as for other species as described in this technical note; however, we will also qualitatively assess the potential additional risk in relation to lighting.

1.6 Modelling parameters

1.6.1.1 The Band model incorporates a number of parameters relating to the birds and their behaviour, as well as physical parameters relating to the turbines, to provide the mechanistic prediction of collision risk. It is necessary to incorporate degrees of uncertainty in some of those parameters to ensure that the risk is not underestimated. At the same time, it is widely acknowledged that additive layers of precaution in all parameters may lead to overestimation of risk and therefore alternative values may also be presented where emerging evidence indicates it is appropriate to do so. This is particularly the case in relation to avoidance rates and nocturnal activity factors, which have some of the biggest influences on the predicted magnitude of risk.

1.6.1.2 In compliance with Natural England advice (Natural England, 2021), the CRM will incorporate the mean total avoidance rates presented in the 2014 SNCB note, which was based on a review of Cook *et al.* (2014). With use of Band model option 2, these will include a range incorporating variability or uncertainty (±2S.D.) (Table 1.1). Outputs incorporating avoidance rates derived from current studies will also be considered, e.g. ORJIP Thanet Bird Collision Avoidance study (Skov *et al.*, 2018) and Vattenfall Aberdeen seabird flight behaviour study by RPS and DHI.

1.6.1.3 Nocturnal Activity Factors (NAFs) also have a large influence on the CRM outputs. They are applied to account for a level of flight activity at night when it is not possible to sample bird flight density in the survey area. Nocturnal activity is generally considered to be lower than during the day, therefore a percentage uplift is applied to the diurnal densities derived from the baseline aerial digital surveys. Natural England (2021) states that NAFs are currently under review and in the meantime recommend the NAFs shown in Table 1.1. We consider that these may values may overestimate the risk for gannet and therefore will present alternative values based on other published evidence (Furness *et al.*, 2018) alongside those recommended by Natural England (2021).

1.6.1.4 Various other biometric parameters of each bird species are needed for species-specific CRM, including bird length, wing-span, flight speed and flight type. The proposed parameters are shown in Table 1.1, complying with recommendations in Natural England (2021). For the purpose of CRM, all species are assumed to use 'flapping' flight and have 50% proportions of flights upwind/downwind.

1.6.1.5 In addition, the wind farm parameters that represent the Maximum Design Scenario (MDS) in relation to collision risk will be incorporated into the CRM. The wind turbine parameters representing the MDS for the Mona and Morgan Offshore Wind Projects are shown in Table 1.2.

Table 1.1: Species biometrics and input parameters for CRM.

[a] Body length and wing-span values from BTO Bird Facts (Robinson, 2005).

[b] Flight speeds for black-legged kittiwake, great black-backed gull, European herring gull, lesser black-backed gull and northern gannet are as specified in Natural England (2021), derived from Pennycuick (1987, 1997) and Alerstam et al. (2007). Fulmar flight speed from Pennycuick (1997). Manx shearwater flight speed is the mean ground speed reported by Gibb et al. (2017) for flapping flight.

[c] Specific avoidance rates are not provided in advice documents for northern fulmar and Manx shearwater, therefore we propose to use the default 98% avoidance rate (SNCB, 2014).

[d] evidence based NAF for gannet based on 8% nocturnal flight activity during the breeding season and 4% during the non-breeding season (Furness *et al.*, 2018). Standard NAF derived from Natural England (2021) and King *et al.* (2009).

Species	Body length (m)[a]	Wing-span (m)[a]	Flight speed (m/s)[b]	Nocturnal Activity Factor	Avoidance rate (%)
Black-legged kittiwake	0.39	1.08	13.1	2-3 (25-50%)	0.989 (±0.002)
Great black-backed gull	0.71	1.58	13.7	2-3 (25-50%)	0.995 (±0.001)
European herring gull	0.60	1.44	12.8	2-3 (25-50%)	0.995 (±0.001)
Lesser black-backed gull	0.58	1.42	13.1	2-3 (25-50%)	0.995 (±0.001)
Northern fulmar	0.48	1.07	13.0	4 (75%)	0.98 (±0. 2)[c]

Species	Body length (m)[a]	Wing-span (m)[a]	Flight speed (m/s)[b]	Nocturnal Activity Factor	Avoidance rate (%)
Manx shearwater	0.34	0.82	11.46	5 (100%)	0.98 (±0.2)[c]
Northern gannet	0.94	1.72	14.9	1-2 (0-25%) (and 4-8%)[d]	0.989 (±0.002)

Table 1.2: Wind turbine parameters in the MDS for CRM.

[a] Maximum parameter values presented are specific to the 15MW wind turbine model.

Parameter[a]	Parameter value	Source/Reference
Max. number of turbines	107	Project Design Envelope
Number of rotor blades per turbine	3	Project Design Envelope
Max. blade width (m)	6.8	Project Design Envelope
Average blade pitch (degrees)	3	Project Design Envelope
Max. rotor radius (m)	125	Project Design Envelope
Average rotation speed (rpm)	6.4	Project Design Envelope
Wind turbine model	15MW	Risk magnitude has been analysed for a range of turbine capacity models based on an interaction between the maximum number of wind turbines of that model and the maximum values of key CRM parameters; the 15MW model yielded the worst-case risk and it is expected that risk for all other models considered would be less.
Minimum air gap (LAT, MSL) (m)	34, 30	Project Design Envelope, air gap relative to Lowest Astronomical Tide (LAT and Mean Sea Level (MSL) allowing for 4m tidal offset between LAT and MSL.

1.7 Seasonality

1.7.1.1 As described for the displacement assessment, collision risk will be reported for each season. Seasons will be defined according to the breeding, non-breeding and migratory periods using seasonal divisions proposed for Biologically Defined Minimum Population Scales (BDMPS) by Furness (2015) (Table 1.3). The seasonal divisions will be adjusted as necessary to reflect local colony-specific information where it may be available.

Table 1.3: Seasonal definitions, from Furness (2015).

Species	Pre-Breeding Season/spring migration	Breeding season	Migration-free breeding season	Post Breeding Season/autumn migration	Non-breeding/winter season
Black-legged kittiwake	January – April	March – August	May – July	August – December	n/a
Great black-backed gull	n/a	Late March – August	n/a	n/a	September – March
European herring gull	n/a	March – August	n/a	n/a	September – February
Lesser black-backed gull	March – April	April – August	May – July	August – October	November – February
Northern fulmar	December – March	January – August	April – August	September – October	November
Manx shearwater	Late March – May	April – August	June – July	August – early October	n/a
Northern gannet	December – March	March – September	April – August	September – November	n/a

1.8 Assessing impacts against appropriate populations

1.8.1.1 The estimated collision risks will be presented on a monthly basis with no apportioning to colonies, i.e. the total predicted collision rates, as well as apportioned to relevant colonies. The approach to apportioning and population assessment will be provided in a separate technical note for consultation with the Ornithology EWG.

1.8.1.2 The values derived from the CRMs will be presented in full, including all variations that incorporate variability and uncertainty in input parameters as described above for bird densities, flight heights, nocturnal activity factors and avoidance rates.

1.8.1.3 For the breeding season, the assessment will be undertaken against an appropriate regional population scale (covering the total colony counts within mean-maximum foraging range plus one standard deviation). Foraging ranges will be initially identified from Woodward *et al.* (2019), although colony specific information will be reviewed and used to derive appropriate foraging ranges if it is available. Species-specific mean-max (+1S.D.) foraging ranges compiled by Woodward *et al.* (2019) will be used to select the relevant colonies (SPA and non-SPA) and calculate appropriate breeding population sizes. The location of the breeding sites will be sourced from data.gov.uk (Seabird Nesting Counts (British Isles)). The latest colony counts will be sourced from the Seabird Monitoring Programme (SMP) online database (https://app.bto.org/seabirds/public/index.jsp).

1.8.1.4 Similarly, the assessment will be done against an appropriate population scale during the non-breeding season using biological populations (BDMPS) defined by Furness (2015), in accordance with SNCB guidance (2017).

1.8.1.5 The magnitude of the collision risks to each species will be assessed initially against a threshold of 1% increase in the rate of baseline mortality, derived from Horswill and

Robinson (2015). Where this threshold is exceeded, the impact will be subject to further consideration such as population modelling. Where the 1% threshold is not exceeded, it will be considered that the impact of the project alone is not significant, but will be examined in the context of the assessment of cumulative or in-combination impacts.

1.9 References

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D.3.8 Response from Natural England regarding the Offshore Ornithology Collision Risk Assessment Technical Note

Date: 07 June 2022
Our ref: DAS/UDS A000566 / 393974
Your ref: Ornithology Baseline Characterisation Technical Note

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

T [redacted]

[redacted]
BP Alternative Energy Investments Limited

BY EMAIL ONLY

Dear [redacted]

Discretionary Advice Service (Charged Advice) - UDS A000566
Development proposal: BP EnBW Morgan and Mona Offshore Wind Farm
Consultation: Ornithology Baseline Characterisation Technical Note

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

Thank you for your consultation on the above dated and received on 24 May 2022.

The following advice is based upon the information within;

- Morgan and Mona Offshore Wind Projects: Offshore ornithology baseline characterisation technical note for the Evidence Plan Offshore Ornithology Expert Working Group. RPS (dated 24 May 2022).

Overarching comments

Natural England welcomes the opportunity to provide comment on the additional detail presented in this technical note, which supplements the Environmental Impact Assessment (EIA) Scoping Reports for the Morgan and Mona projects.

Overall, Natural England is content with the detail set out within the technical note. We provide some detailed comments and advice below.

Detailed comments

1.3 Site-specific surveys analysis

Although analysis of 12% of the sea surface is likely to be sufficient, best practice would be to conduct a power analysis to determine the level and distribution of survey coverage to analyse. We recommend that a power analysis is undertaken to demonstrate that survey coverage is appropriate.

1.4 Model based estimates of abundance and densities

Natural England support and encourage the use of the MRSea package to predict spatial density and abundance of seabirds where appropriate.

- We advise that design-based estimates should be presented for all species, including those estimated by MRSea.

- We suggest ongoing consultation throughout the modelling process to allow Statutory Nature Conservation Bodies to agree or advise on modelling approach, parametrisation, trial runs, etc..

- Month and year should be considered to output density surfaces for each survey. This allows for the use of model outputs in the displacement assessment process.

- We advise that consideration of hot spot/cold spot analysis should be undertaken, this is to aid potential mitigation through siting of array.

- It may be prudent to seek independent advice on the use of MRSea to ensure it is used appropriately. Natural England may seek independent advice to aid our review if necessary.

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

Yours sincerely

[redacted]

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

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

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

Cc [redacted]

D.3.9 Response from Natural England regarding the Offshore Ornithology Collision Risk Assessment and Offshore Ornithology Displacement Assessment Technical Note

Date: 24 June 2022
Our ref: DAS/UDS A000566 / 394421 & 394425
Your ref: Displacement & Collision Risk Modelling Technical Notes

Hornbeam House
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Crewe
Cheshire CW1 6GJ

T [redacted]

[redacted]
BP Alternative Energy Investments Limited

BY EMAIL ONLY

Dear [redacted]

Discretionary Advice Service (Charged Advice) - UDS A000566
Development proposal: BP EnBW Morgan and Mona Offshore Wind Farm
Consultation: Displacement & Collision Risk Modelling Technical Notes

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

Thank you for your consultation on the above dated and received on 27 May 2022.

The following advice is based upon the information within;

- Morgan and Mona Offshore Wind Projects: Offshore ornithology displacement assessment technical note for the Evidence Plan Offshore Ornithology Expert Working Group. RPS (dated 27 May 2022); and
- Morgan and Mona Offshore Wind Projects: Offshore ornithology collision risk assessment technical note for the Evidence Plan Offshore Ornithology Expert Working Group. RPS (dated 27 May 2022).

Overarching comments

Natural England welcomes the opportunity to provide comment on the additional detail presented in these technical notes, which supplements the Environmental Impact Assessment (EIA) Scoping Reports for the Morgan and Mona projects.

We provide detailed comments and advice below.

Detailed comments

Displacement assessment

Natural England agrees with the general approach to displacement assessment as detailed within the technical note provided. We note that further discussion is expected with the Statutory Nature Conservation Bodies (SNCBs) to agree displacement and mortality rates.

In addition to the species detailed, Natural England advise that Manx shearwater (*Puffinus puffinus*) should also be considered. It has previously been advised that the displacement and mortality rates applied to auks are used for Manx shearwater, and it is suggested that this is discussed further via the Evidence Plan process at an Offshore Ornithology Expert Working Group meeting.

Collision risk assessment

The SNCBs are currently in the final stages of drafting new guidance on Collision Risk Modelling (CRM) in light of recent work (Cook, 2021)[1] and a subsequent audit / re-analysis of that work undertaken by Exeter University commissioned by the Joint Nature Conservation Committee (Ozsanlav-Harris *et al.*, in press)[2]. Further, Natural England have commissioned a project, "Consideration of avoidance behaviour of Northern gannet (*Morus bassanus*) in collision risk modelling for offshore wind farm impact assessments" which will inform the treatment of Northern gannet in CRM.

Within the upcoming CRM guidance there will be a clear recommendation to use the stochastic CRM (sCRM), following work to resolve previously identified issues.

Although we do not anticipate that the guidance note and supporting evidence will be published in the near future, we are very close to being able to supply individual projects with all necessary parameters to undertake CRM in line with that forthcoming guidance. Natural England advise that CRM is not undertaken according to the existing guidance as detailed in the supplied technical note. We expect to be in receipt of the data in early July 2022 and will provide the avoidance rates and updated parameters to inform the approach to sCRM as soon as we are able.

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

Yours sincerely

[redacted]

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

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

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

Cc [redacted]

[1] Cook, A.S.C.,P., (2021). Additional analysis to inform SNCB recommendations regarding collision risk modelling. BTO Research Report 739, BTO, Thetford, UK
[2] Ozsanlav-Harris, L., Inger, R., and Sherley, R., (in press). Review of data used to calculate avoidance rates for collision risk modelling of seabirds. *JNCC Report*

From: [redacted]
To: [redacted]
Cc:
Subject: (draft) CRM parameters for Morgan & Mona OWF
Date: 07 July 2022 16:38:28
Attachments: Picture (Device Independent Bitmap) 1.jpg
CRM parameters draft summary.docx

Hi [redacted]

As noted in our response to the Morgan & Mona CRM technical note, there is a forthcoming update to the joint SNCB CRM guidance note. This new guidance is still in draft, and unlikely to be agreed, adopted and published for some time. However, we are fairly confident that the parameters that will be recommended are now unlikely to change. So, please find attached those parameters to enable you to undertake CRM. Note also that we now recommend using the stochastic model.

I must caveat the attached as not representing joint SNCB guidance, and therefore the parameters supplied remain subject to change. However, the attached currently represent Natural England's preferred parameters to undertake your CRM with. Presumably you are looking to run CRM for the PEIR, in which case it may be that in case of any further changes to parameters (hopefully unlikely) these could just be reflected in your ES.

Feel free to get in touch if you have any questions, otherwise, see you at the next ETG.

All the best,

[redacted]

Senior Specialist - Marine Ornithology
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www.gov.uk/natural-england

Draft Avoidance rates and other CRM parameters

Users to be aware that the updated SNCB guidance note has not yet been finalised, so these values may still be subject to change.

Please note:
-NE no longer accept the used of the extended Band model (options 3 & 4)
- the suggested approach to gannet modelling is a novel methodology, involving the reduction of the density of birds in flight by an agreed macro-avoidance rate.

Table 1: Recommended Avoidance Rates (AR) for Collision Risk Modelling taken from Ozsanlev-Harris et al (in prep)

Species	**Basic Band (2012) Model AR**	**Basic sCRM AR**
Northern gannet* **(All gulls rate)**	0.992	0.993 (±0.0003)
Black-legged Kittiwake **(All gulls rate)**	0.992	0.993 (±0.0003)
Lesser Black-backed Gull **(Large Gulls rate)**	0.994	0.994 (±0.0004)
Herring gull **(Large Gulls rate)**	0.994	0.994 (±0.0004)
Great Black-backed Gull **(Large Gulls rate)**	0.994	0.994 (±0.0004)
Sandwich tern (and other tern species) **All gulls and terns rate**	0.990	0.991 (±0.0004)
Other marine species **All gulls and terns rate**	0.990	0.991 (±0.0004)

*Macro-avoidance to be accounted for by a reduction of density of birds in flight based on the level of macro-avoidance displayed by this species. A project has been commissioned by NE to inform this rate using best available evidence, in the interim NE advise the use of a macro avoidance rate of 70%

Table 2 – SNCB recommended parameters for the Basic Band model – Option 1 or 2 (Band 2012)

Species	**AR**	**Flight Speed** [1]	**NAF**[2]	**Body length** [3]	**Wingspan**[4]	**Flight Type**	**% of flights upwind**
Northern gannet* **(All gulls rate)**	0.992	14.9	8 % 1.32	0.94	1.72	Flapping	50
Black-legged Kittiwake **(All gulls rate)**	0.992	13.1	25-50% 2-3	0.39	1.08	Flapping	50
Lesser Black-backed Gull **(Large Gulls rate)**	0.994	13.1	25-50% 2-3	0.58	1.42	Flapping	50
Herring gull **(Large Gulls rate)**	0.994	12.8	25-50% 2-3	0.6)	1.44	Flapping	50
Great Black-backed Gull **(Large Gulls rate)**	0.994	13.7	25-50% 2-3	0.71	1.58	Flapping	50
Sandwich tern (and other tern species) **All gulls and terns rate**	0.990	10.3	Defer to Garthe and Hüppop (2004) or where empirical data is available consult SNCB	0.38	1	Flapping	50
Other marine species **All gulls and terns rate**	0.990	Consult SNCB		Consult SNCB	Consult SNCB	Consult SNCB	Consult SNCB

[1] All flight speeds from Alerstam (1997) except for Gannet from Pennycuick (1987) and Sandwich Tern from Fijn and Gyimesi (2018)

[2]All based on Garthe & Hüppop (2004) other than Gannet which is from Furness et al (2018)

[3] All named species from Snow & Perrins (1987)

[4] All named species from Snow & Perrins (1987)

Table 3 – SNCB recommended summary data for the stochastic CRM model (McGregor et al 2018)

Species	**AR**	**Flight Speed** [5]	**NAF**[6]	**Body length** [7]	**Wingspan**[8]	**Flight Type**	**% of flights upwind**
Northern gannet* **(All gulls rate)**	0.993 (±0.0003)	14.9 (0)	0.08 +-0.10	0.94 (0.0325)	1.72 (0.0375)	Flapping	50
Black-legged Kittiwake **(All gulls rate)**	0.993 (±0.0003)	13.1 (0.40)	Use central value 0.375 and SD of (0.0637) that results in 0.25 and 0.5 being captured in the 95% CI	0.39 (0.005)	1.08 (0.0625)	Flapping	50
Lesser Black-backed Gull **(Large Gulls rate)**	0.994 (±0.0004)	13.1 (1.90)		0.58 (0.03)	1.42 (0.0375)	Flapping	50
Herring gull **(Large Gulls rate)**	0.994 (±0.0004)	12.8 (1.80)		0.6 (0.0225)	1.44 (0.03)	Flapping	50
Great Black-backed Gull **(Large Gulls rate)**	0.994 (±0.0004)	13.7 (1.20)		0.71 (0.035)	1.58 (0.0375)	Flapping	50
Sandwich tern **All gulls and terns rate**	0.991 (±0.0004)	10.3 (3.4)	Defer to Garthe and Hüppop (2004) or where empirical data is available consult SNCB	0.38 (0.005)	1 (0.04)	Flapping	50
Other marine species **All gulls and terns rate**	0.991 (±0.0004)	Consult SNCB		Consult SNCB	Consult SNCB	Consult SNCB	Consult SNCB

[5] All flight speeds from Alerstam (1997) except for Gannet from Pennycuick (1987) and Sandwich Tern from Fijn and Gyimesi (2018)

[6]All based on Garthe & Hüppop (2004) other than Gannet which is from Furness et al (2018)

[7] All named species from Snow & Perrins (1987)

[8] All named species from Snow & Perrins (1987)

References:

Alerstam T, Rosen M, Backman J, Ericson PGP, Hellgren O. 2007. Flight speeds among bird species: Allometric and phylogenetic effects. PLoS Biol 5(8): e197. doi:10.1371/journal.pbio.0050197

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D.3.10 Response from JNCC regarding the Offshore Ornithology Collision Risk Assessment Technical Note and the Offshore Ornithology Displacement Assessment Technical Note

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

JNCC Reference: OIA-08777
Date: 24/06/22

Dear [redacted]

Morgan and Mona Offshore Wind Projects, Offshore Ornithology Collision Risk Assessment Technical Note: Version F01 & Offshore Ornithology Displacement Assessment Technical Note: Version F01

Thank you for consulting JNCC on the Morgan and Mona Offshore Wind Projects, Offshore Ornithology Collision Risk Assessment and Displacement Assessment Technical Notes (both Version F01), both dated 26 May 2022, which we received on 27 May 2022.

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

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

Offshore Ornithology Collision Risk Assessment Technical Note: Version F01

1.1.1.3. Natural England (2021) recommend use of the sCRM for the basic Band model (ie Options 1 and 2). JNCC prefer use of sCRM over the deterministic Band CRM (Band 2012) for Options 1 and 2. Given that in section 1.5.1.2. it states that Band model Option 2 will be used to estimate collision risk, and no other model options will be used, we would recommend use of the sCRM (McGregor *et al.*, 2018).

1.2.1.1. and Table 1.1. Please be aware that the SNCBs are in the process of updating advice on input parameters for use within CRM (and this would include the sCRM). Please seek

advice from JNCC for any updates and to seek latest recommendations re specific input parameters.

1.3.1.1. It is not clear what 'more than negligible frequency' means. Whilst we agree with the list of species provided as being expected to require a collision-risk assessment, we cannot rule out other species at this stage until we have seen density estimates across species for the array plus buffer, based on baseline survey data collection.

1.5.1.2. Whilst we fully support use of generic flight heights from Johnston et al (2014a and 2014b) for use within CRM, we propose that a review of existing available tracking data might provide a source of site-specific flight height information for some species/colonies of relevance. Whilst that would not replace use of Band Option 2 with generic flight heights, it would add additional information for consideration, for example for breeding individuals from known colony of origin, and/or as a comparison of potential collision risk during specific seasons for which the data applies.

Table 1.3 For most species, we would not usually advise use of a migration-free breeding season. For example, for northern gannet we advise the use of three seasons as per Furness 2015: breeding season (March - September), post-breeding migration (September - November), and pre-breeding migration (December - March).

1.6.1.2. Whilst we welcome consideration of emerging evidence, please note that we would not usually recommend use of parameters from a single location (unless that location is site-specific to the windfarm in question) and current (and imminent updates to) SNCB advice on avoidance rates and other input parameters are therefore based on evidence across multiple locations/sources. As noted above, please seek advice from JNCC for any updates and to seek latest recommendations re specific input parameters which includes avoidance rate.

Offshore Ornithology Displacement Assessment Technical Note: Version F01

Note that in addition to a displacement assessment for the operational phase of the Mona and Morgan Offshore Wind Projects, we advise that a displacement assessment is also carried out for the construction and decommissioning phases. This should assume that 50% of the annual displacement impact resulting from the operational phase will occur during construction, and decommissioning, phases.

1.3.1.1 Once species have been screened for sensitivity to displacement, all species where a robust model- and/or design-based abundance estimate can be generated should be subject to a displacement assessment, not only those that have potential to contribute to cumulative effects. Indeed to understand whether or not an impact will contribute to cumulative effects, an individual assessment needs to be made.

1.3.1.1 We advise that Manx shearwater is screened into the displacement assessment. Manx shearwater has a 'disturbance susceptibility' score of 1 according to Bradbury et al. (2014), meaning they are displaced at low levels or less likely to be displaced than other species. We therefore we recommend that a displacement assessment is conducted for Manx shearwater.

1.3.1.1 We advise that black-legged kittiwake is screened into the displacement assessment as recent evidence suggests that they can be sensitive to displacement from offshore wind

farms (Peschko et al 2020; Vanermen et al 2016; Leopold et al 2013). We therefore recommend that a displacement assessment is conducted for black-legged kittiwake.

1.3.1.2 Without an understanding of the numbers of red-throated diver and seaducks observed in the study areas or seeing the results of model- or design-based estimates of abundance and density, we cannot agree that a displacement assessment is not carried out for red-throated diver and seaducks.

1.4.1.2 Table 1.1 For common guillemot we advise the use of two seasons as per Furness 2015: breeding season (March - July) and non-breeding season (August - February).

1.4.1.2 Table 1.1 For razorbill we advise the use of three seasons as per Furness 2015: breeding season (April - July), migration season (August - October and January - March) and winter season (November - December).

1.4.1.2 Table 1.1 For Atlantic puffin we advise the use of two seasons as per Furness 2015: breeding season (April - early August) and non-breeding season (mid-August - March).

1.4.1.2 Table 1.1 For northern gannet we advise the use of three seasons as per Furness 2015: breeding season (March - September), post-breeding migration (September - November), and pre-breeding migration (December - March).

1.4.1.4 Note that for re-throated diver, joint SNCB advice is to assess displacement within the wind farm area plus a 10km buffer (SNCBs, 2022).

1.4.1.4 As previously stated, without an understanding of the numbers of red-throated diver and seaducks observed in the study areas or seeing the results of model- or design-based estimates of abundance and density, we cannot agree that a displacement assessment is not carried out for divers and seaducks.

1.5.1.2 Table 1.2 We advise that a range of mortality rates is presented for all species included in a displacement assessment. This includes northern gannet, for which mortality rates of 1-10% should be used and presented.

1.5.1.2 Table 1.2 Manx shearwater has a ‘disturbance susceptibility’ score of 1 according to Bradbury et al. (2014), meaning they are displaced at low levels or less likely to be displaced than other species. We therefore we recommend that a displacement assessment is conducted for Manx shearwater with displacement rates of 1-10% and mortality rates of 1-10%, noting the requirement to also produce full displacement matrices.

1.5.1.2 Table 1.2 We advise that black-legged kittiwake is screened into the displacement assessment as recent evidence suggests that they can be sensitive to displacement from offshore wind farms (Peschko et al 2020; Vanermen et al 2016; Leopold et al 2013). We therefore recommend that a displacement assessment is conducted for black-legged kittiwake with displacement rates of 30-70% and mortality rates of 1-10%, noting the requirement to also produce full displacement matrices.

1.6.1.2 Note that in the context of HRA, the best estimate of the seasonal population size of the relevant SPA should be used when assessing impacts against the population during the relevant season.

1.6.1.4 It is not clear what "… consideration will be given to age classes within the populations" means in practice?

References

Leopold, M.F., van Bemmelen, R.S.A. & Zuur A.F. (2013) Responses of Local Birds to the Offshore Wind Farms PAWP and OWEZ off the Dutch Mainland Coast. Report number C151/12

Peschko, V., Mendel, B., Müller, S. Markones, N., Mercker, M. & Garthe, S. (2020) Effects of offshore windfarms on seabird abundance: Strong effects in spring and in the breeding season, *Marine Environmental Research*, vol. 162, article 105157, https://doi.org/10.1016/j.marenvres.2020.105157

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For Red-Throated Diver Available at: https://hub.jncc.gov.uk/assets/9aecb87c-80c5-4cfb-9102-39f0228dcc9a#:~:text=The%20Joint%20SNCB%20Interim%20Displacement,England%20and%20JNCC%20in%202012.

Vanermen, N., Courtens, W., Van de walle, M., Verstraete, H. & Stienen, E.W.M. (2016) Seabird monitoring at offshore wind farms in the Belgian part of the North Sea. Updated results for the Bligh Bank & first results for the Thorntonbank

Please contact me with any questions regarding the above comments.

Yours sincerely,

[redacted]

Senior Marine Ornithologist

Email: [redacted]

Telephone: [redacted]

D.3.11 Response from MMO regarding the Offshore Ornithology Technical Notes

From: [redacted]
To:
Cc: [redacted]
Subject: RE: Morgan and Mona Offshore Wind Projects offshore ornithology technical papers
Date: 29 June 2022 09:39:13
Attachments: image002.png
image003.png

CAUTION: This email originated from outside of RPS.

Hello [redacted]

I can confirm that the MMO has no comments to make on the ornithology technical papers at this time.

Kind Regards

[redacted]

[redacted] BSc (Hons) MSc | Marine Licensing Case Officer | Marine Management Organisation
Lancaster House | Hampshire Court | Newcastle upon Tyne NE4 7YH
8[redacted]

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From: [redacted]
Sent: 28 June 2022 15:45
To: [redacted]
Cc: [redacted]
Subject: FW: Morgan and Mona Offshore Wind Projects offshore ornithology technical papers

Hi [redacted]

Please can you send me any comments the MMO has on the Displacement and Collision Risk Modelling (CRM) Technical Notes for the Morgan and Mona projects or confirm if you do not have any comments.

Kind Regards, [redacted]
Senior Marine Consultant
RPS | Energy
[redacted]

From: [redacted]
Sent: 27 May 2022 09:27
To: [redacted]

D.3.12 Meeting minutes

MINUTES OF MEETING

Security Classification: Project Internal

Partners in UK offshore wind

MOM Number	:	20220713_Morgan and Mona Ornithology EWG02	**REV. No.** :	F01
MOM Subject	:	Morgan and Mona Evidence Plan Ornithology expert working group meeting 2.		

MINUTES OF MEETING

MEETING DATE	:	13/07/2022
MEETING LOCATION	:	Microsoft Teams
RECORDED BY	:	[redacted] (RPS)
ISSUED BY	:	[redacted] (RPS)

PERSONS PRESENT:

- [redacted] – bp (GV)
- [redacted] – bp (MP)
- [redacted] – bp (WD)
- [redacted] – RPS (KL)
- [redacted] – RPS (MA)
- [redacted] – Natural England (AuB)
- [redacted] – Natural England (RB)
- [redacted] – JNCC (JW)
- [redacted] – RSPB (AM)
- [redacted] (NRW)
- [redacted] (MMO)
- [redacted] JNCC (RH)
- [redacted] - NE (LB)
- [redacted] -NRW (ES)

APOLOGIES:

- [redacted]

ITEM NO:	DISCUSSION ITEM:	Action & Responsible party	Date
1.	AM- Apologies RSPB haven't been able to provide a written response to the technical papers provided to the EWG last month, although they have been reviewed.		
2.	**Project update (presented by WD)** bp are working with EnBW in a 50/50 partnership (the Applicants) to develop the Morgan and Mona Offshore Wind Projects which are being progressed as two separate projects.		

	Morgan is the northern project located in in English waters, and Mona is the southern project located mostly in Welsh waters. Together, they will have a combined capacity of 3GW. Morgan and Mona will be developed on similar but slightly staggered timescales and will be under separate consent applications. The Mona project is aiming to be operational in 2028 and the Morgan project is aiming to be operational in 2029. The Morgan and Mona Offshore Wind Projects are being developed as separate DCOs with separate landfalls. The Applicant is looking to sign The Crown Estate (TCE) Agreement for Lease this year. We now have final clarity from the National Grid regarding the results of the Pathway to 2030 Holistic network Design which has provided the onshore grid connection points for the Morgan and Mona Offshore Wind Projects. Mona will have a grid connection at the existing Bodelwyddan National Grid substation. Morgan will have a shared grid connection at the existing Penwortham National Grid substation with the Morecambe Offshore Wind Project which is bring progressed jointly by Cobra and Floatation Energy. Both Morgan and Morecambe will share an onshore and offshore cable corridor however the projects will remain electrically separate. This means we have had to separate the Morgan generation and transmission assets applications. The Morgan generation assets scoping report has been submitted to the Planning Inspectorate and the Applicant is working with Morecambe to deliver a joint DCO for the transmission assets. The Morgan (generation assets only) and Mona (generation and transmission assets) PEIR submission will be at the end of Q1 2023. The Morgan generation assets PEIR has been aligned with the Mona PEIR to allow the Applicant to properly consider the cumulative effects between the projects. This alignment is expected to continue to application.		
	Baseline characterisation (presented by MA) KL- We had a comment from JNCC in the offshore ornithology EWG01 regarding disturbance of birds from the aerial surveys. We have response from APEM (the aerial survey contractor) on this and we will send around their response after the EWG. MA- The Mona digital aerial surveys have now completed 24 months of data collection. Morgan digital aerial surveys will continue until March 2023. The surveys have been carried out by APEM. AM- On Hornsea there has been a lot of discussion on MRSea, how it is carried out and how it is presented. It is worth reflecting on the lessons learned from that project, for example the importance of being clear on how auto correlation has been tested for. NatureScot has done a review of aerial surveys and has put together some recommendations on how the results are presented, although this is not published at the moment. Worth looking out for when published. These recommendations may also contain information on how bird disturbance from aerial surveys should be considered in the reporting.	**RPS to share APEM response to JNCC query on disturbance of birds from the aerial surveys**	**Completed**

	MA- RPS have caried out the MRSea for this project so it may not be connected to what was carried out for Hornsea. We have followed the presentation that is set out in the latest Natural England guidance. MRSea has been carried out on the most abundance species (kittiwake, gannet, guillemot, razorbill, Manx shearwater). We have found that the spatial data itself is the only thing that described the spatial abundance of species, other variables e.g. water depth did not explain the spatial abundance. Apportioning of unidentified species was carried out and then availability bias was carried out, in that order. The MRSea analysis uses data from the whole Mona Array Area and the Mona survey area, then data are extracted from the relevant areas (array, array plus buffer) for the collision risk and displacement analysis. The survey captured 30% of the sea surface in the survey area and undertook at least 12% image analysis of the survey area. There was a request for power analysis to be carried out to detect the appropriateness of the 12%. We are asking for more clarification in this EWG on what the EWG members are looking for from this power analysis. We have used the MRSeaPower package before for the ability to detect changes as power analysis is usually used to define the ability to detect future changes rather than characterise a baseline. KL- The purpose of these surveys is to characterise the baseline; they are not pre-construction monitoring surveys. The power to detect changes is not what the Applicant is seeking to do with these surveys. LR- This is something that NRW raised, however without specialists present, LR will take this away. RH- It is something that JNCC would consider worth doing as it can inform if the current survey design has enough power to be used for the pre-construction surveys. Does it detect the level of displacements that we would expect to see for the species that may be impacted? MA- What level of change would be consider acceptable to detect? Previously we have looked for 30% and 50% change. RH- It would depend on the species. It's harder to detect a lower change but we would want to detect a 30% change (if it occurs) for those species that are less sensitive to displacements, but we would also want to detect 50% (if it occurs) so we don't miss any larger displacements. AM- Request for a comparison between the two camera and four camera system with a couple of months of data to ensure that the variability at the site is being captured. This has been done a few times and has always shown that there is sufficient coverage, but distribution is site specific. MA- That is the HiDef approach, APEM have carried out this analysis and they use a selection of images rather than the 2 or 4 camera approaches. This would therefore just involve additional image analysis. The project will discuss the possibility of this internally. In the responses to the technical papers there was a recommendation to carry out hot/cold spot analysis to identify higher and lower use	**RPS to provide post-meeting clarification of the form of the MRSea model** **LR to discuss clarity around request for power analysis with NRW specialists.** **RPS and the Applicant to discuss additional analysis of**	**Completed** **10/08/22**

	areas. This was done on an interim data set as an illustration tool for the Project Design Envelope. The Mona PEIR will be based on the wind turbines occupying the whole Mona Array Area with no siting design within it; that may possibly be done to inform future design. The parameters to use for availability bias were presented in the technical papers and this was agreed in the responses. Abundance and density estimates in the Mona Array Area and buffers will be presented in the PEIR technical report.	**survey images to ensure site variability is being captured.**	**10/08/22**
3.	**Displacement (presented by MA)** The displacement technical paper follows the SNCB guidance approach, and there was general agreement on this in the responses. The Applicant would like recommendation of the approach to displacement and the mortality rates for species to be used. Would the EWG recommend using the same displacement and mortality rates for Manx Shearwater and for Kittiwake as for Auk species? RB- This is the approach we have recommended for other projects. Natural England recommend displacement is modelled for Manx Shearwater but not for Kittiwake. LR- NRW will take this away for comments from specialists. MA- There are several ranges suggested for displacement and mortality; there are several levels within these which are needed to incorporate for uncertainty. We can present the upper and lower limits and mean. If we presented all the permutations of the model output, then this would present a lot of values. Which values need to be presented, which would the EWG like to see the assessment based on? RB- Hornsea becomes a case study for this as the most recent project that has undergone examination, and this is currently being discussed for Hornsea. Worth looking out for what is agreed in examination for this. KL-Can NE flag to the Applicant when an agreement is reached on Hornsea. RB- NE will be looking to split out project specific advice from general NE advice. When NE has reached a general position, this will be shared with the Applicant. GV- If this best practice isn't developed or isn't reached soon, for the purpose of the PEIR we will continue to present the highest, lowest, and mean outputs and then NE can respond to the PEIR if they disagree with the approach. We would appreciate any early flags from NE on their preferred approach. LR- NRW to take this away for comments from specialist. RB- NRW and JNCC are already in possession of the updated CRM parameters that were provided to the Applicant.	**NRW to provide recommendation on the displacement and mortality rates to be used for Manx Shearwater and Kittiwake.** **RB to share NE advice on values to be presented as soon as available. To be circulated to entire EWG.** **NRW to provide comment on preferred displacement and**	**Completed** **TBC**

	KL- If and when NE are in a position to share their recommendations on displacement and mortality model outputs would they be ok for them to be shared with the EWG? RB- Once it has been sent to the Applicant then it will ok to share with the EWG. AM- For Hornsea they haven't presented the outer confidence limits for MRSea. They have presented their approach and NE preferred approach which includes a range of values. This is a reasonable approach. It is key there is clarity on how this information is derived and the extent of uncertainty. LR- There are other pathways and forums outside this EWG where SNCBs can discuss and agree these parameters. MA-We will include the main 5 species recorded in the displacement assessment and including Kittiwake and Manx Shearwater. It is usually recommended to use abundance estimates for all behaviours, is this also applicable to Manx Shearwater? RH- We would be hesitant to say yes there won't be any red throated divers for Morgan as there is only 12 months of data, we would want to wait until there is 24 months of data before we agreed to them being scoped out. MA-Noted. For Morgan, the PEIR will be based on 12 months of data so we accept that there will be some flexibility for change once we have the full data set.	**mortality model outputs to be presented and assessment based on.** **EWG to provide recommendation for abundance estimates for all behaviours for Manx Shearwater**	**Completed** **Completed**
4.	Collision Risk Modelling (presented by MA) KL- RB, noting that this section reflects the updated CRM parameters provided by yourself, can we share these updated parameters with the EWG? MA- We are proposing to use the stochastic model with the updated avoidance rates. AM- Will this be using the stochastic interface deterministically or stochastically? MA- Full stochastic will be used. RB- Avoidance rates are informed by the JNCC work and have been selected for individual species but there is a move away from species specific rates to species group compared to the 2014 advice. They do not fully reflect the gannet work yet but the report on this will be available soon. AM- for the record, RSPB consider jury still out on application of macro-avoidance for gannet on top of the within-wind farm rate. Avoidance behaviour may be different in breeding and non-breeding season (most avoidance may be shown by non-breeders). It incorporates the within-wind farm rate for gulls, but gannet may not be as manoueverable so it may not be appropriate.	**RB to share the updated CRM parameters with the EWG.**	**10/08/22**

	MA- The intention is that we will use the stochastic model for PEIR, using the parameters provided by NE. Is there any progress on collision risk for Manx Shearwater accounting for behaviours that are not picked up from surveys e.g. Nocturnal behaviours? AM- The RSPB don't have a solution for this at this time. Suggest reviewing tagging data to see what pattern of activity is like in the area. MA- Would also like to ask if the parameters for other marine species that are provided in the CRM technical report are appropriate? Physical parameters for Fulmar and Manx Shearwater wer presented in the collision risk technical note; does EWG agree these are appropriate for those species? Collision risk and displacement are additional for species where both are assessed and this will be considered within the assessment. 70% macro avoidance is recommended by Natural England for Gannet. What are the appropriate macro-avoidance rates to apply for this for other species, e.g. Kittiwake? RB- NE don't recommend displacement for kittiwake. For Manx Shearwaters it is more appropriate to work around displacement than collision. LH-It was JNCC that requested that kittiwake was assessed for displacement. JNCC will take this question away to discuss internally.	**EWG to approve or recommend alternative parameter values for Fulmar and Manx Shearwater** **JNCC to provide advice on what macro avoidance rates should be used for Kittiwake**	**10/08/22** **10/08/22**
5.	**Scoping opinion (presented by KL**) We are working through the scoping opinion and will be providing responses to comments where requried. We will be incorporating the scoping opinion in the PEIR where appropriate. The applicant has nothing specific to bring up but would like to offer the EWG the chance to raise anything. RH- Assessment of displacement during construction and decommissioning should include for 50% of the displacement during operation. This should be applied to the same area as should be applied for operation. MA- we have presented these values in our displacement analyses.		
6.	**Approach to LSE screening (presented by KL)** The approach to LSE screening is presented where there is potential for effects on offshore birds. We are still early in the process, and this is the methodology to identify the sites and features, it doesn't include a full list of sites to be considered. We will progress this further once we have more information on the baseline surveys and initial outputs of the displacement and CRM outputs. SPAs and Ramsar sites with offshore and onshore waterbird qualifying features. We are broadly considering sites within 50km of the cable landfall, but this is not final, we will consider wider sites if appropriate. The next step is to consider the site-specific information.		

	LR- Is feedback on the LSE screening methodology going via the steering group or EWG? KL- For those in the steering group and EWG please provide one response via the steering group. For those just in the EWG, please provide a response on the specific LSE methodology for ornithology via the EWG.		
7.	**Discussion and next steps (presented by KL)** Outlined next steps for meeting minutes and agreement logs (attached). Seeking agreement on the approach papers presented and points raised during the meeting. MA- The breeding season apportioning would be carried out using the SNH guidance, is this appropriate. We do not propose to issue a technical note on the apportioning approach. RH- This is the reference tool we would recommend.		
8.	**Close of meeting** **Post meeting clarifications** <u>Further information on the MRSea tool</u> RPS analysts have been consulting with Lindsay Scott-Hayward from CREEM to ensure we use the model appropriately. She gave useful tips on implementing MRSea and explaining the internal workings of the model, but no flaws were identified in the implementation of MRSea by RPS. To clarify the previous point, the spatial terms are generally by far the most important in describing species distributions. The environmental covariates like “water depth” and “distance to coast” provide some additional explanatory power, but this is generally very limited compared to the spatial terms in the model. We also discussed Hornsea, and the major take-away from this was that it is important to be transparent and justify why certain choices made (most notably for Hornsea was that no interaction term was included, without justification). The model used for baseline characterisation in the PEIR is the best model as selected by MRSea. We used what is considered the gold standard (tenfold cross validation, a method adopted from machine learning) to consider which covariates should and should not be included in the model. This will lead to robust estimates of bird distributions and abundances. To double check MRSea abundances and densities in each month, we compared them to design-based estimates. In all cases, the MRSea estimates were very similar to design-based estimates. <u>Query regarding plane flight heights</u> The standard altitude flown by APEM is on average 400 m this offers 1.5 cm Ground sampling distance (GSD) on average across the image footprint (i.e. the pixels at nadir (directly beneath the aircraft) will be even better than 1.5cm – typically 1.4cm GSD). This increases our image resolution and therefore our species identification. APEM recommends		

	that survey flights take place at a height of at least ca. 400 m to avoid disturbance to birds and marine megafauna and optimise ground resolution and footprint, and data quality. We can fly at higher altitudes and still achieve an image resolution of 1.4 cm GSD directly beneath the aircraft and will do so for post-construction monitoring where necessary for safety, however flying at an altitude of 1,350ft also allows comparatively more weather windows than flying at higher altitudes. If APEM were to fly at a higher altitude it would mean fewer weather windows due to low cloud base and we are confident that flying at this altitude does not cause disturbance. APEM's camera systems are mounted vertically and can see through the water column, and therefore can detect individuals below the sea surface. We can categorise any individuals that have dived below the surface, which may not be the same for other providers with obliquely mounted camera systems. We can also demonstrate mathematically that birds towards the centre 80% of an image do not have the time to get out of shot if their reaction distance is between 1,312 ft and 1,476 ft. If disturbance was a genuine factor APEM would have many thousands of images of birds taking off, which is known not to be the case. Furthermore, Komenda-Zehnder et al. (2003) observed that the behaviour of waterbirds was not significantly influenced if aeroplanes flew at 984 ft above ground level. Therefore, there is a considerable body of evidence that flying at altitudes significantly below 450 m does not cause disturbance to birds. APEM have viewed thousands of images collected at an altitude of c. 400 m and have not seen any evidence of flushing, such as aggregations of birds diving or taking off due to the presence of an aircraft. APEM have also undertaken numerous surveys in the Outer Thames Estuary over many years through the baseline, construction, and operation of the London Array Windfarm and for Natural England. A large number of these surveys were conducted at heights of 984 ft (300 m) and showed no disturbance to red-throated divers or other species detected within the surveys. Within the data collected from these surveys, the majority of the divers were sitting on the sea surface, showing no evidence of flushing due to aircraft altitude. APEM carried out numerous surveys over many years that show no evidence of disturbance to species at varying altitudes. Compared to visual surveys (boat/low flying aerial) for instance, proportionally more individuals are seen sitting on the sea surface than flying. Furthermore, APEM has undertaken surveys for Natural England in The Wash SPA which provided data on both wading birds and seabirds during which there were also ground based observers surveying at the same time as the aerial survey. This survey required a GSD of 1 cm flown at an altitude of 1,575ft (480m), and the ground observers confirmed they saw no evidence of disturbance. Furthermore, APEM have been commissioned by SNCBs, including Marine Scotland, Natural England and Natural Resources Wales, to undertake surveys of SPAs and other nationally important sites where a flight altitude of c. 400 m has been agreed for use. One example is the common scoter census projects for JNCC in Carmarthen Bay. These surveys showed no disturbance to common scoter with a flight altitude of (1,100ft) 335 m. In these surveys, the vast majority of the birds are		

	sitting on the water with no signs of disturbance, either flushing or diving. In summary, APEM are confident our survey methodology does not lead to disturbance of birds or marine mammals and is acceptable to SNCB. If there is another concern, such as safety, APEM can amend our flight plan to a higher aircraft altitude with minimal impact to the GSD, however this runs the risk of fewer weather windows.		

D.3.13 Response from JNCC regarding the meeting minutes

Mona Morgan EWG meeting 13th July

JNCC actions

Provide recommendation on the displacement and mortality rates to be used for Manx Shearwater and Kittiwake.

For both kittiwake and Manx shearwater we advise that whole displacement matrices are presented, and then the applicant can work back to establish what levels of displacement and mortality will have an effect. A range of mortality rates from 1-10% are advised.

EWG to provide recommendation for abundance estimates for all behaviours for Manx Shearwater

We advise that a combined estimate of the number of birds on the water (corrected for survey coverage) and of the number of birds in flight (corrected for survey coverage) are used for an assessment of Manx shearwater displacement.

EWG to approve or recommend alternative parameter values for Fulmar and Manx Shearwater

We are in agreement with the suggested parameters for fulmar and Manx shearwater.

JNCC to provide advice on what macro avoidance rates should be used for Kittiwake

JNCC advise that no macro-avoidance density reduction is applied to black-legged kittiwake for inputting into the CRM.

EWG to provide LSE screening comments

Comments provided separately to steering group.

D.3.14 Response from Natural England regarding the meeting minutes

Date: 19 August 2022
Our ref: DAS/UDS A000566 / 400331
Your ref: Morgan and Mona Offshore Ornithology Expert Working Group 02

[redacted]
BP Alternative Energy Investments Limited

c/c [redacted]
RPS/ Energy

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

T [redacted]

BY EMAIL ONLY

Dear [redacted]

Discretionary Advice Service (Charged Advice) - UDS A000566
Contract Reference: BP EnBW Morgan and Mona Offshore Wind Farm
Consultation: Morgan and Mona Offshore Windfarm Offshore Ornithology EWG02

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

The following advice is based upon the information presented in the Offshore Ornithology Expert Working Group (EWG) Meeting 2 (attended on 13 July 2022).

Natural England were asked to provide advice upon:

1. Agreement on the approach to baseline characterisation as set out in the Morgan and Mona baseline characterisation technical paper;
2. Agreement on the approach to displacement as set out in the Morgan and Mona Displacement technical paper, taking into account clarifications to be provided by SNCBs;
3. Agreement to the approach to stochastic Collision Risk Modelling (sCRM) as discussed in the EWG02 meeting, which superseded the Morgan and Mona Collision Risk Modelling (CRM) technical paper following the NE advice;
4. Agreement that on the basis of low abundance of red-throated diver across the Mona array and survey buffer, does the EWG agree this species can be scoped out for the array impacts assessment (noting this will be included for the export cable route);
5. Agreement on the approach to identification of sites and features in the LSE Screening as set out in the slide pack for the EWG02.

