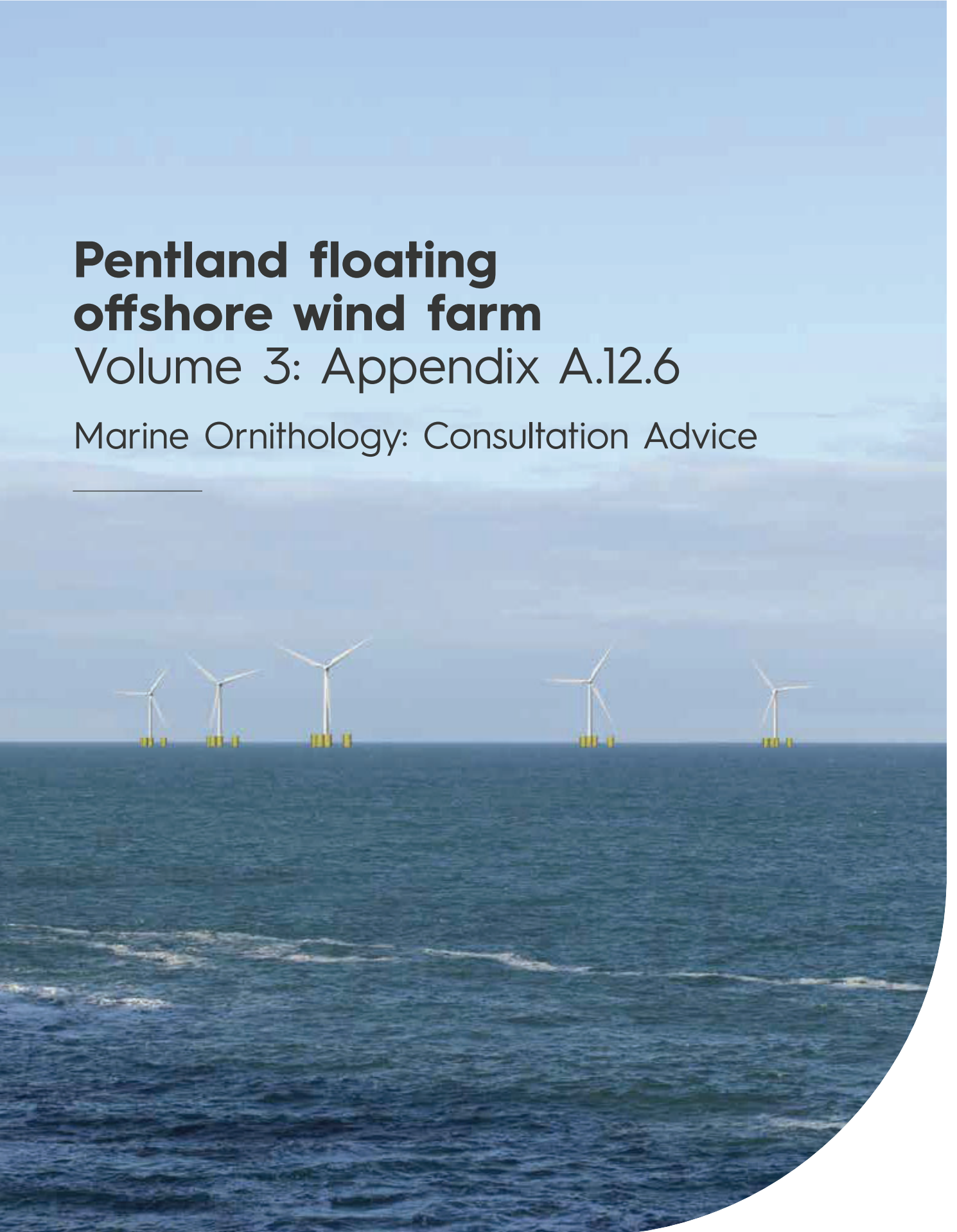


# Pentland floating offshore wind farm

## Volume 3: Appendix A.12.6

Marine Ornithology: Consultation Advice

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## OFFSHORE EIAR (VOLUME 3): TECHNICAL APPENDICES

### APPENDIX 12.6: MARINE ORNITHOLOGY CONSULTATION ADVICE

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**Pentland Floating Offshore Wind  
Farm: Marine Ornithology  
12.6 Technical Appendix –  
Consultation Advice**

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5	09/08/2022	Final report

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## Acronyms and abbreviations

Acronyms / abbreviation	Full name
BDMPS	Biologically Defined Minimum Population Scales
BTO	British Trust for Ornithology
CEH	Centre of Ecology and Hydrology
COP	Copenhagen Offshore Partners
CRM	Collision Risk Modelling
DDC	Dounreay Demonstration Centre
EIA	Environmental Impact Assessment
EIAR	Environmental Impact Assessment Report
ES	Environmental Statement
ESAS	European Seabirds at Sea
HDD	Horizontal Directional Drilling
HIE	Highlands and Islands Enterprise
HRA	Habitats Regulations Appraisal
HWL	Highland Wind Limited
JNCC	Joint Nature Conservation Committee
km	Kilometre
LSE	Likely Significant Effect
m	Metre
MERP	Marine Ecosystems Research Programme
MM	Mean Maximum
MS	Marine Scotland
MS-LOT	Marine Scotland Licensing Operations Team
MSS	Marine Scotland Science
NB	<i>Nota bene</i> meaning 'please note'.
NCA	Nature Conservation Appraisal
NE	Natural England
NS	NatureScot
OECC	Offshore Export Cable Corridor

<b>Acronyms / abbreviation</b>	<b>Full name</b>
PFOWF	Pentland Floating Offshore Wind Farm
pSPA	Potential Special Protection Area
PVA	Population Viability Analysis
RIAA	Report to Inform the Appropriate Assessment
RSPB	Royal Society for the Protection of Birds
sCRM	Stochastic Collision Risk Modelling
SD	Standard Deviation
SMP	Seabird Monitoring Programme
SNCB	Statutory Nature Conservation Bodies
SNH	Scottish Natural Heritage (now NatureScot)
SPA	Special Protection Area
SSSI	Site of Special Scientific Interest
UK	United Kingdom
UXO	Unexploded Ordnance

## I Introduction

- 1 Scoping and consultation have been ongoing throughout the pre-application stage for the Pentland Floating Offshore Wind Farm (PFOWF) Array and offshore export cable(s), hereafter referred to as the 'Offshore Development', both in relation to Environmental Impact Assessment (EIA) and to Habitats Regulations Appraisal (HRA).
- 2 This Technical Appendix (Offshore Environmental Impact Assessment Report (EIAR) (Volume 3): Technical Appendix: 12.6: Marine Ornithology: Consultation Advice) provides the full consultation log capturing all the pre-application advice in relation to Marine Ornithology in respect of the Offshore Development, including the Scoping Opinion issued by Marine Scotland Licensing Operations Team (MS-LOT, 2021) on behalf of Scottish Ministers, the Scoping Opinion Addendum (MS-LOT, 2022a) and the Screening Opinion (MS-LOT, 2022b), as well as other associated consultation advice from Marine Scotland Science (MSS), NatureScot (NS) and Royal Society for the Protection of Birds (RSPB) Scotland.
- 3 Consultation through the pre-application stage has been organised by Xodus with technical support on Marine Ornithology provided by HiDef Aerial Surveying Limited (HiDef).
- 4 The following list of pre-application engagement provides an overview of all the key consultation activities carried out in relation to Marine Ornithology:
  - 16 December 2020: Scoping Report (HWL, 2020) submitted for consultation.
  - 24 March 2021: Marine Ornithology stakeholder meeting with NS.
  - 16 April 2021: Marine Ornithology stakeholder meeting with MSS.
  - 19 August 2021: HiDef paper on proposed assessment methodology for Marine Ornithology.
  - 28 September 2021: MS-LOT issue the Scoping Opinion (MS-LOT, 2021) with appendix of stakeholder advice and consultation responses including those from MSS, NS and RSPB Scotland.
  - 4 November 2021: Marine Ornithology stakeholder meeting with MS-LOT, MSS, NS and RSPB Scotland.
  - 19 November 2021: RSPB Scotland advice on study area buffer, survey duration, apportioning, and tern species.
  - 24 November 2021: MSS / NS advice on survey duration, Special Protection Area (SPA) connectivity, breeding season apportioning.
  - 6 December 2021: RSPB Scotland advice on storm petrel, rates of displacement and mortality, combining collision risk and displacement, population modelling and cumulative assessment.
  - 7 December 2021: MSS / NS advice on rates of displacement and mortality, combining collision risk and displacement, apportioning in the non-breeding season.
  - 14 December 2021: HiDef paper on apportioning approaches during the breeding season.