Our advice within this letter builds on that provided on the Baseline Characterisation technical paper (our reference: 393974), Displacement technical paper (our reference: 394421) and Collision Risk Modelling technical paper (our reference: 394425) provided by RPS.

1. Agreement on the approach to baseline characterisation as set out in the Morgan and Mona baseline characterisation technical paper

Natural England have no further comments to those set out in our advice letter (our reference: 393974) on the Baseline Characterisation technical paper (dated 7 June 2022) provided by RPS. We note from discussions at the Offshore Ornithology EWG Meeting 2 (EWG02) that the designs to be presented at

the Preliminary Environmental Information Report (PEIR) will not be a sited design and therefore some aspects raised in our advice will be considered at a future stage in the project (e.g. cold spotting/ hot spotting).

We note that there was an action from the EWG02 for RPS and the applicant to discuss the possibility of additional analysis of survey images to ensure variability is being captured across the survey area. We await further information regarding the outcomes of these conversations in regard to our recommendation of power analysis to demonstrate that survey coverage is appropriate.

2. Agreement on the approach to displacement as set out in the Morgan and Mona Displacement technical paper, taking into account clarifications to be provided by SNCBs

Natural England has previously provided a response to the Morgan and Mona Displacement technical paper (dated 24 June 2022, our ref: 394421). Following on from the discussions in the EWG02, Natural England additionally do not recommend that displacement is assessed for kittiwake as we currently consider the evidence base to be insufficient and suggestive of inconsistent responses to Offshore Wind Farms (OWFs). If the project chooses to assess kittiwake for displacement effects we advise that it is not acceptable to reduce the densities considered in collision risk modelling.

At this stage in the assessment Natural England recommend that full displacement matrices are presented, for all species excluding kittiwake. An investigation into the range of levels of displacement and mortality rate that would lead to an adverse effect would then enable discussion around the likelihood of impacts occurring. Natural England considers that the formulation of appropriate mortality rates to be used in defining the estimated impact should be guided by site-specific sensitivity for each species.

Natural England advise that a combined estimate of birds on the water and in flight is used to assess displacement of Manx shearwater.

3. Agreement to the approach to sCRM as discussed in the EWG02 meeting, which superseded the Morgan and Mona CRM technical paper following the NE advice

The parameters presented in the email from [redacted], RPS (email dated 26 July 2022, with references provided by email 10 August 2022) appear to be suitable for the species covered. Natural England reiterate that we believe it is of limited value to model CRM for these species. Johnston *et al.* (2014)[1] flight curves for these species indicate a very low risk of collision. If new evidence (e.g. from tagging studies) on flight height can be presented and considered that would significantly alter the expected outputs, Natural England would encourage investigation of this. If CRM is to be undertaken a novel approach may be more appropriate considering these species might be most at risk of collision with the turbine bases, although we note again that very low levels of collision would be expected.

Natural England are not currently able to share the draft CRM parameters which were provided in draft to support RPS's progression of work on the project with the wider EWG members and therefore request that the information we shared with the project team (email dated 7 July 2022, sent by [redacted]) is treated as not for further dissemination. Our draft guidance has been provided to the Marine Industry Group for Ornithology for review. Once approval has been received other interested parties may have access to the final guidance, as required. We note that Natural Resources Wales and the Joint Nature Conservation Committee have received this information as members of the Marine Industry Group for Ornithology. We advise that the project proceed with presenting the rates and reference as draft Natural England guidance until the guidance has formally been published. We will provide an update when the guidance has been published.

[1] Johnston, A., Cook, A.S.C.P., Wright, L.J., Humphreys, E.M., Burton, N.H.K., 2014. Modelling flight heights of marine birds to more accurately assess collision risk with offshore wind turbines. Journal of Applied Ecology 51, 31-41. https://doi.org/10.1111/1365-2664.12191

4. **Agreement that on the basis of low abundance of red-throated diver across the Mona array and survey buffer, does the EWG agree this species can be scoped out for the array impacts assessment (nothing this will be included for the export cable route)**

Natural England agree that red-throated diver displacement arising from the Mona project array is likely to be insignificant based on the data from the 24 months digital aerial surveys for this project presented in the EWG02. However, we consider that some further justification for scoping the species out of a displacement assessment is required. Although very low numbers are detected in the baseline survey data it will be necessary to understand the density and distribution of red-throated divers across the survey area. This is of particular importance in light of our previous advice that an adverse effect on site integrity on this species due to displacement could not be ruled out at Burbo Bank Extension Offshore Wind Farm. A comparison of the predicted density and distribution of the species in relation to the historic and contemporary boundary of the Liverpool Bay Special Protection Area (SPA) may be useful, noting that the historic boundary is a more realistic representation of the area within the SPA where higher diver densities are encountered.

5. **Agreement on the approach to identification of sites and features in the LSE Screening as set out in the slide pack for the EWG02.**

As set out in the Evidence Plan Steering Group Meeting 3 (held on 20 July 2022) the ornithology approach is only broadly described, and will be reviewed at a future date once work has been carried out on the baseline characterisation, CRM and displacement modelling. At present Natural England does not have any further comment to make, and will provide further comment at a future date once further detail is available.

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

Yours sincerely

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

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

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

Cc [redacted]

D.3.15 Response from NRW regarding the meeting minutes

From: [redacted]
To:
Cc:
Subject: RE: Morgan Mona Offshore Ornithology EWG02
Date: 16 August 2022 17:33:24
Attachments: image001.png

CAUTION: This email originated from outside of RPS.

Hi [redacted]

Thank you for your email and apologies for the delayed response following the Second Morgan and Mona Offshore Ornithology Expert Working Group that took place on 13th July 2022, as you are aware, I have only just returned from leave. Please find below NRW Advisory (A) responses to the relevant action points from the meeting:

- **LR to discuss clarity around request for power analysis with NRW specialists.**

  The NRW Scoping Response stated that *"The level of coverage required to be sufficient for baseline characterisation will depend on the nature of the area being surveyed and the abundance and distribution of receptors across the area. A power analysis should be undertaken to inform survey design and ensure that such designs maximise the probability of detecting changes in abundance and distribution through future comparison with data that may be collected post-consent."* The applicant proposes to collect data from approximately 30% of the sea surface and analyse 12%. It is unclear where the justification for the 12% analysed comes from and how it relates to these survey data, hence advising the applicant to make this clearer.

  Typically, NRW (A) would recommend a power analysis to ensure that there is sufficient statistical power to detect changes in abundance and distribution through future comparison with data that may be collected at a later stage, demonstrating that the applicant has considered whether the current survey design has enough power to be used for the pre-construction surveys. It is important that analyses have the power to detect trends in abundance or distribution and the level of displacements for the species that may be impacted.

- **NRW to provide recommendation on the displacement and mortality rates to be used for Manx Shearwater and Kittiwake.**

For Manx Shearwater and Kittiwake, NRW (A) advise that whole displacement matrices are presented. At a later stage, the applicant can work back to establish what levels of displacement and mortality are likely to have an effect. NRW (A) advise using a range of mortality rates from 1-10%.

- **EWG to provide recommendation for abundance estimates for all behaviours for Manx Shearwater**

The SNCBs advise that a combined estimate of the number of birds on the water (corrected for survey coverage) and of the number of birds in flight (corrected for survey coverage) are used for an assessment of Manx shearwater displacement.

- **EWG to approve or recommend alternative parameter values for Fulmar and Manx Shearwater**

  NRW (A) agrees with the suggested parameters for Fulmar and Manx shearwater.

Unfortunately Elwyn is currently away from his desk due to unforeseen circumstances, so I am not able to finalise the Agreement Log, but will do so as soon as possible on his return. We have no amendments / comments to make on the minutes from the meeting.

I will be in touch shortly re. actions following the Steering Group meeting and Marine Mammal EWG.

Kind regards,

[redacted]

[redacted]

Uwch Gynghorydd Morol (Rhaglen Ynni Adnewyddadwy ar y Môr) / Senior Marine Advisor – Offshore Renewable Energy Programme

Cyfoeth Naturiol Cymru / Natural Resources Wales
Ffôn/ Phone: *Please contact me initially via email or Teams*
Trefynwy / Monmouth

Yn falch o arwain y ffordd at ddyfodol gwell i Gymru trwy reoli'r amgylchedd ac adnoddau naturiol yn gynaliadwy.

Proud to be leading the way to a better future for Wales by managing the environment and natural resources sustainably.

cyfoethnaturiol.cymru / naturalresources.wales

Twitter | Facebook | LinkedIn | Instagram

Croesewir gohebiaeth yn Gymraeg a byddwn yn ymateb yn Gymraeg, heb i hynny arwain at oedi.

Correspondence in Welsh is welcomed, and we will respond in Welsh without it leading to a delay.

D.3.16 Advice note from Natural England regarding the HPAI and impact assessment

Highly Pathogenic Avian Influenza (HPAI) outbreak in seabirds and Natural England advice on impact assessment (specifically relating to offshore wind)

September 2022

1. We are currently unclear what the short, medium and long-term effects of the 2022 HPAI outbreak will be on seabird colony abundance and vital rates (productivity and survival), though impacts at some English colonies in 2022 were likely substantial (e.g. emerging indications of estimates include adult mortality in ~50% of the UK's only roseate tern colony at Coquet Island SPA, and ~10% of Sandwich terns at the North Norfolk Coast SPA). We do not know the extent of population resilience – for instance, how many non-breeding birds might replace adults dying from HPAI in 2022 in future breeding seasons.

2. We expect HPAI to remain a threat to UK breeding seabirds (and terrestrial species of birds, especially perhaps wintering waterbirds) for the foreseeable future. It will take several years for data to be gathered on abundance, mortality and productivity, so we will need to work with imperfect knowledge in the interim.

3. The species understood to be of greatest relevance for imminent impact assessment of offshore wind farms in England are black-legged kittiwake, Sandwich tern, northern gannet, great black-backed gull, common guillemot and razorbill.

4. We expect seabird data collected prior to summer 2022 (approx. June) to remain a valid representation of 'typical' seabird distribution and density, as this was before mass mortality events began to take place. (At this point, we assume affected colonies will recover in the short or long term, depending on available recruits to colonies, scale of further outbreak, and other factors). Data collected at sea from summer 2022 onwards will need discussion with Natural England, to understand how the species and colonies of concern, and their density at sea at certain times, may have been affected by HPAI. We welcome engagement with developers actively engaged in data collection through the Evidence Plan process.

5. Implications for data collection planned for projects beyond Round 4 will largely be site- and species-specific, and we recommend careful interpretation of results in consultation with Natural England. As the duration and severity of the epidemic is unknown and evidence will continue to accumulate over time, an iterative approach seems likely to be required.

6. Broadly, we expect any changes in abundance at colonies to be reflected proportionately in the at sea data. That is, it is reasonable to assume distribution patterns will remain broadly similar, but densities to change accordingly.

7. This assumption means that the scale of impact is likely to remain in proportion to the size of the colony. For instance, if a population were reduced by 10% then we would expect 10% fewer collisions. However, where a population has been significantly depleted, it should be considered whether an equivalent level of impact would have greater implications for the newly reduced population.

8. This would also reflect the likely need to ensure that the sea areas that support SPA (Special Protection Area) seabird colonies provide suitable conditions to restore populations where HPAI impacts have reduced population sizes, rather than simply maintain them. Natural England will aim to provide conservation advice that reflects any such changes.

9. Given the significant uncertainties about the health and resilience of seabird colonies introduced by HPAI, Natural England is likely to further emphasise the need to continue with a risk-based approach to its advice on additional impacts from development, particularly where

populations have been significantly impacted. This is to ensure that the impacts of HPAI are not compounded by those from development.

9. This approach is also likely to be taken to compensation discussions. We are likely to recommend that the nature, scope and scale of compensatory measures reflect the uncertainties around population trends, recovery and resilience introduced by HPAI.

10. We need much more data, and urgently need all concerned with seabird conservation and related developments to fund monitoring of key variables at important colonies, so that collectively we can make best decisions about impact and its effects in the face of the threat from HPAI.

11. Natural England will shortly publish its advice to Defra underpinning an English Seabird Conservation and Recovery Plan, which includes direct recommendations for seabird recovery, some relating to disease as well as seabird monitoring.

12. We must work collectively to ensure that seabird populations are made more resilie nt to the type of catastrophic event caused by HPAI. This includes delivering the actions relating to feeding, breeding and survival as outlined in Natural England's recommendations to Defra in the England Seabird Conservation and Recovery Plan.

D.4. Offshore ornithology EWG meeting 3

D.4.1 Meeting minutes

MINUTES OF MEETING

Security Classification: Project Internal

Partners in UK offshore wind

MOM Number	:	20221130_Morgan gen Mona OO EWG03 MoM	**REV. No.** :	F02

MOM Subject : Morgan generation assets and Mona Offshore Ornithology Expert Working Group meeting 3

MINUTES OF MEETING

MEETING DATE : 30 November 2022

MEETING LOCATION : MS Teams

RECORDED BY : [redacted] (RPS)

ISSUED BY : [redacted] (RPS)

PERSONS PRESENT:

- [redacted] - RPS (KL)
- [redacted] - RPS (ST)
- [redacted] - RPS (JS)
- [redacted] - RPS (LM)
- [redacted] - RPS (AN)
- [redacted] - bp (MP)
- [redacted] -bp (WD)
- [redacted] - bp (GV)
- [redacted] - JNCC (JW)
- [redacted] - JNCC (RH)
- [redacted] - JNCC (JB)
- [redacted] - Natural England (ABR)
- [redacted] - Natural England (RB)
- [redacted] - Natural England (LB)
- [redacted] - NRW (LR)
- [redacted] - NRW (HR)
- [redacted] - TWT (GJC)
- [redacted] - Natural England (JH)
- [redacted] - IoM (RS)
- [redacted] - MMO (AP)
- [redacted] - MMO (RG)

APOLOGIES

- [redacted] - RSPB (AM)
- [redacted] - RSPB (AD)

ITEM NO:	DISCUSSION ITEM:	Responsible party	Date
1.	**Project update (presented by WD)** bp are working with EnBW in a 50/50 partnership (the Applicants) to develop the Morgan Offshore Wind Project Generation Assets ('Morgan (Generation Assets)') and the Mona Offshore Wind Projects ('Mona'), which are being progressed as two separate projects. Morgan (Generation Assets) is the northern project located in English waters, and Mona is the southern project located mostly in Welsh waters. Together, they will have a combined capacity of 3GW. The Morgan Offshore Wind Project and the Morecambe Offshore Windfarm (developed by Cobra Instalaciones Servicios, S.A. and Flotation Energy plc) have been scoped into the Pathways to 2030 workstream under the Offshore Transmission Network Review (OTNR). Under the OTNR, the National Grid Electricity System Operator is responsible for conducting a Holistic Network Design Review to assess options to improve the coordination of offshore wind generation connections and transmission networks. The output of this process concluded that the Morgan Offshore Wind Project and the Morecambe Offshore Windfarm should share a transmission assets route corridor to a shared grid connection location at Penwortham in Lancashire. Both projects support the Holistic Network Design Review conclusions and intend to collaborate on a shared route corridor. The Morgan and Morecambe Transmission Assets project will be subject to a separate DCO. This consenting approach will provide a formal structure for the projects to collaborate, allows for integrated consideration of cumulative effects and streamlining the process with a single consent which should be simpler for stakeholders. The Applicants therefore intend to set up a separate Evidence Plan Process (EPP) to cover the Morgan and Morecambe Transmission Assets. The Mona and Morgan (Generation Assets) EPP will progress as planned and be separate from the Morgan and Morecambe Transmission Assets EPP. Mona is being taken forward as a separate DCO including both the generation and transmission assets. The individual Morgan (Generation Assets) and Mona PEIR submissions will be at the end of Q1 2023. The two PEIR submissions have been aligned to allow the Applicant to properly consider the cumulative effects between the projects. The Morgan and Morecambe Transmission Assets PEIR is likely to be submitted in Q3 2023.		
2.	**Baseline characterisation (Presented by JS)** For the Mona Offshore Wind Project a buffer of 4-10km has been used as the Array Area was refined after the digital aerial surveys		

	were commissioned. For Mona, 24 months of data are available to be included in PEIR. For Morgan generation, only 12 months of data are available to be included in PEIR. All species in the digital aerial surveys were identified by APEM and those raw counts were used in the spatial distribution modelling. RB- Have the unidentified auk species been apportioned to particular species? There is a high percentage of unidentified auks so you need to be careful of identification bias. Apportioning such a large proportion of unidentified auks based on the proportions of identified species may not be appropriate. It would be useful to understand how this varied seasonally. JS- The spatial modelling doesn't include the unidentified auks. After the spatial modelling, the unidentified auks are apportioned and included in the resulting densities. The spatial model was only completed on the most common species as the model doesn't run for a low number of data points. The model uses spatial and environmental variables to aid predictions of the spatial distribution. For the months and species where there was sufficientnt data for modelling, non-parametric bootstrapping was used instead to predict densities and spatial distribution. HR- Where you have provided MRSea estimates, will design-based estimates also be provided? JS- Yes, we have calculated both for all species where MRSea was undertaken. We also consider the availability bias e.g. for auks species that are underwater. For example if puffins are underwater for 16% of the time, then we would increase the densities by 16%. We then attributed the unknown species after the modelling was undertaken. There are high levels of variation in the densities between the Mona and Morgan surveys across the same month. As well as high levels of variation between the same months across different years. KL- The densities presented do take into account the unidentified species. JS- The density maps presented include the apportioned unidentified auk species. KL- We can take this away and look at why the number of unidentified auk species is so high. RB- Yes this may be helpful regarding the question of how many birds need to be identified to have confidence in the spatial modelling. *Post meeting note from Natural England:* *In relation to the discussion about the possibility of investigating the impact of the unidentified portion of the auk data on the spatial mapping & density surfaces, which followed on from Natural England raising concerns about apportioning from low ID rates with no real understanding of bias.*	**The Applicant to investigate why the number of unidentified auks are high.** **Also to look at seasonal variation.**	In progress

	The issues here are around ID bias, but this includes the possibility that some of that bias may be driven (directly or indirectly) by environmental covariates. *Essentially, it would be useful/informative to ascertain if it is really appropriate to inflate the densities, and if spatial modelling of a species with such a low ID rate is likely to be representative.*		
3.	**<u>Collision risk modelling (presented by JS)</u>** Collision risk modelling (CRM) was undertaken using the Shiny app online. It is a stochastic collision risk model. It is built from the basic band model. It allows you to include the confidence limits for parameters and the model will sample from a range and provide outputs on that range. The densities that fed into the model were either derived from MRSea where available, or from non-parametric bootstrapping where MRSea was unavailable. KL- The EWG was provided with methodology papers for CRM, displacement and baseline characterisation ahead of the last EWG meeting. We had broad agreement on the methodology. The parameters that fed into the model e.g. avoidance rates were agreed as part of the last EWG meeting. For black-legged kittiwake, most of the predicted collisions occurred outside the breeding season. Collision increased the baseline mortality by 0.023-0.055%. HR- What definitions of seasonality are you using? JS- They are based of the biological defined seasons from Furness 2015[1]. HR- Kittiwake has three seasons, breeding, non-breeding and migratory. JS- This has been considered for the technical reports, it has only been presented as breeding and non-breeding in the graphs in the presentation for simplicity; but the three seasons have been accounted for in the technical reports. Great black-backed gulls showed high variability with low collisions due to low predicted densities. Collision increased the background mortality by 0.18-0.87%. For lesser black-backed gulls, collisions were very low due to low predicted densities. Collisions increased the background mortality by 0.003-0.022%. Herring gulls were more common, collisions were roughly equal between the breeding and non-breeding seasons. Collision increased the background mortality by 0.002-0.016%.		

[1] Furness, Robert. (2015) Non-breeding season populations of seabirds in UK waters: Population sizes for Biologically Defined Minimum Population Scales (BDMPS). Natural England Commissioned Report. 164.

	For northern gannet, the breeding season had higher densities and therefore there were higher predicted collisions. Based on advice we received these densities were decreased by 70% to account for the macro-avoidance rates. Gannets were the only species for which we were asked to apply this. Collision increased the background mortality by 0.0005%-0.0043% Northern fulmar were recorded mostly in the non-breeding season. They mostly do not fly at heights associated with collision risk . Collision increased the background mortality by up to 0.001%. Manx shearwater had 0 collisions as they don't fly at collision risk height. All species apart from great black-backed gulls had less than 0.1% increase in baseline mortality. With great black-backed gulls having less than 1% increase in baseline mortality. It has therefore been concluded that collision risk for the project alone is unlikely to affect populations. Cumulative effects will also be considered, and results will be presented in the EWG meeting in Q1 2023.		
4.	**<u>Migratory CRM (presented by JS)</u>** The SOSSMAT tool has been used for migratory CRM. If you divide the number of survey flight lines that cross the Mona array area by the total number of flight lines, you get a proportion of the total bird population expected to cross the array area. This proportion is then multiplied by the total bird population from census studies to get the total number of birds at risk of collision (with no avoidance) when crossing the array area. HR- What flight heights have been used? JS- We have used those recommended in the SOSSMAT guidelines. HR- Have the full range of flight heights in the SOSSMAT guidelines been used. LM- We have used the percentage of birds potentially at turbine height from the SOSSMAT tool which is based on a range of values. HR- Have seabird migrations been considered? LM- No, the modelling is not really appropriate to undertake assessment on migratory seabirds. HR- NRW would suggest a slightly different approach for migratory seabirds such as terns and skuas. As they don't migrate in straight lines as the model assumes, they need to be considered in the contact of the migratory front and where the offshore wind farm sits within that. Suggested taking an approach similar to that undertaken by WWT and McArthur Green for Marine Scotland project on strategic assessment of collision risk of OWFs to migrating birds.	**NRW to provide the reference to how McArthur Green have considered migratory seabirds -** information and link provided in separate NRW response	Complete

5.	**Displacement assessment (presented by JS)** We have used the matrix displacement approach, as agreed in previous EWG meetings. We have used a range of displacement and mortality rates as advised by the EWG in the last meeting. For construction and decommissioning we have implemented half of the displacement rate used for operation, as advised by the EWG in the last meeting. We have used regional populations based on Furness 2015. For each species in each bio-season we have used peak numbers. Mona has two estimates, one for each survey year so an average of those peaks across the two years has been used. For Morgan generation, only one year of data is available for PEIR so we have one peak. The full two years of data will be included in the Morgan generation assets environmental statement. HR- For Manx Shearwater, NRW would advise that the displacement rates for auks are used. JS – We have used the displacement rates included in the displacement note circulated to the EWG on 05 May 2022 before the last EWG meeting. RB- NE advised after the last EWG that Manx Shearwater should have the same displacement rates as auk species. KL- We will take this away and update the assessment if required. *Post meeting note* *In Natural England's response to the displacement technical note provided by RPS on 27 May 2022. They state 'Natural England advise that Manx shearwater (Puffinus puffinus) should also be considered. It has previously been advised that the displacement and mortality rates applied to auks are used for Manx shearwater, and it is suggested that this is discussed further via the Evidence Plan process at an Offshore Ornithology Expert Working Group meeting.'* *JNCC responded to the displacement technical note with 'We therefore we recommend that a displacement assessment is conducted for Manx shearwater with displacement rates of 1-10%'* *NRW responded to the action from the last EWG meeting 'NRW to provide recommendation on the displacement and mortality rates to be used for Manx Shearwater and Kittiwake.' with 'For Manx shearwater and kittiwake, NRW (A) advise the whole displacement matrices are presented. At a later stage, the applicant can work back to establish what levels of displacement and mortality are likely to have an effect. NRW (A) advise using a range of mortality rates from 1-10%.'* *JNCC responded to the same action with 'A range of mortality rates from 1-10% are advised.'* *NRW and JNCC have not provided clear steer to the Applicant on displacements rates to be used for Manx Shearwater. However, the full matrices are to be presented in the PEIR, as requested by NRW*	**NRW and JNCC to provide guidance on the displacement rates to be used in the Environmental Statement assessment – see separate NRW response.**	Complete

	and other stakeholders. The assessment for the PEIR has been undertaken using 1-10% displacements rates for Manx Shearwater. If further advice cannot be provided at this time, this can be further discussed with the EWG upon review of the full matrices in the PEIR.		
6.	**<u>Apportioning assessment (presented by JS)</u>** We have undertaken apportioning based on the NatureScot method. We take the centroid of the offshore wind farm and use the mean-max foraging range plus one standard deviation. The mortalities form collisions and displacement are then apportioned to each colony. Apportioning is undertaken based on the proximity of a colony to the offshore wind farm, which is then assigned a weighting factor. We have used the standard age composition from Furness 2015 which provided the number of expected immature individuals in the population for each adult. RB- Natural England do not advise separating out sabbatical birds rates for apportioning. HR- NRW would also not recommend separating out sabbatical birds for apportioning. RB- You said that you have used the mean max foraging rates plus one standard deviation. As well as looking at the mean max, Natural England would recommend that the max from each species from each colony is looked at. This is detailed in the Natural England best practice guidelines. We don't want to dilute the impact by including additional colonies unnecessarily but using this method, an important SPA colony may be included. HR- This apportioning approach is appropriate for the breeding season. How has apportioning been done for the non-breeding season? JS- We have only been able to do it for the breeding season. We have used the Furness 2015 data which provides a breakdown of different colonies. HR- for the non-breeding season, NRW advice would be to use the tables in appendix A of Furness 2015 - by using the proportion of the relevant colony figure against the total BDMPS population during the respective season (further detail in separate NRW response). AN- we have used the tables in appendix A for non-breeding season. RS- The Isle of Man has protected colonies of birds. Are they included for apportioning. JS- The main focus has been the SPAs. KL- Non-SPA colonies have been considered within the EIA and these will include the Isle of Man Marine Nature Reserve colonies.	**RPS to consider updating apportioning assessment to include sabbaticals in adult mortalities.** **RPS to check NE best practice guidance.**	In progress Complete

7.	**LSE screening (presented by KL)** We have undertaken a more detailed review for Mona now that we have the apportioning and CRM results for offshore ornithology. We have considered these results in the LSE screening to ensure it is proportionate. Where mortalities were >1 individual, these sites were screened in for 'in combination'. Where mortality was <1 these sites were screened out. This is based on the worst-case scenario where the layers of conservatism in the displacement and CRM analysis as well as the maximum design parameters used (e.g. for displacement the maximum mortalities associated with the greatest displacement, up to 70%, and the greatest mortality rates, up to 10%) should ensure a precautionary approach. When the project is considered alone, all species were below the 1% threshold, even for the worst case scenarios. HR- NRW doesn't agree that sites can be screened out based on less than 1% increase in baseline mortality. LSE should be a coarse screening filter, so where a feature of a site is present on the OWF site and there is connectivity and a potential impact pathway we would expect the site to be screened in and taken through to the appropriate assessment phase. The results of the apportioning of impacts (collision/displacement etc) and assessments of impacts against baseline mortality should be included in the appropriate assessment. KL- We understand that this is the typical approach adopted historically, but the aim of our approach is to provide a more proportionate Appropriate Assessment. We are trying to manage the size of the Information to Support Appropriate Assessment (ISAA) and focus it on those SPAs and features of SPAs where there is potential for LSE. We feel this is important as it ensures the ISAA is focussed on the key SPAs, rather than screening in a very large number of SPAs where we have clear evidence that the risk to these SPAs is minimal (even in highly conservative worst case scenarios). This will help all parties to manage workloads during the pre-application process and into examination. Particularly when we have the evidence (i.e. through site specific modelling and assessments) to support this approach. HR- NRW will take this away and consider this approach. RB- Natural England would take the same stance. We understand the approach to reduce the documentation burden. We will also take this away and respond on how we would like it presented. We also don't consider the use of de minimis to be appropriate for in combination effects.	**NRW and Natural England to consider the proposed approach to LSE screening– see separate NRW response**	Complete
8.	**Avian Flu (presented by KL)** We understand that the Highly Pathogenic Avian Influenza (HPAI) is a very live issue and we have seen the Natural England guidance on it published in September 2022 and provided to the Sheringham and Dudgeon extension consent application. For the		

	Mona Offshore Wind Project, we have 24months of data which is all pre- HPAI. The Natural England advice is that data collection pre-June 2022 remains valid. For Morgan generation, we have 12-month pre and 12 months post June 2022. We will continue to look at the data as it comes in but at the moment we can't see anything beyond natural variation that has been seen in the Mona data. It is unclear how HPAI will affect the Irish Sea populations, most studies so far have focused on the Scottish populations. We would expect that if the Irish Sea populations are reduced then the collision risk and displacement would also proportionally decrease. Does the EWG have and advice or comments on the HPAI? RD- It has come through late on the IoM, from mid-July. Effects have been widespread since then. RB- It is a live issue and Natural England have no further advice from what has already been published. RS- Has hen harrier been considered within the assessment. We have a large population on the IoM and there may be a flight line between the IoM and Wales/England. JS- We have considered hen harriers in the technical reports.		
9.	**<u>Next steps (presented by KL)</u>** • Meeting minutes to be circulated 2 weeks following the EWG. • Agreement logs to be circulated following EWG. • Agreement on approach to LSE Screening using apportioning. • Meeting Q1 2023 to discuss results for Morgan generation. LB- Is there consideration for barrier effects for migratory birds. KL- We will take this away to consider the potential for barrier effects and disruption of the normal migratory path.	**RPS to consider the potential impact of barrier effects and disruption of the normal migratory path.**	In progress

D.4.2 Response from Natural England regarding the meeting minutes

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

[redacted]
BP Alternative Energy Investments Limited

c/c [redacted]
RPS/ Energy

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

[redacted]

BY EMAIL ONLY

Dear [redacted]

Discretionary Advice Service (Charged Advice) – UDS A000566
Development proposal: BP EnBW Morgan and Mona Offshore Wind Farm
Consultation: Ornithology EWG03

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

The following advice is based upon the information within the Ornithology Expert Working Group (EWG) Meeting 3 (attended on 30th November 2022) and subsequent meeting notes provided 12th December 2022 by [redacted].

Natural England was asked to provide advice upon:

1) Agreement on approach to LSE screening using apportioning
2) Investigation of the implications of low ID rate for Auks on the spatial modelling and density surfaces
3) Manx shearwater displacement rates

Detailed comments

1) Agreement on approach to LSE Screening using apportioning

LSE Screening

The LSE Screening stage of the HRA process details whether those constituent elements of the plan or project which are (a) not directly connected with or necessary to the management of the European Site(s) features and (b) could conceivably adversely affect a European site, would have a **likely significant effect,** either alone or in combination with other plans and projects, upon the European sites and which could undermine the achievement of those conservation objectives.

In accordance with case law, this HRA has considered an effect to be 'likely' if there is a risk or a possibility of it that '*cannot be excluded on the basis of objective information'* and to be 'significant' if it *'undermines the conservation objectives'* (Case C127-02 *Waddenzee* (paras 45 & 47*).*

This assessment of risk therefore takes into account the precautionary principle (where there is scientific doubt) and **excludes**, at this stage, any measures proposed and outlined in the submitted details of the plan/project that are specifically intended to avoid or reduce harmful effects on a

European site(s).

Natural England advise that LSE should be treated as a coarse screening filter to identify all instances of qualifying features with potential protected site connectivity and an impact pathway. If significant (possible) effects cannot be excluded on the basis of objective information without extensive investigation, further assessment should be presented in an Appropriate Assessment.

Natural England appreciate the desire to reduce the burden of documentation, but consider that the overall information supplied essentially remains unchanged. Natural England does not agree that it is appropriate to screen species/sites out of LSE based on a <1% increase in baseline mortality. It should also be noted that Natural England also does not consider the use of de minimis to be appropriate for screening impacts out of consideration for in-combination assessments.

Apportionment

Natural England advise that where site-specific information on age classes is not available a precautionary approach should be adopted, and all adult-type birds should be treated as adults. The use of stable age structures is not appropriate over the spatial scale of an OWF survey area. Further, we reiterate that Natural England advise that sabbatical rates should not be considered for apportioning.

2) Investigation of the implications of low ID rate for Auks on the spatial modelling and density surfaces

Natural England has concerns regarding the apportioning of auks from low ID rates, with no real understanding of bias. Species-specific ID bias cannot be accounted for. Further, there is the possibility that additional ID bias may be driven (directly or indirectly) by environmental covariates. It would be useful to ascertain if;

1) it is appropriate to inflate the densities by apportioning of unidentified birds
2) spatial modelling of identified birds for species with such a low ID rate is representative of the population in the study area.

(i.e., in both cases, what percentage should be identified to have confidence in this approach)

Natural England would recommend asking the Digital Aerial Survey provider why the auk ID rate is so low as it would be useful to understand if there are options to improve this through, e.g. increased interrogation of raw data.

3) Manx shearwater displacement rates

Natural England highlight the paucity of evidence around Manx shearwater displacement and acknowledge that the whole displacement matrix will be presented in the PEIR. This will allow evaluation of the likely levels (if any) at which a significant effect may be expected.

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

Yours sincerely,

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

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

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

Cc [redacted]

Annex 1
European Protected Species

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

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

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

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

D.4.3 Response from NRW regarding the meeting minutes

Project Mona & Morgan (Generation) Offshore Ornithology EWG03: NRW Actions

[redacted]
Senior Marine Advisor

5th January 2023

Introduction

This advice is provided in response to the **Meeting Actions from the Offshore Ornithology Expert Working Group (EWG) meeting 03 which took place on 30th November 2022.**

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

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

The recipient acknowledges that:

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

Advisors Consulted:
Marine Ornithology

Actions

NRW to provide the reference to how McArthur Green have considered migratory seabirds

NRW Advisory (A) agree with the use of SOSSMAT for migratory non seabirds. However, consideration should also be given to migratory seabird species such as skuas and terns that may not get picked up in large numbers on aerial surveys due to the snapshot nature of the surveys, for collision risk for Mona and Morgan. As noted during the Offshore Ornithology EWG03 meeting, it would not be appropriate to use SOSSMAT for these species as they often migrate following coastlines at a distance offshore, rather than straight lines between point of origin and destination, which is an assumption of SOSSMAT. Therefore, alternative approaches are required, such as estimating the abundance of a species of bird migrating through a wind farm footprint area based on an apportionment of migrant bird numbers across a broad migratory front. As an example, for a species that might pass through the Irish Sea as part of a longer migratory route (such as great skua), the risks that the population is exposed to relate to the proportion of the broad migratory front that passes across the proposed wind farm area. For a species that migrates exclusively over the sea, the broad migratory front could be defined as the width of the Irish Sea. Consideration should also be given to the distribution of birds within the broad migratory front: birds could be distributed evenly, or they might have a skewed distribution. For example, if the species tends to avoid the coast on migration through the Irish Sea, then distribution could be biased towards the centre of the Irish Sea.

This approach is broadly consistent with the approach taken in the report for the Marine Scotland project on strategic assessment of collision risk of OWFs to migrating birds (WWT Consulting Ltd, 2014) http://www.gov.scot/Resource/0046/00461026.pdf

NRW to provide guidance on the displacement rates to be used in the Environmental Statement Assessment

NRW (A) agree with the displacement rates presented of 30-70% for auks and 60-80% for gannet.

Regarding Manx shearwater, there is currently no evidence for any particular range of displacement rates (1-10%, 30-70% or any other) for this species from offshore wind farms. Therefore, NRW (A) welcome that the whole matrices will be presented in the PEIR and agree that this can be further discussed with the EWG upon review of the full matrices in the PEIR.

NRW to consider the proposed approach to LSE screening

NRW (A) do not agree with the approach set out during the Offshore Ornithology EWG to LSE screening. This is because LSE is a coarse screening filter, should be simple, and if further evidence is brought in, then effectively this should be part of the Appropriate Assessment (AA). This provides a transparent approach that can be followed through the Report to Inform Appropriate Assessment (RIAA). As such, NRW (A) would expect all sites where a qualifying feature has been recorded on the development site and where there is

potential connectivity (e.g. within foraging range) and a potential impact pathway (e.g. displacement or collision) and hence the potential to undermine the conservation objectives for the feature, to be carried through to the AA phase. Any additional work looking at e.g. apportioning impacts and assessments of predicted impacts against baseline mortality etc. should be included in the AA.

Additional NRW Comments following the Offshore Ornithology EWG03 meeting

Age classes, sabbaticals and apportionment of impacts

Apportionment of age classes:
NRW (A) do not agree with the use of the PVA stable age structures, as it is very difficult to state that this is what it is at the specific offshore site in a specific season. NRW (A) currently advise that proportions of adults and immatures are based on age-class information from site-specific surveys. NRW (A) note the difficulties associated with ageing some species from digital aerial data and currently recommend that in the absence of site-specific information on age classes, a precautionary approach assuming all adult-type birds are adults, is adopted.

Sabbaticals:
As noted during the EWG meeting, NRW (A) currently advise that sabbaticals are not included/taken into consideration, therefore, sabbaticals should not be removed from impact assessments.

Apportionment to colonies:
Impacts should be apportioned to colonies (both SPA/Ramsar for HRA and SSSIs for EIA). NRW (A) welcome the use of the NatureScot method for apportionment of impacts in the breeding season.

For apportionment of impacts to relevant colonies during the non-breeding season(s), NRW (A) advise the use of the data presented in the tables in Appendix A of the BDMPS report (Furness 2015 - Non-breeding season populations of seabirds in UK waters: Population sizes for Biologically Defined Minimum Population Scales (BDMPS) - NECR164 (naturalengland.org.uk)). Appendix A provides the BDMPS for seabirds during each season, such as during migration or winter (Furness, 2015). Please note that a separate BDMPS may need to be defined for the migration seasons as well as for the 'winter' period between migration seasons. It is possible to apportion seabird species to a specific SPA population by using the proportion of the relevant colony figure against the total BDMPS population during the season. Whether the colony figure in the BDMPS tables used is the adult figure or that for all ages depends on the approach to impact assessment (e.g. if a PVA model is being employed and impacts within the model are specified as changes to adult survival, then calculating the proportion of adults within the relevant BDMPS would be the appropriate approach). NRW (A) note that SSSIs are not listed in the Appendix A Furness (2015) report tables, so for these, there will be a need to find an appropriate proxy site to use.

D.4.4 Response from JNCC regarding the meeting minutes

From: [redacted]
To: [redacted]
Cc: [redacted]
Subject: RE: Morgan Mona offshore ornithology EWG03 meeting
Date: 22 December 2022 11:59:40
Attachments: image002.jpg
image003.jpg
image004.png
image005.png
image006.jpg
Morgan_Mona_OOEWG_Agr Log F03_JNCC.xlsx

Good afternoon [redacted]

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

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

NRW and JNCC to provide guidance on the displacement rates to be used in the Environmental Statement assessment
For Manx shearwater displacement we advise that whole displacement matrices are presented. At a later stage, the applicant can work back to establish what levels of displacement and mortality are likely to have an effect.

NRW and Natural England to consider the proposed approach to LSE screening. Agreement on approach to LSE Screening using outputs for collision risk modelling, displacement assessment and associated apportioning paper.
LSE is a coarse screening filter, should be simple and if further evidence is bought in, then effectively this should be part of the appropriate assessment. This provides a transparent approach that can be followed through the RIAA. Therefore, we would expect all sites where a qualifying feature has been recorded on the development site and where there is potential connectivity (e.g. within foraging range) and a potential impact pathway (e.g. displacement or collision) and hence the potential to undermine the conservation objectives for the feature to be carried through to the AA phase. Any additional work looking at e.g. apportioning impacts and assessments of predicted impacts against baseline mortality etc. should be included in the AA.

Apportionment of age classes (slides 37-39 - Apportioning)
We do not agree with the use of the PVA stable age structures, as it is very difficult to say that this is what it is at the specific offshore site in a specific season. We currently advise that proportions of adults and immatures are based on age-class information from site-specific surveys. We note the difficulties associated with ageing some species from digital aerial data and currently recommend that in the absence of site-specific information on age classes, a precautionary approach assuming all adult-type birds are adults is adopted.

Kind regards,

[redacted]

[redacted] BSc(Hons)
Offshore Industries Adviser

Marine Management Team
JNCC, Inverdee House, Baxter Street, Aberdeen, AB11 9QA
[redacted]

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

jncc.gov.uk

D.5. Offshore ornithology EWG meeting 4

D.5.1 Meeting minutes

MINUTES OF MEETING

Security Classification: Project External

Partners in UK offshore wind

MOM Number	:	20230223_Morgan gen Mona OO EWG04 MoM	**REV. No.** :	F02
MOM Subject	:	Morgan generation assets and Mona Offshore Ornithology Expert Working Group meeting 4		

MINUTES OF MEETING

MEETING DATE	:	23 February 2023
MEETING LOCATION	:	MS Teams
RECORDED BY	:	[redacted] (RPS)
ISSUED BY	:	[redacted] (RPS)

PERSONS PRESENT:

- [redacted] - RPS (KL)
- [redacted] - RPS (ST)
- [redacted] - RPS (JS)
- [redacted] - RPS (LM)
- [redacted] - RPS (AN)
- [redacted] - bp (MP)
- [redacted] - bp (SR)
- [redacted] - Niras (MH)
- [redacted] - JNCC (JW)
- [redacted] - JNCC (RH)
- [redacted] - Natural England (RB)
- [redacted] - Natural England (EW)
- [redacted] - Natural England (LB)
- [redacted] - Natural England (AR)
- [redacted] - Natural England
- [redacted] - NRW (HR)
- [redacted] - IoM (RS)
- [redacted] - MMO (AP)
- [redacted] - RSPB (AM)
- [redacted] - TWT (BS)

APOLOGIES

- [redacted] - RSPB (AD)
- [redacted] - NRW (LR)
- [redacted] - MMO (RG)
- [redacted] - TWT (GJC)
- [redacted] - JNCC (JB)
- [redacted] - Natural England (ABR)

ITEM NO:	DISCUSSION ITEM:	Responsible party	Date
1.	**Project update (presented by MP)** The Applicant is expecting to publish the Mona and Morgan Generation Preliminary Environmental Information Reports (PEIR) end of March/ April 2023. Statutory consultation will then take place in April and May 2023. We have increased the duration of statutory consultation to 47 days taking into account the Easter holidays so we hope this will give the stakeholders time to read and respond to the PEIRs. Only the first year of data from the digital aerial surveys was available to feed into the Morgan Gen PEIR. The surveys end in March 2023 and the full two years of data will be incorporated into the Environmental Statement to accompany the DCO application. The Applicant will consult with the Expert Working Group (EWG) in summer 2023 to provide an update on the site-specific data and to confirm if there are any changes to the assessment as a result of the second year of data.		
2.	**Feedback and actions from EWG03 (presented by JS)** In EWG03, there was a query on why some auk ID rates were lower in some months than expected. We queried this with APEM and APEM have now updated their Auk ID rates. These updates will be taken into account in the Environmental Statement. KL noted that this lower ID rate primarily related to a few months, winter season, in particular in winter 2020/21. In EWG03 it was suggested that the displacement rates that should be used for Manx Shearwater are 70% displacement and 10% mortality. The numbers in this presentation present the recommended rates and they will be used for the Environmental Statement. KL- JNCC also requested that the full displacement matrices were presented. There are in PEIR so while we have not taken forward 70% displacement and 10% mortality these are included in the tables. JS- There was also a request for sabbaticals to be included as adult birds. The numbers in this presentation address this and this will be included in the Environmental Statement, however, it was not possible to update the PIER. KL- Sabbaticals are presented in the PEIR, they are included as a separate column rather than added to the adults. AM- Have collision risk impacts on Manx Shearwater been scoped out? What did you use for flight heights.		

	JS- We have carried out collision risk modelling for Manx Shearwater, we use generic flight heights from Johnston *et al*.[1] AM- There is some evidence that Manx Shearwater fly at wind turbine height. There is a general assumption from generic flight heights that they do not fly this high. However, there is evidence that is not in the public domain that they do fly that high. It would be good to see that acknowledged as an uncertainty.		
3.	**<u>HPAI survey update (presented by JS)</u>** The second summer of Morgan digital aerial surveys has recorded only six deceased birds, five of which were gannets and one unidentified. They make up a low proportion of total birds recorded however noting that it is one snapshot in time so this is more an overview of what has been recorded rather than a quantitative assessment of the impact of HPAI. There were also slightly lower numbers of birds recorded in the second year of surveys compared to the first however it is not possible to conclude whether the lower numbers in the second year are attributable to HPAI or other random fluctuations. It is normal for bird numbers to vary substantially between years even under baseline conditions and the abundances were broadly at a similar level as the first year of aerial surveys. AM- It is great that dead birds are also being recorded and presented. Are these records being passed on to any organisation? The SNCBs have jointly agreed how any data would be centralised but it would be good if it could be collated e.g. by NRW. HR- If the information can be shared within someone in NRW then I would suggest Matty Murphy. AM- The potential challenge is the assessment on populations and whether populations are still robust to the additional mortality from projects. There needs to be some consideration of this in the interpretation of the PVA results and in the HRA on the SPA populations against which impacts are assessed. There are also sources of natural variation from tidal cycles, it would be interesting to look at whether tidal cycles account of the difference in data between the first and second year of the survey. JS- In the MRSea models, we already incorporate environmental variations so we can look at tidal cycles in more detail. RS- It is welcome that the project is looking into HPAI. For the surveys results, should we set aside the averages and just use the higher numbers as one year of data is before the outbreak and one year is after. JS- If the affected colonies get new colony counts then the information will be comparative as the numbers affected will be compared against the updated population numbers.	**RPS to look at tidal cycles influence on survey result variability** **NRW to provide a list**	On going

[1] Johnston, A., Cook, A.S.C.P., Wright, L.J., Humphreys, E.M. and Burton, N.H.K. (2014), Modelling flight heights of marine birds to more accurately assess collision risk with offshore wind turbines. J Appl Ecol, 51: 31-41. https://doi.org/10.1111/1365-2664.12191

	KL- Could one of the SNCBs provide a list of the HPAI related data from the digital aerial surveys that would be useful for them to have and who we should provide this data to. The project will discuss what information can be made available. HR- Yes NRW will come back to you on this. *Post meeting note: NRW have requested that survey data records of dead birds are reported to Defra at* [redacted] *as well as being sent to NRW through their avain flu reporting email* [redacted]	**of HPAI survey data that would be useful and a contact to send this data to.**	Complete
4.	**<u>Mona Offshore Cable Corridor (presented by JS)</u>** Impacts on the Mona Offshore Cable Corridor have been assessed qualitatively and quantitatively in the PEIR. The Mona Offshore Cable Corridor overlaps with the Liverpool Bay SPA. Conservative assumption is that the maximum displacement zone (from installation vessel) at any given time will be along a 4km stretch of the cable corridor (noting displacement will more likely be encircling the cable installation vessel). Red throated diver and common scoter were assessed quantitatively in the PEIR. BS- Is the project not looking to co-locate its cable corridor with the other wind farms in the area? KL- Not for Mona, for Morgan the cable will be in a co-located cable corridor with the Morecambe offshore wind project. The Mona project team looked at whether this would be viable (e.g. with Awel Y Mor), but this was not possible. BS- If the route is entirely different from the others on the north coast then the resistance that has occurred on Awel Y Mor may come up on Mona. KL- bpEnBW ran through the cable routing process and approach with the steering group so this has been presented to stakeholders. It will be fully detailed within the PEIR site selection chapter. MP- The Applicant has carried out a detailed site selection process and the offshore cable corridor avoids a high number of constraints; the cable corridor presented in the PEIR is the most viable option. HR- Is the worst case one installation vessel at one time, or could it be more? KL- Assumption is for one installation vessel at one time. HR- Would suggest that timing restrictions be considered for Red throated diver and common scoter so that the cable is not laid during key times for these species. RB and AM echoed this recommendation. KL- This could be examined but based on the numbers affected that will be presented, we don't think that this measure is	**The Applicant to review red throated diver and common scoter seasonality in Liverpool Bay SPA area in relation to**	On going

	required. The Applicant is looking to use vessel management practices to reduce disturbance where possible. RB- The mortality estimates may be very small however for the Liverpool Bay SPA there is concerns over availability of supporting habitats for red throated diver due to displacement effects. Natural England already consider there to be adverse effects on red throated diver in the Liverpool Bay SPA.	**cable installation**	
5.	**<u>Overview of the new conservation advice package for Liverpool Bay SPA (presented by EW)</u>** The new conservation advice package published by NRW, JNCC and Natural England. The package has been updated to make the attributes and features more clear for each feature. Species distribution, disturbance, supporting habitat and food availability attributes have been updated. For most attributes, the conservation objective is to maintain, with the exception of those associated with supporting habitat within the SPA, where there is a restore objective for extent of supporting habitats. Specifically, this relates to disturbance which projects should look to minimise. Red-throated diver have restore objectives for the distribution and extent of supporting habitats for non-breeding population attributes. There is also an update to the seasonality of each of the features.		
6.	**<u>Morgan Gen CRM analysis (presented by JS)</u>** The approach is the same as for Mona but based on the first 12 months of survey data. It will be updated with the full 24 months of survey data for the application. Collision risk modelling (CRM) was undertaken using the Shiny app online. It is a stochastic collision risk model. It is built from the basic band model. It allows you to include the confidence limits for parameters and the model will sample from a range and provide outputs on that range. The densities that fed into the model were either derived from MRSea where available, or from non-parametric bootstrapping where MRSea was unavailable. RS- The Isle of Man has a significant great black backed gull population. The Applicant should look at the seabird counts for the colonies. AN- the Isle of Man colonies are included the PEIR, with all colonies including isle of man included within each species foraging range: this includes GBBG and isle of man colonies		
7.	**<u>Migratory collision risk modelling (presented by JS)</u>** The SOSSMAT tool has been used for migratory CRM. RS- Have whooper swan and hen harrier been checked as migrants?		

	LM- Yes they have been included, all migratory water birds have been included. The table in the slides just presents a summary of some of the key species.		
8.	**<u>Apportioning assessment (presented by JS)</u>** We have undertaken apportioning based on the NatureScot method. We take the centroid of the offshore wind farm and use the mean-max foraging range plus one standard deviation. The mortalities form collisions and displacement are then apportioned to each colony. Apportioning is undertaken based on the proximity of a colony to the offshore wind farm, which is then assigned a weighting factor. We have used the standard age composition from Furness 2015 which provided the number of expected immature individuals in the population for each adult. HR- Last EWG we discussed that the age structures from the BPMPS was being used for age-class apportioning. Advice was that data from the survey images should be used to inform this. JS- We have not done this in the PEIR as the site survey data did not have this information. We will go back to APEM about this. RB-Survey for gannet should be able to come up with an age structure. JS- Yes, we can go back to APEM on this.	**Applicant to check with APEM on whether age structure can be provided for survey impacts**	Ongoing
9.	**<u>Cumulative Effects Assessment (presented by JS)</u>** The cumulative effects assessment (CEA) was carried out for • Common guillemot • Razorbill • Atlantic puffin • Northern gannet • Black-legged kittiwake. The CEA was based on a 500km range which is based on the maximum foraging range of a species included in the assessment. Publicly available data on projects was included. If further data becomes available before the application then this will be incorporated into the Environmental Statement where possible. HR- The cumulative assessment should be based on all projects within the relevant BDMPS population area for each species (as defined in Furness 2015) rather than use of a 500km range. RB- Agree with HR suggestions. Noted an example whereby during the non-breeding season, birds from North Sea colonies could move into the Irish Sea. KL- The Applicant can consider this request for the application. Concern that you would end up with a very large list of projects, so not proportionate.	**The Applicant to review whether all projects within the relevant BDMPS should be included in the cumulative assessment for the Environmental Statement**	Ongoing

	JS- A tiered approach has been adopted based on the certainty that a project will be developed and the reliability of information available in the public domain. RS- There is the Orsted Isle of Man wind farm, this could be considered although understand it is not at the application stage yet. KL- There is no public information about the Isle of Man wind farm therefore there is no information on which to undertake a quantitative assessment. We cannot make any assumptions on what other projects may do. It is included in the project CEA long list and the Applicant is aware of it but we have not been able to include it in the PEIR assessment due to lack of specific information. LB- On the discussion regarding the range over which cumulative projects are considered. It would be relevant to include some of the North Sea and Scottish Projects as populations with birds that overwinter in the Irish Sea may also travel to the North Sea. AN- Is this based on marine pathway ranges? LB- Yes.		
10.	**<u>Population Viability Analysis (presented by JS)</u>** HR- We would advise that a burn in should be used and it should be 5 years. Impacts should commence when the offshore wind farm starts operating. AN- We used the Natural England tool and this specified that the burn in is for future works. We can include it for the application but that is why we did not use it in the first instance. AM- The tool has been updated but not the associated guidance. RB- The tool has been updated but not the guidance and recommend a 5 year burn in. SR- When will the guidance be updated? RB- will take that away and confirm. RH- In the CEA, when you are accounting for impacts from Erebus on guillemot, where have you taken the numbers for the impact assessment? We did disagree with some of the rates in the original ES. There are several addendums to the ES that use different rates. JS-We used the displacements to run our own analysis. AN- With regards to burn in period, that assumes we are using relatively up to date colony counts, what shall we do if colony counts were last counted a long time ago? If we do a burn in period for that, the model may run for more than the specified burn in period. Can we have your thoughts on that? HR- Need to give it some consideration and will get back to you on that .	**Natural England to confirm when the PVA model guidance will be updated.** **NRW to respond to RPS query around burn in time to be used in PVA modelling for**	Complete Complete

	RS- Where are the growth rate for the populations from? AN- We use the productive and demographic rates form Horswill and Robinson 2015. This is then put into the model. RS- some populations we known are declining on Isle of Man. AN- we have used the recommended source of Horswill and Robinson 2015. We acknowledge this may be outdated and so can we request that JNCC provide the data they used to present their productivity graphs on their seabird population reports (e.g. as presented here https://jncc.gov.uk/our-work/black-legged-kittiwake-rissa-tridactyla/)? This will then allow us to consider more updated productivity and survival scores for PVA. JW- we will take this away and see what can be done. RS- supports this recommendation.	**older colony counts** **JNCC to look into providing access to the data they used to produce their productivity score graphs for UK countries and for each species. JNCC confirmed that the BTO should be contacted.**	Ongoing
11.	**<u>LSE Screening methodology (Presented by KL)</u>** We discussed the approach to LSE screening with the steering group in July 2022. We described the slightly different approach that has been taken for the Mona and Morgan Gen PEIRs. Following this, we have had clear feedback from stakeholders on the approach to LSE Screening and therefore would like to discuss a compromise approach for the final application. Approach taken in the PEIR is that apportioning assessment has been used to identify the SPAs and qualifying features where a risk of LSE could not be excluded. Where mortalities were <1 individual they were screened out from the assessment as LSE could be ruled out alone and in-combination. Where mortalities identified from apportioning were >1 individual, these sites were screened in, with a particular focus on 'in combination' effects. Where mortality was <1 these sites were screened out. This is based on the worst-case scenario where the layers of conservatism in the displacement and CRM analysis as well as the maximum design parameters used (e.g. for displacement the maximum mortalities associated with the greatest displacement, up to 70% displacement, and the greatest mortality rates, up to 10%) should ensure a precautionary approach. If more realistic/less conservative assumptions are made (e.g. lower displacement and mortality rates), the numbers of birds affected are reduced considerably. For those sites that have been taken forward to the appropriate assessment i.e. where there is the potential for more than one bird to be affected, only very small numbers have been identified both in absolute numbers and as a proportion of the background mortality for the relevant SPAs (see slide showing mortalities for guillemot at Lambay Island and Ireland's Eye SPAs). These are against background mortalities of hundreds or thousands of individuals per annum (i.e. therefore the in-combination impacts		

	are well within background variation). If all sites with potential connectivity with the Mona and Morgan Generation Offshore Wind Projects were screened in, the Information to Support Appropriate Assessment (ISAA) would be exceptionally long with a large number of tables presenting very small mortality numbers for Mona and Morgan Generation. In the approach adopted for PEIR, the Applicant is looking to develop a proportionate HRA, responding to well known and acknowledged criticisms of the HRA process and making the assessment more accessible for stakeholders. As flagged by the offshore ornithology EWG, in terms of an audit trail, the apportioning numbers that have been used to screen out SPAs are all set out in the HRA Stage 1 screening document. As such, future projects can undertake a full in-combination assessment that includes mortality estimates from the Mona and Morgan Generation Offshore Wind Projects. We have had feedback from stakeholders in the last offshore ornithology EWG that this approach to LSE screening is not what has been applied to other wind farms historically. The Applicant is therefore suggesting a compromise solution, noting that the approach for PEIR will be as previously set out. For the HRA Stage 1 screening and ISAA to be submitted with the application for consent, the Applicant will look to take a more traditional approach to the HRA Stage 1 screening while trying to control the level of detail in the ISAA. We would look to screen on the basis of the foraging ranges from SPAs with breeding colonies (as is typically undertaken for UK offshore wind farms). We would also look to screen SPAs and qualifying features out, where it can be demonstrated that there will be 0 mortalities of breeding birds (i.e. through CRM, displacement or apportioning e.g. fulmer and Manx shearwater and collision risk modelling, see slides). The Applicant is proposing to undertake a 'two step' integrity test. The first step would be to undertake a high level initial assessment within the ISAA, using the apportioning paper to present where there is no risk of adverse effects on integrity on an SPA and not including a very detailed assessment against the conservation objectives for each low risk SPA (e.g. using a brief, tabulated approach to concluding no adverse effects on integrity). The Mona and Morgan Generation Offshore Wind Projects are well sited offshore wind farms in regard to ornithological aspects for the HRA and numbers across the sites area generally low therefore we are expecting a good number of SPAs to fall into this low risk category, that is, most if not all of the SPAs and features which were screened out at LSE in the PEIR. In the second step, a more detailed assessment would then be undertaken on the SPAs where there is a greater risk of adverse effects on integrity (likely to be focussed on in-combination effects). Requested Feedback:	**EWG to provide feedback on whether a compromise solution to the assessment included in the ISAA would be acceptable in**	Completed

	• Please can the EWG provide feedback to these meeting minutes to indicate if a compromise solution would be acceptable in principle – this would allow us to work on restructuring the LSE Screening and ISAA for the ES. • While reviewing the PEIR could stakeholders provide feedback on which SPAs would be worth taking forward to the detailed assessment within the ISAA (i.e. second step integrity test).	**principle (see post meeting note below).**	
12.	**<u>Next steps (presented by KL)</u>** • Meeting minutes to be circulated 2 weeks following the EWG. • Agreement logs to be circulated following EWG. • Agreement on approach to LSE Screening using apportioning. The EWG05 will be organised in summer 2023 to discuss the section 42 response and updates for the Environmental Statement.		
13.	**Close of meeting.**		
14.	**Post Meeting Note:** Following the EWG meeting, a follow up meeting was held on 8 March 2023 with NRW (HR and LR) to re-present the LSE Screening methodology (Item 11 above) as HR was unable to attend the end of the EWG meeting on 23 February 2023. During the meeting, the LSE screening thresholds proposed for the DCO application (i.e. 0 adults individuals from SPAs) was queried by HR. HR asked whether this would include "rounding down" apportioned features/SPAs and therefore would this mean <0.5 adult individuals as a threshold for screening out sites/features? KL noted that if this threshold of <0.5 adult individuals (or another numerical threshold as advised by SNCBs) was acceptable to all SNCBs, then that would help ensure the ISAA is proportionate. HR not certain that this would be acceptable to SNCBs. KL queried whether this could be discussed with other SNCBs and feed back to the project in the meeting minutes. Action HR and LR. HR questioned whether this threshold would assume the highest mortalities for both Displacement and Collision Risk. KL confirmed this was the approach for the LSE Screening; the full range of mortalities is presented in the apportioning paper, but for LSE Screening the project would use the highest, most conservative number. Coming onto the compromise approach outlined for the ISAA (i.e. step 1 to undertake a "high level" integrity test), HR suggested that 1% of baseline mortalities from the SPA could be used as a threshold for those sites included in a "high level" assessment in the ISAA. HR suggested this could include a presentation (e.g. in tabular format) of the SPA, qualifying feature, apportioned mortalities, total population (and year), baseline mortalities and project mortalities as a % of the baseline mortalities. Those over	**HR and LR (NRW) to liaise with SNCBs on:** **(a) whether there is a numerical threshold which could be used for LSE Screening.** **(b) whether the 1% baseline mortality threshold could be used for the "Step 1" integrity**	Completed

	the 1% threshold would require more detailed consideration in the ISAA. KL queried whether this could be discussed with other SNCBs and feed back to the project in the meeting minutes. Action: HR and LR.	**test in the ISAA.**	

D.5.2 Response from Natural England regarding the meeting minutes

Date: 27 March 2023
Our ref: DAS/UDS A000566 426713
Your ref: Morgan & Mona Ornithology EWG04 23.02.23

[redacted]
BP Alternative Energy Investments Limited

c/c [redacted]
RPS/ Energy

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

[redacted]

BY EMAIL ONLY

Dear [redacted]

Discretionary Advice Service (Charged Advice) – UDS A000566
Development proposal: BP EnBW Morgan and Mona Offshore Wind Farm
Consultation: Morgan & Mona Ornithology EWG04 23.02.23

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

The following advice is based upon the information within the 4th Ornithology Environmental Working Group for Morgan generation and Mona offshore wind projects (attended on 23rd February 2023) and subsequent meeting notes provided 13th March 2023 by [redacted].

Natural England was asked to provide feedback on:

1) Compromise solution: ISAA Assessment
2) Cable route: Red-throated diver and Common scoter at Liverpool Bay SPA
3) Cumulative effects assessment
4) PVA guidance

Detailed comments

1) Compromise solution: ISAA assessment

Natural England considers that a fully detailed methodology should be presented in writing to support the proposed approach to LSE & the ISAA assessment. In principle, Natural England is supportive of the two-stage approach to the appropriate assessment. Natural England considers the approach suggested by NRW to be acceptable, using <1% of baseline mortality to rule out AEOI in stage one, and further detailed assessment of any site/feature combinations where predicted mortality exceeds 1% of baseline, e.g., through PVA and consideration of impacts against conservation objectives.

Natural England retains some concerns with the approach to LSE screening. Natural England reiterates that LSE should represent a coarse initial filter. Natural England does not agree that mortalities of <1 individual should be screened out from the assessment, as Natural England does not agree that LSE can necessarily be ruled out on this basis, especially in-combination. With regards to what can be treated as 0 mortality (rounded if <0.5 or =0 only), Natural England advises that actual 0 only should be used to screen out LSE.

Natural England re-iterates that a clear audit trail to enable in-combination assessments is vital. It is essential that all predicted impacts on each SPA are clearly presented in an accessible document so that future projects can draw on it.

The method as detailed does not consider impacts to non-breeding birds. Non-breeding season populations of seabirds in UK waters: Population sizes for Biologically Defined Minimum Population Scales (BDMPS) - NECR164 (naturalengland.org.uk) should be used to identify potential connectivity in the non-breeding season. Relevant sites should then be considered in the appropriate assessment, most likely (but not necessarily) at the 'light touch' phase.

Finally, Natural England believe that this 'compromise' approach may be appropriate for this specific project scenario, where there is potential connectivity to a very large number of sites but the likelihood of substantial impacts is generally low. However, it should be acknowledged that this approach will not necessarily be appropriate for all cases.

2) **Cable route - Red-throated diver and Common Scoter at Liverpool Bay SPA**

The proposed cable route passes through a relatively important area for common scoter and red-throated diver in the Liverpool Bay SPA. The mortality estimates may be very small, however, at the Liverpool Bay SPA there is concern over the reduced availability of supporting habitats for red-throated diver due to displacement (i.e., the 'distribution' & 'disturbance' conservation objectives rather than 'abundance'). Natural England already considers there to be adverse effects on red throated diver in the Liverpool Bay SPA. Therefore, Natural England would strongly advise that all works on the cable corridor are undertaken in the period May-September, avoiding the red-throated diver non-breeding season as defined in the conservation advice package, Liverpool Bay/Bae Lerpwl SPA - UK9020294A (naturalengland.org.uk).

3) **Cumulative effects assessment**

Please refer to Natural England's published guidance on screening and apportioning in the breeding and non-breeding seasons and cumulative and in-combination assessments in 'Offshore Wind Marine Environmental Assessments: Best Practice Advice for Evidence and Data Standards. Phase III: Expectations for data analysis and presentation at examination for offshore wind applications'. Natural England advise that the proposed use of an arbitrary 500km range is not appropriate for screening in projects for a cumulative effects assessment. The relevant spatial scale will be species-specific and should be based on the relevant BDMPS (Furness, 2015).

4) **PVA guidance**

Please refer to Natural England's published guidance on PVA in 'Offshore Wind Marine Environmental Assessments: Best Practice Advice for Evidence and Data Standards. Phase III: Expectations for data analysis and presentation at examination for offshore wind applications' (see section 5.3.1.1 Population modelling). With respect to use of a burn-in period, note that this guidance states *"PVAs should estimate the impacted and unimpacted populations over the lifetime of the project and include a 'burn-in' period (5 years) to allow the model to reach stability prior to the projection period beginning."*

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

Yours sincerely,

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

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

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

Co[redacted]

Annex 1
European Protected Species

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

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

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

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

D.5.3 Response from NRW regarding the meeting minutes

Project Mona & Morgan Offshore Ornithology EWG04 NRW Actions

[redacted]
Senior Marine Advisor

27th March 2023

Introduction

This advice is provided in response to the Meeting Actions from the Mona and Morgan generation Offshore Ornithology EWG04 which took place on 23rd February 2023.

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

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

The recipient acknowledges that:

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

Advisors Consulted:
Marine Ornithology

Actions

Action: NRW to respond to RPS query around burn in time to be used in PVA modelling for older colony counts

NRW Advisory (A)'s understanding is that the burn-in is done as a separate component and is done before the main PVA runs are done - the burn-in involves running baseline PVA simulations for n burn-in years and outputting the age structures that are obtained at the end of this period. This age structure is then used as the initial age structure within the main PVA runs. The burn-in run, and main PVA run are identical except in the way that the initial age structure is specified. So, NRW (A) advise that the PVAs are parameterised using a 5-year burn-in period, with the impacts set to commence when the project is anticipated to start operating and to run for the lifetime of the project, and with the starting population being the latest count for the site in question.

Action: EWG to provide feedback on whether a compromise solution to the assessment included in the ISAA would be acceptable in principle (see post meeting note in meeting minutes)

In principle, NRW (A) are supportive of the two-stage approach to the appropriate assessment. We advise use of <1% of baseline mortality to rule out AEOI from the project alone or in-combination in stage 1 of ISAA integrity assessment, with further detailed assessment of any site/feature combinations where predicted mortality exceeds 1% of baseline mortality e.g. through PVA and consideration of impacts against conservation objectives in stage 2. NRW (A) consider that a fully detailed methodology should be presented in writing to support the proposed approach to LSE and the ISAA assessment. We also understand that the approach to LSE and ISAA taken in the PEIR will be the original approach rather than any updated/amended one. We therefore recommend that detail is provided in the PEIR of the proposed revised approach that will be taken in the submission.

NRW (A) retain some concerns with the approach to LSE screening. We reiterate that LSE should represent a coarse initial filter. We do not agree that mortalities of <1 individual should be screened out from the assessment, as we do not agree that LSE can necessarily be ruled out on this basis, especially in-combination. With regards to what can be treated as 0 mortality (rounded if <0.5 or =0 only), NRW advises that actual 0 only should be used to screen out LSE.

NRW (A) again advise that a clear audit trail to enable in-combination assessments is vital. It is essential that all predicted impacts on each SPA are clearly presented in an accessible document so that future projects can draw on it.

The method as described appears to focus on impacts to breeding birds with no consideration to non-breeding birds. NRW (A) advise Furness (2015) is used to identify potential connectivity in the non-breeding season. Relevant sites should then be considered in the ISAA, which would most likely be at the stage 1 / 'light touch' phase.

Whilst NRW (A) consider that this 'compromise' approach may be appropriate for this specific project, where there is potential connectivity to a very large number of sites but the likelihood of substantial impacts is generally low, it should be acknowledged that this approach will not necessarily be appropriate for all cases.

Action: NRW to liaise with SNCBs on: (a) whether there is a numerical threshold which could be used for LSE Screening. (b) whether the 1% baseline mortality threshold could be used for the "Step 1" integrity test in the ISAA

A meeting was held between NRW, NE and JNCC on 20/03/23 to discuss these issues and the 'compromise' solution to the assessment to be included in the ISAA in the submission. As a result, please see our response above to the Action regarding compromise solution to assessment included in the ISAA.

Additional NRW Comments following Offshore Ornithology EWG04

Cable route – Liverpool Bay SPA
The proposed cable route passes through a relatively important area for common scoter and red-throated diver in the Liverpool Bay SPA. As noted during the OO EWG, NRW (A) advise that works on the cable corridor are undertaken outside of the key times for these species – i.e. avoiding works between October-April – see Liverpool Bay SPA conservation advice package.

Cumulative Effects Assessment
As noted during the OO EWG, NRW (A) do not consider that the proposed use of an arbitrary 500 km range is appropriate for screening in projects for a cumulative effects assessment. The relevant spatial scale will be species-specific and should be based on the relevant BDMPS as defined in Furness (2015).

REFERENCES

Furness, R.W. (2015) Non-breeding season populations of seabirds in UK waters: Population sizes for Biologically Defined Minimum Population Scales (BDMPS). Natural England Commissioned Reports, Number 164. Available from: http://publications.naturalengland.org.uk/file/5734162034065408

D.5.4 Response from JNCC regarding the meeting minutes

From: [redacted]
To: [redacted]
Cc: [redacted]
Subject: RE: Morgan generation and Mona offshore wind project Offshore ornithology EWG04
Date: 27 March 2023 16:37:11
Attachments: image002.jpg
image003.jpg
image004.png
image005.png
image006.jpg
RE Morgan generation and Mona offshore wind project Offshore ornithology EWG04.msg
Morgan_Mona_OOEWG_Agr Log F04_JNCC_update.xlsx

Good afternoon, [redacted]

With regard to the latest Orni Expert Working Group (EWG 04), JNCC have no comments to make on the minutes from 23/02/2023 (email 13/03/2023).

There were two actions on JNCC in response to this meeting. I know Rebecca responded directly to you on the first of these (copy of the email attached for completeness). With regard to the second action; EWG to provide feedback on whether a compromise solution to the assessment included in the ISAA would be acceptable in principle (see post meeting note in meeting minutes), please see our response below.

JNCC response:
We advise that a fully detailed methodology should be presented in writing to support the proposed approach to LSE & the AA.
We agree in principle that mortalities of zero individuals can be screened out at the LSE screening stage. We advise that actual 0 only should be used at the LSE screening stage (meaning no value other than 0.0 individuals).
We agree in principle that 1% baseline mortality can be used within Stage 1 of the Two step Integrity Test within the AA for the alone assessment.
We advise that 1% baseline mortality is also used in the in-combination assessment, and where mortality from Mona or Morgan in-combination with the other identified projects results in an increase in 1% or greater of baseline mortality, that will be taken to Stage 2.
These thresholds are key to ensuring relevant impacts are taken through to the in-combination assessment and that all predicted impacts on each SPA are clearly presented in an accessible document so that future projects can draw on it.

With regards to the Agreement Log, we have added an update to cell H36 in blue. For clarity, the text in cell H36 reads:

> "27/03/2023 Update: We advise that a fully detailed methodology should be presented in writing to support the proposed approach to LSE & the AA prior to seeking agreement on the approach."

If you have any questions, please let me know.

Kind regards,

[redacted]

[redacted] BSc(Hons)

Offshore Industries Adviser
Marine Management Team
JNCC, Inverdee House, Baxter Street, Aberdeen, AB11 9QA
[redacted]
[redacted]

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


jncc.gov.uk

D.5.5 HRA Methodology update for Mona/Morgan Generation

Partners in UK offshore wind

MORGAN GENERATION AND MONA OFFSHORE WIND PROJECTS

HRA Methodology Update

Image of an offshore wind farm

05 May 2023
F01

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

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

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1.3.3 Integrity test: step 2 3

Acronyms

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

Units

Unit	Description
%	Percentage

1 HRA METHODOLOGY UPDATE

1.1 Introduction

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

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

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

1.2 Stage 1 HRA Screening

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

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

1.3 Stage 2 ISAA

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

1.3.2 Integrity test: step 1

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

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

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

1.3.3 Integrity test: step 2

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

D.6. Offshore ornithology EWG meeting 5

D.6.1 Meeting minutes

MINUTES OF MEETING

Security Classification: Project External

Partners in UK offshore wind

MOM Number	:	20230629_Morgan and Mona Offshore Ornithology	**REV. No.**	:	F02
MOM Subject	:	Morgan and Mona Evidence Plan Offshore Ornithology meeting 5			

MINUTES OF MEETING

MEETING DATE	:	30/06/2023
MEETING LOCATION	:	Microsoft Teams
RECORDED BY	:	[redacted] (RPS)
ISSUED BY	:	[redacted] (RPS)

PERSONS PRESENT:

- [redacted] – bp (GV)
- [redacted] – bp (SR)
- [redacted] – RPS (KL)
- [redacted] - RPS (ST)
- [redacted] – RPS (LM)
- [redacted] – Niras (MH)
- [redacted] – Niras (WG)
- [redacted] – JNCC (JW)
- [redacted] – JNCC (RH)
- [redacted] – Natural England (KB)
- [redacted] - Natural England (RB)
- [redacted] – Natural England (AR)
- [redacted] – NRW (LR)
- [redacted] – NRW (HR)
- [redacted] – NRW (EL)
- [redacted] – IoM (RS)
- [redacted] – MMO (AP)
- [redacted] -MMO (MS)
- [redacted] – NRW (RN)

APOLOGIES:

- [redacted] -RSPB
- [redacted] -RSPB

ITEM NO:	DISCUSSION ITEM:	Responsible party	Date
	Project updates (presented by GV) Statutory consultation on the Mona and Morgan Generation PEIRs ended on 4th June. The Applicant appreciates all the feedback; we are currently reviewing all the responses and how they can be addressed. From the statutory consultation feedback and parallel activities, the Applicant has been considering a number of project		

	updates. There are several updates to the project description envelope that are expected to be included in the application. The Applicant is looking to reduce the Mona Array Area and the Morgan Generation Array Area. They are expected to be reduced from what was presented in PEIR and lie wholly within the array areas presented in the PEIR. The Mona Array Area is anticipated to be reduced by approximately 33% and lie wholly within Welsh offshore waters. The Morgan Array Area is anticipated to be reduced by approximately 10%. The primary driver for these reductions is shipping and navigation, specifically ensure safety of navigation. The need for changes for the project design envelope has been highlighted through engagement with a number of the ferry companies in the Irish Sea. The reductions have also been driven through consultation with aviation and other sea users receptors. The layout principles for both Mona and Morgan Generation are expected to be updated to increase the spacing requirements between offshore structures, the specific updates will be communicated in due course. These updates are to address concerns from commercial fisheries. The Applicant is anticipating that monopile foundations will be removed from the project design envelope. The foundations options remaining will be gravity base or jackets (which may be pin piled or suction bucket foundations). This is being driven by the ground conditions. The Applicant expect there to be a mixed foundation solution taken forward to the application, likely to be a mix of jacket and gravity base foundations. The smallest wind turbine option is being removed from the project design envelope due to feedback from the supply chain that this turbine option won't be available at the time of construction. The rotor diameter will therefore also increase from 280m to 320m and this is also based on feedback from the supply chain on the parameters for the wind turbines that will be available at the time of construction. *Post meeting note: The rotor diameter will increase from 280m to 320m not 340m, as set out in the slide pack. The slide pack has been updated and is circulated alongside these meeting minutes.* The Applicant is also reviewing the parameters for the design envelope following the Section 42 statutory consultation responses. Any updated parameters will be fully explained and justified within the application. RH- Will there be a reduction in the number of turbines? GV- Yes, the PEIR presented a maximum of up to 107 wind turbines and the application will be for less than that. HR- Are there plans to update the abundance estimates for the new array areas and subsequently update the CRM assessments. LM- Yes we will update all the assessments to account for the project design changes.		

	<u>Section 42 responses - overarching (presented by KL)</u> The Applicant and RPS have been working through all the S42 responses, looking to the project design envelope and the environmental assessment. There were a couple of key responses that we wanted to raise to the steering group; these will also be discussed with the EWGs. There were several requests for the project to undertake assessments for historic projects where quantitative information required to include them in the cumulative and in-combination assessments is not available. The cumulative and in-combination assessment can only be undertaken on publicly available data and it may not be appropriate to undertake analysis for other projects. There is also no precedent for that type of analysis. The IoM offshore windfarm is in the early stage of the planning process and we expect the scoping report to be published in the autumn. We will incorporate the information in the public domain into the cumulative and in-combination assessment for Mona and Morgan Generation, in line with the Tiered approach. There were a few comments on the site-specific data available to be included in the PEIR. The benthic data for the Mona Offshore Cable Corridor and the zone of influence for the Mona and Morgan Array Areas will be presented in the July EWG. For marine mammals and offshore ornithology, the 24 months of survey data for Morgan Generation will be presented and discussed in the October EWG meetings for those topics. Natural England provided comments on the Morgan Generation and the Morgan and Morecambe Offshore Wind Farms: Transmission Assets (Transmission Assets) applications to ensure that a whole project assessment is undertaken. Are there specific topics or receptors that are of particular concern for the cumulative assessment for Morgan Generation and the Transmission Assets together? The Applicant is considering how human topic cumulative impacts are addressed and we have strategies for those impacts. We can only base the CEA on information in the public domain. These projects are subject to separate consent applications so there will always be difficulty regarding what information is available at the time of application. However, that is why the tier approach to CEA was developed and adopted and we feel the approach set out in the slides adequately addresses the concerns raised. We will circulate the slides after the meeting so you can review the approach to CEA in full. Please can the stakeholders provide their feedback in writing with the meeting minutes. LR- As the projects are being developed by the same applicant, you will have more information than is the public domain e.g. for Morgan Generation, the PEIR is based on 12 months of data. Will the Mona Cumulative Effects Assessment (CEA) be able to present	**Stakeholders to provide their feedback on the approach to the CEA for Morgan Generation**	Complete

	updated information for Morgan Generation using the full 24 months of data. KL- The Mona DCO application will be submitted first in Q1 2024. We don't know the exact gap between the Mona and Morgan Generation applications. The information included in the Mona CEA needs to be already in the public domain, it would be legally very difficult to include new information for Morgan Generation in the Mona application before the Morgan Generation application is published. In addition, there is a risk that if we include information for Morgan Generation that hasn't been finalised, the information may change and then this would pose a risk to the Mona DCO application. HR- Is there a chance that Mona and Morgan Generation will be in examination at the same time with CEAs based on different numbers. Will there be a need to change the CEA for Mona during examination? KL- We don't expect them to be on the exact same timeline, but we are anticipating that there will be an overlap in the examination. It is not unusual for CEAs to be updated in examinations so one of the first actions once the Morgan Generation application was published would be to submit a note to the Examining Authority for the Mona DCO at the earliest opportunity to outline the implications to the Mona CEA. For these types of developments, it is inevitable that one must go first, but as they are being developed by the same applicant and have the same EIA consultants, we will be able to move quickly to update stakeholders on any implications for the applications.		
	<u>Section 42 response- Offshore ornithology (Presented by LM and MH)</u> **<u>Auk ID rates:</u>** There were some responses regarding the low Auk species ID rates from the site-specific surveys. Statutory Consultation responses recommended to carry out some scenario testing to investigate the potential impact of low species ID rates and determine if spatial modelling and apportioning is appropriate. This was specifically in relation to the Mona data. RPS have gone back to APEM on this and they have re-analysed the data and provided updated Auk species ID rates. Before, there were several winter months with ID rates of common guillemot and razorbill below 25%, and now there are only 2 months below 50%. Overall, all monthly ID rates of common guillemot and razorbill have been improved and we are proposing to use the updated ID rates in the application. Please can the EWG clarify if scenario testing is still suggested considering the updated ID rates? HR- Do you know what APEM have changed in this re-analysis in order to get the higher ID rates? LM- They have gone back over the data however we don't know specifically what they have done. KL- It is possible that they have used a more experienced member of staff who is able to ID birds in more images.	**EWG to clarify if scenario testing is still suggested considering the updated Auk species ID rates** **The Applicant to provide further detail on methodology for raising the**	Complete Complete

	HR- It would be good to see something in writing from APEM regarding what changes have been made that have resulted in the increased Auk species ID rates. . RB- I would like to agree with HR, we would want to know how these ID rates have been updated. Providing new ID rates seems strange and we would like to see the methodology for this. *Post meeting note: NRW need to see the detail on what exactly Apem have done that has resulted in these revised species ID rates first and then can consider scenario testing in light of further understanding of what Apem are doing.* **Migratory Seabirds:** The Applicant agrees with the Statutory Consultation response that SOSSMAT might not be appropriate for scoping of migratory seabird species. As recommended, an alternative approach is considered for the Environmental Statement which is based on the Marine Scotland project on strategic assessment of collision risk of OWFs to migrating birds. Can the EWG provide feedback on whether this approach would be acceptable. HR- This approach sounds fine and it in line with what NRW have suggested. What species will be considered? LM- Gull species, skua species, shearwater species, storm petrels and Leach's petrel, tern species, gannet and kittiwake HR- Seabird species such as gannet, kittiwake and auks are more likely to be adequately represented in the monthly digital aerial surveys and so do not require assessments of passage populations. However, species like terns, skuas and little gull which may pass though the site on passage may not be adequately captured by baseline characterisation surveys, which represent a snapshot of conditions at the particular time of the survey and hence assessments should account for the flux of such birds on passage through the site. *NRW post meeting note: As confirmed during the EWG, NRW Advisory are content with the approach set out during the EWG and slides, which is in line with the approach we outlined in our previous advice.* **Liverpool Bay SPA (KL presented):** The RPS and Niras ornithologists have reviewed the HiDef report that supported the updated Liverpool Bay SPA conservation advice package. This report confirmed that aggregations of common scoter and red-throated divers broadly coincided with inshore areas of the Mona offshore export cable which are previously known to support large aggregations of this species during the winter. The Applicant is looking at what can be done to reduce the impact of the projects on birds. For the Mona export cable installation, ideally schedule works to avoid the most sensitive period, but where it is not possible to avoid cable installation from 1st November to 31st March, measures will be set out in the consent plan 'Measures to minimise disturbance to marine mammals and rafting birds' to be submitted with the application. Measures will include not over revving vessel engines and sticking to defined transit routes. These	**Auk species ID rates** **EWG to provide feedback on the proposed methodology for scoping of migratory seabirds**	Complete

	are standard measures for reducing disturbance to birds from SPAs. Noting the impact of cable installation will be very short term and intermittent, and to reiterate, works would be scheduled to avoid this period wherever possible. RB- Natural England would highlight that there isn't much that can be done to minimise disturbance to red throated diver due to cable installation works; the measures to minimise disturbance were more related to activities such as Crew Transfer Vessel movements, rather than cable installation works. The only effective measure is to not be present in the area. KL While the Project will schedule works to avoid the most sensitive period where possible, the project is not including Horizontal Directional Drilling (HDD) operations at the landfall in the works for which scheduling will be undertaken to avoid the wintering period within the SPA. The HDD operations will be undertaken in the intertidal area or very nearshore. As red throated diver and common scoter are generally not present or present in very low numbers in the very nearshore area, the impact will be very small. It is therefore not proportionate to apply the restrictions to the HDD operations. RB- This sounds ok for red throated diver, but it would be worth taking a close look at common scoter who may be found closer to shore. HR- NRW provisionally agree with Natural England, as long as all qualifying features (so including the wintering waterbird assemblage) are considered and a justification provided. *Post meeting note: The Mona intertidal bird surveys recorded red-throated diver at a peak of 65 birds in January 2022 at the Mona landfall area, although they were usually found at lower densities but present during all the wintering months in which surveys took place (December 2021 to March 2022). Red throated diver were recorded at densities between <0.1-1 average birds per hectare in the nearshore area (1.5km from shore). None were recorded within the intertidal area and to roughly 150m off the shore. Common scoter were recorded at a peak of 2,150 in January 2023 with <0.1 average birds per hectare recorded within one hectare in the intertidal area and at densities between <0.1-5 average birds per hectare within 150 m of shore (Mona Offshore Wind Ltd, 2023[1]).* **<u>Cumulative/in-combination assessments (presented by MH)</u>** Statutory consultation highlighted that the cumulative and in-combination assessments do not factor in impacts from a number of other projects due to a lack of data. Impacts specified as 'unknown' have been treated as zero which will inevitably underestimate impacts, potentially significantly. Statutory consultation responses consider this approach to be unacceptable, and hence consider it inappropriate to comment on the potential	**Natural England to update the Applicant with progress**	Ongoing

[1] Mona Offshore Wind Ltd, 2023, Mona Offshore Wind Project Preliminary Environmental Information Report, Volume 7, annex 24.2: Intertidal ornithology Technical Report. https://enbw-bp-consultation.s3.eu-west-2.amazonaws.com/PEIR/04+Preliminary+Environmental+Information+Report/07+-+Onshore+Annexes/RPS_EOR0801_Mona_PEIR_Vol7_24.2_IO_TR+FINAL.pdf

	significance of cumulative or in-combination assessments presented in the PEIR submission. MH noted that for some older projects no CRM or apportioning of impacts to designated sites was undertaken. The Applicant cannot quantify impacts for these assessments as it would not be appropriate to undertake an assessment for another project and there is no precedent for it. These projects will be considered qualitatively in the CEA and in-combination to ensure they are included. KL- We would like further feedback and discussion on how we should approach this. Do the SNCBs have suggestions for how to proceed. RB- Natural England have a proposed approach. Natural England have secured funding to run a project to gap fill the assessment numbers for old offshore wind farm projects that didn't undertake that analysis. This will consider their Rochdale envelope and the as built scenarios. This is more important for the Irish Sea as there is a higher proportion of older projects, compared to the North Sea. Natural England are looking to get it contracted as soon as possible and once complete the numbers will be in the public domain for future offshore wind projects to use. GV- When do you expect this to be available to use? RB- Natural England are aware of the accelerated timescales for these Irish Sea projects. We are hoping it can be delivered very quickly but we don't have a date at this point. Ideally by the end of the year. GV- Is there any intention to engage with the industry on the methodology and expectation for use? This study sounds very useful but industry buy in will be key to ensure it is used consistently. RB- As soon as the industry is consulted or steering groups established for this type of project, it significantly increases the timescales for delivery. In terms of buy-in, it will be following the Natural England best practice guidance and the intention is to produce something that is live and so can reflect any updates to methods and parameters. Although it will include as built scenarios there is no mechanism for securing projects to those parameters so we won't be using them in the main assessment. SR- We are updating the application documents over the next few months. We are really keen on this approach however we are not sure the timescales between this project and the Mona and Morgan Generation application will match up. We will wait for any updates from Natural England. Projects usually have a cut off of four months ahead of application for including additional information. KL- If the project could be updated on how this is progressing over the next few months that would be very useful. Even if it is headline outputs on what is being produced. For Mona and Morgan Generation we will have to progress with the approach we have set out but we welcome this project from Natural England	**and consider Irish sea as a priority area, given the project programme for DCO submission in Q1 2024.**	

	and as and when outputs are available, we can look to incorporate into the CEA as appropriate. RB- We will keep the Applicant up to date as far as possible. It might be possible to have a phased delivery with the Irish Sea coming first. **<u>Cumulative assessment in non-breeding season:</u>** Originally, the cumulative study area was based on gannet foraging ranges. Statutory consultation response disagreed with this approach. For non-breeding season, the cumulative study area for the application will encompass other relevant marine developments, especially other offshore wind energy developments within the 'UK Western Waters and Channel' which is the relevant Biologically Defined Minimum Population Scales (BDMPS) region (Furness, 2015) and offshore wind energy developments within the Republic of Ireland waters (excluding developments off county Clare, Galway, Mayo and Sligo). Colonies in the Irish Sea do not contribute many birds to the BDMPS population in the North Sea therefore there shouldn't be a need to include projects in the North Sea. *Post meeting note: The action has been updated to request feedback on the cumulative study areas to match the discussion in the EWG.* *Post meeting note from NRW: Do you mean proposed foraging ranges here? - as the approach discussed in the EWG was relating to cumulative assessment in the non-breeding season and the approach does not use foraging ranges, it was to use the 'UK Western Waters and Channel' BDMPS. This is effectively what we advised in our PEIR response – essentially the cumulative assessments should include all plans/projects located within the relevant species specific BDMPS as defined in Furness (2015) – which for most relevant species is the 'UK Western Waters', although should note that for Manx shearwater and kittiwake the relevant BDMPS is 'UK western waters & Channel' and for GBBG, the Mona/Morgan sites are located within the 'SW & Channel waters' BDMPS, although they are also near to the 'West of Scotland' BDMPS as well.* **<u>Foraging ranges and breeding populations:</u>** JNCC recommend using the foraging range for guillemot and razorbill from Woodward et al. (2019) which exclude data from Fair Isle and use colony specific foraging ranges for gannet, see table at the bottom of this section. This is unlikely to affect the assessment significantly but we would like clarification on the foraging ranges we should be using. Foraging ranges proposed to be taken through to the assessment will be included as a post meeting note in the meeting minutes for agreement. RH- Yes, it would be good to have these provided in writing in the meeting minutes. JNCC has colony specific ranges which we can provide, these should be consistent with the NatureScot tool. To calculate the regional breeding population, the Applicant followed the same approach as Awel Y Mor. We calculated the number of birds breeding within the species' foraging ranges of the array areas and added that to the proportion of immature	**EWG to provide feedback on proposed cumulative study area(s)?** **JNCC to provide the colony specific foraging ranges** **NRW to send the regional breeding population calculations for west coast projects**	Complete Complete Complete

	birds from the BPMPS (i.e., western waters) during the return migration. An alternative approach would be to include the proportion of immature birds based on actual numbers of the colony within the foraging range. HR- This has been discussed for a number of west coast projects. NRW and the other SNCBs have produced some calculations for the west coast summing up the adults and immatures including no western water totals. We can send this to these projects to ensure a consistent approach. KL- Will we be able to see how these numbers have been calculated and the rationale behind the calculations. HR- It is a table summing up the numbers for all the colonies so it should be clear. RS- Is the change to regional breeding populations for just immature birds or adults as well. LM- Yes, we sum up all the colonies within breeding range. HR- Will that be used for the whole assessment or just displacement and CRM. LM- Used across the whole assessment. MH- For the regional breeding population, would it mean that the population is the same for any project on the west coast? HR- Yes. RH- JNCC are also happy with this approach. *Post-meeting query: Can JNCC confirm the foraging range to apply for puffin. For guillemot and razorbill the foraging ranges excluding data from Fair Isle are recommended however for puffin, the foraging ranges incorporating Fair Isle data are recommended. Can JNCC explain the different treatment of foraging range data for puffin?* **<u>Whooper Swan:</u>** The Applicant has assessed collision risk on whooper swan. We have had a response to the PEIRs from Orsted that they have data from monitoring at Western Duddon Sands. Should we be requesting this data from Orsted or are there other data sources from Irish Sea we should be using? We have done an assessment based on the data included in the SOSMAT tool. RS- TWT did tracking of Whooper swan in the Irish Sea. MH- That data would have been included in the SOSSMAT tool. KL- Does the EWG think we need these data considering we have done an assessment using the SOSSMAT tool. We aren't sure what data this is or how quickly it could be attained. RS- Do we know anything about their flight heights offshore.	**JNCC to confirm the foraging range to apply for puffin** **EWG to provide feedback as to whether the applicant needs to request the whopper swan data from Orsted.**	Complete Complete

LM- There are some general guidance on flight heights in the Wright *et al*. (2012)[2] paper that have been used in the assessment.

Post meeting note: NRW Advisory did not raise anything about Whooper Swan and were content with it being assessed using the SOSSMAT approach, so no further comment on this.

Post meeting note: Please see below table of foraging ranges suggested to be used in the application.

Mean- max foraging ranges with standard deviation (SD) for seabird species (Woodward et al., 2019). Sample sizes are shown in parentheses (i.e. no of individuals tracked).

Species	Mean Max foraging range + SD
Arctic tern	25.7±14.8 (9)
Black-headed gull	18.5 (1)
Common gull	50 (1)
Common tern	18.0±8.9 (16)
Great cormorant	25.6±8.3 (4)
Northern fulmar	542.3±657.9 (16)
Northern gannet	315.2±194.2 (21) for colonies without site specific maximum values. However, for Grassholm SPA and St Kilda SPA where site specific evidence exceeds this value (509.4 km), 516.7 km and 709 km are used respectively.
Common guillemot	(55.5±39.7) Use of mean max+1SD discounting Fair Isle values, as presented in Woodward *et al.* (2019).
Herring gull	58.8±26.8 (10)
Black-legged kittiwake	156.1±144.5 (37)
Lesser black-backed gull	127±109 (18)
Little tern	5 (1)
Manx shearwater	1,346.8±1,018.7 (6)
Atlantic puffin	137.1±128.3 (7)
Razorbill	(73.8±48.4). Use of mean max+1SD discounting Fair Isle values, as presented in Woodward *et al.* (2019).
Roseate tern	12.6±10.6 (3)
Sandwich tern	34.3±23.2 (9)
European shag	13.2±10.5 (17)

LSE screening and ISAA approach (presented by KL)

This slide is a repeat of what has been presented in previous EWGs. It summarises the updated approach to the HRA screening and ISAA that was sent to the steering group and offshore ornithology EWG in May 2023. The applicant is looking for feedback on if this approach is acceptable for the application.

Feedback provided by SNCBs ahead of the meetings (as action from Steering Group meeting 5 on 29/06/2023).

Key points:

RPS to update HRA

[2] Wright, L.J., Ross-Smith, V.H., Austin, G.E., Massimino, D., Dadam, D., Cook, A.S.C.P., Calbrade, N.A. and Burton, N.H.K., 2012. Assessing the risk of offshore wind farm development to migratory birds designated as features of UK Special Protection Areas (and other Annex 1 species). *BTO Research Report*, *592*.

	Approach is only for these wind farms – not to be applied to other offshore wind farms. SNCBs broadly content with the approach for the projects alone and agree unlikely to be substantial effects for the projects alone. SNCBs do not agree with use of the 1% threshold for in-combination. KL noted that the approach needs to be amended to clarify that the 1% threshold would only be used if it could be demonstrated that the effect was under this threshold for all projects considered in the in-combination assessment (noting limitations on data availability for historic projects as set out above). RPS to update HRA methodology paper. *Post meeting note: NRW Advisory would like to see the updated HRA methods paper first before making any agreement on the proposed approach.* Approach does not refer to non-breeding birds – see discussion points above relating to non-breeding birds. Approach is acceptable for the test against conservation objectives relating to populations from distant SPAs, but not for conservation objectives related to distribution of features in SPAs and availability of habitat. KL noted this broadly aligns with the approach taken for PEIR, where SPAs such as the Irish Sea front and Liverpool Bay SPA were screened in. HR- Can you put explanation in writing and we can consider it. KL- Yes it will go in the meeting minutes for review. RB noted the comment and reiterated that this is why the approach is likely to be only appropriate for these projects. RB- In relation to the in-combination approach, discussion like this would benefit from the slides ahead of time. It is difficult to share our opinion in meeting without thinking it through if we haven't seen the slides before. KL- Fully understand we will send over slides ahead of the meeting in October.	**methodology paper to clarify in-combination approach.**	Complete
	<u>Power analysis (presented by LM)</u> Power analysis was requested from the SNCBs, following feedback during Expert Working Group (EWG) meetings, in order to demonstrate that the current coverage is appropriate for the purposes of the EIA and ISAA. The original request for a power analysis was to determine the adequacy of coverage of the baseline characterisation survey. As 'adequacy' is not clearly defined, the power analysis in this report determines how appropriate the survey coverage would be for any potential monitoring of ornithology populations (e.g. pre- and post-construction monitoring), should this be required. However, this can be used to infer the adequacy of coverage for the EIA, specifically in relation to the magnitudes of change which are predicted in the EIA. Thus, this report determines the statistical		

	power to determine a potential displacement effect of building the Mona Offshore Wind Project and the Morgan Generation Assets given the current coverage and a range of displacement scenarios used in the EIA and ISAA. The analysis revealed that to achieve a statistical power of 80% a minimum number of 852 birds across 12 months of breeding season or non-breeding season was required to detect a displacement of 30%, providing that 12 months of breeding season and non-breeding season data are available. For the scenario with a 40% displacement, this number decreases to 467 birds over 12 months of breeding season and non-breeding season. In the EIA and the ISAA the range of displacement rates used was 30% to 70% for auks and kittiwake, and 60 to 80% for gannet. For the higher displacement scenarios which the EIA and ISAA are based on, the numbers of birds and densities required to achieve 80% power would be considerably lower. Based on the lowest level of potential effect outlined in both the EIA and the Information to Support the Appropriate Assessment (ISAA), which stands at 30% displacement, the set of analyses demonstrates that the coverage of analysis of the baseline characterisation surveys are sufficient for detecting changes in the majority of bird species. Where the coverage is not sufficient to detect change, even if displacement was very high for these species this would not be detectable given their consistent low abundances in the Mona and/or Morgan digital aerial survey area. Consequently, it can be concluded that these surveys and resulting data are appropriate for establishing the baseline to inform the EIA and ISAA. RB- Thanks for undertaking the analysis. We will review the report and provide any comments. RH- Agree, thanks for undertaking it and look forward to reviewing the paper.	**EWG to provide feedback on power analysis and update agreement logs on baseline characterisation.**	Complete
	<u>Agreement logs (presented by KL)</u> The latest agreement logs were circulated in May and it would be useful if stakeholders could review their positions within those agreement logs and update them now the PEIR has been reviewed. Parallel to that the Applicant and RPS is working through the statutory consultation responses and looking at where we consider agreement has been reached. If stakeholders can provide feedback on agreement logs to date and then following the EWGs, we will circulate the meeting minutes two weeks after the meeting, but the agreement logs may be a week or so behind that to incorporate the statutory consultation feedback.	**Stakeholders to provide updated EWG agreement logs to reflect the information provided in the PEIR.**	Complete
	<u>Next Steps (presented by KL)</u> KL noted that meeting minutes are to be circulated 2 weeks following the meeting, with agreement logs circulated after the meeting minutes. Next EWG meeting planned for October 2023.		