- 16 December 2021: Marine Ornithology stakeholder meeting with MS-LOT, MSS, NS and RSPB Scotland.
- 22 December 2021: Request for Scoping Opinion. Pentland Floating Offshore Wind Farm EIA Scoping Report Addendum (HWL, 2021) submitted for consultation.
- 21 January 2022: NS provide references on auk wintering attendance.
- 2 February 2022: Nature Conservation Appraisal (NCA) Screening Report (HWL, 2022) submitted for consultation.
- 16 February 2022: HiDef paper on Marine Ornithological cumulative / in-combination assessment relevant to both EIA and HRA processes.
- 21 February 2022: Marine Ornithology stakeholder meeting with MS-LOT, MSS, NS and RSPB Scotland to discuss scope of cumulative impact assessment.
- 31 March 2022: MS-LOT response confirming MSS (30 March 2022) and NS (18 March 2022) advice on use of MS Apportioning Tool and SeaBORD modelling.
- 9 May 2022: Confirmation from the Joint Nature Conservation Committee (JNCC) on the correct colony counts for kittiwake, guillemot, razorbill and puffin and North Caithness Cliffs SPA.
- 16 May 2022: MS-LOT issue the Scoping Opinion Addendum (MS-LOT, 2022a) including stakeholder advice and consultation responses from MSS, NS and RSPB Scotland.
- 25 May 2022: MS-LOT response confirming MSS / NS advice on use of a conversion factor for auks in SeabORD displacement modelling.
- 17 June 2022: MS-LOT issue the Screening Opinion for HRA (MS-LOT, 2022b) including stakeholder advice and consultation responses from MSS, NS and RSPB Scotland.
- 23 June 2022: Confirmation from Highlands and Islands Enterprise (HIE) that the survey report and associated data for the Dounreay Demonstration Centre (DDC) is publicly available and can be shared for use in relation to the Offshore Development.

5 Table 1 presents the full consultation log of regulatory and stakeholder advice relevant to Marine Ornithology and indicates where it has been addressed in the Offshore application. EIAR Chapter and appendix titles are shortened as follows for ease of reading in Table 1:

- Offshore EIAR (Volume 2) Chapter 12: Marine Ornithology shortened to '*the EIAR Chapter*'.
- Offshore EIAR (Volume 3) Technical Appendix 12.1 Marine Ornithology: Baseline Data shortened to '*Technical Appendix 12.1: Baseline Data*'.
- Offshore EIAR (Volume 3) Technical Appendix 12.2 Marine Ornithology: Connectivity and Apportioning shortened to '*Technical Appendix 12.2: Connectivity and Apportioning*'.
- Offshore EIAR (Volume 3) Technical Appendix 12.3 Marine Ornithology: Collision Risk Modelling shortened to '*Technical Appendix 12.3: Collision Risk Modelling*'.
- Offshore EIAR (Volume 3) Technical Appendix 12.4 Marine Ornithology: Displacement Analysis shortened to '*Technical Appendix 12.4: Displacement Analysis*'.
- Offshore EIAR (Volume 3) Technical Appendix 12.5 Marine Ornithology: Population Modelling shortened to '*Technical Appendix 12.5: Population Modelling*'.

**Table 1 Consultation advice relating to Marine Ornithology and how this has been addressed in assessment**

Consultee	Headline	Comment / Issue Raised	Offshore Development Approach and Section ID
<b>Scoping Opinion</b>			
MS-LOT (on behalf of Scottish Ministers)	HRA screening	The Scottish Ministers recommend that the Developer submits a Habitats Regulations Appraisal (“HRA”) screening report at the earliest opportunity and prior to the submission of the EIA Report. The Scottish Ministers note that it is the Developer’s intention to carry out an HRA alongside the EIA Report, however, advise that this is submitted as soon as possible taking into account the representations provided by the consultees at the scoping stage. The Scottish Ministers highlight that any application should incorporate a full HRA, further guidance can be provided on this iterative process if required by the Developer.	A NCA Screening Report (HWL, 2022) was submitted for consultation on 2 February 2022 and the Screening Opinion (MS-LOT, 2022b) was received on 17 June 2022. The advice thus received has been incorporated into the Report to Inform the Appropriate Assessment (RIAA) which provides assessment of impacts on SPA qualifying interests.
MS-LOT (on behalf of Scottish Ministers)	Baseline including surveys	With regard to the proposed study area, the Scottish Ministers advise that the EIA Report must include sufficient justification for the use and appropriateness of a 2 km buffer area in light of the emerging standing guidance for a 4 km buffer. The Developer should also undertake a baseline characterisation of the export cable landfall area and proposed export cable corridor in line with MSS advice. In addition, the Scottish Ministers assume that the Developer intended to refer to the proposed study area as the Offshore Study Area rather than “the Marine Licence area...” and that this was done in error.	The digital aerial survey work and proposed survey design (the same design as had been used for the Dounreay Tri project including a 2 km buffer) was discussed at a meeting on 4 June 2020 prior to surveys commencing later in the year (September 2020). No objections were received on the proposed approach and therefore work commenced on this basis using the 2 km buffer.  In their scoping consultation advice, released to Highland Wind Limited

Consultee	Headline	Comment / Issue Raised	Offshore Development Approach and Section ID
MS-LOT (on behalf of Scottish Ministers)	Baseline including surveys	With regard to the baseline surveys, the Scottish Ministers highlight the representations by NatureScot, RSPB Scotland and MSS and advise that the Developer must provide a sufficient and scientifically robust justification for deviating from the normal	<p>(HWL) in advance of the formal Scoping Opinion (MS-LOT, 2021), both NS and RSPB Scotland indicated that they would advise the survey buffer is extended to 4 km. This was done for all remaining surveys in the programme from April 2021 to August 2021, covering the main breeding period for seabirds.</p> <p>Use of a 4 km survey buffer was discussed at the meeting held on 4 November 2021; MSS / NS agreed to the adequacy of the survey work by email, 24 November 2021.</p> <p>The Project has also reduced the footprint of the proposed wind farm area by 50%, this has therefore meant that the survey area extends beyond the 2 km buffer applied to the submitted PFOWF Array Area (for the data re-analysis).</p> <p>Baseline characterisation of the Offshore Export Cable Corridor (OECC) and cable landfall is presented in Section 12.4.4.14 of the EIAR Chapter.</p>
			<p>Available survey data was discussed at the meeting held on 4 November 2021 where it was proposed to use the 2015 Dounreay Tri data in combination with</p>

Consultee	Headline	Comment / Issue Raised	Offshore Development Approach and Section ID
MS-LOT (on behalf of Scottish Ministers)	HRA screening	<p>best practice approach to not undertake two full years of surveys. The Scottish Ministers highlight the MSS advice that the site may have adequate historical data that could be sufficient to inform the assessment and agree that a decision on the requirement of data to inform assessment should be made upon presentation of all of these data in an informative assessment. The Scottish Ministers advise that the Developer must set out how the datasets will be combined for analysis and further discuss this with NatureScot, RSPB Scotland and MSS. In addition, the Scottish Ministers highlight that Marine Scotland best practice recommendations on combining datasets is to be published soon and recommend that this is considered.</p>	<p>the 2020 / 21 data collected for the Offshore Development, thus providing the two years of pre-submission survey work. MSS / NS agreed to the approach by email, 24 November 2021.</p> <p>Data analysis for the submitted PFOWF Array Area (and 2 km buffer) is explained and presented in Technical Appendix 12.1: Baseline Data.</p>
		<p>The Scottish Ministers advise that recommendations from NatureScot, RSPB Scotland and MSS regarding key species, Special Protection Area (“SPA”) connectivity, seabird sensitivity, reference populations and additional data sources required for HRA and EIA must be fully implemented by the Developer. The Scottish Ministers agree with NatureScot that the focus of the ornithology assessment will cover impacts affecting qualifying SPA and pSPA features, including migratory species. The Scottish Ministers highlight the NatureScot advice that there is still a need to complete the long list process despite the preceding ornithological assessment undertaken for the Dounreay Tri Demonstration Project. MSS are in agreement and advise that the completion of a long-list process at HRA screening will provide a clearer indication on the species to be considered. In relation to SPA connectivity, the Scottish Ministers highlight the RSPB Scotland recommendation regarding the additional SPA</p>	<p>The NCA Screening Report (HWL, 2022) was submitted for consultation on 2 February 2022 and the Screening Opinion (MS-LOT, 2022b) was received in response on 17 June 2022</p> <p>Seabird sensitivity and reference populations are addressed in the species summaries provided for baseline characterisation in Section 12.4.4 of the EIAR Chapter, as well as in Table 12.15 (species sensitivity) and Tables 12.16 and 12.17 (reference populations).</p> <p>Technical Appendix 12.1: Baseline Data presents all species observations recorded during survey work and</p>

Consultee	Headline	Comment / Issue Raised	Offshore Development Approach and Section ID
MS-LOT (on behalf of Scottish Ministers)	Impact pathways	<p>sites to be assessed and advise that the Developer adopt a precautionary approach to identifying relevant sites for seabirds with a clear methodology on exclusion of sites and species set out in the EIA Report. The Scottish Ministers advise that SPA connectivity is derived primarily using the mean-max + 1 Standard Deviation (SD) from Woodward et al. 2019, as detailed in the NatureScot representation. Where there was insufficient data for Woodward et al. (2019) to derive a mean-max + 1 SD (i.e. where there is greater uncertainty in inferring potential for likely connectivity with a breeding site), the Scottish Ministers recommend further discussion and agreement with MSS and NatureScot with respect to a suitable precautionary approach regarding alternative metrics.</p>	<p>provides a short summary of the additional data made available by HIE for the Dounreay Demonstration Centre.</p> <p>Technical Appendix 12.2: Connectivity and Apportioning deals with SPA connectivity for breeding seabird interests.</p> <p>A RIAA has been submitted as part of this application which assesses the impacts on qualifying SPAs including for migratory species (NB, all Potential Special Protection Area (pSPAs) relevant to assessment are now designated). Ramsar sites are also addressed in the RIAA.</p>
		<p>Within Table 8-13 the Developer summarises the potential impacts during different phases of the Proposed Development upon ornithological features proposed to be scoped in and out of the assessment in the EIA Report. The Scottish Ministers broadly agree with the impacts proposed to be scoped in and out however, advise that all additional impacts identified in the NatureScot, RSPB Scotland and MSS representations are also scoped in and fully addressed in the EIA Report. For the avoidance of doubt, these are summarised in the following paragraphs.</p>	<p>Noted.</p> <p>The additional impacts are summarised in the next eight rows of this consultation table.</p>

Consultee	Headline	Comment / Issue Raised	Offshore Development Approach and Section ID
MS-LOT (on behalf of Scottish Ministers)	Impact pathways	The Scottish Ministers advise that impacts associated with the installation of the export cables must be scoped in and considered in relation to the overlap with the North Caithness Cliffs SPA. The Scottish Ministers recommend that an assessment of the cable route and activities must be included and justified in the HRA and the EIA Report in line with NatureScot's representation and MSS advice. The Scottish Ministers recommend that impacts of entanglement of foraging birds with debris, such as fishing gear that snags on mooring lines must also be scoped in and considered in the EIA Report, as supported by MSS advice.	Impacts associated with the offshore export cable(s) are addressed in Sections 12.6.1.1.2 and 12.6.2.6.2 of the EIA Chapter and in the RIAA.  Potential for entanglement with debris caught on mooring lines is addressed in Section 12.6.2.4 of the EIA Chapter and in the RIAA.
MS-LOT (on behalf of Scottish Ministers)	Nocturnal species	In addition, the Scottish Ministers advise that impacts for Procellariiform species (petrels, shearwaters and fulmars) should also be scoped in in terms of their nocturnal activity and collision risk. It is recommended that the Developer seek clarification on how to approach this assessment of these impacts in discussion with NatureScot, RSPB Scotland and MSS. Furthermore, the Scottish Ministers advise that impacts of attraction to structures and vessels due to artificial light and subsequent risks of collision or stranding should be scoped in and considered qualitatively for shearwater and petrel species, in line with the RSPB Scotland representation and the MSS advice.	Impacts on nocturnally active species are scoped in and are qualitatively addressed in Section 12.6.2.1.10 of the EIA Chapter as well as in the RIAA in respect of shearwaters and petrels as SPA qualifying interests.
MS-LOT (on behalf of Scottish Ministers)	Impact pathways	The Scottish Ministers agree that pollution impacts are scoped out; however, recommend that more detail is provided in the EIA Report regarding embedded mitigation to reduce this impact during construction and operation. The viewpoint is also	Environmental Management Plans will include pollution prevention measures and are proposed as embedded mitigation, Section 12.5.5, Table 12-20 of the EIA Chapter.

Consultee	Headline	Comment / Issue Raised	Offshore Development Approach and Section ID
MS-LOT (on behalf of Scottish Ministers)	Impact pathways	<p>supported by the RSPB Scotland representation and the MSS advice.</p> <p>The Scottish Ministers note that disturbance from noisy pre-construction activities, such as unexploded ordnance detonation and geophysical surveys have not been considered. The Scottish Ministers broadly agree with NatureScot that mitigation measures necessary to reduce impacts to marine mammal species will help reduce any impacts to diving seabirds however, advise that the mitigation measures taken for marine mammals could be broadened to reduce the risk to birds as recommended in the MSS advice.</p>	Possible disturbance from pre-construction activity is considered in Section 12.6.1.1.1 of the EIA Chapter.
MS-LOT (on behalf of Scottish Ministers)	Assessment methods	<p>With regard to the proposed methods of assessment the Scottish Ministers advise that the Developer must fully consider the representations from NatureScot, RSPB and the MSS advice. In addition, the Scottish Ministers strongly recommend further discussion with NatureScot, RSPB Scotland and MSS regarding displacement and barrier effects, collision risk, apportioning and population consequences and to agree the appropriate approaches and methods to use in the assessment.</p>	<p>Noted.</p> <p>Pre-application meetings held with MSS, NS and RSPB Scotland on 4 November 2021, 16 December 2021 and 21 February 2021, and pre-application advice sought on a range of issues.</p>
MS-LOT (on behalf of Scottish Ministers)	Cumulative assessment	<p>With regard to the cumulative assessment, the Scottish Ministers advise that this should include other consented wind farms in the Moray Firth. For the breeding season, the cumulative assessment should consider projects within the mean-max foraging range of the colony SPA under consideration, using Woodward <i>et al.</i> (2019). This view is supported by the representation from NatureScot and the MSS advice. For the non-breeding season, the cumulative assessment should include all relevant</p>	<p>Cumulative and in-combination impacts are respectively assessed in Section 12.7 of the EIA Chapter and in the RIAA, including consideration of other projects within the mean-max foraging ranges identified by Woodward <i>et al.</i> (2019).</p>

Consultee	Headline	Comment / Issue Raised	Offshore Development Approach and Section ID
		<p>developments within the region defined for the species, either by Biologically Defined Minimum Population Scales or other agreed approach, in line with the representation from NatureScot. The Scottish Ministers advise that if species such as common scoter and red and black-throated divers, associated with terrestrial SPAs, are encountered by surveys during the breeding seasons then in-combination impacts with onshore wind farm developments should also be considered. RSPB Scotland agrees with this view and the Scottish Ministers direct the Developer to the list of onshore developments listed in the RSPB Scotland representation to be considered in the assessment if this is the case. The Scottish Ministers recommend further discussion with NatureScot, RSPB Scotland and MSS to reach agreement on the ultimate list of relevant developments to be included upon provision of the HRA screening document.</p>	<p>Technical Appendix 12.2: Connectivity and Apportioning discusses the approach to non-breeding season assessments and possible SPA apportioning, taken through to Section 12.7 of the EIAR Chapter and to the RIAA. Consideration is given to red-throated diver impacts, but the birds were not recorded in high enough numbers to generate any site population estimates or to quantify impacts. In this regard, impacts from the Offshore Development are effectively zero and do not add to any cumulative or in combination impacts with the onshore development.</p> <p>The initial list of projects to consider for cumulative / in combination assessment was presented in the NCA Screening Report (HWL, 2022), with the final long list of projects considered in relation to Marine Ornithology presented in Table 12.27 of the EIAR Chapter.</p> <p>Red-throated diver as a qualifying interest of Caithness and Sutherland Peatlands SPA are addressed in the RIAA.</p> <p>Common scoter and black-throated diver were not recorded during survey</p>



Consultee	Headline	Comment / Issue Raised	Offshore Development Approach and Section ID
MS-LOT (on behalf of Scottish Ministers)	Mitigation	<p>With regard to mitigation, the Scottish Ministers direct the Developer to the MSS advice on embedded mitigation and advise that the 'air gap' is considered when refining the design envelope as, generally, a project with fewer turbines and larger 'air gaps' will lead to reduced collision risk. This view is also supported by the RSPB Scotland representation. In addition, the Scottish Ministers advise that where significant impact pathways have been identified, the full range of mitigation techniques and published guidance is considered and discussed in the EIA Report as referenced in the NatureScot representation.</p>	<p>work and have therefore been screened out.</p> <p>HWL has increased the air gap to 35 m, as noted in Section 12.5.5 of the EIA Chapter on embedded mitigation, and in Table 12-20.</p> <p>Collision risk is identified as most significant impact pathway and increasing the air gap between the rotor blades and the sea is the key mitigation measure to address it.</p> <p>The maximum number of WTGs that will be installed for the Project has also reduced from ten down to seven.</p> <p>All relevant mitigation options and published guidance have been considered for the full range of potential impact pathways in both the EIA Chapter and in the RIAA.</p>
MS-LOT (on behalf of Scottish Ministers)	Climate change and ecosystem effects	<p>With regard to climate change and ecosystem effects, the Scottish Ministers advise that the impacts of how certain climate stressors may work in combination with potential effects from the proposed wind farm is assessed in the EIA and recommend further discussion with MSS and NatureScot on how to assess this with respect to ornithology.</p>	<p>Climate change and ecosystem effects are discussed for seabirds in general in Section 12.4.5.1 of the EIA Chapter and specifically for kittiwake in Section 12.4.4.1.</p>

Consultee	Headline	Comment / Issue Raised	Offshore Development Approach and Section ID
MSS	HRA screening	In common with NS and RSPB, MSS highlight the potential connectivity of the proposed development with several SPA / pSPAs and their features. As such, we agree with NS and RSPB that provision of the HRA screening report should provide adequate detail for consultees and advisors to provide adequately informed advice for screening of sites and features for inclusion for HRA.	The NCA Screening Report (HWL, 2022) was submitted for consultation on 2 February 2022, and the Screening Opinion (MS-LOT, 2022b) was received in response on 17 June 2022.
MSS	Baseline including surveys	MSS welcome the collection of contemporary site-specific ornithology data, by means of aerial surveys, September 2020 through to August 2021. These data are established in Table 8-14 as being the data that may be used to inform assessment methods. Ordinarily, baseline data to inform assessment would comprise of two full years of data. MSS consider that the site may have adequate historical data that could be sufficient to inform the assessment for the site. MSS advise that a decision on the requirement of the data to inform assessment should be made upon presentation of all of these data in an informative format. In addition, justification should be presented for the use and appropriateness of the 2 km buffer used in baseline data collection.	Available survey data was discussed at the meeting held on 4 November 2021 where it was proposed to use the 2015 Dounreay Tri data in combination with the 2020 / 21 data collected for the Offshore Development, thus providing the two years of pre-consent survey work. MS / NS agreed to this in their email of 24 November 2021.  Collision risk modelling uses density of flying birds of the relevant species within the PFOWF Array Area and displacement analysis is based on an estimate of the population size for the PFOWF Array Area plus 2 km buffer; Technical Appendix 12.1: Baseline Data.
MSS	General	MSS consider the scoping report to have provided several key impacts and methods for assessment of these impacts. However, there are several potential routes to impact that need further consideration, discussed below. MSS would welcome further	Noted. MSS comments addressed in the subsequent rows.