D.6.2 Response from JNCC regarding the meeting minutes

From: [redacted]
To: [redacted]
Cc: [redacted]
Subject: FW: Morgan Generation & Mona fifth offshore ornithology EWG meeting
Date: 28 July 2023 15:38:42
Attachments: image002.png
image003.png
Mona Morgan OWFs Ornithology EWG 5 actions FINAL.docx
Morgan_Mona_OOEWG_Agr Log F05_JNCC.xlsx

Hi [redacted]

Regarding the fifth Ornithology EWG, please see our response to the actions below (attached for convenience) and the reviewed Agreement Log.

Stakeholders to provide their feedback on the approach to the CEA for Morgan Generation.
We agree with the proposed approach to the CEA for Morgan Generation.

EWG to clarify if scenario testing is still suggested considering the updated Auk ID rates.
Once further detail on the methodology for raising the Auk ID rates from Apem has been provided we can clarify whether scenario testing is still suggested.

EWG to provide feedback on the proposed methodology for scoping of migratory seabirds.
We agree with the use of the SOSSMAT tool for scoping migratory seabirds.

EWG to provide feedback on proposed foraging ranges.
We agree with the proposed foraging ranges as listed in the minutes.

JNCC to provide the colony specific foraging ranges.
A full table of the foraging ranges we recommend is provided.

Species	Foraging Range (km)	Metric
Common eider	21.5	MM
Red-throated diver	9	Max/MM
European storm petrel	336	Max/MM
Leach's storm petrel	657	Mean
Northern fulmar	1200.2	MM+SD
Manx shearwater	2365.5	MM+SD
Northern gannet	509.4	MM+SD
European shag	23.7	MM+SD
Cormorant	33.9	MM+SD
Black-legged kittiwake	300.6	MM+SD
Black-headed gull	18.5	Max/MM
Mediterranean gull	20	Max/MM
Common gull	50	Max/MM
Great black-backed gull	73	Max/MM
Herring gull	85.6	MM+SD
Lesser black-backed gull	236	MM+SD
Sandwich tern	57.5	MM+SD

Little tern	5	Max/MM
Roseate tern	23.2	MM+SD
Common tern	26.9	MM+SD
Arctic tern	40.5	MM+SD
Great skua	931.2	MM+SD
Common guillemot*	95.2	MM+SD
Razorbill*	122.2	MM+SD
Black guillemot	9.1	MM+SD
Atlantic Puffin	265.4	MM+SD

*Excludes Fair Isle Data

Exceptions to recommended foraging ranges:

Species	Exception Applied	Foraging range (km)	Metric
Northern gannet	Forth Islands SPA	590	Max
	Grassholm SPA	516.7	Max
	St Kilda SPA	709	Mac
Common guillemot	All Northern Isle SPAs	153.7	MM+SD
Razorbill	All Northern Isle SPAs	164.6	MM+SD

JNCC to confirm the foraging range to apply for puffin.

We confirm that the foraging range to use for Atlantic puffin is 265.4km (MM+SD). Woodward et al. (2019) state (page 138) that "As was the case for common guillemot and razorbill, foraging distances travelled by Atlantic puffin from Fair Isle are higher than those at most other sites (RSPB dataset), although they are not as exceptional when compared to other sites as those of the other two auk species" and "Observations of birds carrying fish have been made at distances of 250 km from the Faeroe Islands (Harris & Wanless 2011), offering further speculative evidence that Atlantic puffins forage at longer distances than the other auk species. Hence the distances observed from Fair Isle and Hermaness should not necessarily be considered exceptional until more data and data from additional colonies have been collected, particularly data from colonies where local prey availability may be greater". Therefore, we advise using the generic mean max +1SD value as stated in table 5.

EWG to provide feedback as to whether the applicant needs to request the whopper swan data from Orsted.

We suggest that the applicant enquire as to the type and duration of whooper swan data that Orsted hold and provide a summary of the outcomes of the study, before determining whether or not the full data needs to be requested.

EWG to provide feedback on power analysis and update agreement logs on baseline characterisation.

It is stated that the power isn't affected by the survey coverage, but is affected by the density of birds, which is affected by the survey coverage. The results compared to Mona and Morgan data are given in number of birds. But as this power analysis is trying to determine whether survey coverage is sufficient to detect change in both density and abundance, JNCC considers it more appropriate to compare the required densities of birds rather than the required number of birds.

Stakeholders to provide updated EWG agreement logs to reflect the information provided in the PEIR.

Update provided to Mona Item 10 and Item 11 in the Agreement Log.

Please let me know if you have any questions.

Kind regards,

[redacted] | **Offshore Industries Adviser | JNCC**
Pronouns: she/her
Inverdee House, Baxter Street, Aberdeen, AB11 9QA | [redacted]
Working pattern: Monday to Friday

Website **Twitter** **Facebook** **LinkedIn**

D.6.3 Response from Natural England regarding additional actions

Date: 17 August 2023
Our ref: DAS/UDS A009203 442325
Your ref: Morgan and Mona Offshore Ornithology EWG05 Additional Actions

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

cc [redacted]
RPS

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

[redacted]

BY EMAIL ONLY

Dear [redacted]

Discretionary Advice Service (Charged Advice): UDS A009203
Development proposal: Morgan Generation and Mona Offshore Windfarm
Consultation: Morgan and Mona Offshore Ornithology EWG05 additional actions via email (7th August 2023)

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

The following advice forms Natural England's response to the email sent to Natural England on 7th August 2023 regarding additional actions from the fifth Offshore Ornithology EWG.

Natural England were asked to provide a response to the actions:

- EWG to clarify if scenario testing is still suggested considering the updated Auk ID rates
- EWG to review the updated HRA methodology note and confirm progress to agreement on approach to LSE Screening

Detailed comments

Auk ID rates and apportioning

Natural England appreciate the clarification provided on the enhanced QA methodology for improving auk ID rates. We note that at Mona significant improvements were made in some months, although ID rates of <50% remain for 2 months. We also note that in some months the sample size differed, with increases and decreases apparent. It would be useful to understand why. Although improved ID rate data from Morgan has not been presented we assume that the same QA process has, or will be applied. In this case, we do not consider it necessary to carry out scenario testing in support of using the identified fraction of the auk population to apportion unidentified birds.

Updated HRA methodology

Natural England highlight that we did not agree with the approach taken to LSE screening of birds in the non-breeding season(s) undertaken by the Round 4 HRA. Our position remains unchanged. Furthermore, we do not consider plan-level HRA to necessarily be an appropriate 'guide' for methodologies to be applied at the project level, as certain concessions/adaptations may be made due to the scale of the process.

Natural England retain concerns regarding the approach to non-breeding season LSE screening detailed in paragraph 1.2.14. Natural England do not consider it appropriate to consider breeding season foraging ranges to identify sites for consideration in the non-breeding season, and consider this approach to be fundamentally flawed due to the generally wide ranging and migratory nature of seabirds outside of the breeding season. Natural England advise that the Applicant reviews the approach taken in the Morecambe OWF PEIR. In this case, potential connectivity (and thus, LSE if there is an impact pathway) has only been assumed for cases where the contribution of an SPA population is thought to represent >1% of the BDMPS population. This provides a proportionate and sensible screening approach to reduce the site/species combinations for consideration, while ensuring those that may be at risk are properly considered.

In paragraph 1.3.2.1 we suggest the following edit as highlighted, *'If the predicted magnitude for the project alone and**/or** in-combination (acknowledging the known uncertainties related to effects from other projects in the Irish Sea) is <1% of the baseline mortality of the reference population for a qualifying feature, then a high level assessment will be presented and a conclusion of no AEOI can be made.'*

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

Yours sincerely,

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

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

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

Cc [redacted]

Annex 1
European Protected Species

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

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

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

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

D.6.4 Response from Natural England regarding the meeting minutes

Date: 27 July 2023
Our ref: DAS/UDS A009203 442325
Your ref: Morgan and Mona Offshore Ornithology EWG05 30th June 2023

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

cc [redacted]
RPS

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

[redacted]

BY EMAIL ONLY

Dear [redacted]

Discretionary Advice Service (Charged Advice): UDS A009203
Development proposal: Morgan Generation and Mona Offshore Windfarm
Consultation: Morgan and Mona Offshore Ornithology EWG05

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

The following advice forms Natural England's response to the meeting minutes provided for the Morgan and Mona Offshore Ornithology EWG05 attended by Natural England on 30th June 2023.

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

- The approach to the CEA for Morgan Generation
- Clarify if scenario testing is still suggested considering the updated Auk ID rates
- The proposed methodology for scoping of migratory seabirds
- Whether the applicant needs to request the whooper swan data from Orsted.
- Proposed foraging ranges

Detailed comments

Meeting Minutes

The statement "*RB – Will that be used for the whole assessment or just displacement and CRM*" on page 8 of the meeting minutes has been mistakenly attributed to [redacted]. We are unsure who made the statement.

Cumulative and in-combination assessments

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

projects.

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

Auk ID Rates

Natural England retain concerns regarding the reported large auk ID rates, and the apportioning of unidentified birds to species. We reiterate that the provision of updated ID rates with no explanation as to how or why these have improved relative to previous analysis simply raises further concerns around the data processing that has been undertaken.

Natural England therefore consider that scenario testing to confirm that apportioning of unidentified large auks is appropriate may still be required. However, we suggest in the first instance that a full explanation of the methods used to improve ID rates, and some evidencing of those rates should be presented to the EWG for review and discussion.

Migratory seabirds - proposed methodology

Natural England agree with the proposed methodology for assessing impacts on migratory seabirds and propose further discussion through the EWG if required as the Applicant progresses this assessment.

Proposed foraging ranges and breeding populations

Natural England have discussed and agreed the approach for species-specific foraging ranges and calculation of EIA breeding populations with JNCC and NRW, which we understand have now been supplied to the Applicant. We welcome further discussion through the EWG if required.

Assessment of red-throated diver

Natural England note that the assessment of red-throated diver has not been discussed further with the EWG following PEIR submission. Natural England agree that red-throated diver at Liverpool Bay SPA can be screened out at the LSE stage for HRA due to the 10km distance from the Morgan and Mona projects. However, we do not consider it appropriate to screen the species out of a displacement assessment for EIA due to low abundance in the survey area. It is of note that red-throated diver tend to occur at low density. Furthermore, this analysis if of importance for consideration in cumulative assessments.

Natural England advise that displacement is assessed from the Morgan and Mona sites + 4km buffer using a displacement rate of 100% and mortality rates of 1-10%.

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

Yours sincerely,

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

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

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

Cc [redacted]

Annex 1
European Protected Species

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

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

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

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

Proposed methodology for 'gap-filling' the Irish Sea R4 cumulative & in-combination assessments

At present, Natural England do not consider that AEOI can be ruled out beyond reasonable scientific doubt for several species/SPA combinations at Round 4 Irish Sea projects. This is due in part to a lack of appropriate consideration of impacts arising from pre-existing OWFs. This presents a clear consenting risk and would ideally be resolved prior to examination. Natural England consider that some estimate of impact must be attributed to all projects screened in to cumulative and in-combination assessments to reduce or eliminate this risk which arises in some cases simply from a lack of provision of relevant information.

A basic approach is suggested to generate **indicative** numbers for currently 'unknown' displacement and collision impact estimates, depending on the level of data available for the relevant projects. It is acknowledged that the approach detailed below is flawed. However, the intention is simply to enable an informed expert judgement to be made on the likelihood of risk with respect to AEOI, and thus the necessity of assessing this risk in more detail.

It is of note that some OWFs screened into the assessments may be nearing end-of-life with limited (or no) overlap with the proposed project. It would be appropriate to consider timelines and determine if any of these sites can be screened out.

Where it is necessary to 'gap-fill' for a particular development, the following methods are proposed.

Displacement

1. Review the submitted environmental statement. It is accepted that displacement mortality estimates may not be presented. However, if there is abundance data, utilise this to populate project-specific displacement matrices for relevant species. We also suggest review of the Round 4 plan-level HRA to determine if any suitable estimates are presented therein.

If no abundance data available…

2. Use a nearby windfarm with a published estimate of mortality arising from displacement as a proxy. Scale this estimate according to the relative area of the two arrays and appropriate buffers.

Collision

1. Review the submitted environmental statement. It is accepted that collision mortality estimates may not be presented. However, if there is abundance data, utilise this to run project-specific CRMs according to current best practice for relevant species. We also suggest review of the Round 4 plan-level HRA to determine if any suitable estimates are presented therein.

If no abundance data available…

2. Use a nearby windfarm with a published estimate of mortality arising from collision as a proxy. Scale this estimate according to the relative number of turbines in the two arrays. The difference in the turbine specifications should be considered to determine if this method is likely to over or underestimate impact.

In the absence of any relevant site-specific data for a given development from which estimates of displacement or collision mortality can be derived, Natural England consider that the relatively clustered nature of OWFs in the Irish Sea lends itself to the alternative approach of using a site within a 'cluster' as the proxy to base the scaling of impacts upon. This could be carried out for multiple sites simultaneously if the same proxy is used.

If >1 nearby sites to a given development requiring "gap-filling" have data, the most appropriate proxy site according to location, data quality & comparability should be selected. Alternatively, consideration of multiple sites could be discussed further.

If, having generated estimates as detailed above, the total impacts lead to cumulative and/or in-combination increases in baseline mortality of >1% it will be necessary to undertake a more rigorous assessment of estimated impacts at projects where gap-filling has been necessary.

We suggest further engagement with relevant SNCBs on this point if required.

If a more rigorous assessment is considered necessary, the best available bird density estimates and known array footprint + buffers and consented turbine parameters should be used to generate refined project specific assessments of displacement and collision mortality. If baseline characterisation data are not available for a given "gap-filling" project, MERP, strategic VAS of OWF areas, or the recent Welsh Atlas data could be considered (links and references available on request).

D.6.5 Advice to Mona/Morgan regarding EIA scale reference populations for assessment

Advice to Mona/Morgan generation regarding EIA scale reference populations for assessments

For the breeding season, the BDMPS is defined as the breeding population within foraging range from the project, plus non-breeders and immature birds. The population is likely to originate from a much wider range of colonies (not just SPA colonies) and may include young immature birds spending the summer in their wintering area as well as immatures loosely associated with local colonies (Furness 2015).

Given that there is little evidence to support calculations of the number of juveniles, immatures and non-breeding birds that remain in their wintering areas into the breeding season, we advise that regional baseline population sizes for the breeding period can be derived from the relevant BDMPS tables in Appendix A of Furness (2015) by summing the adult and immature population estimates for all colonies that sit within a given regional scale:

Species	**Breeding season reference population (sum of adults and immatures at relevant colonies)**	**Relevant BDMPS and Tables from Appendix A of Furness (2015) used**
Gannet	522,888	Western waters, Tables 15/17
Kittiwake	245,234	Western waters & Channel, Tables 48/50
Lesser black-backed gull	240,750	Western waters, Tables 37/41
Herring gull	217,167	Western waters, Table 43
Great black-backed gull	44,753	South-west & Channel waters, Table 46
Guillemot	1,145,528	Western waters, Table 63
Razorbill	198,969	Western waters, Table 65
Puffin	1,482,791	Western waters, Table 69
Manx shearwater	1,821,544	Western waters & Channel, Table 13

Worked example for calculation for gannet 'UK western waters' breeding season reference population calculation (all information taken from Tables 15 and 17 of Furness (2015):

Population	**Most recent count**	**Breeding adults**	**Immatures**	**Total**
Sule Skerry & Sule Stack	2004	9,350	7,574	16,924
North Rona & Sula Sgeir	2004	18,450	14,944	33,394
St Kilda	2004	119,244	96,588	215,832
Ailsa Craig	2004	54,260	43,951	98,211
Grassholm	2009	78,584	63,653	142,237
UK western non-SPA colonies	2004	9,000	7,290	16,290
TOTAL		*288,888*	*234,000*	***522,888***

For EIA assessments, we advise calculating the total predicted annual impact for a species and assessing this against the largest seasonal population (breeding or non-breeding) at the appropriate BDMPS (largest BDMPS for use in annual assessments highlighted yellow):

Species	Breeding season BDMPS	Autumn/post-breeding BDMPS*	Winter/non-breeding BDMPS*	Spring/pre-breeding BDMPS*
Gannet	522,888	545,954	-	661,888
Kittiwake	245,234	911,586	-	691,526
Lesser black-backed gull	240,750	163,304	41,159	163,304
Herring gull	217,167	-	173,299	-
Great black-backed gull	44,753	-	17,742	-
Guillemot	1,145,528	-	1,139,220	-
Razorbill	198,969	606,914	341,422	606,914
Puffin	1,482,791	-	304,557	-
Manx shearwater	1,821,544	1,580,895	-	1,580,895

* Non-breeding season BDMPSs from Furness (2015)

Annual predicted impacts should be assessed against the baseline mortality of the relevant BDMPS.

References

Furness, R.W. (2015) *Non-breeding season populations of seabirds in UK waters: Population sizes for Biologically Defined Minimum Population Scales (BDMPS)*. Natural England Commissioned Reports, Number 164.

D.6.6 Response from NRW regarding updated HRA methodology

From: [redacted]
To: [redacted]
Cc: [redacted]
Subject: RE: Mona and Morgan Gen updated HRA methodology
Date: 29 June 2023 17:32:51
Attachments: image001.png
image003.png
image004.png

CAUTION: This email originated from outside of RPS.

Good afternoon, all.

As discussed in this morning's Steering Group meeting, please see over-arching comments from our Ornithologists regarding the updated HRA methodology.

1. We agree with the proposed updated HRA methodology with regard to the project alone assessment.

2. We disagree with the proposed updated HRA methodology with regard to the in-combination assessment. It is stated in 1.3.2.3 that "If the predicted magnitude is >1% of the baseline mortality of the reference population for a qualifying feature, then further consideration will be given to the magnitude of the likely effect, including the contribution of impacts from other plans and projects, in-combination." We do not agree that sites are not further considered in-combination where the predicted impact from the project alone is <1% of baseline mortality. While <1% of baseline mortality may be insignificant in the context of a project alone, this additional level of mortality should be included in an assessment of in-combination impacts.

Kind regards,

[redacted] | **Offshore Industries Adviser | JNCC**
Pronouns: she/her
Inverdee House, Baxter Street, Aberdeen, AB11 9QA | [redacted]
Working pattern: Monday to Friday

Website Twitter Facebook LinkedIn

From: [redacted]
Sent: Thursday, June 29, 2023 11:49 AM
To: [redacted]
Cc: [redacted]

[redacted]

Subject: RE: Mona and Morgan Gen updated HRA methodology

Good Morning [redacted]

In response to the updated HRA methodology, Natural England are satisfied that the two-stage process to the appropriate assessment is sensible due to the projects potential connectivity with a large number of designated sites with an expectation that the likelihood of substantial impacts is low. However, we note that this approach might not always be appropriate for all projects.

We retain two major concerns relating to the methodology described in the update document.

1. Screening of non-breeding season impacts is not mentioned. The BDMPS should be used to identify potential connectivity and screen in relevant sites for assessment.
2. Project alone impacts resulting in <1% increase in baseline mortality are screened out of in-combination assessment. Natural England advise that this approach is not acceptable and these impacts should be considered in-combination.

Natural England also highlight that step 1 of the integrity test makes a high-level assessment against the conservation objectives, but relies solely on magnitude of increase in baseline mortality as a 'test' against which to conclude no AEOI, or move on to step 2. Given the project location, this approach is likely fine. However, we note that for assessment against conservation objectives that are not linked to the abundance of features (e.g. distribution of features within the site or availability of habitat) this would not be satisfactory.

Kind regards,

[redacted]

[redacted]
Pronouns: He/Him
Marine and Coastal Lead Adviser
Cheshire to Lancashire Area Team

Natural England

[redacted]

www.gov.uk/natural-england

From: [redacted]
To: [redacted]
Cc: [redacted]
Subject: RE: Mona and Morgan Gen updated HRA methodology NE
Date: 29 June 2023 11:49:18
Attachments: image002.png

Good Morning [redacted]

In response to the updated HRA methodology, Natural England are satisfied that the two-stage process to the appropriate assessment is sensible due to the projects potential connectivity with a large number of designated sites with an expectation that the likelihood of substantial impacts is low. However, we note that this approach might not always be appropriate for all projects.

We retain two major concerns relating to the methodology described in the update document.

1. Screening of non-breeding season impacts is not mentioned. The BDMPS should be used to identify potential connectivity and screen in relevant sites for assessment.
2. Project alone impacts resulting in <1% increase in baseline mortality are screened out of in-combination assessment. Natural England advise that this approach is not acceptable and these impacts should be considered in-combination.

Natural England also highlight that step 1 of the integrity test makes a high-level assessment against the conservation objectives, but relies solely on magnitude of increase in baseline mortality as a 'test' against which to conclude no AEOI, or move on to step 2. Given the project location, this approach is likely fine. However, we note that for assessment against conservation objectives that are not linked to the abundance of features (e.g. distribution of features within the site or availability of habitat) this would not be satisfactory.

Kind regards,

[redacted]

Pronouns: He/Him
Marine and Coastal Lead Adviser
Cheshire to Lancashire Area Team

Natural England

[redacted]

www.gov.uk/natural-england

D.6.7 Response from NRW regarding updated HRA methodology

From: [redacted]
To:
Cc: [redacted])
Subject: RE: Mona and Morgan Gen updated HRA methodology NRW
Date: 29 June 2023 17:38:23
Attachments: image002.png

CAUTION: This email originated from outside of RPS.

Hi [redacted]

Following on from the Steering Group meeting this morning, NRW Advisory's comments / advice on the Mona and Morgan updated HRA approach are as follows:

NRW Advisory (A) considers that the proposed updated HRA methodology can be considered appropriate with regard to the project alone assessment for breeding colonies for this particular project, where there is potential connectivity to a very large number of sites, but the likelihood of substantial impacts is generally low. However, it should be acknowledged that this approach will not necessarily be appropriate for all offshore wind cases.

NRW (A) note that the method as described appears to focus on impacts to breeding birds with no consideration to non-breeding birds. We advise, as previously, that Furness (2015) is used to identify potential connectivity in the non-breeding season. Relevant sites should then be considered in the Appropriate Assessment, which would most likely be at the Step 1 Phase.

However, NRW (A) disagree with the proposed updated HRA methodology with regard to the in-combination assessment. Paragraph 1.3.2.3 states that:
"*If the predicted magnitude is >1% of the baseline mortality of the reference population for a qualifying feature, then further consideration will be given to the magnitude of the likely effect, including the contribution of impacts from other plans and projects, in-combination*."
We do not agree with this approach, as whilst <1% of baseline mortality may be insignificant in the context of a population from project alone impacts, this does not mean that this level of additional mortality should not be added to an assessment of in-combination impacts.

NRW (A) also note that Step 1 of the integrity test makes a high-level assessment against the conservation objectives, but relies on magnitude of increase in baseline mortality only as a 'test' against which to conclude no AEOI, or move on to Step 2. Given the project location, this approach is likely satisfactory, but we note that for assessment against conservation objectives that are not linked to the abundance of features (e.g. distribution of features within the site or availability of habitat) this would not be satisfactory.

As discussed during the meeting, we are happy for you to share our response with PINS assuming this is approved by bp who are the named customer on our DAS agreement under which this advice is provided.

Kind regards,
[redacted]

Enw / [redacted]
Teitl swydd / Uwch Gynghorydd Morol - Rhaglen Ynni Adnewyddadwy ar y Môr / Senior Marine Advisor - Offshore Renewable Energy Programme

Adran / Tîm Cyngor a Rheoli Ardal Morol / Marine Area Advice & Management Team

Croesewir gohebiaeth yn Gymraeg a byddwn yn ymateb yn Gymraeg, heb i hynny arwain at oedi.
Correspondence in Welsh is welcomed, and we will respond in Welsh without it leading to a delay.

D.6.8 Provision of Auk ID paper

Auk identification guide

1. Main identification criteria used by APEM

Identifying winter auks in digital aerial still imagery requires skill and experience on the part of the observer, including consideration of several lines of evidence and influencing factors. Such factors arise from survey image quality which varies due to weather conditions, sea state and light levels during the image capture stage of surveys. Factors relating to image processing, resolution, and location of birds within the image footprint are also considered. Conditions vary between, and even within, surveys, meaning the appearance of a given species may not be identical in different images. We must therefore adapt our approach to survey conditions.

In favourable conditions, winter guillemots are lighter coloured than razorbills. Under different lighting conditions, plumage appearance can range from light brown, to darker grey-brown, to almost charcoal grey in colour. Razorbills in winter are usually darker than guillemots; however, additional features required to confidently classify a sitting razorbill include the subtle tapered shape and the narrower black central band towards the tail, which gives them a rather pointed appearance. Nearby birds may also provide a useful point of comparison.

Identification of birds in flight is straightforward in favourable light conditions when plumage colour is apparent. Razorbills exhibit blacker upper parts and are whiter on the flanks and the trailing edge to the wings. Differentiation between species is easier in mixed flocks as it enables direct comparison of diagnostic features.

It is not possible to identify every guillemot or razorbill to species level during winter surveys. All efforts are made to survey in the most favourable conditions possible to achieve the highest quality imagery; however, less favourable conditions are more likely to occur in winter. Confidence in identification to species level may be reduced where birds are captured in the trough of a wave and behaviours such as sitting low in the water, diving, splashing at the surface or wing stretching may also impede identification. Strong lighting may also alter apparent plumage colouration, below, you can find some examples of varying conditions and imagery.

Distinguishing between the two subspecies of guillemot that occur in the UK is extremely difficult. The guillemot subspecies *aalge* is a darker and larger subspecies compared to the subspecies *albionis*[1]. These distinguishing features are subtle and difficult to separate, even in the field[1]. This makes it practically impossible to identify the individual subspecies in the imagery and therefore this is not something APEM offers.

[1] JNCC – Guillemot (*Uria aalge*) (accessed via https://jncc.gov.uk/our-work/guillemot-uria-aalge/ - 01/08/2023)

2. Example imagery used for guidance in auk species identification

Figure 1 Perfect light and sea conditions (January).

Perfect light and sea conditions show conspicuous plumage detail of razorbills and guillemots (top 2 birds) (Figure 1). Note the oval-shaped, brownish plumage of guillemots compared to the tapered black plumage on razorbills. Direct comparison of the two species within the same image increases confidence in identification.

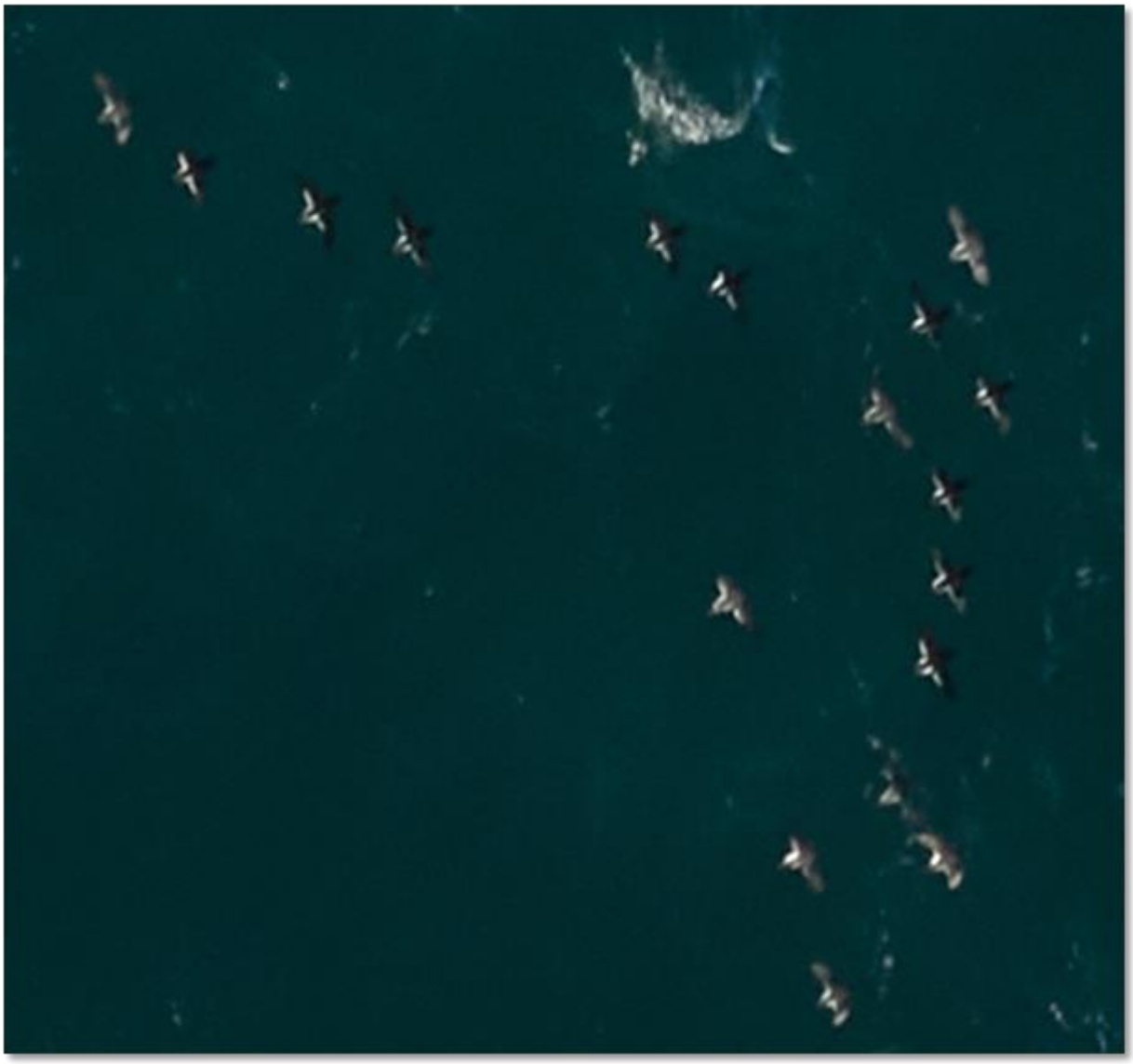

Figure 2 Clear image of guillemots and razorbills (early February).

A mixed group of guillemots and razorbills in flight (Figure 2) shows the distinct differences in plumage, including the whiter sides and trailing edges to the wings on the razorbills. Again, identification is aided by direct comparison between species within the same image.

Figure 3 Mixed group of guillemots and razorbills in flight (November).

Two guillemots (red underlined) are easily distinguished from the surrounding razorbills by their lighter plumage and less white colouration in the trailing edges to the wings (Figure 3).

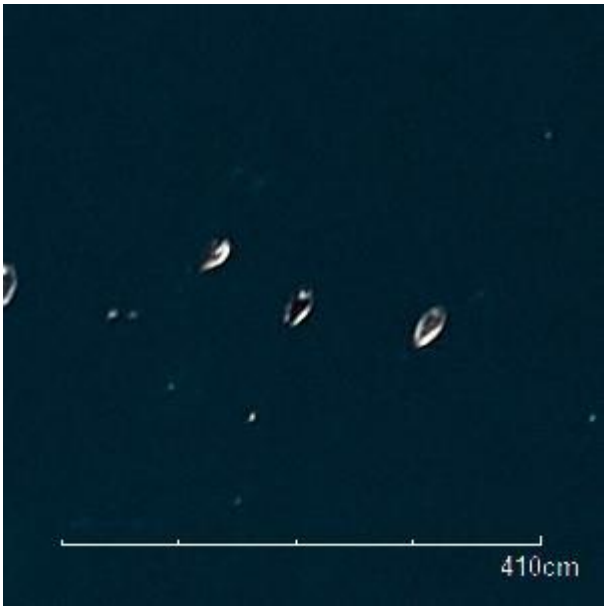

Figure 4 Sitting razorbill, guillemot and guillemot/razorbill.

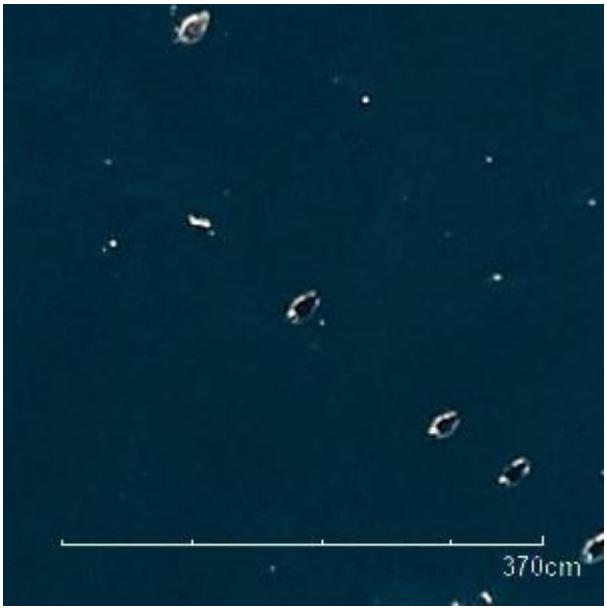

Figure 5 Sitting razorbills and one guillemot in favourable light conditions (January).

Good lighting and image quality enable distinction between a razorbill (centre) and guillemot (right) (Figure 4). However, the positioning and posture of the left-hand bird precludes identification with full confidence. Although likely to be a guillemot based on colouration, it would be recorded as guillemot/razorbill.

Figure 5 illustrates the overall shape and plumage of four razorbills (sitting in line from the centre to the bottom-right corner of the image), in comparison to the guillemot at the top of the image. The razorbills also show white necks and cheeks and a black 'cap' on the head.

Figure 6 Guillemots and a razorbill imaged in less favourable conditions (October).

Although image clarity is lower in Figure 6, subtle differences in plumage and bird shape still enable four razorbills to be distinguished from the single guillemot to the right of the image.

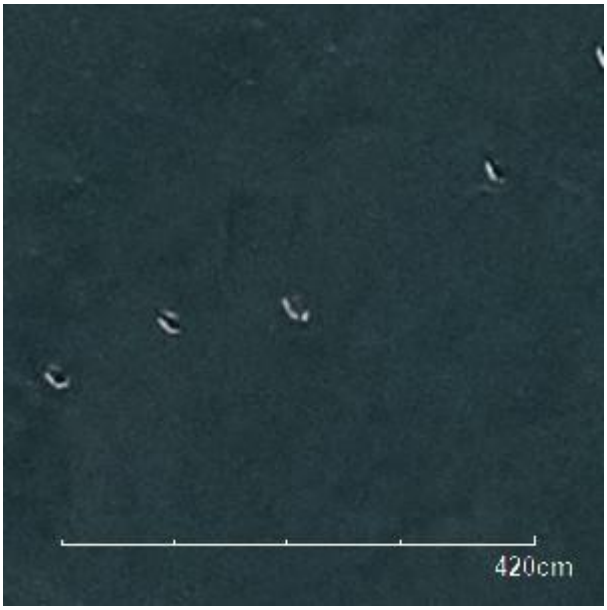

Figure 7 Guillemots and razorbills imaged in less favourable conditions (October).

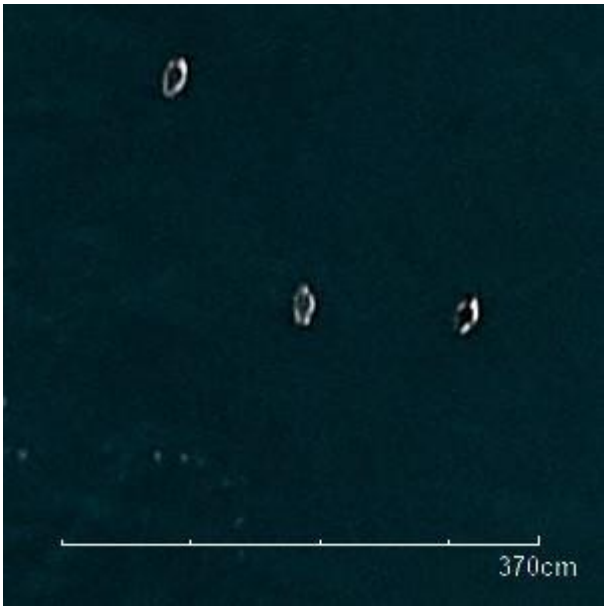

Figure 8 Darker image of two guillemots and a razorbill (November).

Despite the less favourable conditions, the guillemot in the centre of Figure 7 can be distinguished from the surrounding razorbills by the narrower shape of the dark plumage of the razorbills in comparison to the paler dark plumage of the guillemot.

Although Figure 8 was taken under less favourable lighting conditions, the razorbill on the right can be distinguished from the guillemots to the left by its darker and more tapered black plumage.

3. Example imagery Auk species in Morgan with 100% ID certainty

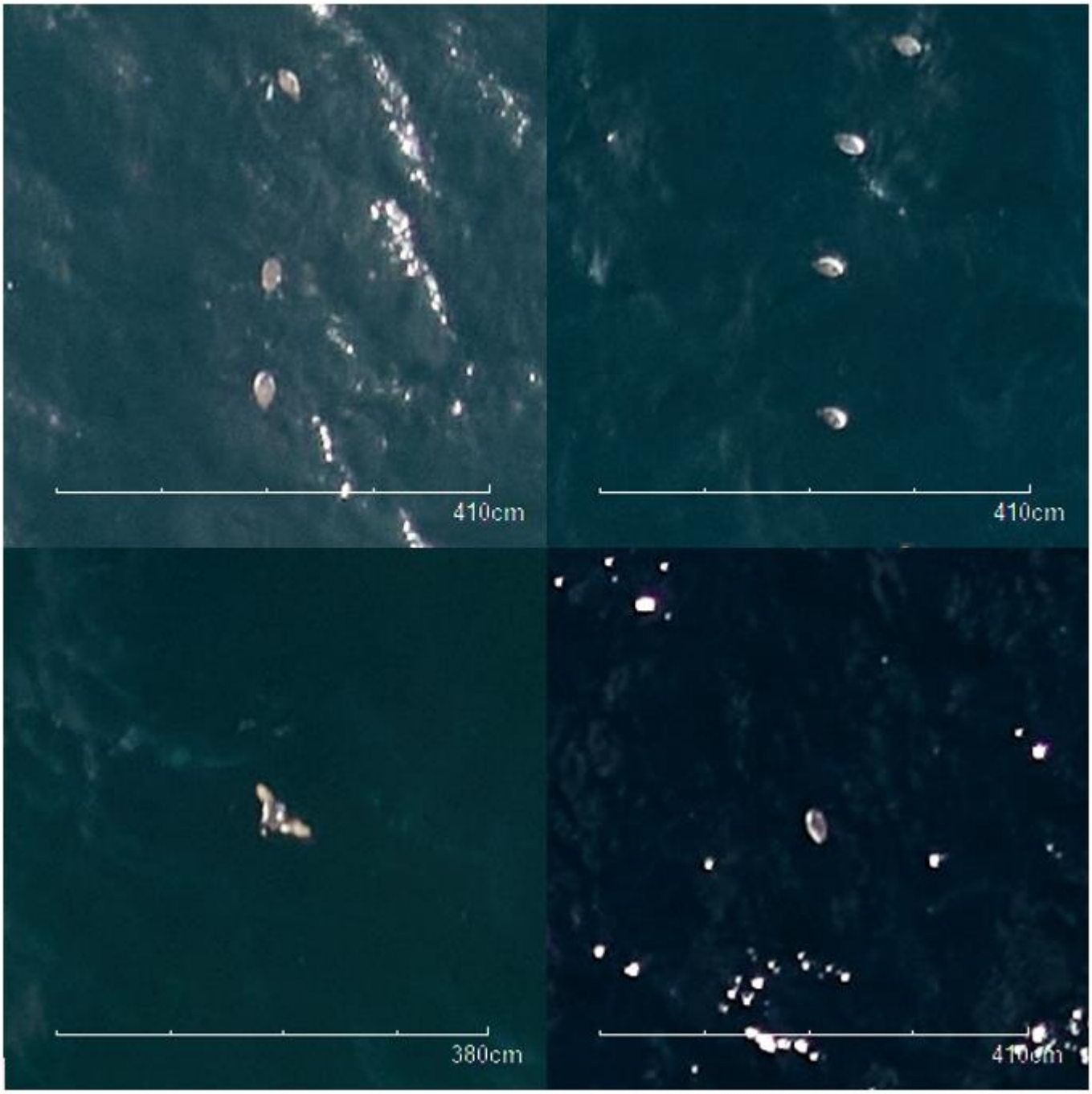

Figure 9 Examples of Guillemot identified with 100% certainty in the Morgan project.

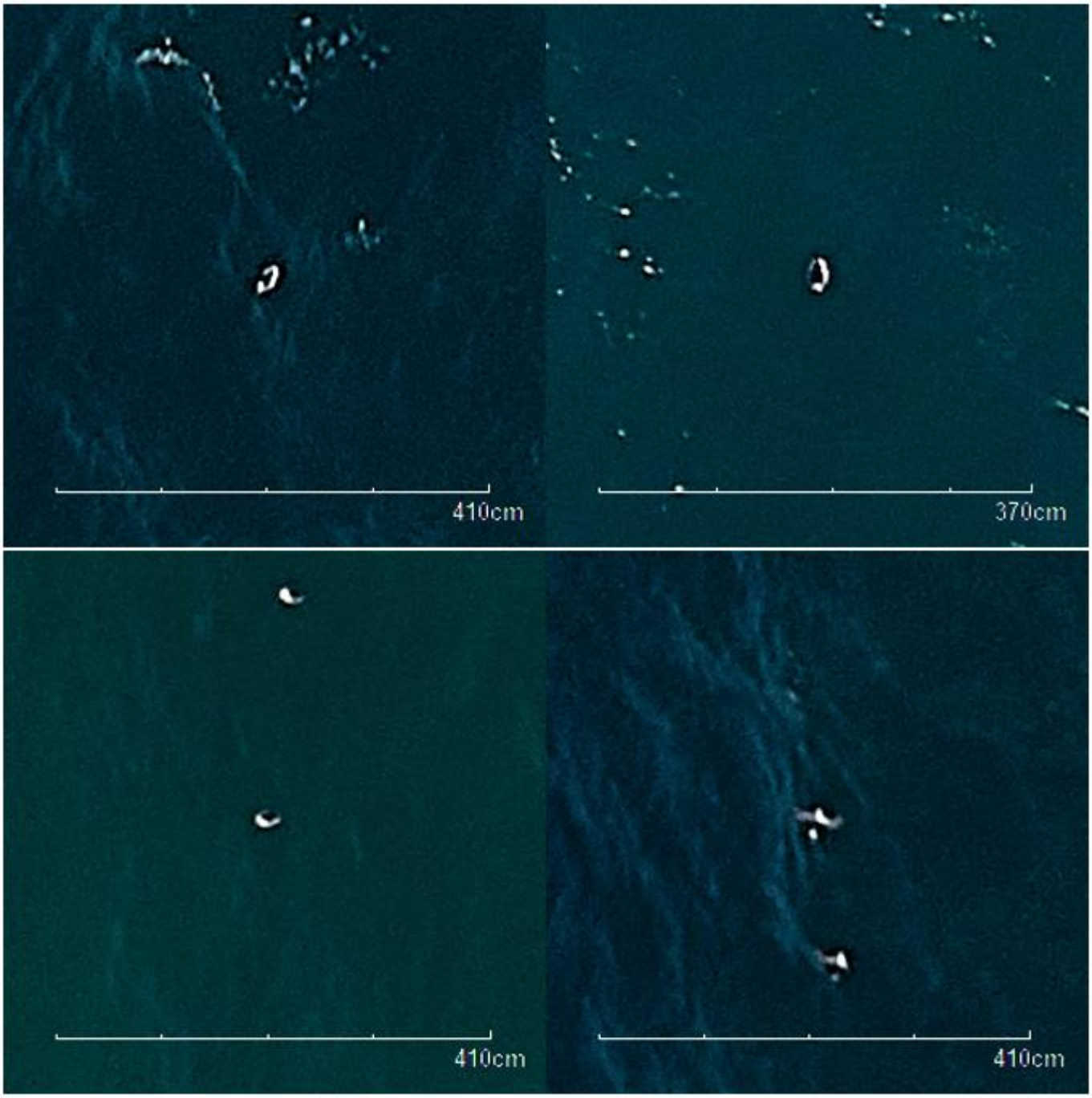

Figure 10 Examples of Razorbill identified with 100% certainty in the Morgan project.

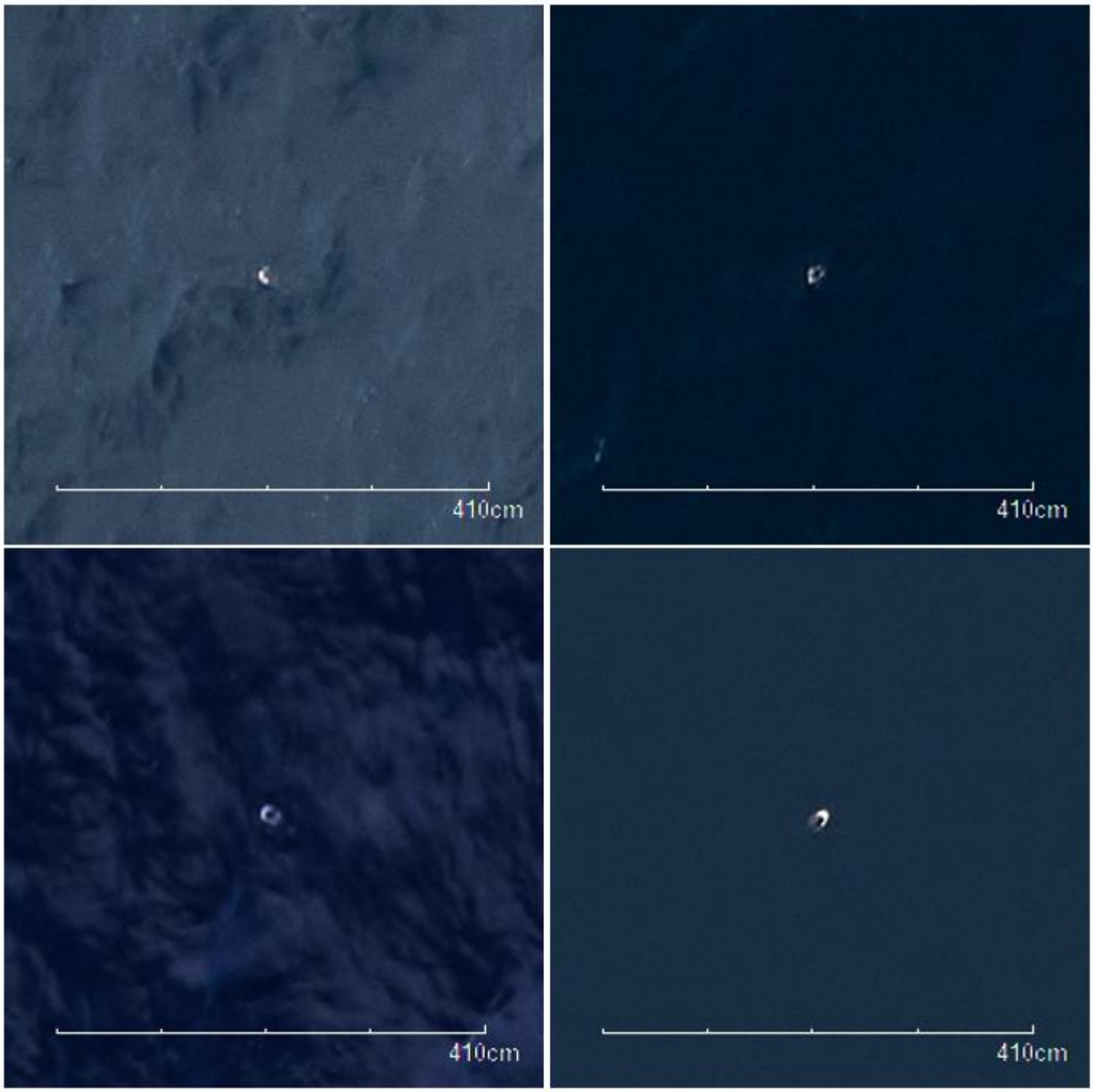

Figure 11 Examples of Puffin identified with 100% certainty in the Morgan project.

D.6.9 Response from APEM regarding the Auk ID rate paper

[redacted]
BP
Chertsey Road,
Sunbury on Thames,
Middlesex
TW16 7BP

25th July 2023

APEM Ref: P00006098

RE: Morgan auk identification review

Dear[redacted],

As requested, please find enclosed an explanation of the process followed to review auks previously identified in group-level categories and determine if identification levels could be improved to species-level, and APEM's identification criteria used to distinguish auk species, with some examples.