Consultee	Headline	Comment / Issue Raised	Offshore Development Approach and Section ID
MSS	Cumulative assessment	<p>discussion, together with NS and RSPB around how these impacts are assessed.</p> <p>NS advise that cumulative assessment should include the Moray Firth wind farms, and RSPB consider that for some species their breeding ecology may require onshore wind developments to be considered in cumulative assessment. NS also suggest this potentially requires consideration for great black-backed gull. MSS would welcome further discussion and agreement with MS-LOT and NS regarding the project list to be considered in the cumulative assessment and how terrestrial wind farms are considered.</p>	<p>The initial list of projects to consider for cumulative / in combination assessment was presented in the NCA Screening Report (HWL, 2022), with the final long list of projects considered in relation to Marine Ornithology presented in Table 12.27 of the EIAR Chapter.</p> <p>The Moray Firth wind farms are considered particularly in relation to cumulative / in combination impacts on key seabird populations at North Caithness Cliffs SPA Onshore wind farms have been considered for red throated diver, the only species likely to be impacted significantly by the Offshore Development and terrestrial wind farms. Due to the low numbers of red-throated diver recorded across the PFOWF Array Area significant cumulative impacts are not likely. In combination impacts against the red-throated diver population at Caithness and Sutherland Peatlands SPA are considered in the RIAA.</p>

Consultee	Headline	Comment / Issue Raised	Offshore Development Approach and Section ID
MSS	Baseline including surveys	<p>Specific comments are detailed below: Study Area MSS agree with both NS and RSPB that given the increase in scale from the original Dounreay Tri Limited project additional justification and clarification, should be provided as to the suitability of the 2 km buffer in the context of the proposed development, when emerging standard guidance is for a 4 km buffer. However, MSS note that a 2 km buffer was included in an earlier survey methods document (dated 4 August 2020) which MSS and NS advised on, with neither commenting then on the adequacy of the stated buffer size. Consideration could be given to increasing to a 4 km buffer (given this emerging as standard guidance) for any outstanding surveys, this could be informed by discussion with NS, MSS, and RSPB.</p>	<p>Section 12.7 of the EIAR Chapter considers the cumulative impacts for great black-backed gull.</p> <p>See above. The matter was discussed at the meeting held on 4 November 2021 and MS / NS agreed to the adequacy of the survey work by email, 24 November 2021.</p>
MSS	Baseline including surveys	<p>The export cable landfall occurs within the North Caithness Cliff SPA. We support a baseline characterisation of this area and of the proposed cable route. We do not expect aerial survey coverage of this region.</p>	<p>Baseline characterisation of the OECC and cable landfall is given in Section 12.4.4.14 of the EIAR Chapter. This is supported by coverage from the digital aerial surveys (Figure 12.1 of the EIAR Chapter) as well as specific vantage point surveys from the coastline (Jackson, 2022).</p>

Consultee	Headline	Comment / Issue Raised	Offshore Development Approach and Section ID
MSS	Baseline including surveys	<p>Baseline Surveys: The developer provides indicative detections from 12 months of surveys in 2015. The detections provided in Tables 8-10 and 8-11 are provided as densities in the original report and MSS support the NS suggestion that data are provided in a consistent approach and where data are combined, appropriate methods are used. For example, soon to be published Marine Scotland best practice recommendations on combining data from different survey platforms may be beneficial, as RSPB also suggest (though by RSPB for 'contextual assessment' only).</p>	<p>Both the 2015 Dounreay Tri and 2020 / 21 data for the Offshore Development were collected using the same method and provider: HiDef digital aerial video surveys. Data analysis is explained and presented in Technical Appendix 12.1: Baseline Data.</p>
MSS	Baseline including surveys	<p>In section 8.5.7, the scoping report states further surveys undertaken in an adjacent area in 2015 and 2016 (Figure 8-8) had broadly the same result. MSS suggest these and other data are provided to inform site characterisation, to allow for comparison as to the relative density estimate in the overall area between years.</p>	<p>Technical Appendix 12.1: Baseline Data provides a short summary of the additional data made available by HIE for the DDC and what this shows in relation to survey work undertaken for the Offshore Development.</p>
MSS	Baseline including surveys	<p>In common with NS and RSPB we welcome the decision to undertake new surveys between September 2020 and August 2021. MSS advise that existing data and new data are presented for provision of fully informed advice. This should include consideration of the age of survey data (raised as of concern by RSPB as &gt;5 years pre-application) and when using multiple sets of survey data as to how these are combined.</p>	<p>Both the 2015 Dounreay Tri and 2020 / 21 data for the Offshore Development were collected using the same method and provider: HiDef digital aerial video surveys. Data analysis undertaken for the revised PFOWF Array Area is explained in Technical Appendix 12.1: Baseline Data.  The most recent SPA colony counts for North Caithness Cliffs SPA were undertaken in 2015 so that the survey</p>

Consultee	Headline	Comment / Issue Raised	Offshore Development Approach and Section ID
MSS	HRA	Key species: In agreement with NS, MSS advise that the focus of the ornithological assessment will pertain to impacts affecting qualifying SPA and pSPA features, including migratory species.	work undertaken that year for Dounreay Tri ties into this available SPA data.
MSS	Connectivity and Apportioning	As advised by NS, completion of a long-list process at HRA screening will provide a clearer indication of the key species that should be considered.	Species' SPA status is acknowledged in the EIA Chapter, with HRA presented in the RIAA. (NB. all pSPAs relevant to assessment are now designated).  SPA long list process completed as presented in the NCA Screening Report (HWL, 2022) submitted on 2 February 2022.
MSS	Connectivity and Apportioning	SPA connectivity: MSS agree with the guidance provided by NS regarding SPA connectivity, namely that SPA connectivity is derived primarily using the mean-max + 1 SD from Woodward et al. 2019. We agree with the exceptions detailed by NS in terms of site-specific exceptions and the grouping of the including and excluding Fair Isle foraging ranges. However, we consider further discussion and agreement should be sought with respect to a suitable precautionary approach regarding alternative metrics where there was insufficient data for Woodward et al. (2019) to derive a mean-max + 1 SD, i.e. where there is greater uncertainty in inferring potential for likely connectivity with a breeding site.	MSS and NSS advice on connectivity has been followed as presented in the NCA Screening Report (HWL, 2022). No specific comment was made on this work in the Screening Opinion (MS-LOT, 2022b) so it has been assumed that MSS and NS were content with what had been done. This is now presented for application in the RIAA and in Technical Appendix 12.2: Connectivity and Apportioning.
MSS	HRA screening	Impacts pathways scoped in / out: MSS assume that the HRA screening will include consideration of all features of any SPA and pSPA with connectivity to the proposed development. Below we comment on impacts not considered in this scoping document.	As further discussed in the RIAA, all SPA features with potential connectivity to the Offshore Development have been considered and all are screened into HRA

Consultee	Headline	Comment / Issue Raised	Offshore Development Approach and Section ID
MSS	Impact pathways	<p>Given the impact summary is high level it is not clear whether impacts during construction of the cabling route have been considered in this scoping report. MSS recommend a qualitative (subject to agreement with NS) assessment is presented including presentation of the expected route, an estimated timeline of works, suitable presentation of buffers and connectivity with designated sites and affected features. Whilst effects may be temporary and of a short duration if there is the possibility of pathway to impact and subsequent effects (even if short in duration) to any (for example) breeding or roosting feature, the EIAR and HRA should strive to identify any potential overlap, spatial or temporal, provide evidence for no risk and/or provide further consideration of effects and mitigation to ensure MS-LOT (and NS) are provided with adequate evidence to assess the potential for impact.</p>	<p>with the exception of Arctic tern (no SPAs within foraging range), great black-backed gull and herring gull (neither species recorded in the PFOWF Array Area during the breeding season. Assessment for these three species is presented in the EIAR Chapter.          (NB. all pSPAs relevant to assessment are now designated).</p>
MSS	Impact pathways	<p>Baseline contextualisation of the OECC and cable landfall is given in Section 12.4.4.14 of the EIAR Chapter and potential impacts addressed in Sections 12.6.1.1.2 and 12.6.2.6.2.          The RIAA addresses potential impacts arising from the OECC where it passes through the marine area of North Caithness Cliffs SPA, Horizontal Directional Drilling (HDD) is proposed for the cable landfall.</p>	<p>Noted.          Possible disturbance from pre-construction activity is addressed in</p>

Consultee	Headline	Comment / Issue Raised	Offshore Development Approach and Section ID
MSS	Impact pathways	<p>requires in-depth knowledge of the sensitivity of bird species to sound source levels and frequencies, and for many species this knowledge is lacking. We note that mitigation measures to reduce risk of injury to marine mammals, e.g. watches prior to clearance of Unexploded Ordnance (UXO), may help reduce impacts to diving seabird species. Thus, in the absence of evidence to specifically assess this impact for birds, the mitigation approaches taken for marine mammals could be broadened to reduce risk to birds.</p> <p>We note that entanglement of foraging birds with debris, such as fishing gear, that snags on the mooring lines has not been considered. We acknowledge the limited evidence available to assess how likely entanglement may be, however this potential pathway to impact should be considered. Mitigation measures suggested below in our Marine Mammal response to reduce impacts to marine mammal species should also help reduce any impacts to foraging seabirds, e.g. 'We also consider that the potential for entanglement in debris caught on the mooring lines should be included in the Environmental Statement (ES). We would recommend that strategies to minimise or remove such debris are considered.</p>	<p>Section 12.6.1.1.1 and 12.6.1.1.2 of the EIA Chapter and in the RIAA.</p> <p>Entanglement is addressed in Section 12.6.2.4 of the EIA Chapter and in the RIAA.</p>
MSS	Impact pathways	<p>MSS agree with RSPB comments that impacts should also be considered for Procellariiform species (petrels, shearwaters and fulmar) in terms of their nocturnal activity and collision risk. Clarification on how to approach assessment of these impacts should be sought in discussion with NS, MSS and RSPB.</p>	<p>Impacts on nocturnally active species including shearwaters and petrels are addressed in Section 12.6.2.1.10 of the EIA Chapter and in the RIAA.</p>



Consultee	Headline	Comment / Issue Raised	Offshore Development Approach and Section ID
MSS	Impact pathways	<p>The impacts of attraction to structures and vessels due to artificial light, and subsequent risks of e.g. collision or stranding should be considered qualitatively for shearwater and petrel species. MSS acknowledge there is currently limited information on the likely impacts of attraction to and collision of shearwaters and petrels with wind turbine structures. Literature recording attraction and stranding / collision with vessels and infrastructure is widely available, including an information note from NS on, 'The Effect of Aviation Obstruction Lighting on Birds at Wind Turbines, Communication Towers and Other Structures'. This effect should be considered in assessment considering potential overlap (spatial and temporal) between structures and vessels with lighting and at-risk species, including potential for built-in or other mitigation.</p>	<p>Impacts on nocturnally active species including shearwaters and petrels are addressed in Section 12.6.2.1.10 of the EIA chapter and in the RIAA.</p> <p>Good practice for WTG lighting to be addressed under embedded mitigation, Section 12.5.5 of the EIA Chapter, Table 12-20, Navigational Safety Plan and Lighting and Marking Plan.</p> <p>Table 12-20</p>
MSS	Impact pathways	<p>MSS agree with NS that pollution impacts are scoped out for ornithology, but more information and detail should be provided in the EIA regarding the embedded mitigation reducing this impact during construction and operation (as suggested also by RSPB with respect to the oil used in wind turbine generators).</p>	<p>Environmental Management Plans will include pollution prevention measures and are proposed as embedded mitigation, Section 12.5.5 of the EIA Chapter, Table 12-20.</p>
MSS	Assessment methods	<p>Assessment methods: MSS consider that further detail is required on the methods of assessment to be used for some effects scoped in, such as creation of roosting habitat or foraging opportunities and potential changes in prey availability. MSS consider the appropriateness of approaches to key impacts (collision, displacement and disturbance and barrier effects) mentioned to be adequate. However, we do consider some</p>	<p>HiDef provided an assessment methodology paper to MSS, NS and RSPB Scotland on 7 October 2021, however, no further advice was given in response. Relevant guidance used in assessment is noted in Section 12.2 of the EIA</p>

Consultee	Headline	Comment / Issue Raised	Offshore Development Approach and Section ID
MSS	Reference populations	<p>specific comments for awareness of both emerging and existing guidance and methodologies and are content to partake in further discussion to reach agreement on most appropriate methods together with NS and RSPB where relevant:</p> <p>Breeding birds: MSS agrees with both RSPB and NS that where available the latest figures from the 'Seabird Count' (available via the Seabird Monitoring Programme Database) are used in assessment of impacts to breeding birds.</p>	<p>Chapter. Details of the methodologies adopted for collision risk, displacement and population modelling are given in each of the technical appendices supporting assessment.</p> <p>Latest figures were obtained from the Seabird Monitoring Programme Database as noted in Table 12-3 of the EIAR Chapter.          A spreadsheet of these counts was provided to MSS, NS and RSPB on 7 October 2021.</p>
MSS	Collision Risk Modelling (CRM)	<p>Collision: NS provide a number of recommendations on which model version to use and some discussion on appropriate references for parameter values. RSPB do not provide specific comments here except in the case of the avoidance rate for gannet, where they recommend that the default rate of 98% to be used, based on a recent publication suggesting gannets change their behaviour (which may change their avoidance behaviour) during the breeding season. MSS would welcome further discussion with NS and RSPB concerning this and other collision modelling specifications, to seek agreement on the collision risk modelling approach.</p>	<p>HiDef provided an assessment methodology paper to MSS, NS and RSPB Scotland on 7 October 2021, including proposed species to address under CRM, proposed model options to use and proposed avoidance rates. However, no further advice was given in response.</p> <p>The CRMs undertaken and presented in Technical Appendix 12.3: Collision Risk Modelling follow the NS advice available from the Scoping Opinion (MS-LOT, 2021). CRM for gannet using a 98%</p>

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MSS	CRM	The developer proposes to perform collision risk modelling using both the deterministic Band (2012) model and the stochastic implementation of Band (2012) developed by Masden (2015) and subsequently implemented as a user-friendly web application (McGregor et al. 2018), known as the stochastic collision risk model (sCRM). NS support the use of both approaches, while RSPB recommend solely the use of the sCRM application (i.e. McGregor et al. 2018).	avoidance rate, as requested by RSPB, has been provided for context.
MSS	CRM	MSS support the use of standardised tools such as the sCRM. MSS advise the outputs of the sCRM should be relied on for assessment but for comparability and context it may still be useful to also run the deterministic Band (2012) model.	These matters were further discussed at the meeting held on 16 December 2021 where MSS and NS pulled back from use of stochastic CRM for assessment in respect of the Offshore Development. Their most recent advice (31 March 2021) was to undertake a deterministic CRM. This has been done using the Band (2012) spreadsheets, which provide the same outputs as would be given by the band_crm() function in the stochLAB package. Full CRM outputs are presented in Technical Appendix 12.3: Collision Risk Modelling.
MSS	CRM	The developer proposes to assess collision risk for migratory species qualitatively with reference to the Marine Scotland commissioned strategic level report (Marine Scotland 2014). This approach is supported by NS and MSS. As NS note in their advice, Marine Scotland have contracted a further strategic study, which is currently in progress. The new strategic study also includes further development of the sCRM tool for	Consideration of collision risk to migratory species (wildfowl and waders) is given in Section 12.6.2.1.9 of the EIAR Chapter and in the RIAA. The new strategic study was not available in time

Consultee	Headline	Comment / Issue Raised	Offshore Development Approach and Section ID
MSS	Displacement	<p>migratory species assessment. Should this be available within the assessment timescale then MSS agree with NS that this report and tool should be used, informed by discussion with NS and MSS.</p> <p>Displacement and disturbance effects: To assess displacement effects the developer proposes to use the Statutory Nature Conservation Bodies (SNCB) Matrix Approach (SNCB 2017) potentially with the SeabORD tool (Searle et al. 2018).</p> <p>In agreement with NS, MSS advise that the SeabORD tool should be applied to those species it is currently specified for (i.e. where tracking data is available). The SNCB matrix assessment approach should be used for those species not included in the tool.</p>	<p>for use in the assessment and has therefore not been included.</p>
MSS			<p>As discussed with MSS, NS and RSPB Scotland at the meeting on 16 December 2021, it was originally thought that SeabORD could not be used because of the paucity of tracking data for North Caithness Cliffs SPA. However, a new version of SeabORD (v1.3) was developed in spring 2022 using a 'distance decay' function (which does not require tracking data). MSS and NS recommended that this new version of the tool be used for the Offshore Development in their advice (31 March 2022). This has been done and SeabORD modelling is presented in Appendix 12.4: Displacement Analysis, with the outputs informing assessment in Section 12.6.2.2 of the EIAR Chapter and in the RIAA.</p>
MSS	Connectivity and Apportioning	<p>For the non-breeding season apportioning, NS advise that for the auk species the Biologically Defined Minimum Population Scales (BDMPS) Report (Furness, 2015) population scales be applied, except for common guillemot where the assessment area and population should be derived using breeding season</p>	<p>NS clarified their advice on deriving a guillemot non-breeding population (email 31 March 2022) and this has been applied in the non-breeding season apportioning for this species presented in Technical</p>