As part of APEM's image analysis process, 50% of targets identified within the imagery pass through quality assurance (QA) checks, where the bird image is checked by another team member and re-identified if needed. The QA team have now increased QA of auk species so that 100% of the auks identified in images are checked by APEM's QA team. Additionally, for any auks where there is still uncertainty around the level of ID or that remain identified to group level, are reviewed by a senior member of the QA team. APEM only identify to a species level when completely confident in that ID, if there is any uncertainty APEM uses a higher classification level.

I trust this information meets your requirements but if you have any further questions or require any additional supporting information, please do not hesitate to contact me.

Yours sincerely,
[redacted]

[redacted]

D.6.10 Mona and Morgan Generation Power Analysis report

Partners in UK offshore wind

MONA OFFSHORE WIND PROJECT

MORGAN GENERATION ASSETS

Mona and Morgan Generation Power Analysis

Image of an offshore wind farm

July 2023

F01

www.morganandmona.com/en

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Glossary

Term	Definition
Confidence Intervals	A range of values that provides an interval estimate for the true parameter values, typically calculated at a specified confidence level (e.g., 95% confidence intervals).
Dispersion Structure	The component of the model that accounts for the overdispersion in the dependent variable, allowing for a variance that is not equal to the mean.
Overdispersion	The condition in which the observed variability in a data set is greater than what would be expected under a Poisson distribution.
Overdispersion Parameter (phi)	A parameter that represents the relationship between the variance and the mean in Quasi-Poisson analysis, accounting for overdispersion.
Overdispersion Test	A statistical test used to formally assess the presence of overdispersion in the data by comparing the fitted Quasi-Poisson model to a Poisson model.
Effect Size	A measure of the magnitude of a phenomenon or the strength of the relationship between variables.
Null Hypothesis (H_0)	The hypothesis of no effect or no relationship between variables.
Alternative Hypothesis (H_1)	The hypothesis that contradicts the null hypothesis, indicating an effect or relationship.
Poisson Regression	A regression model used to analyse count data, assuming a Poisson distribution with equal mean and variance.
Quasi-Poisson Analysis	A statistical analysis method used when the assumptions of Poisson regression, such as equal mean and variance, are violated. It accounts for overdispersion, where the variance exceeds the mean.
Power Analysis	A statistical method used to determine the probability of detecting an effect or relationship in a statistical test.
Power Curve	A graphical representation of the relationship between sample size and statistical power.
Sample Size	The number of individuals or units included in a study or experiment.
Significance Level (alpha)	The predetermined threshold used to determine if a result is statistically significant. Commonly set at 0.05 or 0.01.
Statistical Power	The probability of correctly rejecting a null hypothesis when it is false, or the probability of detecting a true effect.
Type I Error	Also known as a false positive, it occurs when a null hypothesis is rejected when it is actually true.
Type II Error	Also known as a false negative, it occurs when a null hypothesis is not rejected when it is actually false.

Executive Summary

A comprehensive series of power analyses was conducted to ascertain the suitability of the 24 months' worth of aerial survey data collected by APEM for the purpose of conducting an Environmental Impact Assessment (EIA). At the request of the Statutory Nature Conservation Bodies (SNCBs), RPS carried out tests to determine the power to detect seabird population changes from the baseline characterisation surveys.

Based on the lowest level of potential effect outlined in both the EIA and the Information to Support the Appropriate Assessment (ISAA), which stands at 30% displacement, the set of analyses demonstrates that the coverage of analysis of the baseline characterisation surveys are sufficient for detecting changes in the majority of bird species. Where the coverage is not sufficient to detect change, even if displacement was very high for these species this would not be detectable given their consistent low abundances in the Mona and/or Morgan digital aerial survey area. Consequently, it can be concluded that these surveys and resulting data are appropriate for establishing the baseline to inform the EIA and ISAA.

The analysis revealed that a minimum average presence of 71 birds per month (or 852 birds across 12 months of breeding season data) was required to detect a displacement of 30%, provided that 12 months of breeding season data are available. For the scenario with a 40% displacement, this number decreases to at least 39 birds (or 467 birds over 12 months of breeding season data).

In the EIA and the ISAA the range of displacement rates used was 30% to 70% for auks and kittiwake, and 60 to 80% for gannet. For the higher displacement scenarios which the EIA and ISAA are based on, the numbers of birds and densities required to achieve 80% power would be considerably lower.

It is worth noting that these numbers remain unaffected by coverage, but reducing the coverage would necessitate higher bird densities in order to reach the required monthly threshold. For instance, if the coverage were halved, the bird densities on-site would need to double to achieve sufficient power to detect change.

Similarly, when dealing with a smaller site, it is equivalent to reducing the coverage. As the Morgan digital aerial survey area is slightly smaller than the Mona digital aerial survey area, the density requirement in the Morgan digital aerial survey area would be marginally higher than in the Mona digital aerial survey area. This is because the figure of 852 (30% displacement) or 467 birds (40% displacement) over 12 months of data remains independent of coverage or site size.

It is important to emphasize that this set of analyses is less intricate compared to real-world data, and as a result, a degree of caution has been exercised in determining the necessary sample size. For instance, the assumption has been made that displaced birds disappear rather than being displaced to the buffer zone. In reality, the truth lies somewhere in the middle, where some displaced birds may indeed move to the buffer zone while others may not.

Overall, the power analyses have shown that for all relevant species, the expected species specific displacement rates will be detectable with the current sample size and coverage and therefore the surveys and resulting data are appropriate for establishing the baseline to inform the EIA and ISAA.

1 Introduction

1.1 Introduction

1.1.1.1 RPS has been commissioned by Mona Offshore Wind Ltd and Morgan Offshore Wind Ltd. to conduct a power analysis on the seabird data collected for the Mona Offshore Wind Project and Morgan Offshore Wind Project: Generation Assets. The digital aerial surveys were undertaken by APEM over the course of 24 months from March 2020 to February 2022 (inclusive) for Mona and April 2021 to March 2023 for Morgan Generation.

1.2 Power analysis

1.2.1.1 A power analysis is a statistical technique used to determine the statistical power of a hypothesis test. It involves calculating the probability of correctly rejecting the null hypothesis when it is false (i.e., detecting a true effect) for a given sample size, effect size, and level of significance.

1.2.1.2 In simpler terms, power analysis helps to determine the sample size needed to detect a significant effect with a certain level of confidence. A statistical power of 80% is generally considered appropriate, as it strikes a balance between controlling the risk of Type I[1] errors and achieving a reasonable level of sensitivity to detect true effects.

1.2.1.3 The power of a statistical test is influenced by several factors, including the sample size, the level of significance, the variability of the data, and the effect size. A power analysis takes these factors into account and provides an estimate of the probability of detecting a true effect, given a specific combination of these factors.

1.3 Context

1.3.1.1 The power analysis was a request from the SNCBs, following feedback during Expert Working Group (EWG) meetings, in order to demonstrate that the current coverage is appropriate for the purposes of the EIA and ISAA. Table 1.1 sets out the requests for power analysis and the Applicant's response to date.

1.3.1.2 When an offshore wind farm is built, seabirds may avoid the area in which construction and operation takes place. This is known as displacement. To monitor displacement effects of the wind farm on different species, data on bird abundance and distribution is needed both within the array area and outside the array area (buffer). To test whether the difference in abundance between the array area and the buffer area is significant requires a certain amount of data.

1.3.1.3 The original request for a power analysis was to determine the adequacy of coverage of the baseline characterisation survey. As 'adequacy' is not clearly defined, the power analysis in this report determines how appropriate the survey coverage would be for any potential monitoring of ornithology populations (e.g. pre- and post- construction monitoring), should this be required. However, this can be used to infer the adequacy of coverage for the EIA, specifically in relation to the magnitudes of change which are predicted in the EIA. Thus, this report determines the statistical power to determine a potential displacement effect of building the Mona Offshore Wind Project and the

[1] Also known as a false positive, it occurs when a null hypothesis is rejected when it is actually true.

Morgan Generation Assets given the current coverage and a range of displacement scenarios used in the EIA and ISAA.

Table 1.1: Stakeholder request for power analysis.

Date	Source	Stakeholder	Comments
01 June 2022	Mona scoping response	NRW	The level of coverage required to be sufficient for baseline characterisation will depend on the nature of the area being surveyed and the abundance and distribution of receptors across the area. A power analysis should be undertaken to inform survey design and ensure that such designs maximise the probability of detecting changes in abundance and distribution through future comparison with data that may be collected post-consent.
07 June 2022	Ornithology Baseline Characterisation Technical Note response	Natural England	Although analysis of 12% of the sea surface is likely to be sufficient, best practice would be to conduct a power analysis to determine the level and distribution of survey coverage to analyse. We recommend that a power analysis is undertaken to demonstrate that survey coverage is appropriate.
08 June 2022	Ornithology Baseline Characterisation Technical Note response	NRW	NRW Advisory (A) advise that further information on how the survey design has been arrived at is needed, including results of a power analysis to detect the sample size required for the analysis of aerial survey data.
13 July 2022	Offshore ornithology EWG meeting 2	The Applicant	There has been a request for power analysis to be carried out to detect the appropriateness of the 12%. We are asking for more clarification in this EWG on what the EWG members are looking for from this power analysis. We have used the MRSeaPower package before for the ability to detect changes as power analysis is usually used to define the ability to detect future changes rather than characterise a baseline. The purpose of these surveys is to characterise the baseline; they are not pre-construction monitoring surveys. The power to detect changes is not what the Applicant is seeking to do with these surveys.
13 July 2022	Offshore ornithology EWG meeting 2	JNCC	It [power analysis] is something that JNCC would consider worth doing as it can inform if the current survey design has enough power to be used for the pre-construction surveys. Does it detect the level of displacements that we would expect to see for the species that may be impacted?
13 July 2022	Offshore ornithology EWG meeting 2	The Applicant	RPS and the Applicant to discuss additional analysis of survey images to ensure site variability is being captured. Power analysis will be considered internally.
03 August 2022	Response to Offshore ornithology EWG meeting 2 meeting minutes	NRW	Meeting minute action: LR to discuss clarity around request for power analysis with NRW specialists. The NRW Scoping Response stated that "The level of coverage required to be sufficient for baseline characterisation will depend on the nature of the area being surveyed and the abundance and distribution of receptors across the area. A power analysis should be undertaken to inform survey design and ensure that such designs maximise the probability of detecting changes in abundance and distribution through future comparison with data that may be collected post-consent." The applicant proposes to collect data from approximately 30% of the sea surface and analyse 12%. It is unclear where the justification for the 12% analysed comes from and how it relates to these survey data, hence advising the applicant to make this clearer. Typically, NRW (A) would recommend a power analysis to ensure that there is sufficient statistical power to detect changes in abundance

Date	Source	Stakeholder	Comments
			and distribution through future comparison with data that may be collected at a later stage, demonstrating that the applicant has considered whether the current survey design has enough power to be used for the pre-construction surveys. It is important that analyses have the power to detect trends in abundance or distribution and the level of displacements for the species that may be impacted.
19 August 2022	Response to Offshore ornithology EWG meeting 2 agreement log	Natural England	We note that there was an action from the EWG02 for RPS and the applicant to discuss the possibility of additional analysis of survey images to ensure variability is being captured across the survey area. We await further information regarding the outcomes of these conversations in regard to our recommendation of power analysis to demonstrate that survey coverage is appropriate.
14 November 2022	Response to Offshore ornithology EWG meeting 1&2	The Applicant	The rationale for the digital aerial survey design is presented in the Offshore ornithology baseline characterisation of the PEIR. As per previous responses, the applicant is investigating the use of power analysis.
01 June 2023	Section 42 response to the Mona PEIR	Natural England	The SNCBs recommended in the EWGs that a power analysis is undertaken to demonstrate that survey coverage is appropriate. Although the analysis of 12% of the sea surface is thought likely to be sufficient, best practice would be to conduct a power analysis to determine and evidence this.
01 June 2023	Section 42 response to the Morgan Generation PEIR	Natural England	The SNCBs recommended in the EWGs that a power analysis is undertaken to demonstrate that survey coverage is appropriate. Although the analysis of 12% of the sea surface is thought likely to be sufficient, best practice would be to conduct a power analysis to determine and evidence this.
01 June 2023	Section 42 response to the Mona PEIR	JNCC	Coverage required for good survey and data quality is likely to be site specific, therefore stating that others have done 10% and been approved does not negate the need for power analysis to verify the survey method used. Coverage of Mona aerial surveys is noted as at least 12%.

2 Methods

2.1 Input

2.1.1.1 The digital aerial survey data provided has a quasi-poisson distribution, because birds tend to aggregate more than expected from a regular poisson distribution. A power analysis for a quasi-poisson distribution is similar to that for a standard poisson distribution, with a few modifications to account for overdispersion (phi).

2.1.1.2 The steps involved in running a single power analysis are the following:

1. Define the null and alternative hypotheses (H0: birds are not being displaced, H1: birds are displaced at a rate d).
2. Specify the significance level (alpha) to use for the test (in this case 0.05).
3. Determine the expected effect size, in this case the expected difference in mean bird numbers (lambda) between the Mona Array Area/Morgan Array Area+2km and the buffer zone (ranging from 30% to 70% for this analysis, as agreed with SNCBs for the EIA).
4. Estimate the overdispersion parameter (phi) for the Quasi-Poisson distribution based on the data available (based on the data available a phi of 3 was deemed appropriate, and ranged from 2.1 to 3.4 for the more common species, which are the most reliable to determine this parameter).
5. Use the estimated phi and lambda to generate a control dataset and a reduced dataset (reduced by displacement rate) and run a generalised linear model on it. Data is generated using a negative binomial estimator (Wang & Fuller 2003).
6. Determine statistical significance of this iteration using quasi-poisson generalised linear models (Stasinopoulos et al., 2006, Bolker et al., 2009).
7. Repeat 1000 times to calculate how many of the outcomes are significant at the determined alpha level (0.05).
8. The power is the number of tests test that were significant divided by the total number of tests.

2.1.1.3 The power analysis will vary with sample size, effect size, significance level, and the overdispersion parameter.

2.2 Assumptions

2.2.1.1 The power analysis contains a number of assumptions which are described in this section.

2.2.1.2 The number of photos taken by APEM in each survey month was 5868 for the Mona Offshore Wind Project. The average photo covers 0.0377 km^2, meaning these 5868 photos cover on average ~221 km^2, which is ~15.5% of the survey area.

2.2.1.3 For the purpose of the displacement modelling exercise, it was assumed that half of these photos would serve as a displacement area (array+2km), and the other half as a baseline area with no effect of the wind farm (buffer area outside of the array+2km). In reality, these areas were ~639 km^2 and ~781 km^2 respectively. However, for the purpose of the power analysis any variation in bird numbers generated by a difference in area size was to be eliminated. Moreover, if post-construction monitoring data will be gathered, it is logical to assume that a balanced experimental design will be chosen, for example by increasing coverage in the core area and decreasing it in the buffer

area (so that the number of photos taken in the core and buffer area are the same, which will maximise statistical power).

2.2.1.4 A spatial component was not needed to run the power analysis, as the main determinant of the model outcome was the displacement condition, which was modelled as a two-factor variable (baseline versus displacement). A spatial component was therefore not required to statistically detect differences.

2.2.1.5 To be conservative, in this analysis it was assumed that the number of birds seen in the real data pre-construction will be reduced by the displacement rate within the area dedicated for the wind farm, and will not necessarily increase in the buffer zone. The sample sizes on the x-axes can therefore be directly compared to the real data available, even though in the displacement models fewer birds were modelled to be present.

2.2.1.6 To exemplify this point, assume 500 birds are present in the dataset pre-construction. In the model these will be split evenly among the baseline and displacement site, so 250 and 250. However, the displacement site data is generated assuming 30% to 70% of birds are displaced, making the modelled number of birds present in the displacement site 75 to 175 rather than 250. To remain conservative however, we assume these birds have disappeared rather than moved to the buffer zone. In this scenario, to facilitate ease of comparison with real pre-construction data, the sample size to compare the result to is displayed as 500 birds rather than 325 or 425.

2.2.1.7 Densities were calculated using the average area size covered by a photo in the APEM data, which was 0.0377km^2. Coverage was the average area size per photo multiplied by the number of photos, divided by the size of the digital aerial survey area.

2.3 Detailed breakdown of steps

2.3.1.1 The power analysis was run in the R environment (R Core Team, 2023) using loops and storing the outputs.

2.3.1.2 The initial set of power analyses was run for four effect size scenarios (30%, 40%, 50%, and 70% displacement) and 199 sample size scenarios (between 10 and 1000 birds per month of data), which meant 896 power analyses were done. In this initial set, it was assumed data was collected for a single month (5868 photos).

2.3.1.3 For each of the 896 iterations, an internal loop was run 1000 times, which is the equivalent of a single power analysis for one specific scenario (for example, a displacement rate of 30% and a sample size 500/5868). A single iteration of this internal loop consisted of the following steps (using said example):

1. Generate a baseline dataset of 2934 photos with a mean of 500/5868 birds using a quasi-poisson estimator and an overdispersion term of 3 (this step creates variable datasets across the 1000 iterations due to it being a random process within the boundaries set).
2. Generate a ‘reduced’ dataset of 2934 photos with a mean of 500/5868*(1-0.3) birds using a quasi-poisson estimator and an overdispersion term phi of 3 (this step also creates variable datasets for the same reason, but was reduced in size due to displacement).
3. Run a statistical test (in this case a generalized linear model with a quasi-poisson estimator) between the baseline and the reduced dataset.
4. Extract p-value from the model and compare to the alpha level of 0.05. If $p<0.05$, assign a 1, otherwise assign a 0.

5. Add the outputs to a data frame.

2.3.1.4 When the internal loop was run 1000 times, the number of times a statistical test was significant was determined and divided by the total number of tests. The statistical power is the number of times a test was significant, divided by the total number of tests. For example, if 250 tests out of 1000 were significant, power is 25%.

2.3.1.5 The outputs of a single scenario were added to a data frame and stored, before running the next scenario. As mentioned before, there were 896 scenarios, for each of which 1000 datasets were generated making the total number of iterations (and tests) 896,000.

2.3.1.6 It must again be highlighted that the first analysis was done assuming a single month of data. However, typically these types of analyses will be run on seasonal data, making it likely that at least six months of data will be available for the test using real data. If two years of data are available, the sample size would even be increased to 12 months of data assuming a six-month breeding season.

2.3.1.7 Therefore, a second set of iterations was run to specifically determine the effect of collecting several months of data on the sample size required to detect a statistically significant difference. This set of power analyses considered having six and 12 months instead of one month of data available (assuming one and two breeding seasons of six months each). It was only run for the most conservative 30% displacement scenario for computational purposes, but comparing these two scenarios was considered sufficient to describe the effect of collecting several months of data. Because 30% is the smallest recommended effect size, this requires the highest sample size, and so any larger displacement scenarios will require smaller sample sizes.

2.3.1.8 A third set of iterations was run to model the effect of coverage on the sample sizes required. This assumed that coverage was halved, reducing the number of photos by 50%. Finally, the outputs were compared to the raw data in the Mona and Morgan aerial surveys.

3 Results

3.1 Power analyses

3.1.1 Displacement scenarios 30% to 70%

3.1.1.1 Outputs of the power analyses are presented in figures and tables below. As expected, larger sample sizes are required to detect smaller differences.

3.1.1.2 When a single month of data is available (5868 photos for the Mona Offshore Wind Project), a sample size of 582 birds is required to detect an effect size of 30% displacement 80% of the time. This sample size is 295 birds, 180 birds, and 80 birds for 40%, 50%, and 70% displacement respectively, which is based on the range of effects on seabirds considered in the EIA and ISAA (Figure 3.1,Table 3.1).

Table 3.1: Number of birds (sample size per month) required in the raw data to detect displacement ranging from 30% to 70% with a certain statistical power, modelled for a single month of data.

Sample size required per displacement scenario				
Power	**30%**	**40%**	**50%**	**70%**
<0.20	50	26	20	15
0.20 to 0.40	150	75	50	28

	Sample size required per displacement scenario			
0.40 to 0.60	296	153	93	43
0.60 to 0.80	490	250	153	68
>0.80	582	295	180	80

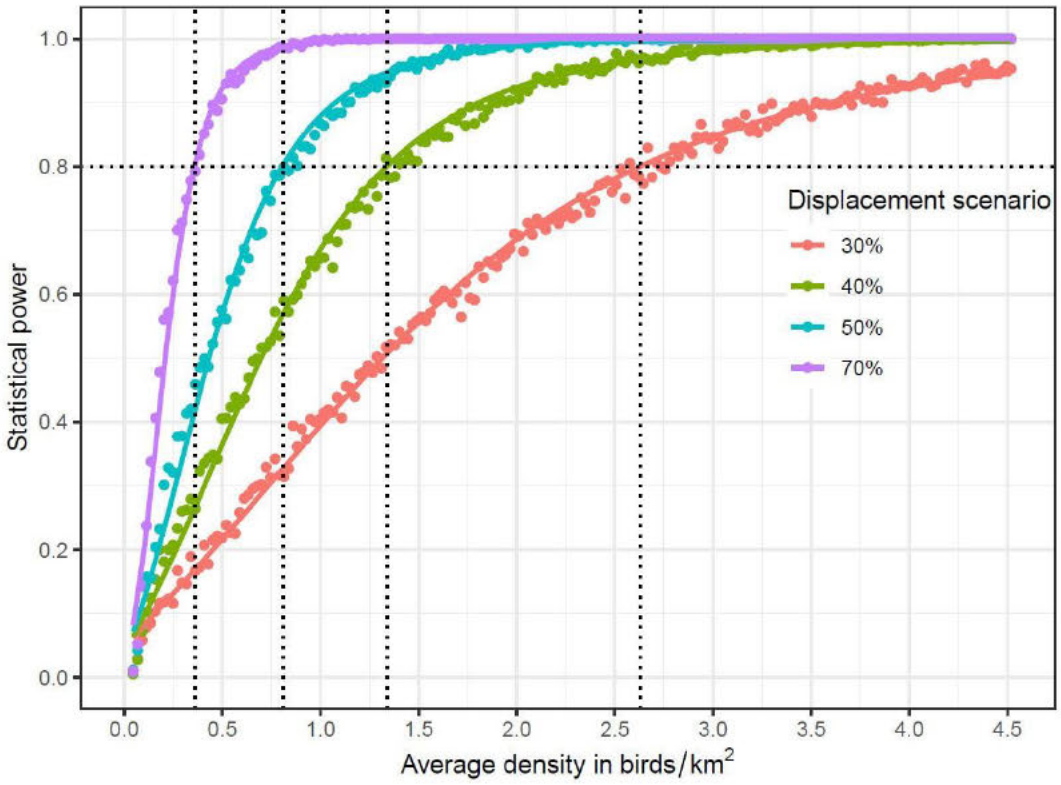

Figure 3.1: Density of birds required in the raw data to detect displacement ranging from 30% to 70%, modelled for a single month of data. Each point is the outcome of 1000 statistical tests, where power is the number of significant tests divided by 1000. Power increases with sample size and more quickly for larger displacement scenarios.

3.1.1.3 When looking at this from a density point of view, the densities required for a single month of data were 2.63 birds/km^2, 1.34 birds/km^2, 0.81 birds/km^2, and 0.36 birds/km^2 for the 30%, 40%, 50%, and 70% displacement scenario respectively (Figure 3.1).

3.1.2 One month versus more months of data available

3.1.2.1 So far, we have assumed that only one month of data was available, which is unrealistic. Typically, there will be at least two years of breeding season data available. Assuming a breeding season of six months, and assuming breeding and non-breeding displacement are generally tested separately, two additional scenarios tested here were six and 12 months of data available rather than one month.

3.1.2.2 When using a more realistic number of months available, the sample size required per month dropped dramatically. With six months of data available, an average of 140 birds per month was required to detect a 30% displacement 80% of the time compared to 582 for one month of data available (Table 3.2). This dropped to 71 birds per month with 12 months of data.

Table 3.2: Number of birds (sample size per month) required in the raw data to detect a displacement of 30% with a range of statistical powers, modelled for one month versus six months of data available and for different power scenarios.

Sample size required per month, 30% displacement			
Power	**1 month of data**	**6 months of data**	**12 months of data**
<0.20	50	15	8
0.20 to 0.40	153	41	20
0.40 to 0.60	299	76	36
0.60 to 0.80	490	118	60
>0.80	582	140	71

Figure 3.2: Density of birds required in the raw data for one versus six versus 12 months of data available. Each point is the outcome of 1000 statistical tests, where power is the number of significant tests divided by 1000. Power increases with sample size and more quickly when more data is available.

3.1.2.3 When looking at this from a density point of view, the density required to reach 80% power for a single month of data was 2.63 birds/km^2, whereas it was 0.63 birds/km^2 for six months of data, and 0.32 birds/km^2 for 12 months of data (Figure 3.2).

3.1.3 Current coverage versus half the current coverage

3.1.3.1 Thus far, we have assumed that the coverage for the power analyses was the same as the coverage in the Mona array area, namely 5868 photos per month covering ~221 km^2, which is about 15.5% of the total digital aerial survey area. However, it was

deemed important to also model the effect of reducing coverage on the statistical power. To this end a set of power analyses was run using half the current coverage (2934 photos per month covering 7.75% of the survey area), assuming six months of breeding season data availability and 30% displacement.

Table 3.3: Number of birds (sample size per month) required in the raw data to detect a displacement of 30% with a range of statistical powers, modelled for one month versus six months of data and for different power scenarios.

Sample size per coverage scenario, 30% displacement		
Power	**Current coverage**	**Half coverage**
<0.20	15	15
0.20 to 0.40	41	38
0.40 to 0.60	76	73
0.60 to 0.80	118	120
>0.80	140	140

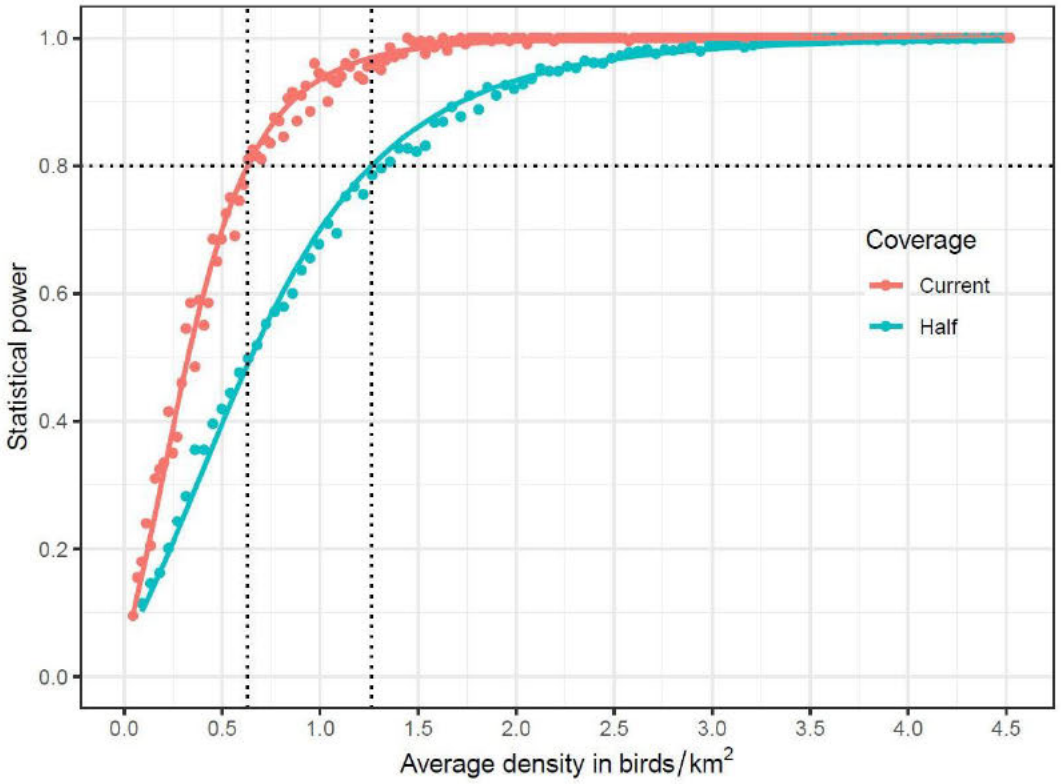

Figure 3.3: Density of birds required in the raw data for current versus half the current coverage. Each point is the outcome of 1000 statistical tests, where power is the number of significant tests divided by 1000. Power increases with sample size and more quickly when more data is available.

3.1.3.2 When coverage was halved, this had no bearing on the number of birds required to reach 80% power (Table 3.3). In other words, whether 5868 photos covering ~221 km^2 (15.5% coverage) or 2932 photos covering ~111 km^2 (7.75% coverage) were available, the number of birds required in the photos remained the same. Any

differences in Table 3.3 are due to differences in random outcomes of generating the data and were not significant.

3.1.3.3 The consequence of halving the current coverage, therefore, is that the density of birds required is double that of the full coverage to reach 80% power (Figure 3.3). For Mona, this means that instead of a density of 0.63 birds per km^2, an average density of 1.26 birds per km^2 was required to have an 80% chance of detecting a significant effect of 30% displacement.

3.1.3.4 Similarly, if coverage was doubled, the number of birds required to detect a change would not change, but the density required would be halved to 0.32 birds per km^2.

3.2 Comparison to Mona data

3.2.1.1 The 24 months of Mona digital aerial survey data was compared to the power analyses by summarising the data per season. For ease of comparison, a simplification was made by splitting the year up in two periods of six months: 'breeding' and 'non-breeding' was assigned in the same way for each species, which is an oversimplification, but will be sufficient for the purpose of this report. March to August (inclusive) was designated as breeding season, and September to February (inclusive) as 'non-breeding'.

3.2.1.2 It must also be noted that only raw data of identified species can be used for displacement analysis. Corrections for attributing unknown species and availability bias cannot be considered before the modelling, but are applied afterwards. Therefore, the raw data required pertains only to individuals identified to species level.

3.2.1.3 Table 3.4 presents the species recorded in the Mona digital aerial surveys that have been taken forward for displacement analysis in the EIA and HRA.

Table 3.4: Mona aerial survey data raw data numbers of two consecutive breeding seasons (March to August inclusive), and numbers required to detect 30% to 40% displacement with 80% power for 2 years of breeding season data (12 months). Green: >80% power, yellow: 50-80% power, orange: 25-50% power, red: <25% power.

Species	Season	Number of birds in raw data	Number of birds required 30% displacement	Number of birds required 40% displacement
Gannet	Breeding	652	852	467
Gannet	Non-breeding	306	852	467
Guillemot	Breeding	5228	852	467
Guillemot	Non-breeding	3577	852	467
Kittiwake	Breeding	1873	852	467
Kittiwake	Non-breeding	1593	852	467
Manx Shearwater	Breeding	2480	852	467
Manx Shearwater	Non-breeding	64	852	467
Puffin	Breeding	28	852	467
Puffin	Non-breeding	4	852	467
Razorbill	Breeding	1051	852	467
Razorbill	Non-breeding	1223	852	467

3.2.1.4 The current coverage is adequate to detect displacement effects of at least 30% for guillemot, razorbill, and kittiwake throughout the year, and for Manx Shearwater during the breeding season. Coverage should also be sufficient to detect at least 40% displacement for gannet during the breeding season, so the power to detect changes with the current survey design is sufficient.

3.2.1.5 A displacement effect of 30% or 40% will not be detectable for Atlantic puffin, nor for Manx shearwater during the non-breeding season. Even if displacement was very high for these species this would not be detectable given their consistent low abundances in the Mona digital aerial survey area. For northern gannet during the non-breeding season this is true to a lesser extent, but a displacement effect of 50% should still be detectable given the gannet numbers present during the non-breeding season. Given the low numbers of these birds in the Mona digital aerial survey area, the effects of displacement on these species during those times of year is expected to be negligible.

3.2.1.6 In the EIA and the ISAA the range of displacement rates used was 30% to 70% for auks and kittiwake, and 60-80% for gannet. For the higher displacement scenarios which the EIA and ISAA are based on, the numbers of birds and densities required to achieve 80% power would be considerably lower.

3.3 Comparison to Morgan data

3.3.1.1 The 24 months of Morgan digital aerial survey data was compared to the power analyses by summarising the raw total number of birds of each species within the array and buffer areas combined per season. For ease of comparison, a simplification was made by splitting the year up in two periods of six months: 'breeding' and 'non-breeding'. This was assigned in the same way for each species, which is an oversimplification, but will be sufficient for the purpose of this report. March to August (inclusive) was designated as breeding season, and September to February (inclusive) as 'non-breeding'.

3.3.1.2 It must also be noted that only raw data of identified species can be used for displacement analysis. Corrections for attributing unknown species and availability bias cannot be considered before the modelling, but are applied afterwards. Therefore, the raw data required pertains only to individuals identified to species level.

3.3.1.3 Table 3.5 presents the species recorded in the Morgan digital aerial surveys that have been taken forward for displacement analysis in the EIA and HRA.

Table 3.5: Morgan aerial survey data raw data numbers of two consecutive breeding seasons (March to August inclusive), and numbers required to detect 30% to 40% displacement with 80% power for 2 years of breeding season data (12 months). Green: >80% power, yellow: 50-80% power, orange: 25-50% power, red: <25% power.

Species	Season	Number of birds in raw data	Number of birds required 30% displacement	Number of birds required 40% displacement
Gannet	breeding	351	852	467
Gannet	non-breeding	245	852	467
Guillemot	breeding	6382	852	467
Guillemot	non-breeding	6018	852	467

Species	Season	Number of birds in raw data	Number of birds required 30% displacement	Number of birds required 40% displacement
Kittiwake	breeding	1126	852	467
Kittiwake	non-breeding	1896	852	467
Manx Shearwater	breeding	1347	852	467
Manx Shearwater	non-breeding	825	852	467
Puffin	breeding	13	852	467
Puffin	non-breeding	3	852	467
Razorbill	breeding	175	852	467
Razorbill	non-breeding	848	852	467

3.3.1.4 The current coverage is adequate to detect displacement effects of at least 30% for guillemot, Manx shearwater, and kittiwake throughout the year, and for razorbill during the non-breeding season. Coverage should also be sufficient to detect at least 40% displacement for gannet during the breeding season so the power to detect changes with the current survey design is sufficient.

3.3.1.5 A displacement effect of 30% or 40% will not be detectable for puffin, or for gannet, nor for razorbill during the breeding season. Even if displacement was very high for these species this would not be detectable given their low numbers in the Morgan digital aerial survey area. For northern gannet during the non-breeding season this is true to a lesser extent, but a displacement effect of 50% should still be detectable given the gannet numbers present (noting the EIA and ISAA assume 60-80% displacement for this species). Given the low numbers of these birds in the Morgan digital aerial survey area, the effects of displacement on these species during those times of year is expected to be negligible. The same applies to the other species recorded in low numbers in the Morgan digital aerial survey area.

3.3.1.6 In EIA and the ISAA the range of displacement rates used was 30% to 70% for auks and kittiwake, and 60-80% for gannet. For the higher displacement scenarios which the EIA and ISAA are based on, the numbers of birds and densities required to achieve 80% power would be considerably lower.

3.4 Summary

3.4.1.1 Based on the lowest level of potential effect outlined in both the EIA and the Information to Support the Appropriate Assessment (ISAA), which stands at 30% displacement, the set of analyses demonstrates that the coverage of analysis of the baseline characterisation surveys are sufficient for detecting changes in the majority of bird species. Where the coverage is not sufficient to detect change, even if displacement was very high for these species this would not be detectable given their consistent low abundances in the Mona and/or Morgan digital aerial survey area. Consequently, it can be concluded that these surveys and resulting data are appropriate for establishing the baseline to inform the EIA and ISAA.

D.6.11 Response from NRW regarding the Mona and Morgan Generation Power Analysis report

From: [redacted]
To: [redacted]
Cc: [redacted]

Subject: RE: Morgan Generation & Mona fifth offshore ornithology EWG meeting
Date: 11 August 2023 14:37:21
Attachments: image001.png

Hi [redacted]

As [redacted] is on leave, please see below for NRW(A)'s comments on the power analysis note.

Kind regards,

[redacted]

NRW(A) welcome the power analysis work that has been undertaken for Mona/Morgan of using baseline survey data to ensure an appropriate level of survey coverage and data analysis has been achieved. We consider the approach taken to be adequate, essentially comparing theoretical baseline and impacted areas to determine how many birds would need to be sampled to achieve suitable power to detect desired effect sizes. The work undertaken does provide some confidence that the surveys conducted are fit for purpose in terms of baseline characterisation for consideration in EIA and HRA.

D.6.12 Response from Natural England regarding the Mona and Morgan Generation Power Analysis report

From: [redacted]
To:
Cc:
Subject: RE: NE Response Power Analysis Technical Note
Date: 10 August 2023 17:32:19
Attachments: image001.png
image002.png

CAUTION: This email originated from outside of RPS.

Hi [redacted],

Please see below comment from our ornithologist regarding the power analysis technical note:

Natural England Comment: "*Natural England welcome the Applicants power analysis using baseline survey data to ensure an appropriate level of survey coverage and data analysis has been achieved. We consider the methods employed to be adequate, essentially comparing theoretical baseline and impacted areas to determine how many birds would need to be sampled to achieve suitable power to detect desired effect sizes. We are in agreement with Applicant that the results suggest that the survey coverage and data analysis undertaken are appropriate for establishing a baseline to be considered for EIA and HRA.*"

Many thanks,

[redacted]
Senior Marine Advisor
Cheshire to Lancashire Area Team
[redacted]

D.6.13 Natural England proposed methodology for 'gap-filling' the Irish Sea R4 cumulative and in-combination assessments

Proposed methodology for 'gap-filling' the Irish Sea R4 cumulative & in-combination assessments

At present, Natural England do not consider that AEOI can be ruled out beyond reasonable scientific doubt for several species/SPA combinations at Round 4 Irish Sea projects. This is due in part to a lack of appropriate consideration of impacts arising from pre-existing OWFs. This presents a clear consenting risk and would ideally be resolved prior to examination. Natural England consider that some estimate of impact must be attributed to all projects screened in to cumulative and in-combination assessments to reduce or eliminate this risk which arises in some cases simply from a lack of provision of relevant information.

A basic approach is suggested to generate **indicative** numbers for currently 'unknown' displacement and collision impact estimates, depending on the level of data available for the relevant projects. It is acknowledged that the approach detailed below is flawed. However, the intention is simply to enable an informed expert judgement to be made on the likelihood of risk with respect to AEOI, and thus the necessity of assessing this risk in more detail.

It is of note that some OWFs screened into the assessments may be nearing end-of-life with limited (or no) overlap with the proposed project. It would be appropriate to consider timelines and determine if any of these sites can be screened out.

Where it is necessary to 'gap-fill' for a particular development, the following methods are proposed.

Displacement

1. Review the submitted environmental statement. It is accepted that displacement mortality estimates may not be presented. However, if there is abundance data, utilise this to populate project-specific displacement matrices for relevant species. We also suggest review of the Round 4 plan-level HRA to determine if any suitable estimates are presented therein.

If no abundance data available…

2. Use a nearby windfarm with a published estimate of mortality arising from displacement as a proxy. Scale this estimate according to the relative area of the two arrays and appropriate buffers.

Collision

1. Review the submitted environmental statement. It is accepted that collision mortality estimates may not be presented. However, if there is abundance data, utilise this to run project-specific CRMs according to current best practice for relevant species. We also suggest review of the Round 4 plan-level HRA to determine if any suitable estimates are presented therein.

If no abundance data available…

2. Use a nearby windfarm with a published estimate of mortality arising from collision as a proxy. Scale this estimate according to the relative number of turbines in the two arrays. The difference in the turbine specifications should be considered to determine if this method is likely to over or underestimate impact.

In the absence of any relevant site-specific data for a given development from which estimates of displacement or collision mortality can be derived, Natural England consider that the relatively clustered nature of OWFs in the Irish Sea lends itself to the alternative approach of using a site within a 'cluster' as the proxy to base the scaling of impacts upon. This could be carried out for multiple sites simultaneously if the same proxy is used.

If >1 nearby sites to a given development requiring "gap-filling" have data, the most appropriate proxy site according to location, data quality & comparability should be selected. Alternatively, consideration of multiple sites could be discussed further.

If, having generated estimates as detailed above, the total impacts lead to cumulative and/or in-combination increases in baseline mortality of >1% it will be necessary to undertake a more rigorous assessment of estimated impacts at projects where gap-filling has been necessary.

We suggest further engagement with relevant SNCBs on this point if required.

If a more rigorous assessment is considered necessary, the best available bird density estimates and known array footprint + buffers and consented turbine parameters should be used to generate refined project specific assessments of displacement and collision mortality. If baseline characterisation data are not available for a given "gap-filling" project, MERP, strategic VAS of OWF areas, or the recent Welsh Atlas data could be considered (links and references available on request).

D.7. Offshore ornithology EWG meeting 6

D.7.1 Meeting minutes

MINUTES OF MEETING

Security Classification: Project External

Partners in UK offshore wind

MOM Number	:	20231019_Morgan and Mona Offshore Ornithology	**REV. No.** :	F02
MOM Subject	:	Morgan and Mona Evidence Plan Offshore Ornithology meeting 6		

MINUTES OF MEETING

MEETING DATE	:	19/10/2023
MEETING LOCATION	:	Teams
RECORDED BY	:	[redacted] (RPS)
ISSUED BY	:	[redacted] (RPS)

PERSONS PRESENT:

- [redacted] – bp (SR)
- [redacted] – bp (MP)
- [redacted] - RPS (ST)
- [redacted] – RPS (AP)
- [redacted] – RPS (BM)
- [redacted] – RPS (AM)
- [redacted] – RPS (LM)
- [redacted] – Niras (MH)
- [redacted] – Niras (WG)
- [redacted] – Niras (FC)
- [redacted] – JNCC (RS)
- [redacted] JNCC (RH)
- [redacted] – NRW (LR)
- [redacted] – NRW (NP)
- [redacted] – NRW (HR)
- [redacted] – NRW (EL)
- [redacted] – NRW (PB)
- [redacted] – IoM (RS)
- [redacted] MMO (AMP)
- [redacted] -MMO (MS)
- [redacted] -RSPB (AD)
- [redacted] – Natural England (EW)
- [redacted] – The Wildlife Trust (GJC)

APOLOGIES:

- [redacted] GV)
- [redacted] – RPS (KL)
- [redacted] – JNCC (JW)
- [redacted] – Natural England (KB)
- [redacted] Natural England (RB)
- [redacted] Natural England (AR)
- [redacted] – NRW (RN)
- [redacted] –RSPB

ITEM NO:	DISCUSSION ITEM:	Responsible party	Date
1.	**Introduction and Agenda (ST)** Introductions and welcome to the meeting. Agenda: project update followed by explanation of the approach to LSE screening and the ISAA. This has been previously discussed therefore the aim is to formalise what has been agreed. The NE advice note regarding gap filling for cumulative/in-combination assessments circulated by [redacted] at Natural England will be discussed briefly, albeit the advice is currently being considered by the Applicant and RPS at this time. Our ornithology team LM and AM will explain the updates to the Mona Technical Reports and comparisons of the Preliminary Environmental Information Report (PEIR) results and MH will discuss the Morgan Generation updates. Finally the agreement logs will be discussed along with next steps.		
2.	**Project updates (presented by MP)** Following responses to the Mona and Morgan Generation Preliminary Environmental Information Reports (PEIRs), the project design envelope has been reviewed and updated. The Mona and Morgan array areas have been reduced in size, mainly in response to shipping and navigation and commercial fisheries consultation and assessments. Slide 5 of pre-meeting presentation pdf provides links to the offshore newsletters for Mona and Morgan Generation that were published in September 2023 and presents key offshore updates. The maximum number of wind turbines has been reduced from 107 to 96 for both Mona and Morgan Generation projects. The rotor diameter of the largest wind turbine has increased from 280 m to 320 m for both Mona and Morgan Generation. Monopiles have been removed from the list of foundation options included in the project design envelopes. Gravity base foundations and jackets on suction buckets or pin piles (drilled or driven) are retained. No cable protection higher than 70 cm will be installed within the Menai Strait and Conwy Bay SAC. The percentage of export cable requiring cable protection has been reduced to not exceed 10% of the total length within the SAC. Additionally, no more than a 5% reduction in water depth will occur at any point along the export cables without prior written approval from the Licensing Authority in consultation with the MCA. The Mona export cables will be installed under the intertidal area from below MLWS to above MHWS		

	onshore via trenchless techniques. Open-cut trenching within the intertidal area has been removed for the project design envelope. The Mona sandwave clearance volume for the inter-array cables has been reduced from 9,542,806 m^3 to 4,188,876 m^3 through a reduction in clearance width from 104 m to 80 m. The Mona sandwave clearance volume for the offshore export cables has been reduced from 12,051,955 m^3 to 1,504,000 m^3 through a reduction in clearance width from 104 m to 40 m and a reduction in the percentage of offshore export cable requiring clearance from 70% to 20%. The Morgan Generation sandwave clearance volume for the inter-array cables has been reduced from 11,843,641 m^3 to 5,026,651 m^3 through a reduction in clearance width from 104 m to 80 m and a reduction in the percentage of inter-array cable requiring clearance from 50% to 40%.		
3.	**<u>Project updates – Liverpool Bay SPA (presented by AP)</u>** The Applicant can now confirm that intertidal installation of the export cable will be via trenchless techniques; open cut trenching has been removed from the project design envelope. In regard to installation of the export cable through the Liverpool Bay Special Protection Area (SPA), in the previous EWG the Applicant discussed and committed to implementing a voluntary timing restriction to export cable installation activities within the SPA to avoid the most sensitive winter periods for the relevant bird species in the SPA (for example red throated diver and common scoter), with a caveat around nearshore works. This was following receipt of Section 42 consultation responses regarding concerns about potential disturbance to SPA ornithological features. The applicant requested at the last EWG that the installation of any trenchless techniques at the landfall would not be included in that voluntary seasonal restriction. This was on the understanding that the main area disturbed by trenchless techniques would be the nearshore (at the cable exit pit), where the abundances of these key species are significantly lower (e.g. red throated divers aggregate further offshore than the landfall works), the highly limited extent of cable installation at the landfall and that any increase in vessels would be limited in extent and duration. Natural England and NRW previously indicated the following at the last Offshore Ornithology EWG:		

	RB - This sounds ok for red throated diver, but it would be worth taking a close look at common scoter who may be found closer to shore. *HR- NRW provisionally agree with Natural England, as long as all qualifying features (so including the wintering waterbird assemblage) are considered and a justification provided.* As discussed in the last EWG there would be a small number of vessel movements associated with those trenchless technique operations and the applicant has been looking to refine the number of vessel movements to as few as possible during the wintering period. The conclusions from the Applicant's work after the last EWG were that there could be a need for **up to 8 vessel movements** during the winter period associated with installation of the export cable at the landfall. All vessel movements associated with the installation of the export cable at the landfall during the wintering period would be subject to industry best practice measures such as sticking to defined routes, crew briefings and avoiding sudden changes to speed and direction etc. An Outline Vessel Management Plan will be produced to manage these vessel movements. This is to ensure there will be minimal disturbance to birds above the baseline levels and no adverse effect on the integrity of the SPA. The applicant is looking for agreement from stakeholders that trenchless technique operations and associated vessel movements (as detailed above, up to 8) in the wintering period will not be included in the voluntary seasonal restriction for the Liverpool Bay SPA. *Post meeting note from NRW: I think it was noted on the last EWG by NE that there isn't much that can be done to minimise disturbance to red throated diver due to cable installation works; the measures to minimise disturbance were more related to activities such as Crew Transfer Vessel movements, rather than cable installation works. The only effective measure is to not be present in the area. So not sure that the VSP plan bit will be particularly relevant?* HR – Having listened, it probably sounds okay as it will be a temporary activity, but it would be useful to look through it in writing to check before agreement. *Post meeting note from NRW: Will there be anything further provided in writing?* *Applicant response:* Vessel *movements associated with trenchless technique operations to install the export cable in the intertidal area will be detailed in writing in the Outline Landfall method statement to be submitted with the application for consent.*	**EWG to advise whether agreement can be reached that up to 8 vessel movements at the Mona landfall to facilitate the export cable installation via trenchless techniques will not be subject to seasonal restrictions in Liverpool Bay SPA but managed via industry best practice measures (such as an Outline Vessel Traffic Management Plan).**	Complete

	RH – Sounds fine in principle but please put it in writing and we can take it away to look over and discuss. *Post meeting note from NRW and JNCC: This should be RH from JNCC (now updated).* EW – Best to take some written confirmation to the ornithologists. *Post meeting note from NRW: Given that: any disturbance impact to features of the SPA will be temporary for the time of the vessel presence; birds will be able to return once the vessel has gone; there will be other habitat available within the SPA to the birds for the time they are disturbed from the landfall area; up to 8 movements across the key winter period of Nov-Mar represents a small proportion over this timescale; and a commitment to HDD for landfall has been made, NRW Advisory do not expect this temporary activity to result in an AEOSI, but it would be worth also obtaining NE and JNCC agreement.*		
4.	**<u>LSE Screening and ISAA Approach (presented by AP)</u>** Slide 8 of pre-meeting presentation pdf - The Applicant will issue a revised Habitats Regulations Assessment (HRA) Methodology paper to the EWG following this meeting to formalise this agreement. The approach on breeding birds has been agreed. Where the apportioning assessment shows 0 birds are impacted in a SPA, those SPAs/features will be screened out at LSE in the HRA Stage 1 Screening Report and will not be taken forward to the ISAA. *Post meeting note from NRW: True zero? As think that's what was agreed?* *Applicant response: Less than 0.1 when using one decimal place. Anything above 0.05 has been rounded up (i.e. to 0.1). For example, 0.04 has been rounded to 0.0 so has been excluded.* *Post meeting note from NRW: Not agreeing to approach until we see and have reviewed the final updated HRA methodology note.* *Applicant response: Noted, the final updated HRA methodology note was provided on 23/11/23.* It is agreed that this approach does not apply to SPAs where assessment is against conservation objectives (CO's) that are not linked to the abundance of features (e.g. distribution of features within the site or availability of habitat, such as for Liverpool Bay SPA).. The approach to SPAs like Liverpool Bay is unaffected; Liverpool Bay is	**The Applicant will issue a final updated HRA methodology note to the EWG attendees following the meeting to formalise the agreement on approach to LSE screening and the ISAA.**	Complete

	screened in and will be fully assessed as was done in the PEIR. For birds during the non-breeding season, the approach the project is adopting is based on Natural England and NRW feedback, and will be based on the Morecambe PEIR approach (which has also been used on Berwick Bank offshore windfarm). For the BDMPS areas, SPAs within foraging ranges/breeding colonies and where a non-breeding population of an SPA contributes less than 1% of the BDMPS, LSE is screened out for this SPA/feature. *Post meeting note from NRW: I'm a bit confused by what is written here – I thought from what had been discussed before and what is in the slide pack pdf sent prior to this EWG that the approach would be:* *SPAs located within foraging range will be screened in for LSE in the breeding season and non-breeding season impacts will also be apportioned to these colonies to give an overall annual predicted impact.* *Then for SPAs that are not located within foraging range and hence not screened in in the breeding season, these will be screened in for LSE in the non-breeding season if the non-breeding SPA populations contribute >1% of the BDMPS population (based on info presented in tables in Appendix A of Furness 2015). So those that aren't within foraging range in breeding season and contribute <1% of BDMPS population in non-breeding season(s) are screened out?* *Applicant response: NRWs description is correct, that is the approach that has been followed.* Where the non-breeding bird population of an SPA population represents more than 1% of the BDMPS, in the SPA will be taken through to the ISAA. The key SPAs in the region are screened in for birds during the non-breeding season. Then the projects have the Step 1 and Step 2 Adverse Effect On Integrity (AEOI) test. For Step 1 a 'high level' assessment of AEOI is undertaken using the threshold of a 1% increase in baseline mortality for concluding no AEOI. This High-level assessment is likely to be tabulated. The project is working through the details of this, but there will be a section heading in the ISAA for each SPA and then tables below that. One table for the project alone – which will present the numbers of birds affected (all of which are <1% baseline mortalities) with a clear conclusion of no AEOI. Then there will be another table for each feature/species, with the project alone number and the other plans/projects considered cumulatively.		

	This will have a lot more accompanying text, explaining any caveats associated with the in-combination numbers. AP showed an example of the tables for Ailsa Craig SPA project alone and in-combination for the High-Level Step 1 AEOI Test. The EWG mentioned in the last meeting that they would like to see what the Step 1 assessment might look like, we have presented an example template for how the assessment may be presented for the project alone and in-combination assessments. HR – we would advise that the tables include information/figures for: the apportioned impact for the colony, the colony count/size and date, the mortality rate (%), the baseline mortality for the colony and hence 1% baseline mortality figure and then the % of baseline mortality the impact equates to. This is so it is clear exactly how the figures and conclusions have been derived. The Applicant will not be circulating these detailed slides with these minutes as RPS/Niras are currently developing the assessments. However, the EWG have the draft slides shared ahead of this EWG meeting for reference. RPS and Niras are currently working on this and there are extra items that will be added in (e.g. whether the numbers are apportioned or not from certain projects). We have presented examples in this meeting to give attendees an idea of what the 'Step 1' is broadly aiming at. The ISAA won't include much supporting text for the project alone tables. As was set out in the HRA Methodology paper, the aim is to present a succinct AEOI test where the SPA is at very low risk to the project – so not going through the full AEOI test against all the CO's if we can demonstrate its <1% increase in baseline mortality. For in-combination the Applicant is looking to take the same approach as for the project alone, however there are differences. For in-combination the assessment is being presented by SPA and then species. The project mortalities will be presented, the percentage increase in baseline mortalities for each project (where available) will then be added up at the end to determine whether the project results in a <1% increase in baseline mortalities. Broadly the aim is to quantify the in-combination effects on each SPA/feature. For those recent projects (e.g. Morgan Generation, Mona and Morecambe), it's a bit more straightforward as the methodologies have been agreed and they are comparable across the projects. But for the older projects, it's likely these tables will require more supporting text; for example, there may be some CRM numbers, but it's likely these would not necessarily be apportioned to the SPA. So as was discussed at	**The Applicant and RPS will review the advice note issued by Natural England regarding the CEA and confirm the project approach following the meeting.**	Ongoing

	previous EWGs, although numbers can be presented, these would need to come with caveats, so the project is not overstating impacts. It is understood that Natural England advised in the last offshore ornithology EWG that a project was being commissioned by Natural England to help provide some quantification of the impacts associated with these historic projects. Unfortunately, that project will not be available in time to inform the Application. Advice was provided by Natural England with suggestions on addressing the including of older offshore wind projects within the CEA and in-combination assessments. It was noted that this was not a long-term solution but a note to enable the impacts to be quantified for these applications. The advice note will be looked at by the Mona and Morgan Gen projects and how older projects can be incorporated into the projects assessments, including the Step 1 integrity test and the CEA in the Environmental Statement chapter. The approach of the project will be confirmed after the meeting. *Post meeting note from NRW: We cannot make any comments/agreements to the proposed approach to the in-combination assessments (step 1 or step 2) until we see the proposed approach set out/example provided and until we know what is being proposed following the gap filling advice provided by NE.*		
5.	**<u>Mona updated results (presented by LM)</u>** Slide 10 of pre-meeting presentation pdf – Due to the number of project changes to address stakeholder comments, the baseline characterisation presented in the Environmental Statement will be slightly different to that presented in the PEIR. The reduction of the Mona Array Area, abundance estimates have been revised for the baseline characterisation. The notable changes to the Mona baseline characterisation relate to revised Auk ID rates which we have used to characterise the baseline in the Environmental Statement. The Apportionment of unidentified species was applied to design and model-based estimates of known species. Those species taken froward include red-throated diver, guillemot, razorbill, Atlantic puffin, Manx shearwater, northern gannet, black-legged kittiwake, northern fulmar, herring gull, lesser black-backed gull and great black-backed gull. The table in the slides (slide 10 of pre-meeting presentation pdf) shows the monthly breakdown of total raw abundance for identified and unidentified auk and shearwater species. There have been updates to the regional breeding population for the Environmental Statement method since the PEIR.		

	In the breeding season, regional populations have been calculated utilising data from the Seabird Monitoring Programme (SMP) database. Breeding data within the mean-maximum foraging range plus one standard deviation has been extracted from the online SMP database up to the year 2023. To not significantly under-estimate the regional breeding population a check of all designated and non-designated site colonies within the relevant foraging range has been undertaken to ensure all of these colonies are accounted for within the regional breeding population estimated for each species. In these cases, the most recent population estimate for each colony was used. In addition to breeding adult birds associated with the breeding colonies, there will be immature and juvenile seabirds present within the region. Population counts therefore have been adjusted to account for these seabirds. Calculation of the total regional breeding population was explored collaboratively with the Offshore Ornithology Expert Working Group (EWG) due to there being little evidence to support the calculation of the number of juveniles, immatures and non-breeding birds that remain in their wintering areas into the breeding season. The SNCBs proposed that the sum of the adult and immature population estimates for all colonies that sit within the relevant species BDMPS scale (e.g. UK Western waters) from Furness (2015) should be used in order to estimate the total regional breeding population. The EWG noted that there are potential inaccuracies associated with this approach. The Applicant notes that this approach makes broad assumptions about immature populations and therefore increases the total regional breeding population figure. The Applicant is proposing a more precautionary approach for the Environmental Statement whereby the number of immature birds present in the regional BDMPS has been estimated using the ratio of immatures per breeding adult provided in the relevant species accounts in Furness (2015). This approach, used in the Mona and Morgan Gen project's assessments to date, assumes that all immatures associated with each breeding colony will be present within the foraging range defined for each species. The Applicant acknowledges there are also potential inaccuracies with this approach. This approach likely under-estimates the true count of juvenile and immature birds due to failing to account for juvenile and immature birds migrating across to UK colonies in the breeding season from wintering grounds outside of the UK. However, this will result in a more precautionary assessment due to making use of a much smaller total regional breeding population against which the impacts have been assessed. The assessment would		

	lead to impacts being considered greater than if the Applicants used the SNCB recommended approach. Two tables were presented using guillemot for the SNCB recommended approach as an example stating that the BDMPS is over a million birds, and the Applicant has considered all colonies within the foraging ranges for the approach used in the Environmental Statement. *Post meeting note from NRW: Please could these comparisons be included in any written document of proposed approaches? As these slides were not included in the pre-meeting slide pdf – the slide for regional breeding population calculations was blank in the pdf I was sent.* *Applicant response: The Applicant has since circulated a note to the EWG on regional breeding population which shows the population size for common guillemot for our proposed approach and SNCB.* ST - Any thoughts on this approach? HR – Following the last EWG, NRW (on behalf of NRW/JNCC/NE) shared with the Applicants the approach to calculating EIA scale breeding season reference populations that the SNCBs have agreed. It is worth noting that this approach has been sent to multiple other projects, including all of the Irish Sea R4 projects and most of the Celtic Sea demonstrator flow projects. NRW understand from Natural England that the Morecambe project is happy to use the SNCB approach as sent to Mona/Morgan and NRW have received no comments to date from the Celtic Sea demonstrator project this has been sent to and hence we assume they are also happy to use the proposed approach. We also note that the approach to calculating the numbers follows that used at projects in the North Sea, I believe since around Hornsea 2 and East Anglia 3, so it has a lot of precedence for being taken forward. Also note that the approach proposed by the Mona/Morgan projects is not appropriate when you are thinking about cumulative assessments. LM – the project is taking a different approach for cumulative assessments; we are basing our approach on the BDMPS. HR – The project's proposed approach has also been using a mishmash of data. For the breeding season for birds within foraging ranges most recent SMP data is being used. The project is then using immature data from Furness (2015). NRW would recommend the project follow the approach that we have set out which is consistent with the advice being given to other projects as agreed between SNCBs, JNCC, Natural England and NRW. This methodology is what we are all advising to use		

	for projects currently. Acknowledging that it has limitations and requires a lot of further work, which is being looked at through an SNCB task and finish group. That work will not happen in time for this project so we would suggest you use the consistent approach that has the precedent from what happens in the North Sea. This is what we understand other projects coming in around the same time will be using. MH – This approach was not used for the assessments for Hornsea 2 or Hornsea 3. NIRAS produced these assessments. The approach only incorporated breeding birds in the breeding season. HR – I don't know whether that was the case; I understand that this approach came up for Hornsea 2 and on one of the East Anglia projects, which referred to it from Hornsea 2. MH – I can confirm that the approach was not undertaken as NIRAS led the assessments for both projects. HR – That was my understanding of what Natural England's advice was. *Post meeting note from NRW: Whilst the Hornsea 2 and 3 Applicants may not have taken the approach themselves, from when I was working at NE at this time, I understand it was the approach advised by the specialists working on the Hornsea 2 and 3 projects and is what they used in formulating their advice. The NE approach was taken by the more recent Norfolk and East Anglia projects and Hornsea 4.* *Applicant response: We note that Hornsea 4 did not follow the approach provided by Natural England in the application but they have provided an Assessment Sensitivity Report post-application which updates the assessment and presents three approaches to calculate regional breeding populations, including the SNCB approach.* MH – The immatures weren't included in the breeding season for the Hornsea 2 and 3 assessments; it was just the breeding adults. The projects (Hornsea 2 & 3) tried to include immatures within a regional population due to apportioning advice received from Natural England that this approach was not suitable. To move forward from this, we agree that using this for cumulative does underestimate the population. The project will review the detail provided for the approach to the cumulative assessment by the SNCBs. The foraging ranges of guillemot, for example, are much less than Manx shearwater. While the approach advised by the SNCBs would give the same answers as using the foraging	**The Applicants will review the detail provided for the cumulative approach and organise discussions with stakeholders to seek agreement with the final approach.**	Ongoing

	ranges of breeding adult birds for species such as Manx shearwater and gannets, by introducing the method for guillemot the population might be overestimated. In the Irish sea because you have a split between the Irish sea and Celtic Sea projects using a BDMPS area you will overestimate the population. We suggest it would be better to apply the guillemot foraging ranges to the projects considered cumulatively in the breeding season to see what sea area that covers and therefore what colonies that covers. For guillemot the results are likely to illustrate a smaller area than for example gannet which has a much larger foraging range. The suggested approach to the use of foraging ranges will be reviewed for the approach to the cumulative assessment. HR – This approach could be used for breeding adults. However, when considering non-breeding birds and immatures that are not constrained to the colonies, foraging ranges don't apply and as such are not appropriate to use for calculations for these.. MH – Immatures is the population we know least about so the approach at the moment uses the Furness (2015) ratio to multiply the population rather than the population provided in the Furness 2015 report. HR – That is how Furness has come up with the population numbers in those Appendix A tables. Those are refined for a colony so you will end up with the same numbers? MH – No because the data the project is using is the most up to date from SMP so it is those numbers multiplied by the ratio (for immatures). The immature ratio from Furness isn't dependent on the number of adult birds, it's a stable age population so the ratio shouldn't change. The project doesn't know how these immature birds are distributed, there is evidence for kittiwake that they will get closer to their natal colonies as their natal classes increases. Our populations (immature) should always be smaller than what is calculated in the whole BDMPs so it should more readily identify significant effects. *Post meeting note from NTW: The suggestion was that the ratio shouldn't change, but I thought this was going to be checked by Niras?* *Applicant response: The ratio may change if there have been changes in adult survival (possible) or age at first breeding (unlikely). We don't however propose to update the ratio as provided in Furness (2015).* MH – Worth thinking about how project alone and cumulative might differ for certain species.	**The Applicant will review the BDMPS advice from**	

	HR – This needs a lot of thought, so is unlikely to get resolved here. MH - The populations of immature birds in the region of the Mona and Morgan Generation Offshore Wind Project are smaller so that could mean they more readily identify significant effects. HR – Or perhaps identify significant effects which are not really significant. MH – Hopefully the assessment will come to the same conclusions whether we have the need for PVA or not. HR - It would be good to see any revised methods set out in writing and any assessment conclusions/comparisons from approaches set out, so this can be considered further outside this meeting. AM – We can prepare a separate technical note explaining the approach taken in the PEIR, the comments we received from the SNCBs and the approach for the Environmental Statement. HR – If that could be set out it would be useful to be able to see the reasoning behind the proposed approach. SR – The project was unsure about some of the wording in the SNCB advice; NIRAS do you want to clarify that? MH - I think that has been clarified. HR - There is inaccurate wording throughout the information that has come from the Furness report. MH - Thank you for clarifying. SR – We asked the SNCBs if the advice received was advised to all projects or was it project specific. Due to the timescales and low impact level would there be an opportunity for the SNCBs to see this project as an exception due to the low levels of impact. Would our proposed approach be acceptable as our assessments will be submitted prior to the advice coming through from the SNCB task and finish group? HR - Advice sent to the project has been sent to all R4 Irish sea projects and has also gone to Celtic Sea flow demonstrator projects so it is consistent across projects. SR - The Mona and Morgan projects are ahead of other projects so we thought there might be opportunities due to low bird numbers and looking at the most realistic and precautionary approach. The projects will take this discussion forward and get back with a more detailed response.	**SNCBs and prepare and share a note explaining the approach taken in the PEIR and the approach now being taken for the Environmental Statement including the comments received from the SNCBs for review by the EWG.**	Complete

	Post meeting note from NRW: It should be noted that even if NRW Advisory were to agree that this approach may be acceptable in this specific case as a result of low numbers and that it wouldn't materially alter our advice/conclusions, we would still note in our response that we do not necessarily agree with the approach in general and would not recommend other projects take it, as we do not want to set a precedent that other projects, with larger impacts, may follow.		
6.	**Displacement, CRM and Apportioning (presented by LM)** LM – Slide 12 of pre-meeting presentation pdf - Displacement - shows the increase to baseline mortality presented at PEIR and for the Environmental Statement for a range of species. Manx shearwater is presented after discussions from the previous offshore ornithology EWG meeting, and red throated diver is also included. The new approach to calculate regional breeding populations proposed by Mona/Morgan (as set out in discussion on item 5 above results in changes in background baseline mortality and % increases in baseline mortality in the Environmental Statement for displacement assessments. Manx shearwater (using auk displacement & mortality rates) has been added to the displacement assessment in the Environmental Statement. Red-throated diver has also been added to the displacement assessment in the Environmental Statement. The Environmental Statement has been updated to include data based on the updated Auk ID rates. *Post meeting note from NRW: No new approach was agreed following EWG05 and the SNCBs have said we don't agree with the approach the projects have set out for this EWG. This matter is still to be considered further and the Applicants are to produce a technical note on this for the SNCBs to consider – we have not seen this yet, so this issue is not yet resolved.* *Applicant response: Noted, the technical note produced to clarify the Applicant's position regarding calculation of the regional breeding populations was issued on 29/11/23.* Slide 13 of pre-meeting presentation pdf - Collision – the new approach to calculate regional breeding populations proposed by Mona/Morgan (as set out in discussion on item 5 above results in changes in background baseline mortality and % increases in baseline mortality for CRM in the Environmental Statement. There are no changes except for northern gannet and the change in mortality rates is shown in the table on the slide. Northern gannet		

	was specifically recommended to be modelled using both a 'no displacement' and a '70% displacement' scenario (agreed in EWG meeting 2, 13th July 2022). Have presented both JNCC avoidance rates (Ozanlav-Harris et al., 2023)and Natural England draft guidance on recommended avoidance rates (Natural England, pers. comm., 7 July 2022). *Post meeting note from NRW: Don't understand this, as the slide on CRM in the pdf I was sent pre-meeting suggests changes to all species baseline mortality and % increase in mortality except fulmar, LBBG and Manx shearwater. Although note changes are very small and don't affect conclusions.* *Or is this meaning no changes to input parameters to CRM/methodology except for gannet?Applicant response: For collision, the only increase in mortality is for Gannet in ES - in the scenario which assumed no displacement.* *Post meeting note from JNCC: I'd prefer this report to be cited as Ozsanlav-Harris et al., 2023 whenever it is used. Although it is a JNCC report, it does not in itself constitute our recommended avoidance rates. Referring to it as 'JNCC avoidance rates' incorrectly gives the message that we advise use of every number in the report as it appears, which is not necessarily the case. Our advice on implementation of the results of Ozsanlav-Harris et al., 2023 will be included in the joint SNCB guidance note on CRM. This uses the rates from Ozsanlav-Harris et al., 2023, but species grouping is an important aspect of this, therefore advice from the joint SNCB guidance note on CRM should be followed.* *Applicant response: Thank you - we have updated the reference throughout our documents.* RH – Please clarify what the JNCC avoidance rates are as referred to, as far as I am aware the numbers are the same as those in the Natural England draft guidance. AM – The draft guidance was given to us by Natural England, which didn't specify the species-specific rates for large gulls. The JNCC paper from 2023 specify species specific rates including for great black back gull. The project has used both the Natural England's large gulls (non-species specific rates of 99.39) and the JNCC paper for species specific rates which are 99.91. Therefore, the project has modelled both of the rates from each paper. RH – Recommend the project use groupings in Natural England's advice. It is the groupings in the Natural England report that are most appropriate to use.	**JNCC to check and provide the reasonings for using groupings over species specific rates.**	Complete

	HR - Agree with [redacted] point regarding the groupings; what's in the Natural England advice will be in the SNCB advice note when it is available. AM – For using groupings over species specific is there some reasoning? RH – It will say in the advice note the reasoning for the groupings but would have to go back to check these. AM - For the Environmental Statement we will present both the species specific and groupings rates to show we have taken into account all the evidence available to us. AM - Apportioning - at PEIR the Applicant only presented SPAs and non-SPAs. In the Environmental Statement the project has also shown apportioning for non-designated sites and used updated ranges. Used where possible the age class site specific data to determine what proportion of immature and adult populations would be affected. At PEIR stable age populations were used alongside site specific age-class data per the advice from SNCBs. For the non-breeding season, we did not update Furness counts, we have lifted them directly from the appendix A tables of the Furness 2015 report, for all colonies within the BDMPS region. The table presented shows the differences between increase in baseline mortality for gannet SPAs at PEIR and Environmental Statement as an example. For one of the gannet SPAs the increase in average annual mortality is greater in the Environmental Statement ([redacted]). The other three shown in the table (Grassholm, Saltee Islands and Irelands Eye SPAs) all have a lower increase in average mortality values than in the PEIR. *Post meeting note from NRW: NRW advice was not to use stable age structures, so not sure why this seems to be saying PEIR used stable age structures alongside site specific data?* *Also, I don't recall the PEIR using site-specific age class data, it just used stable age structures, which NRW advised were not used and advised to use site-specific age-class data from digital aerial surveys.* *Applicant response: The Applicant has used site-specific age classes data in the ES wherever possible. We made assumptions about age classes where low sample size.* AM –PVA – Following advice from NRW and updates to the apportioning regarding Great Ormes Head SSSI and Little Ormes Head SSSI, PVA was carried out for common guillemot as the predicted increase in baseline mortality exceeded 1%. The predicted impacts did not exceed 1% baseline mortality for any other species for the project alone and hence no other PVAs were conducted for		

	species for impacts from the project alone. For great black-backed gull both Natural England and Ozsanlav-Harris et al. (2022) avoidance rate collision results were modelled. Both guillemot and great black-backed gull were selected for further assessment of the predicted cumulative impacts due to the predicted cumulative increase in baseline mortality exceeding 1% of baseline mortality for their BDMPS. The PVAs included a 5-year burn in period. The CEA PVA will include updates on other project and plans up to the cut off of 3 months for CEA projects and plans before the application. *Post meeting note from NRW: The Ozsanlav-Harris report does not strictly represent JNCC advice, the report is available on the JNCC website as they commissioned the report – it should be referred to by the authors and not as JNCC advice. The 'NE' advice referred to here, represents SNCB (incl. NE, JNCC and NRW) advice*		
7.	**Mona updated EIA (presented by LM)** Updates on EIA - The impacts assessed for the ES are the same as the PEIR and there are no significant differences between the PEIR and the Environmental Statement. The impacts assessed are disturbance and displacement from airborne noise, underwater sound and vessel presence; indirect impacts from underwater sound affecting prey species, temporary habitat loss/disturbance and increased suspended sediment concentrations; collision risk; barriers to movement and combined displacement and collision risk. The conclusions from the PEIR remain unchanged; no significant effects are anticipated for the Environmental Statement.		
8.	**Morgan Generation updated results (presented by MH)** Morgan Generation assessments are currently being undertaken and are not complete at this stage. This section of the meeting presents the indicative results for Morgan Generation. An update on the Morgan Generation assessments will be provided in the December 2023 EWG meeting. MH - Baseline - Updates made between PEIR and the Environmental Statement are similar for Mona and Morgan Generation. We now have 24 months of survey data for the Morgan project and the Morgan array area has been reduced. As with Mona, the auk ID rates for Morgan Gen have been improved and attribution of unidentified birds to species level has been updated to reflect the improved ID rates and was applied when calculating design and model-based abundance estimates – table on slide 21 shows these identifications and abundance.		

	Slide 19 of pre-meeting presentation pdf shows the results of the baseline characterisation based on the full 24 months of data. The project is using population estimates for the Morgan array plus a 4km buffer. The Species identified within this range that are of regional importance have been taken forward into the Environmental Statement assessments. The species of regional importance include the following during their breeding seasons; kittiwake, great black-backed gull (also during non-breeding season), herring gull, guillemot and razorbill. Little gull was a species of regional importance during their non-breeding season. No species was recorded in numbers greater than the regional importance. Migratory seabirds were not recorded in large numbers during the baseline surveys, but they have been taken through into the EIA with the low numbers recorded due the SPA connectivity. For those species not considered of regional importance, this is due to low or zero abundance around the array area. Three of these species were not recorded in baseline surveys (red-throated diver, cormorant and shag). These species won't be taken through to HRA due to lack of SPA connectivity. *Post meeting note from NRW: Note the pre-meeting slide pack pdf sent out only has 22 slides in it – as additional slides were presented during the meeting and the slide numbers don't match up with those referenced in these minutes, it would be useful if the updated slide pack could be sent for reference.* *Applicant response: The slide references in these minutes have been updated to reflect the slide pack set to the EWG.* CRM species included are unlikely to change from the draft presented on the slides. Manx shearwater species have been included due to uncertainty surrounding the vulnerability metrics. Migratory seabirds and migratory waterbird species have been taken through to the CRMs standard approach. All have been modelled. Following the PEIR the full 24 months of baseline digital aerial survey data is incorporated and new parameters included. *Post meeting note: Not sure what is meant here – taken through the migration modelling approaches (e.g. SOSS MAT for waterbirds), or taken through using the migrants tab of the Band CRM spreadsheet?* *Applicant response: A combination of two approaches/ tools were followed to quantify the number of birds that may cross the morgan Array Area during migration periods: the SOSS Migration Assessment Tool (SOSSMAT)*		

	and an approach used in a Strategic assessment of collision risk of Scottish offshore wind (WWT Consulting and MacArthur Green, 2014). The resulting number of seabird and non-seabirds estimated to cross the Morgan Array Area was inputted into the Band (2012) single transit Collision Risk Model (CRM). Comparison of difference between PEIR and Environmental Statement shows increases in collision risk for kittiwake, great black-backed gull and lesser black-backed gull. There is a reduced collision risk or no change in the collision risk for herring gull, gannet and Manx shearwater. It is noted there isn't a large difference, the values are low even where proportionally the collision risk has increased percentage wise. The values of great black-backed gull show that even with a percentage increase the values in terms or numbers of birds only shows 5.7 birds are estimated in the collision risk assessment compared to 2.8 from the PEIR. It is an increase within the ES but is still a very low number of individuals at risk. Displacement – The project has included kittiwake due to JNCC request to include kittiwake in the displacement analysis and slide 26 shows those species considered in the Environmental Statement including guillemot, razorbill, fulmar, Manx shearwater and gannet. The update from the PEIR is that the full 24 months of data is now incorporated, rather than just the 12 months analysed at PEIR. Comparison of draft results between PEIR and the Environmental Statement. The apportioning has not been completed in time for this presentation and PVAs will be undertaken as required when we know what sites we are considering. ST - Are there any questions or queries? SR – [redacted] did [redacted] (Natural England) have any specific comments that were shared with you? EW - I haven't been given any comments to bring forward in this discussion.		
9.	**<u>Agreement logs (presented by ST)</u>** As discussed in previous EWG meetings we have made good progress on methodologies, and these have been logged in the agreement logs. The next aim is to map out progress towards conclusions and mitigation agreements as we move to application submission. The projects are looking to agree topics now based on the PEIR and project update and information provided in this presentation, and other EWG discussions. The projects are aware that there will be some items under discussion		

	and so agreements will be made once these discussions take place and as the projects progress the advice received from the PEIR and EWGs. Regarding the offshore ornithology agreement log, the agreement log includes a request for agreement that for the project alone there will not be any significant or adverse effects on integrity of designated sites. This is based on the PEIR and updates shown today that there is no greater magnitude of impact than was presented at PEIR. The applicant understands the EWG will wish to see the full cumulative assessment ahead of providing agreements on impact levels, but we wanted to highlight that we are not in a position of significant/adverse effects or impacts for Mona or Mogan Gen. Some additional items in the agreement log and others have been flagged as under discussion, and some have been flagged as agreed. We would like to map a pathway to agreement and where we want to progress to, up to application. These logs will form framework for statements of common ground. *Post meeting note from NRW: Based on what was discussed under point 10, we will await review of the technical documents prior to updating the agreement logs.*	**Stakeholders to review and update the agreement log**	Ongoing
10.	**<u>Questions/comments and next steps</u>** LR – Requested we have more information in writing on revised methodologies – and requested this information is provided through the EWGs rather than other pathways – this would be helpful to maintain an accurate audit trail. HR – Regarding the agreement logs will those come through before the updated LSE ISAA approach and other written documents we are expecting? Noted that it would be better to see these documents before updating the agreement logs. ST – The project will issue the meeting minutes but we are aware it will be better for you to get the updated documents with the agreement logs. Therefore, those documents and the agreement logs may be sent out after the meeting minutes. AM – Avoidance rates were mentioned, but the Natural England advice document mentioned previously doesn't explain the reasons between using species specific or groupings. Is that something you can provide so we can understand what is required of us. RH – We will check that all the SNCBs are happy for that to be provided and will get that information regarding	**JNCC to check with SNCBs that they are happy to provide the information requested and to provide the information to the Applicant.**	Complete

	use of species specific or groupings in the assessments across to you if it is. AM – Thank you. SR – The next EWG is scheduled for December 2023 but the project would like to reach resolutions/agreements as soon as possible. Would attendees be open to another EWG to focus on these conversations if needed? LR – Happy to have another EWG if that makes sense and time allows. HR – Agree with LR, however if there was another EWG we would suggest that this would be after we have received and had time to consider the technical documents mentioned in the earlier discussions in order for any EWG discussion to be productive. SR – Thank you. EW – If anything can be forwarded, we can ensure we get our specialists in. RH – We would be happy to participate. MP – Any comments from RSPB, IOM or the Wildlife Trusts? GJC- Not from The Wildlife Trust, we will need to get specialists to review this information.	**The applicant to review discussions, issue the updated notes, and once feedback is received to confirm whether another offshore ornithology EWG is required.**	Complete
11.	**<u>Next Steps (presented by ST)</u>** The meeting minutes will be circulated 2 weeks following the EWG and the agreement logs and updated LSE ISAA approach and other written documents will be circulated shortly after that. The next EWG will be December 2023 to present the Morgan Generation assessment unless it is agreed and organised that another meeting prior to that is deemed useful. MP – If specialists can't attend the next EWG in December, please let us know, and please look into getting specialist cover attendance for the meeting from your organisations so that we can have a productive discussion ahead of the DCO submissions in the new year. Thank you for your time today. **Meeting closed.**	**EWG attendees to confirm specialist attendance at the December EWG meeting**	Complete

D.7.2 Response from NRW regarding the meeting minutes

From: [redacted]

Subject: RE: Morgan Mona offshore ornithology EWG meeting 6
Date: 24 November 2023 10:30:07

CAUTION: This email originated from outside of RPS.

Hi [redacted],

Thank you for circulating the meeting minutes from the sixth Offshore ornithology EWG on 19th October. Please find attached NRW Advisory comments – and apologies again for the slight delay. Thank you for also providing the updated HRA methodology note and technical note on Avoidance rates. We also note that further discussion / additional documentation will be circulated relating to the following two actions from the 6th Offshore Ornithology EWG (in addition to the updated Agreement Log):

- The applicants to review the detail provided for the cumulative approach and organise discussion with stakeholders to seek agreement with the final approach.
- The applicant will review the BDMPS advice from SNCB's and prepare and share a note explaining the approach taken in the PEIR and the approach now being taken for the Environmental Statement including the comments received from the SNCBs for review by the EWG.

Kind regards,
[redacted]

D.7.3 Response from JNCC regarding the meeting minutes

Mona and Morgan Ornithology EWG 06

19/10/2023

JNCC actions

NRW and Natural England to check and provide the reasonings for using groupings over species specific rates.

Natural England to check with SNCBs that they are happy to provide the information requested and to provide the information to the Applicant

Please find below an excerpt from the soon to be published joint SNCB advice note on Collision Risk Modelling regarding the use of species groupings.

The SNCB recommended avoidance rates are those presented in Ozsanlav-Harris *et al.* (2023) (which incorporates collision data from all suitable terrestrial, coastal and offshore wind farms that was available at the time of the analyses).

The previous 2014 advice note provided avoidance rate advice on five key species (lesser black-backed gull *Larus fuscus*, herring gull *Larus argentatus*, great black-backed gull *Larus marinus*, black-legged kittiwake *Rissa tridactyla* and northern gannet *Morus bassanus*). Aside from herring gull, all recommended avoidance rates were derived from a species group data set (e.g. 'all gull' for kittiwake and gannet) or a species sub-group ('large gull' for lesser black backed gull and great black backed gull) and for all other species (e.g. terns, skuas) a default rate of 98% was advised.

This current guidance seeks to simplify this further, acknowledging that the paucity of offshore, species-specific data undermines the confidence we can place in species-specific rates at this stage.

3.1 Lesser black-backed, great black-backed, and herring gull

We recommend the 'large gull' rate for these species.

Whilst individually, these species had data to estimate avoidance rates from up to 12 sites, data quality is variable. Individual species avoidance rates are similar (Tables 2 – 5 Ozsanlav-Harris *et al.* 2023) as expected from these biologically similar species, particularly for the Basic Band model. We therefore recommend an amalgamated 'large gull' rate for each of these species.

3.2 Kittiwake

We recommend that the 'all gull' rate is used for black-legged kittiwake.

There was data with which to estimate avoidance rates for this species from only two sites. Whilst kittiwake are a small gull, behaviourally they may be considered as not very similar to the other small gull species for which we have data to estimate avoidance rates, insofar as kittiwake are considered more marine in nature and forage much further offshore than other small species for which we have data (e.g. Woodward *et al.* 2019). We therefore recommend an amalgamated 'all gull' rate for this species.

3.3 Common and black headed gulls

We recommend the 'small gull' rate for these species.

Whilst individually, these species had data to estimate avoidance rates from up to 13 sites, data quality is variable. We therefore recommend an amalgamated 'small gull' rate for each of these species.

3.4 All other gulls and skuas

We recommend the 'all gull' rate is used for all other gull species, and for skuas.

Given the lack of data for other gull species, we recommend using the 'all gull' rate for any gull species not already covered. Given the lack of data for skua species and the fact that skuas are behaviourally similar to gulls, we recommend using the 'all gull' rate for any skua species.

3.5 Gannet

We recommend the 'all gull' rate is used for gannet.

There is extremely limited species-specific data to estimate an avoidance rate for this species. Whilst we might consider the most biologically similar species for which we do have data to be the larger gull species, given the uncertainties around gannet avoidance behaviours in vicinity of turbines and manoeuvrability, we have chosen to use an amalgamation of data across all gulls to reflect this uncertainty.

The avoidance rates calculated in Ozsanlav-Harris *et al.* (2023), as with previously estimated avoidance rates, are within-windfarm avoidance rates. Whilst this is sufficient to capture avoidance for most species, studies have consistently shown that gannet exhibit macro-avoidance (similar to displacement but affects flying birds only; reduces the number of birds entering an OWF footprint compared to what might be expected in the absence of the OWF).

We recommend that the 'all gull' within-windfarm avoidance rate is used for gannet. Consideration should be given to applying a macro-avoidance rate in addition to this. This may be achieved in practice by reducing the density of gannet in flight going into the CRM by an appropriate macro-avoidance rate. NE have commissioned a review of gannet macro-avoidance rates which can inform this. Potential application of macro-avoidance rates to gannet may differ between countries and therefore should be discussed with relevant SNCB.

3.6 Terns

We recommend that the 'all gulls and terns' rate is used for all tern species.

Individually, and collectively, tern species had data to estimate avoidance rates from only two sites. The data set is heavily influenced by one of these sites, Zeebrugge, where the turbine locations relative to the colony are not considered representative; the Zeebrugge turbines are positioned on a breakwater between the tern colony and the sea and account for 44 of the 45 sandwich tern collisions.

In the absence of a more balanced set of data for tern behaviour we consider it more appropriate to recommend that the 'all gulls and terns' rate is used for terns at this time.

3.7 Other marine species

For any species not covered above, we recommend discussion with the relevant SNCB. The 'all gulls and terns' rate is likely to be the default for most species not already covered.

D.8. Offshore ornithology EWG meeting 7

D.8.1 Meeting minutes

MINUTES OF MEETING

Security Classification: Project External

Partners in UK offshore wind

MOM Number	**:**	20231208_Morgan and Mona Offshore Ornithology	**REV. No.**	**:**	F02
MOM Subject	**:**	Morgan and Mona Evidence Plan Offshore Ornithology meeting 7			

MINUTES OF MEETING

MEETING DATE	**:**	08/12/2023
MEETING LOCATION	**:**	Teams
RECORDED BY	**:**	[redacted] (RPS)
ISSUED BY	**:**	[redacted] (RPS)

PERSONS PRESENT:

- [redacted] – bp (SR)
- [redacted] – bp (MP)
- [redacted] bp (GV)
- [redacted] - RPS (ST)
- [redacted] – RPS (KL)
- [redacted] RPS (AM)
- [redacted] RPS (LM)
- [redacted] – RPS (NG)
- [redacted] Niras (MH)
- [redacted] England (RB)
- [redacted] England (MT)
- [redacted] – JNCC (RH)
- [redacted] NRW (NP)
- [redacted] – NRW (PM)
- [redacted] – Natural England (KB)
- [redacted] – NRW (HR)
- [redacted] – NRW (EL)
- [redacted] – NRW (PB)
- [redacted] – IoM (RS)
- [redacted] – MMO (AMP)
- [redacted] - RSPB (AD)
- [redacted] – The Wildlife Trust (GJC)

ITEM NO:	DISCUSSION ITEM:	Action	Date
1.	**Project Updates (presented by MP)** Assessments are being finalised right now, the Applicant is aiming to submit the Mona DCO application towards end of February 2024 and the Morgan Gen DCO application after Easter 2024. Any further comments and completion of the agreement logs before the Christmas break would be appreciated as we are now at a critical time and are unable to include anything new at this stage. All	**The Applicant to provide an update on the response to the advice from Natural England**	

	previous stakeholder comments have been considered. KL: The Applicant is still considering the advice from Natural England regarding how to incorporate historic offshore wind projects into the cumulative and in-combination assessments. The Applicant is engaging in the spirit of the Natural England advice to consider a solution, an update will be provided in due course.	**regarding how to incorporate historic offshore wind projects into the cumulative and in-combination assessments**	25/01/24
2.	**<u>Mona and Morgan Generation regional baseline population calculation (presented by LM and AN)</u>** LM presented the approach to calculating the regional population for the project alone assessments and explained how and justified why it differed from the SNCBs advice. The approach is detailed in the meeting slides and the technical note sent to the EWG. Regional populations have been calculated utilising data from the SMP database. Breeding data within the mean maximum foraging range plus one standard deviation has been extracted from the online SMP database from between 2018 and 2023. Population counts were adjusted as the colony count does not include birds (e.g. immatures) which might summer in the area but do not attend the colony. The Applicant is not comfortable with the populations proposed to be used in the SNCB project alone assessment as they are not based on species specific foraging ranges. Using the populations calculated using the SNCB approach will lead to an over estimation of the population that may interact with the project alone and may under estimate the increase in baseline mortality (resulting from displacement and collision).The applicant would like to highlight that the age of these populations (based on colony counts) as some colonies used within the Furness (2015) Appendix tables are based on Seabird 2000 surveys (counts undertaken between 1998 and 2002). The number of birds in the regional baseline population used by the applicant's approach is lower for most species. HR- for gannet and Manx shearwater the SNCB advised numbers are lower and hence more precautionary. RB- We will need to "agree to disagree" on other species but for gannet and Manx shearwater the lower number should be used. NRW and JNCC agreed with RB.		

	LM and AN confirmed that the population numbers calculated using the Applicants approach will be presented for all species, but the numbers presented for gannet and Manx shearwater would be both the applicant's and the SNCBs regional baseline populations. The most precautionary (lowest) number of birds will be presented within the EIA/HRA. MH: Is there a proposal to update the Furness report now the seabirds count data is available? RB: Yes we are hoping to do this but further funding is required. AD: The SMP has been updated with the latest Grassholm count data and this shows that numbers have dropped.	**Applicant to include SNCB's regional baseline population for gannet and Manx shearwater**	For the Environmental Statement
3.	**<u>CEA breeding regional population (presented by LM and AN)</u>** Whilst we have previously highlighted shortcomings of the SNCB approach for the project alone assessment, we have followed the SNCB approach outlined for the CEA breeding population. For the breeding season, BDMPS figures (i.e. to sum the adult and immature population estimates for all colonies that sit within the relevant species specific BDMPS scale, e.g. UK western waters) were included and the annual predicted EIA impacts are assessed against the largest seasonal BDMPS figures.		
4.	**<u>Avoidance rates (presented by LM/AN)</u>** Collision risk modelling has been undertaken using a range of avoidance rates that incorporate those recommended by the EWG. Resulting collision risk estimates are also discussed within the assessments conducted. The Applicant believes that the use of species specific avoidance rates presented in Ozsanlav Harris *et al*. (2023) is the most accurate approach which allows the most representative modelling of species level impacts. The Applicant would like to understand the literature based rationale for using group avoidance rates as advised by Natural England, Natural Resource Wales and JNCC rather than using species specific rates. RB- Previous advice has been to use grouped rates. Formal advice will be out soon but will be almost identical to advice previously given. May need to agree to disagree. Happy for both grouped and		

	species specific rates to be presented. It's absolutely fine to present an alternative approach. AM- both rates would be presented and any impact over 1% of baseline mortality (from either avoidance rate) would be investigated further using PVA for the project alone and cumulatively.		
5.	**<u>Mona Updated HRA (Presented by LM)</u>** LM presented an update to the Mona HRA with a worked example of a stage 1 screening table, followed by a stage 2: Step 1 integrity table for project alone and in-combination. Within the breeding foraging range of the Mona Array Area (mean-max 127.0 km ± 109), there are six SPAs with Lesser Black Backed Gulls (LBBG) as a feature in the breeding season (Ribble & Alt Estuaries SPA, Morecambe Bay and Duddon Estuary SPA, Lambay Island SPA, Ailsa Craig SPA, Rathlin Island SPA, Skomer, Skokholm and the Seas off Pembrokeshire/Sgomer, Sgogwm a Moroedd Penfro SPA). Only the Ribble and Alt Estuaries SPA has mortality from collisions over 0.0 with mortality from collisions of 0.1 (with an avoidance rate of 0.994). The leads to an increase in baseline mortality of 0.01% (with an avoidance rate of 0.994). Therefore, LSE has been screened out for all SPAs for LBBG with the exception of the Ribble and Alt Estuaries SPA. Only two colonies of LBBG in the non-breeding season have mortality from collisions greater than 0.0, 'Skokholm, Skomer, Mholm' and UK Western non-SPA colonies which have mortality from collisions of 0.1 and 0.2 respectively. This results in an increase in baseline mortality of 0.00% for both colonies. Quantitative information from projects in-combination have been presented where available, and qualitative information has been done where this information is not available. For LBBG at the Ribble and Alt Estuary the impact from the Mona Offshore Wind Project in-combination is considered to present an increase in baseline mortality of 0.32%. It can be concluded that there is no risk of an adverse effect on the integrity of the Ribble and Alt Estuaries SPA and Ramsar site beyond reasonable scientific doubt as a result of collision risk with respect to operations and maintenance of the Mona Offshore Wind Project in-combination with other projects. SNCBs noted that the Morgan and Mona HRA Updated Methodology F03 and Natural England's guidance on incorporating historic offshore wind		

	projects into the cumulative and in-combination assessments were still in circulation and couldn't comment on the validity of this approach for the in-combination assessment. KL – The Mona and Morgan numbers are so low they don't meaningfully contribute to in-combination and we have taken the most precautionary approach in the ISAA. Overall we have concluded no adverse effect on site integrity for all sites assessed. A recent planning appeal decision made by the Planning Inspectorate with regard to the Breckland SPA and The Plough determined that the impact on designated features (i.e. curlew nests) was so low as to not act in-combination with other plans or projects. [redacted] RB – In terms of apportioning methods have you used site specific data? Have sabbaticals been removed? AN- confirmed no, all birds have been included including sabbaticals. HR – were site specific ages classes used? AN- confirmed that for species which had enough data from the site specific data (e.g. gulls). RB – fantastic, so used all aged birds, great. SR- so does that still stand as the most precautionary approach? RB- Yes, it's rare our advice regarding using site specific age classes is followed on this. Glad the projects are following the Natural England advice.		
6.	**Morgan Generation updated results for offshore ornithology (presented by MH)** Morgan Generation assessments are currently being undertaken and are not complete at this stage. This section of the meeting presents the indicative offshore ornithology results for Morgan Generation. The species included in the collision risk modelling are: kittiwake, great black backed gull, herring gull, lesser black backed gull, Manx shearwater and gannet. Modelling has been conducted using EWG recommended parameters alongside other values (e.g. range of avoidance rate from Ozsanlav-Harris et al., 2023; Skov et al., 2018) to account for uncertainty and variability. MH presented a comparison of the CRM results for the Preliminary Environmental Information Report		

	(PEIR) and the Environmental Statement. There are no major differences, and no significant effects are predicted. Migratory CRM has been undertaken using the SOSSMAT Tool and WWT Consulting and MacArthur Green (2014) approaches. For migratory waterbirds collision risk estimates represent less than 0.1% increase in baseline mortality for all species and therefore no significant effect is predicted. For migratory seabirds all results represent <0.01% increase in baseline mortality and therefore no significant effect is predicted. For the displacement assessment, the following species have been included: guillemot, razorbill, fulmar, Manx shearwater, gannet and kittiwake at the request of JNCC. Displacement and mortality rates used are those that have been recommended by the EWG. MH presented the approach to apportioning for Morgan Generation. Apportioning approach incorporates all breeding colonies (SPA and non-SPA) within relevant foraging ranges of Morgan Generation Assets. It follows the two stage NatureScot Approach and uses Seabird 2000 data and as well as more recent data. If required, the Natural England PVA tool will be used. The approach will be consistent with that applied for PEIR incorporating changes as discussed in previous EWG meetings.		
7.	**<u>Morgan Generation updates HRA (Presented by MH)</u>** Within the breeding foraging range of the Morgan Array Area (mean-max 127.0 km ± 109), there are six SPAs with Lesser Black Backed Gulls (LBBG) as a feature in the breeding season. Only the Ribble and Alt Estuaries SPA, Morecambe Bay and Duddon Estuary SPA and Bowlands Fells SPA have mortality from collisions over 0.0 with mortality from collisions of 0.1 (with an avoidance rate of 0.994) for all three. The leads to an increase in baseline mortality of 0.02% for the Ribble and Alt Estuaries SPA and <0.01% for the other two SPAs (with an avoidance rate of 0.994). Therefore, LSE has been screened out for all SPAs for LBBG with the exception of these three SPAs.		

8.	**Questions/comments** SR: Based on what we have presented today, we hope this gives you the reassurance you need and given the low numbers, would you agree that there is no adverse effect on integrity on any SPA both alone and in combination and therefore no requirement for a derogation case for Mona or Morgan Generation? RB – Natural England would not be able to agree that on this call without seeing the full application. It looks promising and I would be amazed if either Mona or Morgan Generation has adverse effects alone. I am also not concerned regarding in combination, but we would need to see the full application assessments. However, it looks good, the numbers look good. HR - NRW would agree with Natural England. We will review the figures in the application.		
9.	**Next Steps (presented by ST)** The meeting minutes will be circulated 2 weeks following the EWG and the agreement logs. The applicant intends to hold an EWG in Q1 2024 to go through outstanding items before the Morgan Generation application.	**Applicant to set up an offshore ornithology EWG for Q1 2024** **Stakeholders to review and respond to the agreement logs**	Complete Ongoing

D.8.2 Response from NRW regarding the meeting minutes

From: [redacted]
Subject: RE: Morgan Mona offshore ornithology EWG meeting 7
Date: 22 January 2024 16:09:09
Attachments: image002.png
image003.png
20231208_Morgan and Mona_Offshore Ornithology 07 MoM_DRAFT F01.docx
Morgan_Mona_OOEWG_Agr Log F06.xlsx

Hi [redacted],

Thank you for sending on the Minutes for Marine Ornithology EWG07 and Agreement Log. Please find our comments included on the minutes as track changes, and the relevant columns of the agreement logs populated for both Mona and Morgan.

We were also wondering if we should still expect to receive an update on the response to the advice from Natural England regarding how to incorporate historic offshore wind projects into the cumulative and in-combination assessments this week, as per the meeting minutes.

If you have any questions or require any clarification please do not hesitate to let me know.

Many thanks,

[redacted]

Croesewir gohebiaeth yn Gymraeg a byddwn yn ymateb yn Gymraeg, heb i hynny arwain at oedi.
Correspondence in Welsh is welcomed, and we will respond in Welsh without it leading to a delay.