Consultee	Headline	Comment / Issue Raised	Offshore Development Approach and Section ID
MSS	Displacement / CRM	<p>foraging range. MSS advise that emerging evidence (e.g. auk tagging studies from MacArthur Green and SEATRACK) could alter our understanding of the movement and distribution of auk species during the non-breeding season, and as such, should new evidence emerge within the assessment timeline, then it may be appropriate to review how these species are assessed for the non-breeding season. MSS welcome the suggestion from both NS and RSPB towards further discussion and agreement on displacement mortality values to be used in assessment.</p>	<p>Appendix 12.2: Connectivity and Apportioning.</p> <p>Puffin and razorbill were recorded in minimal numbers in the Offshore Study Area during the non-breeding season, so whilst displacement impacts for each species were modelled over this time (Technical Appendix 12.4: Displacement Analysis), no cumulative assessment was undertaken in this regard.</p>
MSS	Displacement / CRM	<p>For kittiwake, NS advise that there needs to be further discussion to reach agreement on whether the species is assessed for displacement and barrier effects in addition to collision risk. RSPB do not provide specific comment on this. As NS note it was previously unclear whether collision risk and displacement risk are mutually exclusive. A soon-to-be published Marine Scotland commissioned study now indicates that these are not mutually exclusive risks at the population scale, though the study also indicates complexities around how collision and displacement / barrier effect assessments should be parameterised in a common way. Once that report is published MSS advise that there should be further discussion to reach agreement on the approach to be taken for kittiwake.</p>	<p>Assessment for kittiwake presented in the EIAR Chapter and in the RIAA considers both collision risk and displacement barrier effects.</p> <p>Kittiwake included for SeabORD modelling (Technical Appendix 12.4: Displacement Analysis).</p> <p>The MS commissioned report has not yet been published so was not available for reference or further discussion.</p>
MSS	Displacement / CRM	<p>For gannet, NS advise that displacement effects need to be included in assessments. MSS agree that this should be assessed and suggest that there should be further discussion</p>	<p>Collision and displacement mortalities were estimated for both the breeding and non-breeding seasons, but there</p>

Consultee	Headline	Comment / Issue Raised	Offshore Development Approach and Section ID
		<p>around the approach to take. This should include consideration of whether to assess for both the breeding and non-breeding seasons, or only for the breeding period, and whether barrier effects need to be considered in addition to displacement. This should be informed by baseline data and the forthcoming Marine Scotland commissioned report.</p>	<p>were zero mortalities in the non-breeding season. Collision and displacement mortalities were simply added together as a 'worst case' (which will over-estimate impacts) and, even so, were not considered to be significant for the Offshore Development on its own. Information is provided in section 12.5 of the EIAR Chapter.</p> <p>The MS commissioned report has not yet been published so was not available for reference.</p>
MSS	Displacement	<p>NS state that they support the use of SeabORD during the breeding season for those species with tracking data, with SeabORD providing an integrated assessment of displacement and barrier effects. Where it is not possible to apply the SeabORD tool, MSS support a qualitative approach to assessment for barriers to movement effects.</p>	<p>SeabORD tool has been utilised where possible, and undertaken for kittiwake, guillemot, razorbill and puffin at North Caithness Cliffs SPA as presented in Technical Appendix 12.4: Displacement Analysis, with the outputs informing assessment in Sections 12.6.2.2 and 12.6.2.3, of the EIAR Chapter and for advice on North Caithness Cliffs SPA in the RIAA.</p> <p>A qualitative approach has been undertaken where SeabORD was not</p>

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MSS	Population Viability Analysis (PVA)	<p>Population Viability Analysis: Where effects are assessed to be potentially significant either from the proposed development alone or in combination with other developments, PVA modelling should be used to better understand population level impacts for protected sites (SPA populations). NS suggest a threshold of 0.2% change in adult survival rate. However, MSS advise that there should be further discussion to agree appropriate thresholds for when PVA should be undertaken; the 0.2% change in adult survival value may be appropriate for some species but given interspecific variation in annual survival a percentage of background mortality may be a more appropriate approach. The developer does not provide detail on their proposed methods for PVA. In common with NS and RSPB, MSS recommend the Natural England (NE) tool as a parameterising approach for implementing PVAs for seabird populations. MSS also highlight a recently completed strategic project regarding PVA, for consideration when undertaking population level assessment. The recommendations of Searle <i>et al.</i> (2020) should be considered carefully when parameterising PVA models; this includes where to draw population and demographic parameter estimates from and suggestions to ‘tune’ demographic parameters to improve model performance, but this must follow an automated and transparent approach.</p>	<p>possible, see section 12.6.2 of the EIAR Chapter.</p> <p>As set out in the RIAA, modelling of SPA population consequences has been undertaken using PVA (Technical Appendix 12.5: Population Modelling), employing a Leslie-Matrix model as recommended by Searle <i>et al.</i> (2020). The PVA modelling was undertaken within the Natural England tool, following advice, and using Horswill &amp; Robinson (2015) default parameters and their associated standard deviations.</p> <p>Searle <i>et al.</i> (2020) recommend a “sense-check” of the PVA modelling ; this was done by checking the models against the known population trends for kittiwake, guillemot and puffin at North Caithness Cliffs SPA, applying the models to the SPA citation populations (year taken to be 1996) and projecting forward to 2015 (the date of the most recent population counts at the SPA). The modelled abundances over this time were then compared with the recorded counts as a “sense-</p>

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MSS	Connectivity and Apportioning	Apportioning: The developer suggests apportioning will follow the NS interim Guidance, found in NatureScot (2018). NS advise that apportioning should follow emerging Marine Scotland guidance for those species it pertains to and NS interim guidance for other species. MSS assume that the emerging Marine	<p>check”, particularly in relation to the default survival rates (from Horswill &amp; Robinson, 2015) used in the modelling.</p> <p>This background work confirmed the validity of the models used but has been too complex to report. Further discussion with stakeholders (MSS, NS and RSPB) is welcomed if they wish to explore these matters in more detail.</p> <p>NS advice on ‘thresholds’ to consider (for determining whether PVA is required) has been interpreted by applying adult survival rates (<i>l-survival rate</i>) to most recent SPA population counts to get a measure of baseline mortality. The 0.2% threshold of significance is then applied to these baseline mortalities to give a gauge on the amount of ‘allowable’ mortality before PVA is required.</p>
			<p>There was extensive discussion around breeding season apportioning during the pre-application discussion resulting in HiDef providing a discussion paper (14 December 2021) in this regard.</p>



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MSS	Connectivity and Apportioning	<p>Scotland guidance referred to is the recently published report and MS Apportioning Tool (Butler et al. 2020). RSPB support the use of this recently developed tool. MSS are in general agreement with NS but wish to clarify that the MS Apportioning Tool includes two different apportioning options: one a new method using the Wakefield et al. (2017) colony specific distributions, and the NatureScot breeding season 'theoretical approach' method. MSS advise that there should be further discussion to allow provision of specific advice on breeding season apportioning.</p>	<p>MSS, NS and RSPB Scotland advise that the MS Apportioning Tool (Wakefield option) be applied to kittiwake, guillemot and razorbill, for the Offshore Development, and retrospectively applied to the Moray Firth wind farms for cumulative assessment.</p> <p>NatureScot (2018) guidance using most up-to-date SPA colony counts has been followed for all other species, as reported in Technical Appendix 12.2: Connectivity and Apportioning.</p>
MSS	Cumulative assessment	<p>For apportioning during the non-breeding season, the developer states that there will need to be further discussion to reach agreement on approach but suggests use of the BDMPS approach (Furness 2015). NS state that the BDMPS approach should be used for most species but that this will require further discussion for species that disperse less widely from the breeding area during the non-breeding season (e.g. guillemot). RSPB provided no specific comment here. MSS are in agreement with NS on the general approach and agree that further discussion will be needed to reach agreement on approach (also note our comment above under Displacement and disturbance effects regarding emerging evidence for non-breeding season movement and distribution of auk species).</p>	<p>As above. Non-breeding season apportioning is discussed and presented in Section 4 of Technical Appendix 12.2: Connectivity and Apportioning.</p>
MSS	Cumulative assessment	<p>Cumulative Assessment: MSS agree with NS that in the breeding season, cumulative assessment should consider effects of</p>	<p>The initial list of projects to consider for cumulative / in combination assessment</p>

Consultee	Headline	Comment / Issue Raised	Offshore Development Approach and Section ID
		<p>projects within foraging range of the colony SPA under consideration, using Woodward <i>et al.</i> (2019).</p> <p>MSS welcome further discussion, together with NS and RSPB to reach agreement on the ultimate list of relevant developments to be included upon provision of the HRA screening document. Discussions should focus on SPA species, the inclusion of onshore developments (for those marine species such as red throated divers and great black-backed gulls, whose ecology means they could have connectivity with terrestrial developments during the breeding season) and on the inclusion of additional wind farms.</p>	<p>was presented in the NCA Screening Report (HWL, 2022), with the final long list of projects considered in relation to Marine Ornithology presented in Table 12.27 of the EIAR Chapter.</p> <p>Requirements in respect of red-throated diver and great black-backed gull are considered in Section 12.7 of the EIAR Chapter.</p>
MSS	Mitigation	<p>Embedded Mitigation: It is stated that the 'minimum distance between the bottom of the blade and the water surface will be between 22 m to 40 m'. This is generally termed the 'air gap' in terms of collision risk modelling. Generally, a project with fewer turbines and large air gaps will lead to reduced collision risk. Due to the lower risk of collisions MSS advise that the Developer considers air gap when refining their design envelope and agree with NS recommendation to refine the design envelope as far as possible prior to assessment.</p>	<p>The applicant has increased the air gap to 35 m, a key measure to minimise collision risk as per MSS advice. See Section 12.5.5, Table 12-20 of the EIAR Chapter. The maximum number of VTGs that will be installed for the Project has also reduced from ten down to seven, see Table 12.20 of the EIAR Chapter and section 3.3.1 of the Site Selection and Alternatives (Chapter 3).</p>
MSS	Climate change and ecosystem effects	<p>Climate change and ecosystem effects: Under their general comments (i.e., not in the Ornithology specific Appendix A), NS state a need to assess wider ecosystem-scale effects, including in relation to prey species for top predators (including seabirds). Furthermore, NS state that consideration is given to how certain climate stressors may act in combination with project specific</p>	<p>Climate change and ecosystem effects are discussed for seabirds in general in Section 12.4.5.1 of the EIAR Chapter and specifically for kittiwake in Section 12.4.4.1.</p>

Consultee	Headline	Comment / Issue Raised	Offshore Development Approach and Section ID
MSS	Guidance	<p>effects. These points are largely not developed in the ornithology specific section. Should these factors be considered in assessment, MSS suggests that further discussion will be required to inform on how these are assessed with respect to ornithology.</p> <p>MSS advise that the “Best practice recommendations on combining data from different survey platforms” is under review in the publications process and is expected to be published shortly.</p> <p>MSS advise that, “Study to examine how seabird collision risk, displacement and barrier effects could be integrated for assessment of offshore wind developments (ITQ-0246)” Marine Scotland commissioned study is under review in the publications process and should be made available shortly.</p>	Study not available in time to be considered in the application.
MSS	Guidance	<p>MSS advise that the accompanying tool to “Attributing seabirds at sea to appropriate breeding colonies and populations” is in the publications process. The tool can be supplied in advance of publication; please contact MSS Advice MSS_Advice@gov.scot, FAO: Dr Tom Evans, for further details or to request access.</p> <p>We strongly advise the production of an HRA screening report for this proposal. We advise this should be submitted for comment at the earliest opportunity and in advance of the EIAR in order to fully inform our HRA advice for this project. We would be happy to provide ongoing advice as the HRA progresses.</p>	Tool not available in time to be considered in the application.
NS	HRA screening		NCA Screening Report (HWL, 2022) submitted for consultation on 2 February 2022.

Consultee	Headline	Comment / Issue Raised	Offshore Development Approach and Section ID
NS	Impact pathways	<p>Advice on ornithological interests is provided in Appendix A. The HRA Screening Report has not yet been provided – we provide detailed advice to aid both the EIA and HRA processes together with guidance on expected assessment methods.</p> <p>Key impacts include displacement of birds and/or the risk of collision from the operation of the wind farm. Impacts associated with the installation of the export cables require consideration especially in relation to the overlap with the North Caithness Cliffs SPA.</p> <p>We strongly advise that further information on the data analysis methodologies is submitted and agreed prior to submission.</p>	<p>NCA Screening Report (HWL, 2022) submitted for consultation on 2 February 2022, with the Screening Opinion (MS-LOT, 2022) received in June 2022.</p> <p>Key impacts, including displacement, collision and cable installation, are addressed in Section 12.6, and potential impacts from cable-laying and HDD in North Caithness Cliffs SPA are discussed in the RIAA.</p> <p>The approach to data reanalysis for the submitted PFOWF Array Area is presented in Technical Appendix 12.1: Baseline Data.</p>
NS	Baseline including surveys	<p>Baseline surveys: We note the results Tables at 8.10 and 8.11 give actual detections only. There are no associated design or model-based population estimates or densities, despite these being presented in the original HiDef report of these surveys. We would want to see a plan on how they intend to combine these datasets for analysis. It is also worth noting that great black-backed gull were recorded with a peak in August and further consideration is required on what implications there are cumulatively with terrestrial windfarms.</p>	<p>Data analysis follows the standard block bootstrap method (Buckland <i>et al.</i>, 2001) as discussed in Section 2.2.2 of Technical Appendix 12.1: Baseline Data. Digital aerial survey work in 2015 and 2020 / 21 followed the same methods and survey design (excepting use of an extended 4 km buffer, April – August 2021) therefore it was straightforward to combine datasets as set out in the Technical Appendix. Data from the 4 km buffer is discussed for context, along with the data made available by HIE for the DDC.</p>

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NS	Baseline including surveys	For Dounreay Tri a 2 km buffer was considered appropriate due to the small scale of the proposal. The current proposal is larger than Dounreay Tri and has also employed a 2 km buffer. Current guidance for offshore wind farms is that a 4 km buffer is used, although this can vary depending on species present. Based on the analysis of available data to date, we request further clarification on the appropriateness of a 2 km buffer for the Pentland Floating Offshore Wind Farm.	<p>The peak of 38 great black-backed gull recorded in the August 2015 survey occurred in the 2 km buffer rather than in the PFOWF Array Area itself, therefore the density of flying birds is calculated as zero, as this measurement relates solely to the PFOWF Array Area (Table 3 of Technical Appendix 12.1). Therefore, only a non-breeding season assessment has been undertaken.</p> <p>The original PFOWF Array Area was exactly the same size as Dounreay Tri and it has now been reduced by 50% as shown in Figure 12-1 of the EIAR Chapter.</p> <p>As discussed above, the buffer was increased to 4 km from April-August 2021 and a short summary of the data from this buffer is presented in Annex A of Technical Appendix 12.1: Baseline Data.</p>
NS	HRA	Key Species: We anticipate that the focus of the ornithological assessment will cover impacts to SPA / pSPA qualifying interests including migratory species.	<p>The RIAA provided with this application addresses the SPA qualifying interests under HRA (NB. all pSPAs relevant to assessment are now designated). Wildfowl and wader species are</p>

Consultee	Headline	Comment / Issue Raised	Offshore Development Approach and Section ID
NS	Species screening	There is still a need to complete the long list process despite the preceding ornithological assessment undertaken for the Dounreay Tri Project – this does provide a good indication of the likely key species to be considered.	addressed in Section 12.6.2.1.9 of the EIAR Chapter and also in the RIAA.
NS	Connectivity and Apportioning	SPA Connectivity: We recommend (for the long list) using foraging ranges as published in Woodward <i>et al.</i> (2019) to derive connectivity with SPA colonies and with additional colonies that may be used by seabirds foraging within the SPA. The mean-maximum range + 1SD should be used. The exceptions to this are outlined below.	The two years of ornithological survey data have been reviewed to provide the long list of species for assessment as given in Section 12.4.4 of the EIAR Chapter and in the RIAA. Red-throated diver, petrels, shearwaters, wildfowl and waders are also included for assessment as indicated, even though they were not recorded during survey work, or else recorded in very low numbers.
NS	Connectivity and Apportioning	After consideration of the long list, it may be that just the mean or mean-maximum value will be used for apportioning, depending on the number of sites considered to have connectivity to the development. This is considered a precautionary approach, in that the long list is devised in such a way that it is unlikely that impacts are overlooked, but the apportioning of impacts is undertaken in a manner that does not	The recommended foraging ranges from Woodward <i>et al.</i> (2019) have been used to create the long list. These are addressed in the RIAA and in Appendix 12.2: Connectivity and Apportioning.

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		<p>make it an overly onerous task, nor lead to excessive dilution of impacts across multiple populations.</p>	<p>2022. Therefore, the RIAA is based on the original long lists.</p> <p>As advised, the apportioning undertaken for the RIAA uses the MS apportioning tool (Wakefield option) for kittiwake, guillemot and razorbill, and follows the NS (2018) apportioning guidance for all other species.</p> <p>Subsequent to the advice given in the Screening Opinion (MS-LOT, 2022b), further SPAs for European storm petrel, Leach's petrel and Manx shearwater have been screened in for connectivity and are included in the RIAA (although no apportioning has been undertaken in this regard as assessment for these species is qualitative rather than quantitative).</p>
NS	Connectivity and Apportioning	<p>We therefore advise mean max + 1SD should be used to screen in connectivity to SPAs with the following exceptions:</p> <ol style="list-style-type: none"> <li>For guillemot and razorbill use of mean max + 1SD, including data from Fair Isle for all Northern Isles designated sites. For all designated sites south of the Pentland Firth (i.e. excluding the Northern Isles), use of mean max + 1SD discounting Fair Isle values. North Caithness Cliffs SPA is considered to lie south of the Pentland Firth.</li> <li>For gannet we recommend using mean max + 1SD for all colonies without site specific maximum values. However, the</li> </ol>	<p>Advice noted and followed in carrying out the connectivity screening presented in the NCA Screening Report (HWL, 2022) submitted for consultation on 2 February 2022. No specific comment was made on this work in the Screening Opinion (MS-LOT, 2022b) so it is assumed that MSS and NS were content with what had been done. This is presented in the RIAA and</p>