D.8.3 Provision of Avoidance Rates Technical Note

Partners in UK offshore wind

MONA AND MORGAN GENERATION OFFSHORE WIND PROJECTS

Avoidance Rate Note for the Mona and Morgen Generation Offshore Ornithology EWG

November 2023

F01

Image of an offshore wind farm

www.morganandmona.com/en

Document status

Version	Purpose of document	Authored by	Reviewed by	Approved by	Review date
F01	Technical note for EWG	RPS/NIRAS	RPS	bpEnBW	23/11/23

Prepared by:

RPS/NIRAS

Prepared for:

Mona Offshore Wind Ltd. Morgan Offshore Wind Ltd.

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Table 1.2 Species-specific Avoidance Rates (AR) from Collision Risk Modelling using basic band stochastic CRM from Ozsanlav-Harris *et al*. (2023). AR presented as a median rate (standard deviation; 95% confidence interval). The standard deviation and 95% confidence interval were calculated using the delta method (Powell 2007). Sample size presented as number of report-years and number of bird flights through turbine rotor-swept area contributing data to calculate avoidance rate from CRM.4

1 AVOIDANCE RATE NOTE

1.1 Introduction

1.1.1.1 This note is developed to provide context and rationale for the Applicant's choice to utilise both the grouped avoidance rates and species-specific avoidance rates extracted from the research conducted by Ozsanlav-Harris *et al.* (2023) in the Applicant's Collision Risk Model (CRM) analysis for the Mona and Morgan generation assets Environmental Statement.

1.1.1.2 The Applicant's objective is to gain agreement on the use of species-specific rates for certain species in their conclusions of the environmental impact assessment. The Applicant aims to achieve agreement by providing evidence and explanation in support of using species-specific avoidance rates, using great black-backed gulls as an example species of interest.

1.1.1.3 Species group avoidance rates were recommended for use by Natural England, Natural Resource Wales and JNCC during the Mona and Morgan Generational Assets Evidence Plan Process. However, with the availability of newly published robust species-specific avoidance rates, the Applicant considers it more appropriate to place emphasis on these in the environmental impact assessment in order to produce more representative species-level impacts for the Mona and Morgan generational assets Environmental Statement. Both approaches outlined below are to be presented within the Environmental Statements (and supporting documents) to ensure these can be readily easily compared by the SNCBs on review of the Environmental Statements.

1.1.1.4 Additionally, the Applicant is requesting Natural England, Natural Resource Wales and JNCC provide justification for using species group avoidance rates over species-specific rates to allow the Applicant to understand the advice given.

1.1.2 Background to Collision Risk modelling

1.1.2.1 CRMs are known to be sensitive to the parameter of avoidance rate and as such there has been extensive research and reviews into the generation of the most accurate estimates of these rates and how they are quantified (Cook, 2021). Previously, due to the unavailability of robust species-specific avoidance rates and the limited sample size associated with calculated species-specific avoidance rates for some species, avoidance rates were often pooled for similar species (e.g. 'large gulls' or 'small gulls'). This was done due to the recommendation from the Statutory Nature Conservation Bodies (SNCB) to the Marine Scotland Science Avoidance Rate Review (Cook *et al.* 2014) in 2014. The SNCB (2014) response was in favour of grouped rates due to stating that:

"*in several instances these [avoidance rates] are not derived from species-specific information and as such represent avoidance rates for species groupings (e.g. 'large gulls') rather than for an individual species*" and

"Therefore, we recommend that, until such time as it is possible to calculate a species-specific avoidance rate for kittiwakes, they are classed under the more generic (and precautionary) 'all gull' category.

1.1.2.2 Since the avoidance rate review by the SNCB (2014), several studies such as Skov *et al.* (2018) and Tjørnløv *et al.* (2023) have been published that provide an in-depth quantitative study into species-specific avoidance rates at offshore wind farms. Cook (2021) reiterates the need to update avoidance rates as new evidence emerges:

"Previous studies have estimated suitable avoidance rates for use in the Band model. However, given ongoing data collection, there is a need to update these estimates to ensure they reflect the best available evidence."

1.2 Applicants approach for the Environmental Statement

1.2.1.1 During the drafting of the Preliminary Environmental Information Report, draft guidance (which was based on the Ozsanlav-Harris *et al.* (2023) study) was provided by Natural England (received from [redacted] on the 7 July 2022, prior to the publishing of the review by Ozsanlav-Harris *et al*. (2023). Below is an extract from that email, which recommends the use of grouped avoidance rates instead of species specific rates:

"*As noted in our response to the Morgan & Mona CRM technical note, there is a forthcoming update to the joint SNCB CRM guidance note. This new guidance is still in draft, and unlikely to be agreed, adopted and published for some time. However, we are fairly confident that the parameters that will be recommended are now unlikely to change. So, please find attached those parameters to enable you to undertake CRM. Note also that we now recommend using the stochastic model."*

1.2.1.2 Upon this advice, the Applicant used group avoidance rates in CRM analysis for their Preliminary Environmental Information Reports for Mona and Morgan generation assets (Volume 2, Chapter 10 Offshore Ornithology: Mona Offshore Wind Ltd, 2023).

1.2.1.3 Due to the timing of the Mona and Morgan generational assets Environmental Statement, the Ozsanlav-Harris *et al.* (2023) review was published allowing for the Applicant to check and utilise the source material that influenced the Natural England avoidance rate guidance. The Applicant has therefore chosen to present collision risk modelling utilising both the grouped avoidance rates (as recommended by Natural England, Natural Resource Wales and JNCC), as well as presenting species-specific rates provided by Ozsanlav-Harried *et al.* (2023).

1.2.1.4 The research conducted by Ozsanlav-Harris *et al*. (2023) reviews the approach to calculate the avoidance rate of specific species and groupings, comparing this to the approach by Cook (2021). The Ozsanlav-Harris *et al*. (2023) dataset contains information on collision data from 23 monitoring reports of 19 wind farms (including one offshore), encompassing 11 species or species groups spanning the years 2000 to 2019. Cook (2021) suggests that a minimum of 10 sites may be used as an arbitrary threshold sample size to inform the selection of species-specific avoidance rates over group-specific estimates. The Applicant considers that the dataset presented in the calculation of species-specific rates in Ozsanlav-Harris *et al*. (2023) represents a robust resource. The avoidance rates presented in Table 1.1 are the recommended group avoidance rates extracted from Ozsanlav-Harris *et al*. (2023). The Applicant has utilised these rates within the Environmental Statement for Mona and Morgan Generation Assets.

Table 1.1 Recommended Species-Group Avoidance Rates (AR) for Collision Risk Modelling from Natural England, Natural Resource Wales and JNCC for use in basic band stochastic CRM. Rates have been extracted from Ozsanlav-Harris *et al.* (2023). Results presented as a median rate (standard deviation; 95% confidence interval). The standard deviation and 95% confidence interval were calculated using the delta method (Powell 2007).

Species	Basic sCRM AR
All gulls rate	0.9928 (0.0003; 0.9921 to 0.9934)
Black-legged Kittiwake **(All gulls rate)**	0.9928 (0.0003; 0.9921 to 0.9934)
Lesser Black-backed Gull **(Large Gulls rate)**	0.9939 (0.0004; 0.9931 to 0.9947)
Herring gull **(Large Gulls rate)**	0.9939 (0.0004; 0.9931 to 0.9947)
Great Black-backed Gull **(Large Gulls rate)**	0.9939 (0.0004; 0.9931 to 0.9947)
Other marine species **All gulls and terns rate**	0.9907 (0.0004; 0.9899 to 0.9914)

1.2.1.5 In addition to modelling the grouped avoidance rate, the Applicant has also chosen to model and present the Ozsanlav-Harris *et al.* (2023) species-specific rates in their analysis and the conclusions of the environmental impact assessment for the Environmental Statement is based on these species-specific rates. These are presented in Table 1.2 below.

Table 1.2 Species-specific Avoidance Rates (AR) from Collision Risk Modelling using basic band stochastic CRM from Ozsanlav-Harris *et al.* (2023). AR presented as a median rate (standard deviation; 95% confidence interval). The standard deviation and 95% confidence interval were calculated using the delta method (Powell 2007). Sample size presented as number of report-years and number of bird flights through turbine rotor-swept area contributing data to calculate avoidance rate from CRM.

Species/species Group	Basic sCRM AR	Sample size (no. of report years contributing data to avoidance rate calculation)	Sample size (number of bird flights through turbine rotor swept area taken from reports to Band CRM)
Kittiwake *Rissa tridactyla*	0.9979 (0.0013; 0.9955 – 0.9993)	3	4,283.58
Black-headed gull *Chroicocephalus ridibundus*	0.9923 (0.0005; 0.9913 – 0.9931)	28	127,946.11 (data not made public for 3 reports)
Herring gull *Larus argentatus*	0.9952 (0.0003; 0.9946 – 0.9958)	26	149,874.96 (data not made public for 2 reports)
Lesser black-backed gull *Larus fuscus*	0.9954 (0.0003; 0.9946 – 0.996)	21	87,763.75 (data not made public for 2 reports)
Great black-backed gull *Larus marinus*	0.9991 (0.0002; 0.9987 – 0.9994)	10	12,123.55
Gull species	0.9928 (0.0003; 0.9921 – 0.9934)	36	539,239.28 (data not made public for 3 reports)
Large gull species	0.9939 (0.0004; 0.9931 – 0.9947)	31	281,068.01 (data not made public for 3 reports)
Small gull species	0.9949 (0.0002; 0.9944 – 0.9954)	29	205,429.87 (data not made public for 3 reports)
Gulls & terns	0.9907 (0.0004; 0.9899 – 0.9914)	38	614,016.02 (data not made public for 3 reports)

1.2.1.6 Using the grouped species avoidance rates would result in higher predicted collision mortalities compared to species specific avoidance rates. However, as species-specific rates are calculated from robust analysis, it is considered that the species-specific rate, specifically for herring gull, lesser black-backed gull and great black-backed gull, represents the best available evidence for use in collision risk modelling. Taking great black-backed gull as a representative example, the difference in basic

Band (2012) model avoidance rate between the large gull group rate of 0.9936 (recommended by the SNCBs) and the species-specific rate of 0.9991 represents an avoidance rate difference of 0.0055. The group avoidance rate estimate for large gulls is lower (0.9936) than the three large gull species-specific rates (lesser black-backed gull 0.9954, herring gull 0.9952, great black-backed gull 0.9991) within Oszanlav-Harris *et al.* (2023). The difference is explained in Cook *et al*. (2021) as being due to the identification of birds to group level rather than species level in surveys for two reports used in the analysis by Cook (2021) and subsequently Oszanlav-Harris *et al.* (2023).

1.2.1.7 The species-specific rates for herring gull, lesser black-backed gull and great black-backed gull create no more uncertainty than that associated with the grouped avoidance rates or Large gull, which incorporate data from species that although superficially similar, may exhibit differences in flight behaviour that can affect avoidance behaviour. The Applicant acknowledges that using the grouped avoidance rate for these species would represent a more precautionary approach to estimating collision mortality. However, it is clear from Table 1.2, that a wide range of avoidance exists between these gull species and therefore the use of a grouped rate would be overestimating impacts for these species.

1.2.1.8 Where the sample size is not at the minimum threshold of 10 (Cook, 2021), for example kittiwake, it is considered appropriate to place emphasis on the all gull rate instead of the species-specific rate. By doing the assessments for kittiwake using the all gull rate it will capture the associated uncertainty as it is calculated using data from species that exhibit different flight behaviour than the more marine-based kittiwake

1.2.1.9 In either case, uncertainty associated with all avoidance rates, and especially species-specific rates, is captured as part of the modelling process through the use of the stochastic collision risk model and standard deviation values.

1.3 Agreement Requested

1.3.1.1 The Applicant remains committed to remaining up to date with the latest developments in the literature, with the aim to reduce the inherent uncertainty in the assessments conducted for offshore wind farms.

1.3.1.2 Based on the information presented in this note, the Applicant believes that the use of species-specific avoidance rates presented in Ozsanlav-Harris *et al.* (2023) is the most accurate approach which allows the most representative modelling of species-level impacts. The Applicant is looking for agreement with the conclusions of the environmental impact assessment for the Environmental Statement based on these species-specific rates from Ozsanlav-Harris *et al.* (2023).

1.3.1.3 For clarity, the Environmental Statements (and supporting documents) will present both approaches (as set out in Table 1.1 and Table 1.2) to ensure the SNCBs can review both sets of avoidance rates and for ease of comparison.

1.3.1.4 The Applicant would like to understand the literature based rationale for using group avoidance rates as advised by Natural England, Natural Resource Wales and JNCC rather than using species-specific rates.

1.4 References

Cook, A.S.C.P. (2021). Additional analysis to inform SNCB recommendations regarding collision risk modelling. BTO Research Report, 739.

Johnston, A., Cook, A. S., Wright, L. J., Humphreys, E. M., & Burton, N. H. (2014). Modelling flight heights of marine birds to more accurately assess collision risk with offshore wind turbines. Journal of Applied Ecology, 51(1), 31-41.

Leopold, M. F., van Bemmelen, R. S., & Zuur, A. F. (2012). Responses of local birds to the offshore wind farms PAWP and OWEZ off the Dutch mainland coast (No. C151/12). IMARES.

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Ozsanlav-Harris, L., Inger, R. & Sherley, R. (2023). Review of data used to calculate avoidance rates for collision risk modelling of seabirds. JNCC Report 732 (Research & review report), JNCC, Peterborough, ISSN 0963-8091. https://hub.jncc.gov.uk/assets/de5903fe-81c5-4a37-a5bc-387cf704924d

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D.8.4 Provision of Regional Breeding Populations Technical Note

Partners in UK offshore wind

MONA OFFSHORE WIND PROJECT

MORGAN OFFSHORE WIND PROJECT: GENERATION ASSETS

Mona and Morgan Generation Offshore Wind Farm Projects - Technical Note on Regional Breeding Populations Calculations

November 2023

F01

Image of an offshore wind farm

www.morganandmona.com/en

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APPENDICES

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1 TECHNICAL NOTE ON REGIONAL BREEDING POPULATIONS CALCULATIONS

1.1 Background and Aims

1.1.1.1 The following technical note has been produced to clarify the Applicant's position regarding calculation of the regional breeding population used to assess the impact on background mortality for both the project alone and Cumualtive Effects Assessment (CEA). This technical note is produced in response to the advice note sent by Natural Resource Wales which was agreed by Joint Nature Conservation Committee (JNCC) and Natural England on 19 July 2023 (Appendix A). The advice note titled 'Advice to Mona/Morgan generation regarding EIA scale reference populations for assessments' was provided to the Applicant on 19 July 2023 during the Evidence Plan Process for the Mona and Morgan Generation Offshore Wind Projects.

1.1.1.2 For the project alone and CEA in the Mona Offshore Wind Project and Morgan Offshore Wind Project: Generation Assets (hereafter referred to as the Morgan Generation Assets) Preliminary Environmental Information Reports (PEIR), the regional population within the breeding season was calculated as the sum of breeding adults associated with nearby colonies (within mean-max foraging ranges) plus the proportion of immature seabirds from the Biologically Defined Minimum Population Scales (BDMPS) return migration population.

1.1.1.3 The appropriateness of the regional population within the breeding season approach used and presented in the PEIR was queried by JNCC, Natural England and Natural Resource Wales (NRW) during the PEIR Statutory Consultation.

1.1.1.4 The Applicant has examined the advice note provided by NRW. Although it is unclear whether the advice relates to calculation of the regional breeding population within species-specific foraging range distance or across the BDMPS for each species as defined for non-breeding seasons in Furness (2015), the Applicant has the taken the approach to calculate regional breeding population in the Environmental Statement based on species-specific foraging ranges in line with other accepted projects. The Applicant also queries the adequacy of the populations provided within the NRW advice note for the project alone assessment (Table 2). A further query from the Applicant is the potential difference in approach required for project alone and the CEA. The NRW advice note provided to the Applicant, does not refer to CEA and hence the Applicant is seeking further clarification on the specific application of the advice note.

1.1.1.5 This technical note has therefore been prepared to provide clarity to the Statutory Nature Conservation Bodies (SNCB) on the approach taken to calculate regional breeding populations for the Mona Offshore Wind Project and Morgan Generation Assets project alone assessment. This technical note reiterates the approach followed in the PEIR and provides the updated approach taken in the Environmental Statement for the project alone and the approach to define the regional breeding population for the CEA. The Applicant is looking for agreement on the approach to calculating breeding population for the project alone assessment as well as clarification that the approach to calculate the regional breeding population set out in the NRW advice note should be used for the CEA?

1.2 Project alone regional breeding population

1.2.1 Approach taken during PEIR and the statutory consultation response

1.2.1.1 To calculate the regional breeding population, the PEIR followed the latest approach used and accepted at numerous recent wind farms (e.g. Awel y Môr and the Green Volt Assessments).

1.2.1.2 During the breeding season, in addition to seabirds associated with breeding colonies, there will be immature seabirds and 'sabbatical' seabirds (i.e. mature seabirds not breeding in a given year) present within the region. Population counts (i.e., breeding bird colony counts) therefore must be adjusted to account for these seabirds. The approach followed in the PEIR and at other wind farms (e.g. Awel y Môr) assumed that all immature seabirds in the BDMPS population in the bio-season immediately before the breeding season (usually the return migration bio-season) return to breeding colonies.

1.2.1.3 The total regional population within the breeding season is therefore the sum of breeding adults associated with nearby colonies (within mean-max foraging ranges) plus the proportion of immature seabirds from the BDMPS return migration population (Table 1).

Table 1: Calculation of regional population during the breeding season in the Mona Offshore Wind Project PEIR and the Morgan Generation Assets PEIR.

Species	Breeding population within mean-max foraging range (JNCC, 2022)	BDMPS return migration population (taken directly from Furness 2015 Appendix A tables)	Proportion of immature birds (taken directly from Furness 2015)	Immature individuals	Total combined regional breeding population (adults and immatures)
Gannet	152,372	661,888	44.7%	295,863	448,235
Kittiwake	71,198	691,526	46.6%	322,251	397,251
Lesser black-backed gull	30,140	163,304	40.5%	66,138	96,278
Herring gull	12,710	173,299	55.2%	95,661	108,371
Great black-backed gull	594	17,742	55.8%	9,892	10,486
Guillemot	130,389	1,139,220	42.5%	484,169	614,558
Razorbill	28,148	606,914	42.9%	260,366	281,276
Puffin	34,316	304,557	49.4%	150,451	184,767
Manx shearwater	1,253,612	1,580,895	45.6%	720,888	1,974,500

1.2.1.4 Following the Mona Offshore Wind Project PEIR and the Morgan Generation Assets PEIR, the following Statutory Consultation responses were provided to the Applicant regarding the above approach:

1.2.1.5 Feedback from JNCC Statutory Consultation response: *"Calculation of regional population during the breeding season. We are uncertain of the appropriateness of the approach that has been taken to calculate the regional breeding season reference populations. We suggest that approaches to calculating regional breeding reference populations be explored collaboratively through the offshore ornithology EWG."*

1.2.1.6 Feedback from NRW Statutory Consultation response: *"With reference to Breeding Season, NRW (A) are uncertain of the appropriateness of the approach that has been taken to calculate the regional breeding season reference populations and we have been unable to replicate the numbers presented in Table 10.12 Calculation of regional population during the breeding season, (particularly those for the proportions of immatures and juveniles quoted as within information presented in Furness (2015)). NRW (A) suggest that approaches to calculating regional breeding reference populations be explored collaboratively through the Offshore Ornithology EWG."*

1.2.1.7 Feedback from Natural England Statutory Consultation response: *"Natural England are not convinced that the method used to calculate regional breeding populations is appropriate Recommendation - Natural England propose discussing the approach to calculation of regional breeding populations through the EWG to reach agreement with relevant stakeholders and ensure consistency across relevant projects."*

1.2.2 Advice note from NRW (agreed with JNCC and Natural England) on calculation of regional breeding reference population (sent on 19 July 2023 following EWG05).

1.2.2.1 To calculate regional breeding population, the following advice was given by NRW:

1.2.2.2 "*Given that there is little evidence to support calculations of the number of juveniles, immatures and non-breeding birds that remain in their wintering areas into the breeding season, we advise that regional baseline population sizes for the breeding period can be derived from the relevant BDMPS tables in Appendix A of Furness (2015) by summing the adult and immature population estimates for all colonies that sit within a given regional scale (*Table 2*)".*

Table 2: Regional BDMPS Populations provided by Natural Resource Wales (as agreed with JNCC and Natural England).

Species	Breeding season reference population (sum of adults and immatures at relevant colonies)	Relevant BDMPS and Tables from Appendix A of Furness (2015) used
Gannet	522,888	Western waters, Tables 15/17
Kittiwake	245,234	Western waters & Channel, Tables 48/50
Lesser black-backed gull	240,750	Western waters, Tables 37/41
Herring gull	217,167	Western waters, Table 43
Great black-backed gull	44,753	South-west & Channel waters, Table 46
Guillemot	1,145,528	Western waters, Table 63
Razorbill	198,969	Western waters, Table 65
Puffin	1,482,791	Western waters, Table 69
Manx shearwater	1,821,544	Western waters & Channel, Table 13

1.2.2.3 The Applicant considers that the populations proposed to be used in the project alone assessment are not scientifically robust given that they are not based on species-specific foraging ranges and thus omit the latest scientific evidence on foraging ranges. For example, for the project alone assessment during the breeding season, based on the foraging ranges presented in Woodward *et al.* (2019), there is no connectivity between breeding adult guillemot from the North Rona 71 km northwest of Cape Wrath, Sutherland, Scotland) and Sula Sgeir SPA (18 km west of Rona), and the Mona Offshore Wind Project or the Morgan Generation Assets despite both colonies being located in the UK western waters defined by Furness (2015). Using the populations (Table 2) in the assessment of impact collision and displacement on baseline mortality will lead to a sizeable over estimation of the population that may interact with the project alone and may underestimate the increase in baseline mortality.

1.2.2.4 Furthermore, the Applicant would like to highlight the age of the populations (based on colony counts) used for the project alone assessment. Some colonies used within the Furness (2015) Appendix tables (Table 2), which are based on Seabird 2000 surveys (counts undertaken between 1998 and 2002) and are therefore not commensurate with the baseline characterisation surveys undertaken for the Mona Offshore Wind Project and the Morgan Generation Assets.

1.2.2.5 In addition to the NRW note on regional breeding population, the following email was provided by NRW:

1.2.2.6 *"NRW Advisory (A) note that the BDMPS report (Furness 2015) and proportions of immatures presented in the Tables within Appendix A of this report are calculated with respect to the non-breeding seasons and not the breeding season. We do not think the approach suggested by the Mona/Morgan Applicants is valid as it cannot be assumed that the distribution and origin of immature birds is the same in the breeding season compared to the non-breeding season. NRW (A) do not advise that the non-breeding season proportions in Furness (2015) are in any way applicable to the breeding season – either for adults or immatures. Additionally, we note that the proposal to use the number of breeding adults within foraging range of a project would not be appropriate for cumulative assessment given that other projects could be impacting other parts of the wider population.*

1.2.2.7 *NRW (A) acknowledge that there are potential issues associated with the approach and figures we provided for calculations of breeding season BDMPS figures. However, this requires a lot more consideration and work (which is currently being undertaken by an SNCB task and finish group) and hence in the meantime we recommend that Mona/Morgan take the approach we have previously outlined for breeding season BDMPS figures (i.e. to sum the adult and immature population estimates for all colonies that sit within the relevant species specific BDMPS scale, e.g. UK western waters) and assess the annual predicted EIA impacts against the largest seasonal BDMPS figures as previously advised."*

1.2.2.8 The applicant does not consider appropriate to sum adult and immature population estimates for all colonies that sit with the species-specific BDMPS scale (UK western waters for common guillemot). It should be based on latest evidence instead (i.e. species-specific foraging ranges).

1.2.2.9 The Applicant would like to separately present the approach for the project alone assessment and then the approach to CEA for the Environmental Statements to remove any confusion and misunderstanding. The approach to CEA is discussed in Section 1.3.

1.2.2.10 The Applicant is in agreement that calculating the population of immature birds that may interact with a project is difficult due to the limited evidence pertaining to the movements and distribution of these birds in UK waters.

1.2.3 Updated Approach Taken for the Environmental Statements

1.2.3.1 The approach in the project alone assessment was revised for the Mona Offshore Wind Project and Morgan Generation Assets Environmental Statements from the approach in the PEIRs which is presented in Section 1.2.1. The difference in the size of the breeding regional populations between the PEIRs and the Environmental Statements is presented in Table 3. The approach was amended following the Statutory Consultation responses which questioned the appropriateness of the PEIR approach. The revised Environmental Statement approach was proposed and discussed with Offshore Ornithology EWG.

1.2.3.2 In the breeding season, regional populations have been calculated utilising data from the Seabird Monitoring Programme (SMP) database. The most recent breeding data within the mean-maximum foraging range plus one standard deviation has been extracted from the online SMP database. The most recent available data spanned from between 2018 and 2023, depending on colonies coverage. A check of all designated and non-designated site colonies within the relevant foraging range has been undertaken to include all colony counts within the regional breeding population estimated for each species (Figure 1). In these cases, the most recent population estimate for each colony was used (Seabird Monitoring Programme | JNCC (bto.org)). In addition to breeding adult birds associated with the breeding colonies, there will be immature seabirds present within the region. Population counts therefore must be adjusted to account for these seabirds as the colony count does not include birds (e.g. immatures) which might summer in the area but do not attend the colony.

1.2.3.3 Calculation of the total regional breeding population was explored collaboratively with the Offshore Ornithology Expert Working Group (EWG) due to there being little evidence to support the calculation of the number immatures and non-breeding birds that remain in their wintering areas into the breeding season. The EWG proposed that the sum of the adult and immature population estimates for all colonies that sit within the relevant species BDMPS from Furness (2015) should be used to estimate the total regional breeding population. The EWG noted that there are potential inaccuracies associated with this approach. Additionally, this approach makes broad assumptions about immature populations, such as assuming all immature birds associated with UK colonies are present in UK waters which is known to be incorrect, and therefore increases the total regional breeding population figure.

1.2.3.4 As a more precautionary approach therefore, the number of immature birds present in the regional BDMPS has been estimated using the ratio of immatures per breeding adult provided in the relevant species accounts in Furness (2015). This approach assumes that all immatures associated with each breeding colony will be present within the foraging range defined for each species. The Applicant acknowledges there are also potential inaccuracies with this approach as the distribution and movements of immature birds are poorly understood in a UK context. However, the Applicant considers the approach taken for Environmental Statement to be more robust overall than the SNCBs approach as the Applicant's approach is based on latest scientific evidence (i.e., species-specific foraging ranges).

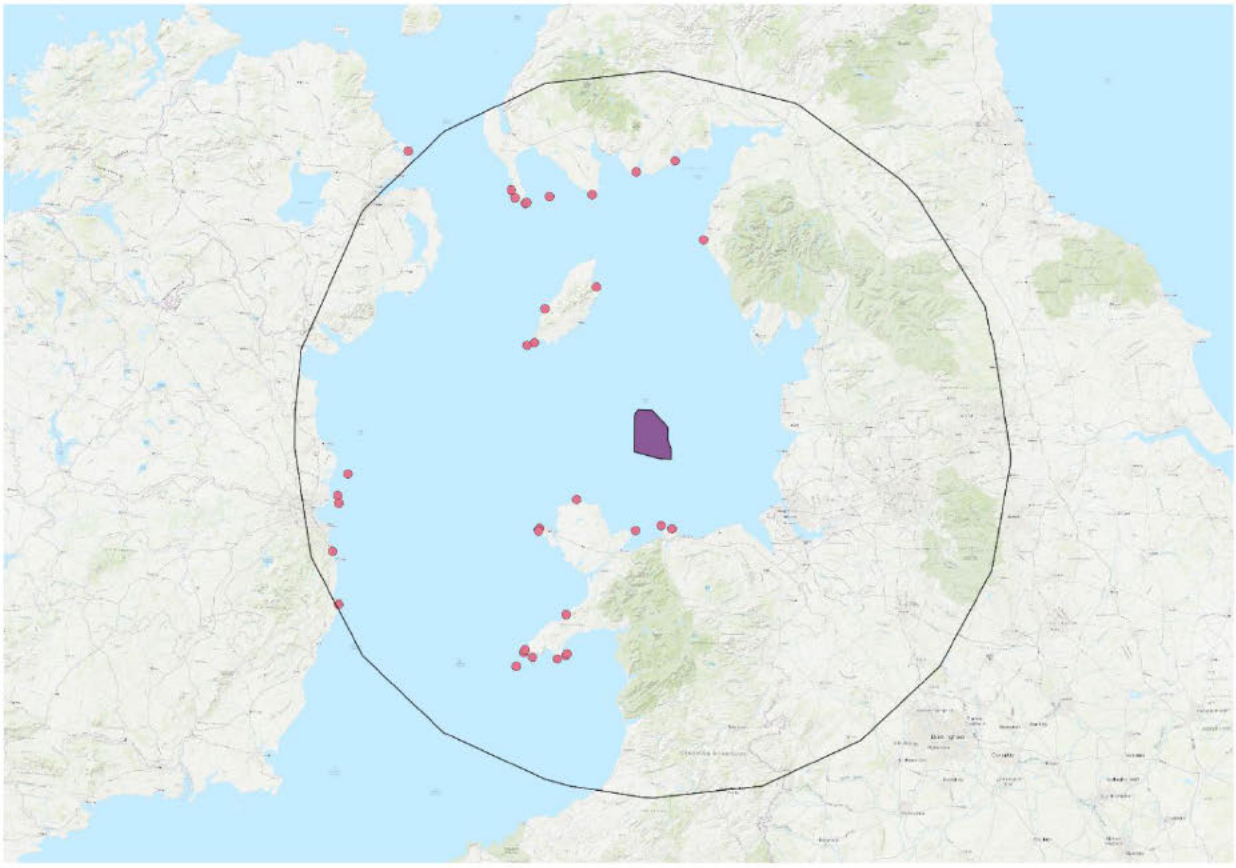

Figure 1: Colony screening example: location of common guillemot SMP colonies. Location of breeding colonies is shown in pink whilst the Mona Array Area is shown in purple. Outline circle indicates the foraging range of common guillemot from the Mona Array Area.

Table 3: Updated regional breeding population for the Mona Offshore Wind Project. The Morgan generation Assets regional breeding population may differ slightly due to project location.

* Note difference also due to inclusion of St Kilda and Grassholm colonies
** Note difference due to utilising Manx foraging range instead of the gannet screening range

Species	Regional BDMPS (adults only)	Immatures per breeding adult (ratio taken from Furness, 2015)	Regional BDMPS (immature birds)	Regional BDMPS (total individuals adult and immature)	Difference between PEIR and ES	Difference between SNCBs and ES
Common guillemot	78,552	0.74	58,128	136,680	-477,878	-1,008,848
Razorbill	10,483	0.75	7,862	18,345	-262,931	- 180,624
Atlantic puffin	99,658	1.04	103,644	203,302	+18,535	-1,279,489
Northern gannet	377,342	0.81	305,647	682,989	+234,754*	+160,101

Species	Regional BDMPS (adults only)	Immatures per breeding adult (ratio taken from Furness, 2015)	Regional BDMPS (immature birds)	Regional BDMPS (total individuals adult and immature)	Difference between PEIR and ES	Difference between SNCBs and ES
Manx shearwater	1,289,394	0.84	1,083,091	2,372,485	+397,985**	+550,941
Black-legged kittiwake	83,340	0.88	73,339	156,679	-240,572	-88,555
European herring gull	14,935	1.09	16,279	31,214	-77,157	-185,953
Lesser black-backed gull	65,348	0.68	44,437	109,785	+13,507	-130,965
Great black-backed gull	662	1.26	834	1,496	-8,990	-43,257

1.2.3.5 The Applicant suggests that considering alternative approaches, this method gives a more precautionary approach as immatures have been estimated using the 'common currency' of Furness (2015) as well as updated counts from SMP whilst ensuring that breeding adult populations are commensurate with the timeframe of baseline surveys.

1.2.3.6 The following email advice was given to the Applicant on 18 October 2023 ahead of EWG06 by NRW:

1.2.3.7 *"The projects approach has also been using a mishmash of data, for the breeding season for birds within foraging ranges most recent SMP data is being used. The project is then using immature data from Furness (2015). NRW would recommend you follow the approach that we have set out which is consistent with the advice being given to other projects as agreed between SNCBs, JNCC, Natural England and NRW. This methodology is what we are all advising to use for projects currently. Acknowledge that it has limitations and requires a lot of further work, that is being looked at through an SNCB task and finish group. That work will not happen in time for this project so we would suggest you use the consistent approach that has the precedent from what happens in the North Sea. This is what we understand other projects coming in around the same time will be using."*

1.2.3.8 As common guillemot as an example, following the Applicants method used for Mona/Morgan the total regional population for common guillemot would be 136,680 individuals (Table 3), whereas using the Natural Resource Wales method, the population would be 1,145,528 individuals (Table 2).

1.2.3.9 Additionally, the Applicant has used breeding season proportion of immature to adult birds (Furness, 2015), which is based on a stable age population model that would not change regardless of season or timeframe from which breeding adult data is sourced. It is also the ratio to calculate the immature population incorporated into the SNCB approach. This ratio has been applied to the breeding adult population which is based on updated SMP count data.

1.2.3.10 NRW states in the email advice from 18 October 2023 to look at approaches taken by wind farms in the North Sea (additionally the Applicant has expanded the search to outside of the North Sea). Following the Applicant review, the following information regarding a selection of offshore wind farms and their approach taken to calculating regional breeding populations for the project alone assessments (Appendix B).

1.2.3.11 It is evident that different approaches have been taken by different wind farms, with the original PEIR method taken by the Applicant when calculating impacts to the regional breeding population utilised by several other recent wind farm applications (e.g. Awel y Môr). The approach taken in PEIR was subsequently deemed inappropriate by the SCNBs during Statutory Consultation and an alternative approach was proposed by SNCBs. It is of note that a recent project (i.e. Rampion 2) has utilised the approach recommended by the SNCBs.

1.2.3.12 The updated approach taken by the Applicant for the Environmental Statements is more precautionary as it does not make assumptions regarding immature birds in the return migration due to estimating immature populations based on updated foraging range adult colony count. Furthermore, using the SNCBs approach will lead to a sizeable over-estimation of the population that may interact with the project alone and may underestimate the increase in baseline mortality. As such, the Applicant's approach is more conservative and precautionary and will result in greater significant of effect than the SNCBs approach.

1.3 CEA regional breeding population

1.3.1 Mona Offshore Wind Project and Morgan Generation Assets PEIRs

1.3.1.1 The approach applied for the Mona Offshore Wind Project and Morgan Generation Assets PEIRs was to take the estimated breeding season regional population used for the project alone assessment in PEIRs (adult plus immatures within the species-specific foraging range), and used that as the cumulative breeding season regional population. This is consistent with the approach used for previous offshore wind farms throughout UK waters.

1.3.1.2 Only wind farms within the species-specific foraging range were considered during the PEIR assessments.

1.3.2 NRW advice note

1.3.2.1 It is the Applicant's understanding that the SNCBs recommends that the Applicant should use the approach provided by Natural Resource Wales for the CEA – 'Advice to Mona/Morgan generation regarding EIA scale reference populations for assessments' provided to the Applicant on 19 July 2023 during the Evidence Plan Process for the Mona and Morgan Generation Offshore Wind Projects.

1.3.2.2 However, the Applicant would like to highlight the following shortcomings relating to this approach:

- The use of historic population count data as it utilises outdated colony count information (as explained in section 1.2.3).
- The use of the BDMPS areas associated with the non-breeding periods for each species for the assessing impacts in the breeding season.

1.3.2.3 In the Natural Resource Wales approach, as seen in Figure 2 for common guillemot, this would mean that for the breeding season, all Round 4 projects within the UK

western water BDMPS would utilise a common guillemot count of 1,145,528 individuals.

1.3.2.4 The Applicant believes the approach is calculated utilising the following method in the NRW approach:

Step 1: The approach consists of taking the return migration period from Furness (2015) which is August to February for common guillemot.

Table 63. BDMPS for common guillemot in non-breeding season (August to February) in 'UK western waters'.

Population	Most recent count	Pairs	Breeding adults	Immatures	Proportion of adults in UK western waters in non-breeding season	Proportion of immatures in UK western waters in non-breeding season	UK western waters number of adults	UK western waters number of immatures	UK western waters Total birds
Faroe Islands	c2000	100,000	200,000	148000	0.05	0.1	10000	14800	24800
Norway	c2000	100,000	200,000	148000	0.01	0.05	2000	7400	9400
Hermaness, Saxavord & Valla Field SPA	2009	4620	9,240	6838	0.02	0.05	185	342	527
Foula SPA	2007	16615	33,230	24590	0.02	0.05	665	1230	1894
Noss SPA	2009	14783	29,566	21879	0.02	0.05	591	1094	1685
Sumburgh SPA	2010	4762	9,524	7048	0.02	0.05	190	352	543
Fair Isle SPA	2010	13066	26,132	19338	0.02	0.05	523	967	1490
West Westray SPA	2007	33900	67,800	50172	0.02	0.05	1356	2509	3865
Calf of Eday SPA	2006	6300	12,600	9324	0.02	0.05	252	466	718
Rousay SPA	2009	6200	12,400	9176	0.02	0.05	248	459	707
Marwick Head SPA	2012	11097	22,194	16424	0.02	0.05	444	821	1265
Hoy SPA	2007	6300	12,600	9324	0.02	0.05	252	466	718
Copinsay SPA	2012	5607	11,214	8298	0.02	0.05	224	415	639
North Caithness Cliffs SPA	2000	47000	94,000	69560	0.02	0.05	1880	3478	5358
East Caithness Cliffs SPA	1999	106500	213,000	157620	0	0	0	0	0
Troup, Pennan & Lion's Heads SPS	2007	10938	21,876	16188	0	0	0	0	0
Buchan Ness to Collieston Coast SPA	2007	12928	25,856	19133	0	0	0	0	0
Fowlsheugh SPA	2012	30100	60,200	44548	0	0	0	0	0
Forth Islands SPA	2011	14674	29,348	21718	0	0	0	0	0
St Abb's Head to Fast Castle SPA	2013	22103	44,206	32712	0	0	0	0	0
Farne Islands SPA	2013	33532	67,064	49627	0	0	0	0	0
Flamborough and Filey Coast pSPA	2008	39641	79,282	58669	0	0	0	0	0
Germany and Denmark	2005	5,000	10,000	7400	0	0	0	0	0
North Sea UK non-SPA populations	2000	147000	294,000	217560	0.01	0.02	2940	4351	7291

Sule Skerry & Sule Stack SPA	1998	7633	15,266	11297	0.95	0.9	14503	10167	24670
North Rona & Sula Sgeir SPA	2012	5000	10,000	7400	0.95	0.9	9500	6660	16160
Cape Wrath SPA	2000	27359	54,718	40491	0.95	0.9	51982	36442	88424
Handa SPA	2011	37993	75,986	56230	0.95	0.9	72187	50607	122793
Shiant Isles SPA	2008	5148	10,296	7619	0.95	0.9	9781	6857	16638
Flannan Isles SPA	1999	9807	19,614	14514	0.95	0.9	18633	13063	31696
St Kilda SPA	1999	15700	31,400	23236	0.95	0.9	29830	20912	50742
Canna & Sanday SPA	1999	3913	7,826	5791	0.95	0.9	7435	5212	12647
Rum SPA	2000	1644	3,288	2433	0.95	0.9	3124	2190	5313
Mingulay & Berneray SPA	2009	13527	27,054	20020	0.95	0.9	25701	18018	43719
North Colonsay and western cliffs SPA	2000	13500	27,000	20000	1	0.95	27000	19000	46000
Ailsa Craig SPA	2013	5247	10,494	7766	1	0.95	10494	7377	17871
Rathlin Island SPA	2011	87398	174,796	129349	1	0.95	174796	122882	297678
Skomer & Skokholm SPA	2013	16300	32,600	24124	0.9	0.8	29340	19299	48639
West coast UK non-SPA populations	2000	79000	158,000	116920	0.95	0.9	150100	105228	255328
Total overseas							12,000	22,200	34,200
Total UK							644,156	460,864	1,105,020
Total							656,156	483,064	1,139,220

Step 2: The second steps consist of summing only the west coast Special Protection Areas (SPAs)/Non-SPA populations.

Sule Skerry & Sule Stack SPA	1998	7633	15,266	11297	0.95
North Rona & Sula Sgeir SPA	2012	5000	10,000	7400	0.95
Cape Wrath SPA	2000	27359	54,718	40491	0.95
Handa SPA	2011	37993	75,986	56230	0.95
Shiant Isles SPA	2008	5148	10,296	7619	0.95
Flannan Isles SPA	1999	9807	19,614	14514	0.95
St Kilda SPA	1999	15700	31,400	23236	0.95
Canna & Sanday SPA	1999	3913	7,826	5791	0.95
Rum SPA	2000	1644	3,288	2433	0.95
Mingulay & Berneray SPA	2009	13527	27,054	20020	0.95
North Colonsay and western cliffs SPA	2000	13500	27,000	20000	1
Ailsa Craig SPA	2013	5247	10,494	7766	1
Rathlin Island SPA	2011	87398	174,796	129349	1
Skomer & Skokholm SPA	2013	16300	32,600	24124	0.9
West coast UK non-SPA populations	2000	79000	158,000	116920	0.95
Total overseas					
Total UK					
Total					

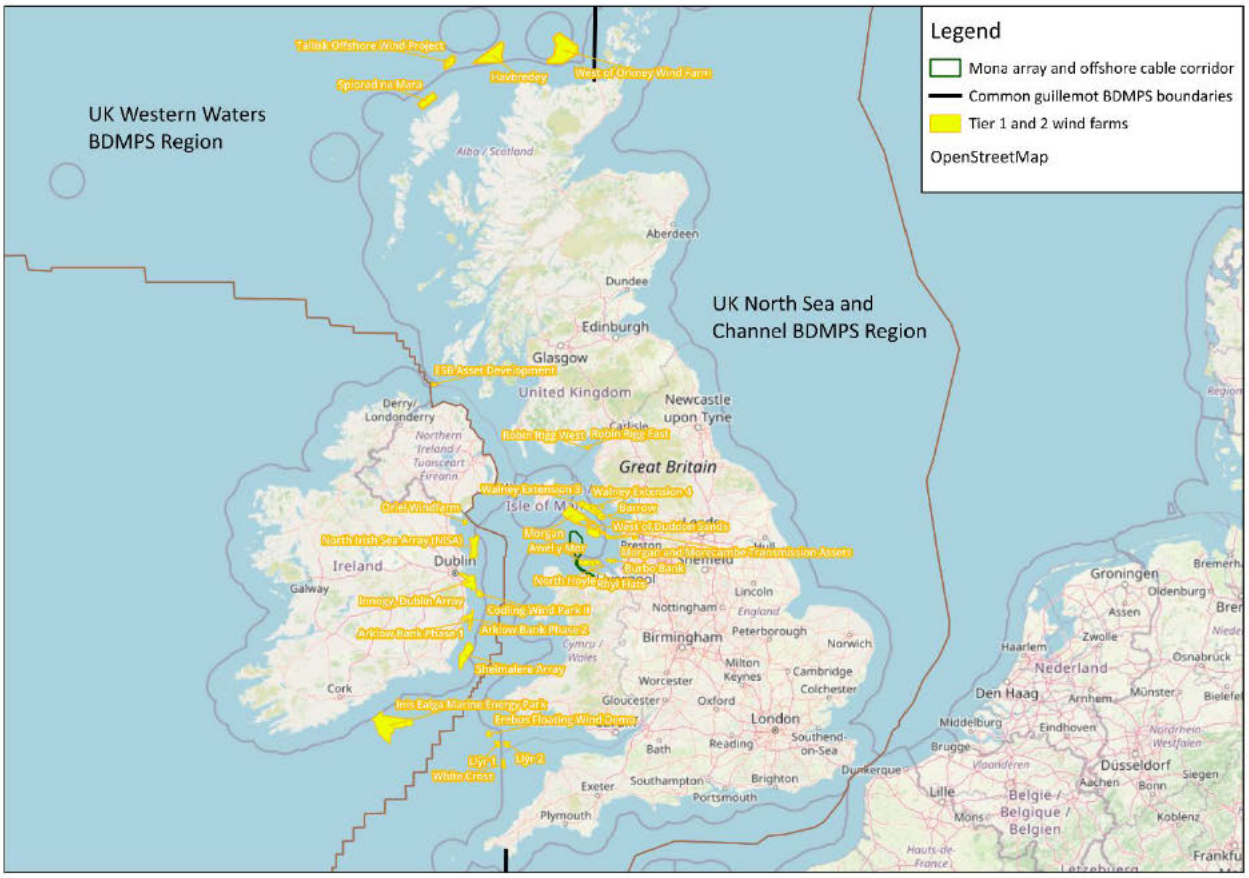

Figure 2: CEA example: common guillemot projects within the same BDMPS region as the Mona Offshore Wind Project and Morgan generation Assets. Please note that the offshore projects within this figure have not been screened further (meaning that some wind farms won't have data available to us yet) and is for demonstration purposes only and should not be considered in the final list of projects considered in the Environmental Statements).

1.3.2.5 This Natural Resource Wales approach makes use of the same Furness proportions as does the project alone assessment, emphasising the 'common currency' approach to calculating immature within the breeding population.

1.3.3 Mona and Morgan Generation Offshore Wind Projects Environmental Statements

1.3.3.1 The Applicant has utilised and calculated an updated regional breeding population (adult and immatures) for the project alone assessment. This approach utilises the foraging range for breeding adult birds and applies an immature proportion (from Furness (2015) to the breeding adult population to calculate the number of immatures associated with the breeding adult population. This therefore represents the population that could interact with the project (accepting the limitations in relation to the movements and distribution of immature birds explained for the project alone approach in section 1.2.2).

1.3.3.2 If this population was used for the CEA it would be consistent with previous project cumulative assessments (Appendix C). It is worth noting that different regional populations for the project alone and cumulative assessments have not been used in the assessments for previous offshore wind projects.

1.3.3.3 Whilst we have highlighted the concerns with the NRW approach in the project alone section, we have included assessments that follow their approach outlined for the CEA assessment in the Environmental Statements. For the breeding season, BDMPS figures (i.e. to sum the adult and immature population estimates for all colonies that sit within the relevant species specific BDMPS scale, e.g. UK western waters) were included and the annual predicted EIA impacts against the largest seasonal BDMPS figures assessed. The Applicant considers the approach proposed by the SNCBs to be robust as it includes the largest population which might be connected and impacted by all projects within the CEA.

1.3.4 Clarifications Requested

1.3.4.1 The Applicant is seeking and clarity on the following point:

- Does the EWG agree with the approach to calculating breeding population for the Morgan Generation and Mona Offshore Wind project alone assessment following consideration of evidence presented in this note?
- Could you confirm that the approach to calculate the regional breeding population set out in the NRW advice note should be used for the CEA?

1.4 References

Blue Gem Wind. (2022) Project Erebus Environmental Statement, Chapter 11: Offshore Ornithology.

Equinor. (2022) Sheringham Shoal and Dudgeon Offshore Wind Farm Extension Projects, Environmental Statement, Volume 1, Chapter 11 - Offshore Ornithology. Document Reference: 6.1.11.

Green Volt. (2023). Green Volt Offshore Windfarm Offshore EIA Report. Chapter 12: Offshore and Intertidal Ornithology.

Orsted. (2022a) Applicant's Response to Deadline 6 Ornithology submissions. Deadline 8. Document Reference: G8.3. Revision 1. EN010098-002113-Hornsea Project Four - G8.3 Comments on responses submitted for Deadline 7.pdf (planninginspectorate.gov.uk).

Orsted. (2022b) Hornsea Project Four, Ornithological Assessment Sensitivity Report, Deadline: 4, Date: 10 May 2022, Document Reference: G4.7. Microsoft Word - G4.7 Ornithology Assessment Sensitivity Report (07649907_A) to pdf.docx (planninginspectorate.gov.uk).

Orsted. (2018). Hornsea Three Offshore Wind Farm Environmental Statement: Volume 2, Chapter 5 - Offshore Ornithology PINS Document Reference: A6.2.5.

RWE. (2023) Awel y Môr Offshore Wind Farm. Category 6: Environmental Statement. Volume 2, Chapter 4: Offshore Ornithology. Deadline 8. Revision: C. Document Reference: 8.70. Application Reference: 6.2.4.

Scottish Power Renewables. (2019a) East Anglia ONE North Offshore Windfarm Chapter 12 Offshore Ornithology Environmental Statement Volume 1, Document Reference: 6.1.12.

Scottish Power Renewables. (2019b) East Anglia TWO Offshore Windfarm Chapter 12 Offshore Ornithology Environmental Statement Volume 1, Document Reference: 6.1.12.

SSE. (2022) Berwick Bank Offshore EIA. Chapter 11 – Offshore and Intertidal Ornithology.

Xodus. (2023) Volume 1, Chapter 13 Offshore and Intertidal Ornithology. DOCUMENT L-100632-S05-A ESIA-013.

Appendix A: Advice to Mona/Morgan generation regarding EIA scale reference populations for assessments. Sent by Natural Resource Wales (agreed by JNCC and Natural England) and provided to the Applicant on 19 July 2023.

1.4.1.1 For the breeding season, the BDMPS is defined as the breeding population within foraging range from the project, plus non-breeding and immature birds. The population is likely to originate from a much wider range of colonies (not just SPA colonies) and may include young immature birds spending the summer in their wintering area as well as immatures loosely associated with local colonies (Furness 2015).

1.4.1.2 Given that there is little evidence to support calculations of the number of immatures and non-breeding birds that remain in their wintering areas into the breeding season, we advise that regional baseline population sizes for the breeding period can be derived from the relevant BDMPS tables in Appendix A of Furness (2015) by summing the adult and immature population estimates for all colonies that sit within a given regional scale:

Species	Breeding season reference population (sum of adults and immatures at relevant colonies)	Relevant BDMPS and Tables from Appendix A of Furness (2015) used
Gannet	522,888	Western waters, Tables 15/17
Kittiwake	245,234	Western waters & Channel, Tables 48/50
Lesser black-backed gull	240,750	Western waters, Tables 37/41
Herring gull	217,167	Western waters, Table 43
Great black-backed gull	44,753	South-west & Channel waters, Table 46
Guillemot	1,145,528	Western waters, Table 63
Razorbill	198,969	Western waters, Table 65
Puffin	1,482,791	Western waters, Table 69
Manx shearwater	1,821,544	Western waters & Channel, Table 13

1.4.1.3 Worked example for calculation for gannet 'UK western waters' breeding season reference population calculation (all information taken from Tables 15 and 17 of Furness (2015):

Population	Most recent count	Breeding adults	Immatures	Total
Sule Skerry & Sule Stack	2004	9,350	7,574	16,924
North Rona & Sula Sgeir	2004	18,450	14,944	33,394
St Kilda	2004	119,244	96,588	215,832
Ailsa Craig	2004	54,260	43,951	98,211

Population	Most recent count	Breeding adults	Immatures	Total
Grassholm	2009	78,584	63,653	142,237
UK western non-SPA colonies	2004	9,000	7,290	16,290
TOTAL		*288,888*	*234,000*	*522,888*

1.4.1.4 For EIA assessments, we advise calculating the total predicted annual impact for a species and assessing this against the largest seasonal population (breeding or non-breeding) at the appropriate BDMPS (largest BDMPS for use in annual assessments highlighted yellow):

Species	Breeding season BDMPS	Autumn/post-breeding BDMPS*	Winter/non-breeding BDMPS*	Spring/pre-breeding BDMPS*
Gannet	522,888	545,954	-	661,888
Kittiwake	245,234	911,586	-	691,526
Lesser black-backed gull	240,750	163,304	41,159	163,304
Herring gull	217,167	-	173,299	-
Great black-backed gull	44,753	-	17,742	-
Guillemot	1,145,528	-	1,139,220	-
Razorbill	198,969	606,914	341,422	606,914
Puffin	1,482,791	-	304,557	-
Manx shearwater	1,821,544	1,580,895	-	1,580,895

* Non-breeding season BDMPSs from Furness (2015)

Furness, R.W. (2015) Non-breeding season populations of seabirds in UK waters: Population sizes for Biologically Defined Minimum Population Scales (BDMPS). Natural England Commissioned Reports, Number 164.

1.4.1.5 Annual predicted impacts should be assessed against the baseline mortality of the relevant BDMPS.

Appendix B: Calculation of Breeding Season Regional Population (Other recent offshore wind farm Environmental Statement approaches) for the project alone assessment

Awel y Môr

Awel y Môr used the Mona Offshore Wind Project and Morgan Generation Assets PEIRs approach for the alone assessment (RWE, 2023). Awel y Môr have assessed impacts against both adult and immature populations. The Applicant would like to highlight that upon inspection of the public examination documents for Awel y Môr there appears to be no disagreement with this approach.

Green Volt

Green Volt used the Mona Offshore Wind Project and Morgan Generation Assets PEIRs approach for the alone assessment (Green Volt, 2023). Green Volt have assessed impacts against both adult and immature populations. Green Volt has only just been submitted and so details regarding outcomes of this approach during are not known at this time.

Hornsea Four

The Environmental Statement was originally submitted following the same approach as Awel y Môr and Green Volt. However, Hornsea Four did receive feedback from Natural England regarding BDMPS:

"Natural England, post-Application, provided the Applicant with a new method to calculate the breeding season population size for relevant species regional BDMPS, which differed significantly to the approach taken for other recently consented OWFs (Orsted, 2022a)".

The authors go on to state:

"The Applicant took a logical approach and added the number of non-UK individuals cited in Furness (2015) with connectivity to the regional BDMPS onto the derived Breeding BDMPS population size but only when considering impacts on an annual basis. Not including non-UK individuals within the regional BDMPS runs the risk of significantly overestimating the potential impacts from UK OWFs on the BDMPS populations."

Orsted submitted an Assessment Sensitivity Report presenting the Applicant and SNCB position on regional breeding population during examination (Orsted, 2022b). The breeding season population for gannet therefore went from 139,302 individuals (DCO Application breeding BDMPS population) to 400,326 individuals (Natural England's breeding BDMPS method population). Orsted also provided a revised annual impact value using Natural England's new breeding BDMPS value plus the additional overseas populations expected based on the value presented in Appendix A of Furness (2015) for the overseas total for each species (e.g. gannet: 445,503 (Revised annual BDMPS population)).

Berwick Bank

For the Berwick Bank Environmental Statement, only the breeding adult population was used for the alone assessment. The impact is assigned to adults and immatures, however only adults impacted have been assessed against the adult population. No immature reference population has been

stated. Below is an extract from the Environmental Statement to make clear that immature and adult impacts were separated before adult impacts were assessed against an adult population;

"Based on the proportion of immature gannets recorded on digital aerial baseline surveys in the breeding season, 1% of the population present are immature birds (Table 11.25), Although this is likely to be an underestimate, since it is not possible to age all birds recorded on surveys, this would mean that an estimated 33 gannets displaced from the Proposed Development array area and 2 km buffer during the breeding season would be immature, with 3,282 adult birds also displaced (SSE, 2022)".

West of Orkney

For the West of Orkney EIA, only adult populations were used in the assessment of impacts. Breeding season populations were calculated from the most recent colony counts from Scottish Seabird Monitoring data for colonies within the mean max foraging range plus one standard deviation from the development area.

"*Impacts on each species' population size have been assessed in relation to relevant adult breeding and non-breeding seasons (Table 13-6) reference populations (Table 13-8). For the breeding season, adult regional populations used for the impact assessment have been based on the best available colony count data obtained from the SMP database (Xodus, 2023)".*

Hornsea 2

The approach taken by Hornsea 2, similarly to Berwick Bank only provided an adult population for the alone assessment, with an immature population not calculated. This population was used for both project alone and cumulative assessments.

Hornsea 3

The approach taken by Hornsea 3, again similarly to Berwick Bank and Hornsea 2 only provided an adult population for the alone assessment, with an immature population not calculated. This population was used for both Project alone and cumulative assessments (Orsted, 2018).

East Anglia One North

Upon investigation into the Environmental Statement for both East Anglia One North, it appears that a similar method to that which was used for Awel y Môr, Green Volt and Hornsea Four was used, estimating immature population from the return migration number from Furness 2015. Below is an extract from the Environmental Statement (Scottish Power Renewables, 2019a):

"Since immature seabirds are known to remain in wintering areas, the number of immature birds in the relevant population during the breeding season may be estimated as 43% of the total wintering BDMPS population (Furness 2015). This gives a breeding season population of 94,007 (BDMPS for the UK North Sea and Channel, 218,622 x 43%)".

This approach has been taken due to the authors of the Environmental Statement stating that no breeding population is within range of both wind farms and hence have used the return migration for the breeding season population. It appears that both immature and adult population have been assessed.

East Anglia Two

Upon investigation into the Environmental Statement for East Anglia Two, it appears that a similar method to that which was used for East Anglia One North was used, estimating immature population

from the return migration number from Furness (2015). Below is an extract from the Environmental Statement (Scottish Power Renewables, 2019b):

"Since immature seabirds are known to remain in wintering areas, the number of immature birds in the relevant population during the breeding season may be estimated as 43% of the total wintering BDMPS population (Furness 2015). This gives a breeding season population of 94,007 (BDMPS for the UK North Sea and Channel, 218,622 x 43%)".

Sheringham Shoal and Dudgeon Extensions

Within the Environmental Statement (Equinor, 2022), the breeding season population has been calculated from the non-breeding component of UK North Sea and Channel BDMPS (0.43 of total population). No updated foraging range count appears to be calculated. This may be due to the author stating for several species that there are no known breeding colonies within the wind farms mean maximum foraging range. Both immature and adult populations have been assessed.

Erebus

For the Erebus Offshore Wind farm, the impacts have been assessed against the adult population only. See the below extract from the Environmental Statement (Blue Gem Wind, 2022):

"For the breeding season, the populations are individual adult birds, whereas for the BDMPS, the populations are adults and immatures".

It is not entirely clear if impacts have been assigned to adult and immature birds during the breeding season, or if the precautionary assumption of all impacts are assumed to be all adult impacts during the breeding season has been adopted.

Appendix C: Calculation of Breeding Season Regional Population (Other offshore wind farm Environmental Statement approaches) for CEA

Hornsea 2 and 3

In the assessment of cumulative impacts, population estimates considered adults only. Below is an extract from the Environmental Statement (Orsted, 2018):

"Furness (2015) indicates that the non-breeding component of a razorbill population will represent 43% of the total population. This would therefore mean that there are an additional 68,124 immature birds associated with breeding colonies in the North Sea. However, the use of these populations is not appropriate in a cumulative context as this would not capture the complexity of the population structure present in the North Sea, as it ignores the distribution of different age classes. Given the complexities of the population affected by cumulative impacts no attempt has been made to compare the predicted impact against a relevant population and instead a qualitative assessment is provided for the breeding season."

East Anglia Two

It appears that only the largest BDMPS population was assessed for cumulative impacts, with CEA not split depending on season. See the following extract (Scottish Power Renewables, 2019b):

"The largest BDMPS for guillemot in UK North Sea waters is 1,617,306 (Furness 2015). At the average baseline mortality rate of 0.14 (Table 12.16) the number of individuals expected to die in a year is 226,423 (1,617,306 x 0.14)."

Awel y Môr

Awel y Môr used the same population that was calculated for the Project Alone assessment in the Environmental Statement and applied to the CEA. The approach is identical to the Mona Offshore Wind Project and Morgan Generation Assets PEIRs approach taken for project alone which is presented in section 1.2.1. In this approach, the total regional population within the breeding season is the sum of breeding adults associated with nearby colonies (within mean-max foraging ranges) plus the proportion of immature seabirds from the BDMPS return migration population.

Green Volt

Green Volt used the same population that was calculated for the Project Alone assessment in the Environmental Statement and applied it the CEA. The approach is identical to the Mona Offshore Wind Project and Morgan Generation Assets PEIRs approach taken for project alone which is presented in section 1.2.1 and summarised above.

Erebus

It appears that this project utilised a different BDMPS CEA breeding population to that of Furness (2015) when calculating CEA impacts. See the following extract (Blue Gem Wind, 2022):

"During the breeding season a total of 41 mortalities are predicted, representing 0.07% of the reference migration free breeding population (55,622; Pritchard et al., 2021)."

Sheringham Shoal and Dudgeon Extensions

It appears that these projects only assessed the annual impacts from CEA and did not break impacts down into season. See the following extract (Equinor, 2022):

"To assess the magnitude of the year-round impact of cumulative OWF collision on lesser black-backed gull, two background populations are considered. Firstly, the largest relevant BDMPS population (autumn migration season UK North Sea BDMPS, consisting of 209,007 individuals (Furness, 2015))."

D.8.5 Provision of CEA Historical Projects Application Approach Technical Note

MONA OFFSHORE WIND PROJECT

MORGAN OFFSHORE WIND PROJECT: GENERATION ASSETS

MORECAMBE OFFSHORE WINDFARM: GENERATION ASSETS

Cumulative Effects Assessment and In-combination Historical Projects Note – Environmental Statement and Habitats Regulations Assessment approach.

Image of an offshore wind farm

January 2024

F01

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Document status

Version	Purpose of document	Authored by	Reviewed by	Approved by	Review date
F01	Note for the EWG/ETG	RPS	RHDHV/ NIRAS	Mona Offshore Wind Ltd. Morgan Offshore Wind Ltd. Morecambe Offshore Windfarm Ltd	25/01/2024

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RPS	**Mona Offshore Wind Ltd.** **Morgan Offshore Wind Ltd.** **Morecambe Offshore Windfarm Ltd**

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1.1 Background and aims

1.1.1.1 This note has been developed collectively by the Mona Offshore Wind Project (hereafter referred to as 'Mona'), Morgan Offshore Wind Project: Generation Assets (hereafter referred to as 'Morgan Generation') and the Morecambe Offshore Windfarm: Generation Assets (hereafter referred to as 'Morecambe Generation'). These three projects will hereafter be referred to collectively as 'the Projects', whilst the applicant of each project will be referred to collectively as 'the Applicants'.

1.1.1.2 The note has been developed in relation to the Projects to outline the approach for quantifying impacts from historic offshore wind projects for which quantitative analyses were not undertaken. The approach has been applied to the offshore ornithology Cumulative Effects Assessment (CEA) of the Projects' Environmental Statements and in the in-combination assessment of the Habitats Regulations Assessments (HRA) of the Projects.

1.1.1.3 The scope of any assessment and information presented within a Report to Inform the Appropriate Assessment (RIAA) or Information to Support Appropriate Assessment (ISAA) must be considered in the context of what is required by the legal regime under the Marine Habitats Regulations (The Conservation of Offshore Marine Habitats and Species Regulations 2017). The appropriate test is whether it can be ascertained beyond reasonable scientific doubt that there will be no Adverse Effects On Integrity (AEOI) of European Sites[1]. That conclusion must be reached taking account the best available scientific evidence. The Courts have re-iterated on a number of occasions that the conclusion reached in an appropriate assessment "*cannot realistically require ascertainment of absolute certainty that there will be no adverse effects*"[2]. It is entirely appropriate for an Appropriate Assessment to be undertaken, working with estimates and expert judgement, provided that there is sufficient information available to allow a conclusion to be reached beyond reasonable scientific doubt.

1.1.1.4 The Applicants' approach has been developed to ensure that the assessments of the Projects are robust, precautionary and provide sufficient detail to conclude no significant effects within the Environmental Statements or no AEOI beyond reasonable scientific doubt for the purposes of the HRAs undertaken for each of the Projects. This includes consideration of all projects that may act cumulatively/in-combination with the focal project, either quantitatively or qualitatively, depending on the availability of data.

1.1.1.5 The Applicants' approach considers the advice given by Natural England (provided advice on 12 October 2023) around 'gap filling' for historical offshore wind projects. The Applicants for the Projects have reviewed the advice provided by Natural England and acknowledge their concern regarding gaps within the CEAs and in-combination assessments, due to older offshore wind farms not undertaking assessments on all key species.

1.1.1.6 It is our understanding that Natural England are in the process of commissioning research to quantify impacts from historic offshore wind projects, but that the outputs of this study will not be available in time for the submission of the application or for the examination phases for the Projects. In the absence of this study, the Applicants will

[1] See decision of the Court of Justice of the European Union in Waddenzee (C-127/02)

[2] See R. (Mynydd y Gwynt Ltd) v Secretary of State for Business [2016] EWHC 2581 (Admin)

work with Statutory Nature Conservation Bodies' (SNCBs) to resolve their concerns regarding potential uncertainty, where it is feasible and practical to do so.

1.2 Advice given by SNCBs during Statutory Consultation and the Evidence Plan Process

1.2.1.1 During the Statutory Consultation on the Mona Preliminary Environmental Impact Report (PEIR) and the Morgan Generation PEIR, Natural Resources Wales (NRW), Joint Nature Conservation Committee (JNCC) and Natural England did not consider it appropriate to base the cumulative (and hence also in-combination) assessments on a large number of 'unknowns' for impacts from many of the historical offshore wind projects. They outlined that, whilst these historic projects may not have undertaken quantitative assessments, or assessments using current approaches, estimates should be generated for these historic projects for which the extent of the impacts are unknown, in order to undertake meaningful CEA and in-combination assessments. NRW, JNCC and Natural England suggested this should be explored collaboratively through the offshore ornithology Expert Working Groups (EWG).

1.2.1.2 Similar consultation comments were received from Natural England and NRW on the Morecambe Generation PEIR. Natural England stated *'The cumulative (and in-combination) assessments do not factor in impacts from a number of other projects due to a lack of data. Unknown impacts have been treated as zero, which will inevitably underestimate impacts, potentially significantly. A qualitative assessment is mentioned for consideration of some projects, but this process is not detailed, or the results fully presented. Natural England consider this approach to be unacceptable, and hence consider it inappropriate to comment on the potential significance of cumulative (or in-combination) presented in the PEIR submission.'*

1.2.1.3 During the pre-application phases for the Projects, Natural England provided advice dated 12 October 2023 on 'gap filling' for historical offshore wind projects, where fully quantitative assessments have not previously been provided.

1.2.1.4 The Natural England advice sets out that AEOI could not be ruled out beyond reasonable scientific doubt for several species and Special Protection Area (SPA) combinations at Round 4 Irish Sea projects, in part due to a lack of appropriate consideration of impacts arising from pre-existing operational offshore wind farm projects. Natural England therefore considered that some estimate of impact must be attributed to all projects screened in to cumulative and in-combination assessments. The Natural England advice note recommended the following two step approach to estimate displacement and collision impacts from the relevant operational projects:

Displacement

1. Review the submitted environmental statement. It is accepted that displacement mortality estimates may not be presented. However, if there is abundance data, utilise this to populate project-specific displacement matrices for relevant species. We also suggest review of the Round 4 plan-level HRA to determine if any suitable estimates are presented therein.

If no abundance data available…

2. Use a nearby windfarm with a published estimate of mortality arising from displacement as a proxy. Scale this estimate according to the relative area of the two arrays and appropriate buffers.

Collision

1. Review the submitted environmental statement. It is accepted that collision mortality estimates may not be presented. However, if there is abundance data, utilise this to run project-specific CRMs according to current best practice for relevant species. We also suggest review of the Round 4 plan-level HRA to determine if any suitable estimates are presented therein.

If no abundance data available…

2. Use a nearby windfarm with a published estimate of mortality arising from collision as a proxy. Scale this estimate according to the relative number of turbines in the two arrays. The difference in the turbine specifications should be considered to determine if this method is likely to over or underestimate impact.

1.3 Applicants' approach to cumulative/in-combination assessments for historic projects

1.3.1 Cumulative displacement

1.3.1.1 The Applicants have used the Step 1 proposed by Natural England (advice of 12 October) in the CEA of the Projects' EIAs. Where possible, the Applicants have obtained abundance data from historical offshore wind farm projects from project-specific documentation (e.g. the original Environmental Statement).

1.3.1.2 The impacts using the obtained abundance estimates are presented in the CEA of the Projects' Environmental Statements as displacement matrices ranging from 1% to 100% mortality and 5% to 100% displacement.

1.3.1.3 Detailed qualitative assessments for historical offshore wind farm projects, for which a quantitative consideration of displacement impacts was not undertaken in project-specific documentation, are also presented in the CEA of the Projects' Environmental Statements.

1.3.1.4 The Applicants consider that Step 2 (utilising data from a nearby wind farm, as suggested by Natural England) is not appropriate. The data from a proxy offshore wind farm, which was collected over a specific spatial and temporal scale, cannot be applied to another offshore wind farm in another area, as conditions within the two areas may be very different. In addition, data associated with many of the projects, from which abundance estimate could be derived, have used survey methods that would no longer be considered robust enough to inform project-level assessments.

1.3.1.5 By adopting Step 1 proposed by Natural England, together with qualitative assessment of projects where no data is available, the Applicants consider that sufficient information is available without undertaking a 'gap-filling exercise' to allow a robust assessment of effect in the EIA.

1.3.2 Cumulative collision

1.3.2.1 The Applicants used part of the Step 1 proposed by Natural England (advice provided on 12 October) in the CEA of the Projects' Environmental Statements. Where possible, the Applicants have obtained collision mortality estimates from historical operational offshore wind farm projects from project-specific documentation (e.g. the original Environmental Statement).

1.3.2.2 Qualitative assessment of historical offshore wind farm projects, for which quantitative consideration of collision impacts was not undertaken in project-specific documentation, are also presented in the Projects' Environmental Statements.

1.3.2.3 The Applicants do not consider it appropriate to run project-specific collision risk models for historical offshore wind farm projects where this data is not available from those projects. Robust collision risk modelling relies on wind farm parameters and project specific abundances, something which is not available for historical projects if the information is not published.

1.3.2.4 Even if information or baseline data from other sources is available, the Applicants would note that there is no precedent for this type of exercise in the offshore wind industry to 'gap-fill' information from existing projects. The Secretary of State has been able to conclude that other such developments would not have an AEOI on European sites without similar information being provided, including the recently consented Awel-y-Môr offshore wind farm.

1.3.2.5 The Applicants consider that Step 2 (use a nearby windfarm with a published estimate of mortality arising from collision as a proxy) is not appropriate. Similarly to the displacement assessment, the data from a proxy offshore wind farm, which was collected over a specific spatial and temporal scale, cannot be applied to another offshore wind farm in another area.

1.3.2.6 The Applicants consider that sufficient information is available without undertaking a quantitative 'gap-filling exercise' and that the combination of quantitative and qualitative information is sufficient to allow a robust assessment of effect in the EIA.

1.3.3 In-combination in HRA (apportioning of displacement and collision)

1.3.3.1 For the HRAs, where possible, the Applicants have utilised apportioned impacts from publicly available, project-specific, documents or the Round 4 plan level HRA documentation within the in-combination assessments for the relevant SPAs and Ramsar sites. This approach is consistent with the approach taken for previous offshore wind farm projects consented in UK waters.

1.3.3.2 When a historical offshore wind farm project has presented a total impact (mortalities) and have apportioned this impact to a specific Ramsar site or SPA, these numbers have been presented. When a historical offshore wind project has presented a total impact (mortalities), but not presented quantitatively an apportioned impact, the total impact has been reviewed. If appropriate, the apportioned value (e.g. the proportion of the species which is likely to have come from a specific colony) from a nearby offshore wind farm which has presented an apportioned value, has been used as a proxy. For example, if West of Duddon Sands Offshore Wind Farm did not present an apportioning value, the apportioning value presented by Walney Extension 4 Offshore Wind Farm could be used. This is only appropriate during the breeding season. The use of proxy values is consistent with the approach taken for previous offshore wind farm projects in UK waters (e.g. the Hornsea Three offshore wind farm).

1.3.3.3 In non-breeding seasons, apportioning values may not have been calculated for SPAs or Ramsar sites in project-specific documentation for historical offshore wind farm projects considered in-combination. However, apportioning values for these seasons are readily calculated from Furness (2015)[3], where a value for total impact (mortalities) has been presented by the historical project. This approach has therefore been adopted by the Projects within the in-combination assessment and is consistent with

[3] Furness, R. (2015) Non-breeding season populations of seabirds in UK waters: Population sizes for Biologically Defined Minimum Population Scales (BDMPS). Natural England Commissioned Report. 164.

the approach taken for previous offshore wind farm projects in UK waters (e.g. East Anglia One North, East Anglia Two, Hornsea Three, Hornsea Four, etc.).

1.3.3.4 Where a historical offshore wind farm has not presented any quantitative data relevant to the in-combination assessment, a qualitative assessment has been undertaken. In addition to the conclusions of historic projects' assessments (where relevant), this considers the relative scale of the historic project, its potential connectivity (e.g. across-sea distance) to the Ramsar site or SPA, and other factors that may affect the likelihood that the historic project would impact the relevant qualifying features.

1.3.4 Consideration of timeframe of historical project

1.3.4.1 Within the Natural England advice (provided on 12 October) it states:

"*some OWFs screened into the assessments may be nearing end-of-life with limited (or no) overlap with the proposed project. It would be appropriate to consider timelines and determine if any of these sites can be screened out".*

1.3.4.2 The Applicants have considered the project lifecycle (i.e. construction, operation and maintenance and decommissioning) of each relevant historical offshore wind project within the UK Western Waters (and Channel) BDMPS region that may act cumulatively or in-combination with the Projects. Those historic projects with lifecycles that have no overlap with the timeframes for the Projects were removed from the CEA or in-combination assessment. Three offshore wind farms (Arklow Bank Phase 1, Barrow and North Hoyle) with end of life pre-2030 were excluded from the CEA and in-combination assessment.

1.4 Conclusions

1.4.1.1 The Applicants consider the methodology presented in this note to be precautionary and robust for assessing impacts from historic offshore wind farm projects, using the best available scientific information with appropriate consideration of the Natural England advice.

1.4.1.2 The approach proposed provides an understanding of the cumulative or in-combination impacts stemming from these historic offshore wind farm projects, thereby enabling a suitable assessment of the risks associated with significant effects or AEOI with greater certainty.

1.4.1.3 The approach presented is also consistent with the approach taken for previous offshore wind farm projects in UK waters (see examples provided above). The Applicants would note that there is no precedent in the offshore wind industry to 'gap-fill' information from existing projects. The Secretary of State has been able to conclude that other developments would not have an AEOI on European sites without similar information being provided, including the recently consented Awel-y-Môr offshore wind farm.

D.9. Offshore ornithology EWG agreement log

Morgan Generation Assets Agreement Log for the Offshore Ornithology Expert Working Group

Item	Meeting Date	Issue on which agreement is sought	Consultee	Progress of agreement in the EWG	Agreement?	Notes
1	18/02/2022	Agreement on the Remit and Inputs to the EWG (as set out in Section 4.4 of the Evidence Plan Template).	NRW	NRW Advisory (A) agree in principle to the remit and inputs to the EWG, although, as stated previously, NRW (A) needs to be able to carefully consider, plan and manage our resources at all times and as such we can only commit to the Evidence Plan Process on a 'best-endeavours' basis. It should also be noted, that the Evidence Plan process falls under our Discretionary Advice Service – whilst we aim to meet demand for the service, there may be times when our capacity to do so is limited. In those instances, we reserve the right to not offer the service. NRW (A) would like to clarify in Section 3.1.1.3 Natural Resources Wales Advisory within the Evidence Plan Template that JNCC remain the statutory consultee for Welsh waters beyond 12 nm, but we will endeavour to align our advice where possible.	Agreed	NRW (A) will endeavour to 'agree' the points outlined in Section 4.4 where possible, but as acknowledged within the Evidence Plan process, it may not always be possible to reach full agreement between all parties. Where agreement is not reached, NRW (A) will advise according to our remit and clearly outline our reasoning. Similarly, in the second to last bullet point in Section 4.4.1, it may not be possible to 'ensure' the effects are reduced to an acceptable level. It should be noted that any advice that we provide is advisory only and will not be binding, or in any way restrict NRW in performing its statutory functions. All advice provided by NRW will be based on the information that has been made available to us, and policies that are in place at that time.
			JNCC	JNCC should be included in any Offshore and Coastal Ornithology EWG meetings as outlined in table 4.6 of the Evidence Plan Template. JNCC have been included in the equivalent table in the meeting presentation of 18/02/2022, but the evidence plan should be updated to reflect this.	Agreed	none
			Natural England	Natural England provided comment on the draft Evidence Plan, via a comments log, on 4 November 2021. It was our view that the Evidence Plan set out the basic framework of the Evidence Plan. This was ahead of the 1st Evidence Plan meeting on 16 November 2021. We welcome the update of the Evidence Plan (version F02, provided 4 February 2022) which has incorporated our earlier comments. The remit of the Offshore Ornithology as set out under 4.4 of the Evidence Plan (v F02) is appropriate and in line with Natural England's previous comments, we agree the remit as set out. We welcome the outlined timetable of future meetings as presented in Table 4.6 to enable resource planning. We would advise that consistency is used in reference to the name of this EWG; it has been referred to as Offshore, Offshore and Coastal and simply Ornithology EWG. We recommend that Ornithology EWG would be most appropriate if discussions which include the intertidal, and potentially inland along cable corridors, ornithology aspects are to be discussed going forward.	Agreed	none
2	18/02/2022	Agreement on Ways of Working document, including timescales.	NRW	NRW (A) agree in principle to the Ways of Working document and the timescales for responding, although we reiterate that more time may be required for a response if there are large / multiple documents or due to unforeseen circumstances. Where deadlines cannot be reached, NRW (A) will notify RPS / bp / EnBW as soon as possible. As above, NRW (A) can only commit to the Ways of Working on a 'best endeavours' basis and reserve the right to not offer our Discretionary Advice Service at times when our capacity to do so is limited.	Agreed	none
			JNCC	Agreed	Agreed	none
			Natural England	We welcome the Evidence Plan Ways of working document (version F01, provided 4 February 2022) as a clear reference document. Natural England agrees with the Ways of Working document which aligns with previous comments in terms of timescales for review and comment provided as part of our comments on the draft Evidence Plan (4 November 2022). As noted in the document, it may be necessary for timescales to be amended to ensure sufficient time to review and comment (e.g. large documents or multiple documents), in which case we will communicate and agree an alternative deadline.	Agreed	none
3	18/02/2022	Agreement on broad approach to aerial surveys.	NRW	NRW (A) agree with the broad approach to aerial surveys.	Agreed	Apologies that NRW Advisory were unable to attend the initial Ornithology EWG due to unforeseen circumstances. Based on the information provided in the PowerPoint presentation and the meeting minutes, NRW Advisory are broadly in agreement with the approach to aerial surveys, but we note the comments raised during the meeting and welcome the opportunity to review further detail of the aerial surveys within the upcoming Scoping Report, to confirm agreement.
			JNCC	We agree with some of the broad aspects of the approach to aerial surveys, based on what we understand this approach to be. We agree with the broad approach to aerial survey, as we understand it, with regards to the use of digital aerial surveys, a grid-based sampling design, monthly surveys, and the use of a 10km buffer to east, south, and west and a 4km buffer to north for Mona. We do not have sufficient details to be able to agree with a flight altitude of 396m stated in the minutes of the 18/02/2022 meeting. Rational for this flight altitude would need to be provided with evidence to show that such a flight altitude would not disturb species sensitive to disturbance. We would require more detail before confirming agreement on any other aspect of the aerial surveys.	Agreed	none

			Natural England	Update 06/07/2023: As commented within Natural England's PEIR response, Natural England's comment on the Ornithology sections was to add CVs to all applicable data presented to demonstrate the level of precision obtained by analysing 12% of the sea surface. It was also noted that the consultation log stated a power analysis remains under consideration.	Agreed	We agree with the survey method set out for the aerial surveys, as set out for the area covered and frequency of coverage, as well as the grid based design and a 12% surface analysis coverage. Natural England agree with the survey method presented for the intertidal and nearshore waterbird surveys, which align with our previous advice (our reference 362549 and 374171, provided 25 August 2021 and 12 November 2021 respectively). As previously stated, we would welcome further discussion regarding the potential continuation of these surveys to cover May to July inclusive so as to cover any passage waders. Once there has been further refinement on the Points of Interconnection for the cables, we would welcome further discussion or update on any changes to the locations for these surveys. As raised in the meeting, we would highlight the risk assessment based on the desk based study where surveys have not been planned, i.e. along the cable route between the array Zone of Influence and the intertidal survey areas. This risk assessment should be considered on the age of the data used. Natural England have commissioned a report using existing data to analyse the abundance and distribution of bird features of Liverpool Bay SPA, this report has not yet been published. Once it is finalised we will be able to provide a copy, this may be useful towards your desk based study although may still be limited due to age of data. We recognise the aim to publish the Preliminary Environmental Information Report (PEIR) for formal consultation in early 2023. This would only allow for one full year of overwintering intertidal bird survey data (surveys starting in winter 2021) to be presented, and for the Morgan sites it is unlikely that the full 24 month survey effort will be completed or data analysed. Natural England highlight the risk that the additional data collection could have potential to change the conclusions, which could cause potential delays to the project. Natural England have previously advised (Natural England reference: DAS/UDS A000566 / 374171, dated 12 November 2021) that two years of survey effort is the minimum expected evidence standard for bird data, and seeks confirmation that the timetable set out for DCO submission allows for this evidence standard.
			RSPB	RSPB request more detail than presented in the outline in these slides to be able to provide agreement on approaches. The RSPB would not be able to agree the survey methodology without further detail, the RSPB has not been party to the discussion that have gone on previously on the survey methodology.	Under discussion	none
			JNCC	The approach to intertidal surveys is not within remit of JNCC.	n/a	none
5	18/02/2022	Agreement on broad approach to characterisation for the export cable corridor using desktop data sources only.	NRW	NRW Advisory agree with the broad approach to characterisation for the export cable corridor.	Agreed	Apologies that NRW Advisory were unable to attend the initial Ornithology EWG due to unforeseen circumstances. Based on the information provided in the PowerPoint presentation, the meeting minutes and previous discussions on the Intertidal and Nearshore Waterbird Survey Methodology, NRW Advisory are broadly in agreement with the approach to the characterisation for the export cable corridor, but we note the comments made with regards the suitability of using desktop data sources alone and welcome the opportunity to review further detail / support for this approach within the upcoming Scoping Report.
			JNCC	We agree with the approach to begin the assessment on export cable corridor using desktop data sources, with the understanding that an assessment will be made of the suitability of the data as the sole source of information, and consideration of the requirement for further survey based on the outcomes of the initial desktop data investigation.	Agreed	none
			Natural England	none	Agreed	The approach to the baseline characterisation, using site-specific data and contextualisation from wider reports and evidence, as set out in the Ornithology EWG meeting is supported. We welcome the data sources listed and again refer to the currently unpublished report, which may be of use to be incorporated to contextualise the primary data collection. Natural England have set up a SharePoint Online (SPOL) site to share Natural England's advice on the environmental considerations and use of data and evidence to support offshore wind and cable projects in English waters. Advice provided on this site includes Natural England and Joint Nature Conservation Committee (JNCC)'s shared advice on 'Nature conservation considerations and environmental best practice for subsea cables in English inshore and UK offshore waters.'
6	13/07/2022	Agreement on the approach to baseline characterisation as set out in the Morgan Mona baseline characterisation technical paper	JNCC	We agree with the approach to baseline characterisation as set out in the Morgan Mona baseline characterisation technical paper and as discussed in the EWG meeting on 13th July 2022.	Agreed	
			Natural England	Update 06/07/2023: As commented within Natural England's PEIR response, Natural England's comment on the Ornithology sections was to add CVs to all applicable data presented to demonstrate the level of precision obtained by analysing 12% of the sea surface. It was also noted that the consultation log stated a power analysis remains under consideration.	Agreed	Natural England have no further comments to those set out in our advice letter (our reference: 393974) on the Baseline Characterisation technical paper (dated 7 June 2022) provided by RPS. We note from discussions at the Offshore Ornithology EWG Meeting 2 (EWG02) that the designs to be presented at the Preliminary Environmental Information Report (PEIR) will not be a sited design and therefore some aspects raised in our advice will be considered at a future stage in the project (e.g. cold spotting/ hot spotting). We note that there was an action from the EWG02 for RPS and the applicant to discuss the possibility of additional analysis of survey images to ensure variability is being captured across the survey area. We await further information regarding the outcomes of these conversations in regard to our recommendation of power analysis to demonstrate that survey coverage is appropriate.
7	13/07/2022	Agreement on the approach to displacement as set out in the morgan Mona Displacement techncial paper, taking into account clarifications to be provided by SNCBs.	JNCC	We agree with the approach to displacement as set out in the Morgan Mona Displacement techncial paper, taking into account our previous written comments on the displacement technical paper (24/06/2022), and comments during the EWG meeting on 13th July 2022 and subsequent comments.	Agreed	

			Natural England	Update 06/07/2023: As commented within Natural England's PEIR response, Natural England will not comment on kittiwake displacement, or consider combined collision and displacement impacts for that species.	Agreed	Natural England has previously provided a response to the Morgan and Mona Displacement technical paper (dated 24 June 2022, our ref: 394421). Following on from the discussions in the EWG02, Natural England additionally do not recommend that displacement is assessed for kittiwake as we currently consider the evidence base to be insufficient and suggestive of inconsistent responses to Offshore Wind Farms (OWFs). If the project chooses to assess kittiwake for displacement effects we advise that it is not acceptable to reduce the densities considered in collision risk modelling. At this stage in the assessment Natural England recommend that full displacement matrices are presented, for all species excluding kittiwake. An investigation into the range of levels of displacement and mortality rate that would lead to an adverse effect would then enable discussion around the likelihood of impacts occurring. Natural England considers that the formulation of appropriate mortality rates to be used in defining the estimated impact should be guided by site-specific sensitivity for each species. Natural England advise that a combined estimate of birds on the water and in flight is used to assess displacement of Manx shearwater.
8	13/07/2022	Agreement to the approach to sCRM as discussed in the EWG02 meeting, which superceed the Morgan Mona CRM technical paper following the NE advice.	JNCC	We agree with the approach to sCRM as discussed in the EWG02 meeting, which superceed the Morgan Mona CRM technical paper following the NE advice, taking into account our previous written comments on the CRM technical paper (24/06/2022), and comments during the EWG meeting on 13th July 2022 and subsequent comments.	Agreed	
			Natural England	-	Agreed	The parameters presented in the email from [redacted], RPS (email dated 26 July 2022, with references provided by email 10 August 2022) appear to be suitable for the species covered. Natural England reiterate that we believe it is of limited value to model CRM for these species. Johnston et al. (2014)1 flight curves for these species indicate a very low risk of collision. If new evidence (e.g. from tagging studies) on flight height can be presented and considered that would significantly alter the expected outputs, Natural England would encourage investigation of this. If CRM is to be undertaken a novel approach may be more appropriate considering these species might be most at risk of collision with the turbine bases, although we note again that very low levels of collision would be expected. Natural England are not currently able to share the draft CRM parameters which were provided in draft to support RPS's progression of work on the project with the wider EWG members and therefore request that the information we shared with the project team (email dated 7 July 2022, sent by [redacted] is treated as not for further dissemination. Our draft guidance has been provided to the Marine Industry Group for Ornithology for review. Once approval has been received other interested parties may have access to the final guidance, as required. We note that Natural Resources Wales and the Joint Nature Conservation Committee have received this information as members of the Marine Industry Group for Ornithology. We advise that the project proceed with presenting the rates and reference as draft Natural England guidance until the guidance has formally been published. We will provide an update when the guidance has been published.
9	13/07/2022	Agreement on the approach to identification of sites and features in the LSE Screening as set out in the slide pack for the EWG02. Note for Steering Group members, this will be agreed via the Steering Group.	JNCC	Comments provided via the steering group	Agreed	
			Natural England	Update 06/07/2023: Natural England are satisfied that the two-stage process to the appropriate assessment is sensible due to the projects potential connectivity with a large number of designated sites with an expectation that the likelihood of substantial impacts is low. However, we note that this approach might not always be appropriate for all projects. We retain two major concerns relating to the methodology described in the update document. 1.Screening of non-breeding season impacts is not mentioned. The BDMPS should be used to identify potential connectivity and screen in relevant sites for assessment. 2.Project alone impacts resulting in <1% increase in baseline mortality are screened out of in-combination assessment. Natural England advise that this approach is not acceptable and these impacts should be considered in-combination. Natural England also highlight that step 1 of the integrity test makes a high-level assessment against the conservation objectives, but relies solely on magnitude of increase in baseline mortality as a 'test' against which to conclude no AEOI, or move on to step 2. Given the project location, this approach is likely fine. However, we note that for assessment against conservation objectives that are not linked to the abundance of features (e.g. distribution of features within the site or availability of habitat) this would not be satisfactory.	Agreed	As set out in the Evidence Plan Steering Group Meeting 3 (held on 20 July 2022) the ornithology approach is only broadly described, and will be reviewed at a future date once work has been carried out on the baseline characterisation, CRM and displacement modelling. At present Natural England does not have any further comment to make, and will provide further comment at a future date once further detail is available.

10	30/11/2022	Agreement on approach to LSE Screening using outputs for collision risk modelling, displacement assessment and associated apportioning paper.	Natural England	Natural England advise that LSE should be treated as a coarse screening filter to identify all instances of qualifying features with potential protected site connectivity and an impact pathway. If significant (possible) effects cannot be excluded on the basis of objective information without extensive investigation, further assessment should be presented in an Appropriate Assessment. Natural England appreciate the desire to reduce the burden of documentation, but consider that the overall information supplied essentially remains unchanged. Natural England does not agree that it is appropriate to screen species/sites out of LSE based on a <1% increase in baseline mortality. It should also be noted that Natural England also does not consider the use of de minimis to be appropriate for screening impacts out of consideration for in-combination assessments.	Agreed	
11	02/11/2023	Agreement on the provision, scope and results of the Power analysis	Natural England	Natural England welcome the Applicants power analysis using baseline survey data to ensure an appropriate level of survey coverage and data analysis has been achieved. We consider the methods employed to be adequate, essentially comparing theoretical baseline and impacted areas to determine how many birds would need to be sampled to achieve suitable power to detect desired effect sizes. We are in agreement with Applicant that the results suggest that the survey coverage and data analysis undertaken are appropriate for establishing a baseline to be considered for EIA and HRA."	Agreed	
			JNCC		No comments in agreement log	
			NRW	NRW(A) welcome the power analysis work that has been undertaken for Mona/Morgan of using baseline survey data to ensure an appropriate level of survey coverage and data analysis has been achieved. We consider the approach taken to be adequate, essentially comparing theoretical baseline and impacted areas to determine how many birds would need to be sampled to achieve suitable power to detect desired effect sizes. The work undertaken does provide some confidence that the surveys conducted are fit for purpose in terms of baseline characterisation for consideration in EIA and HRA	Agreed	
12	02/11/2023	Agreement on the methodology used to improve auk ID rates	Natural England		Agreed	
			JNCC		Agreed	
13	02/11/2023	Agreement on approach to CRM for migratory seabirds	Natural England		Agreed	
			JNCC		Agreed	
14	02/11/2023	Agreement on approach to estimating regional breeding populations	NRW	NRW Advisory (A) note that the BDMPS report (Furness 2015) and proportions of immatures presented in the Tables within Appendix A of this report are calculated with respect to the non-breeding seasons and not the breeding season. We do not think the approach suggested by the Mona/Morgan Applicants is valid as it cannot be assumed that the distribution and origin of immature birds is the same in the breeding season compared to the non-breeding season. NRW (A) do not advise that the non-breeding season proportions in Furness (2015) are in any way applicable to the breeding season – either for adults or immatures. Additionally, we note that the proposal to use the number of breeding adults within foraging range of a project would not be appropriate for cumulative assessment given that other projects could be impacting other parts of the wider population. NRW (A) acknowledge that there are potential issues associated with the approach and figures we provided for calculations of breeding season BDMPS figures. However, this requires a lot more consideration and work (which is currently being undertaken by an SNCB task and finish group) and hence in the meantime we recommend that Mona/Morgan take the approach we have previously outlined for breeding season BDMPS figures (i.e. to sum the adult and immature population estimates for all colonies that sit within the relevant species specific BDMPS scale, e.g. UK western waters) and assess the annual predicted EIA impacts against the largest seasonal BDMPS figures as previously advised.	Under discussion	Update 19/01/2024 - NRW (A) agree to disagree on the alone regional breeding populations. However NRW (A) don't consider this issue to be relevant to Welsh designated sites. We therefore advise the applicant seeks agreement from NE on this matter given the project is located wholly in English Waters.
15	02/11/2023	Agreement on approach to cumulative assessment for projects where impact magnitudes are unavailable	Natural England	Letter 27/07/23 : Natural England have secured funding for a project to quantify displacement and collision impacts from all relevant extant offshore wind farms using contemporary assessment methods projects. We anticipate the project can prioritise the assessment of Irish Sea projects to facilitate a more comprehensive cumulative and in-combination assessment of relevant Round 4 and Round 5 projects. Natural England will keep the Applicant up to date as far as possible in terms of timelines and outputs from this work, and their potential application for the assessments of the Morgan and Mona OWFs. Given the accelerated timelines for submission, this project may not deliver data to enable gap-filling of relevant impacts in time for the cumulative effects assessment. Thus, Natural England would welcome further discussion and consideration of this issue through the EWG. A qualitative assessment/consideration of unknown impacts may be an appropriate compromise.	Under discussion	

			JNCC		No comments in agreement log	
			NRW	Updated 19/01/2024 - Following EWG07, we understand that the Applicant will be providing an update on the response to the advice from Natural England regarding how to incorporate historic offshore wind projects into the cumulative and in-combination assessments. We await this document from the Applicant before we can comment further as per MoM for EWG07.	Under discussion	
17	02/11/2023	Agreement on proposed foraging ranges to be used in EIA and for apportioning impacts to designated sites	Natural England	Letter 27/07/23: Natural England have discussed and agreed the approach for species-specific foraging ranges and calculation of EIA breeding populations with JNCC and NRW, which we understand have now been supplied to the Applicant. We welcome further discussion through the EWG if required.	Agreed	
			JNCC	Letter 27/07/23: JNCC agrees with the proposed foraging ranges as listed in the EWG05 minutes.	Agreed	
			NRW	Updated 19/01/2024 - NRW (A) have discussed and agreed the approach for species-specific foraging ranges and calculation of EIA breeding populations with JNCC and NE, which we understand have now been supplied to the Applicant. We agree with the proposed foraging ranges as listed in the EWG05 meeting minutes	Agreed	
18	19/10/2023	There will be no significant effects on ornithology receptors in EIA terms for the project alone.	Natural England		No comments in agreement log	
			JNCC		No comments in agreement log	
			NRW	Updated 19/01/2024 - As the Morgan generation assets project is located wholly in English waters, NRW's primary area of interest for offshore ornithology for this project is on impacts to Welsh designated sites. Therefore, we will not be providing comment on the significance of effects from the project at EIA scale.	Under discussion	
19	19/10/2023	There will be no adverse effects on integrity on SPAs with ornithology features for the project alone.	Natural England	Natural England consider this likely, but can not draw any firm conclusions until we h	Under discussion	
			JNCC		No comments in agreement log	
			NRW	Updated 19/01/2024 - Whilst the numbers look low based on the updates presented during the EWGs, NRW (A) cannot agree without seeing the full application	Under discussion	
20	19/10/2023	There will be no significant effects on ornithology receptors in EIA terms for the project cumulatively with other plans and projects.	Natural England	Natural England consider this likely, but can not draw any firm conclusions until we h	Under discussion	
			JNCC		No comments in agreement log	
			NRW	Updated 19/01/2024 - Awaiting update from the Applicant regarding how they will incorporate historic projects into the cumulative assessments. However, NRW (A) will not be able to agree to any levels of significance without seeing the full application	Under discussion	
21	19/10/2023	There will be no adverse effects on integrity on SPAs with ornithology features for the project in-combination with other plans and projects.	Natural England	Natural England consider this likely, but can not draw any firm conclusions until we h	Under discussion	
			JNCC		No comments in agreement log	
			NRW	Updated 19/01/2024 - Awaiting update from the Applicant regarding how they will incorporate historic projects into the in-combination assessments. However, NRW (A) will not be able to agree to any levels of significance without seeing the full application	Under discussion	
22	19/10/2023	The mitigation and management measures are appropriate to ensure significant effects and AEOI are avoided for marine ornithological receptors.	Natural England	Natural England consider this likely, but can not draw any firm conclusions until we h	Under discussion	
			JNCC		No comments in agreement log	
			NRW	Updated 19/01/2024 - NRW (A) will need to see full application before we can agree.	Under discussion	
23	19/10/2023	Liverpool Bay - It is agreed that a restriction on cabling activities will be used to avoid the period of November to March.	Natural England	Natural England consider this likely, but can not draw any firm conclusions until we h	Under discussion	
			JNCC		No comments in agreement log	
			NRW	Updated 19/01/2024 - NRW (A) recommend the applicant checks the relevance of this point for Morgan Generation Assets, as the offshore expert cable is to be covered by Morgan and Morecambe Transmission assets.	Under discussion	
24	19/10/2023	Use of the latest species-specific avoidance rates from Ozsanlav-Harris *et al.* (2023) in the non-migatory CRM.	Natural England	Natural England are content with the approach suggested at EWG07	Agreed with caveats	
			JNCC		No comments in agreement log	
			NRW	Updated 19/01/2024 - We note that previous advice sent to the Applicant by NE has been to use species-group avoidance rates. Formal advice will be out soon but will be almost identical to advice previously given. May need to agree to disagree. However, we would be happy for impact for both species group and species-specific rates to be presented. During EWG07, the Applicant confirmed that both rates would be presented and any impact over 1% of baseline mortality (from either avoidance rate) would be investigated further using PVA for the project alone and cumulatively. If this is done, NRW (A) are content with this approach	Agreed	