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		<p>site specific maximum should be used for the following SPA colonies:</p> <ul style="list-style-type: none"> <li>- Forth Islands,</li> <li>- Grassholm, and</li> <li>- St Kilda.</li> </ul> <p>3. For species with insufficient data to calculate Mean Maximum (MM) +1SD then the closest metric is to be used in the following order of preference:</p> <ul style="list-style-type: none"> <li>- Mean Max,</li> <li>- Max,</li> <li>- Mean.</li> </ul>	<p>in Technical Appendix 12.2: Connectivity and Apportioning.</p>
NS	Connectivity and Apportioning	<p>We note the list of SPAs presented in Table 8.9. However, there is no indication of how these were selected. We advise that the initial list of SPAs to be considered should be based on connectivity (i.e. foraging range) with the proposed wind farm.</p>	<p>Noted.          NS advice on using foraging ranges to determine connectivity for the long list of SPAs was followed, as presented in the NCA Screening Report (HWL, 2022), submitted for consultation on 2 February 2022.</p>
NS	Connectivity and Apportioning	<p>Regarding marine pSPAs, the list of SPAs should also include Scapa Flow pSPA rather than the Orkney Inshore Waters pSPA. Also note that the Pentland Firth pSPA has been withdrawn and is no longer afforded policy protection.</p>	<p>Note that all marine pSPAs relevant to assessment are now designated.           All marine SPAs were proposed to be scoped out of assessment as presented in the NCA Screening Report (HWL, 2022)</p>



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NS	Seabird sensitivity	Sensitivity assessments for judging plausible impact pathways for entry onto the long list should consider Furness & Wade (2012), Furness <i>et al.</i> (2013) and Wade <i>et al.</i> (2016).	as there was no connectivity determined between the Offshore Development (the PFOWF Array Area and OECC) and aggregations of seabirds at sea, protected within the marine SPA boundaries. No advice was received on this approach in the Screening Opinion (MS-LOT, 2022b) and it has therefore been included in the RIAA, but screened out of the assessment due to the development not having any direct overlap with the SPA.
NS	Reference populations	For the vast majority of colonies and species the 4 <sup>th</sup> National Seabird Census, 'Seabird Count' has produced updated counts. Although these have not been collated and published, they are available from the Seabird Monitoring Programme Database – please seek further guidance from JNCC at SMPWebsiteAdmin@jncc.gov.uk. Where possible, we therefore advise use of these latest figures for assessment of impacts on breeding populations. For any sites or species without updates, then we advise use of Seabird 2000 consensus figures (Mitchell <i>et al.</i> 2004). For comparative purposes (e.g. apportioning) where	Advice followed as presented in the species summaries for the baseline characterisation presented in Section 12.4 of the EJAR Chapter and in Table 12-14. Latest figures were obtained from the Seabird Monitoring Programme (SMP) database as noted in Table 12-2 of the EJAR Chapter. A spreadsheet of these counts was provided to MSS, NS and RSPB on 7 October 2021. A discrepancy was found in the counts provided by the SMP for North Caithness Cliffs SPA and those presented in Swann (2018); the NS colony monitoring report for 2015/16.

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NS	Impact Pathways	<p>colonies included in apportioning do not have updates, then all colonies will need to use values taken from a similar time period.</p> <p>The key impact pathways (collision risk, displacement, disturbance and impacts to prey species) have been captured in Table 8-13. We note that disturbance from noisy pre-construction activities (such as UXO detonation and geophysical surveys) have not been considered. However, we acknowledge there is limited evidence available to indicate that significant disturbance from underwater noise is likely. Mitigation measures necessary to reduce impacts to marine mammals species will help reduce any impacts to diving seabird species in the absence of such evidence.</p>	<p>The matter was flagged, and clarification sought in an email sent 16 February 2022 with the matter resolved by JNCC providing the confirmed SPA counts for kittiwake, guillemot, razorbill and puffin in their email of 9 May 2022. These confirmed counts are presented in Technical Appendix 12.2: Connectivity and Apportioning and used for reference in relation to PVA (Technical Appendix 12.5: Population Modelling).</p> <p>Key impacts for assessment are presented in Section 12.5.1 of the EIAR Chapter, Table 12-11, with the assessment undertaken in Section 12.6. Possible pre-construction activities are considered in Sections 12.6.1.1.1 and 12.6.1.1.2.</p>
NS	Impact Pathways	<p>We agree that pollution impacts are scoped out. However, we note this table does not consider impacts associated with the installation of the export cable. This is less likely to cause an adverse impact given the slow speed employed by the installation vessel(s), but additional detailed information on cabling activities</p>	<p>Baseline characterisation of the OECC and cable landfall is given in Section 12.4.4.14 of the EIAR Chapter and potential impacts are addressed in Sections 12.6.1.1.2 and 12.6.2.6.2.</p>

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NS	Assessment methods	<p>and associated vessel movements / sizes, including nature of works, locations, duration and timing, will be required to assess potential impacts on seabirds. The cable landfall occurs within the North Caithness Cliffs SPA, therefore assessment of the export cable route and activities will need to be included and justified in the EIAR and HRA.</p> <p>Approach to impact assessment: We set out below our outline advice with respect to assessment methodologies to be used for those key impact pathways as discussed above. Overall, we are content with the approach outlined in table 8.14 of the Scoping Report for impact assessment. We will continue to engage throughout the pre-application process and have sought to identify below where we envisage the need for further discussion to refine and agree assessment methods.</p>	<p>The RIAA addresses potential impacts arising from the OECC where it passes through the marine area of North Caithness Cliffs SPA and considers proposed HDD for the cable landfall.</p> <p>Noted.</p>
NS	Baseline including surveys	<p>NatureScot guidance on seasonal definition for birds in the Scottish Marine Environment should be used for breeding and non-breeding season definitions – this has recently been updated to include the need for 5 years phenology data for use in any local variation.</p>	<p>This advice is noted, however, for assessment in the non-breeding season, Furness (2015) defines the relevant BDMPS populations to refer to. These defined populations relate to the BDMPS periods specified by Furness (2015) and if they are to be used for reference (as also advised by NS, see next row) they cannot easily be altered or amalgamated.</p> <p>Kittiwake, where the issue is of most concern, has two BDMPS reference populations: one for autumn migration and one for spring. These BDMPS</p>

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NS	Displacement	<p>Barrier / Displacement: Displacement should be assessed using the SNCB (2017) matrix methods for the three auk species during both the breeding and non-breeding season. We support the use of the SeaBORD tool (Searle et al. 2018) for assessing barrier / displacement during the breeding season for those species with tracking data. The displacement rate and mortality rates to be used should be discussed and agreed in consultation with Marine Scotland. For the non-breeding season, population sizes should be derived from the zones determined by the BDMPS Report (Furness, 2015). The exception to this being guillemot where the population and impacts should be based on an assessment area derived from the breeding season foraging range.</p>	<p>populations are defined separately and cannot be amalgamated, thus the defined BDMPS periods cannot be combined either.</p> <p>Currently it is not possible to define a single wintering period (or population) for kittiwake assessment. In this regard, all non-breeding mortality estimates from North Sea wind farms are available only for BDMPS seasons and not for any other defined unit, see Section 12.7.3.1.1 of the EIAR Chapter and the RIAA for further details.</p>
			<p>Further to the meeting on 4 November 2021, MSS, NS and RSPB Scotland provided advice on displacement mortality rates in emails dated 6 December 2021 and 7 December 2021. SeabORD modelling has also been carried out for kittiwake, guillemot, razorbill and puffin and the implications of the outputs considered in relation to advised rates of displacement mortality (Technical Appendix 12.4: Displacement Analysis).</p> <p>BDMPS non-breeding populations are provided in Section 12.4.4 (baseline</p>

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NS	Displacement	We have recently updated our advice on assessing displacement impacts on gannet. On further consideration of 1) emerging (but as yet unpublished) evidence from post consent monitoring indicating gannets may displace over larger distances; and 2) the increased number of windfarms being proposed and therefore larger cumulative effect, we consider it is appropriate to start to include displacement impacts within assessments for gannet.	characterisation) of the EIAR Chapter. NS provided further advice on a non-breeding population for guillemot in their email of 18 March 2022, as forwarded by MS-LOT on 31 March 2022.
NS	Displacement / CRM	For kittiwake, collision risk and displacement were previously considered to be mutually exclusive impacts, and as such we advised that assessment focuses on collision risk as the impact of most concern (presenting a greater risk of population consequences). However, we advise that further discussion and agreement on impact pathways and assessment methods in consultation with Marine Scotland is required for this species.	Displacement matrices have been provided for gannet in Technical Appendix 12.4: Displacement Analysis, and combined displacement / collision mortalities are considered in the assessment.  As presented in Technical Appendix 12.5: Population Modelling and in the RIAA, kittiwake collision and displacement mortality estimates have been added together, particularly for consideration of impacts arising from the Offshore Development against the kittiwake population at North Caithness Cliffs SPA. In the absence of further discussion or agreement between MSS and NS on the matter, this is a 'worst case' (precautionary) approach to adopt.

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NS	CRM	<p>Collision Risk: We expect the British Trust for Ornithology (BTO) Birdfacts to be the main reference source for biological parameters to be used in the collision models. These should be discussed and agreed in advance in consultation with Marine Scotland. It would also be helpful to agree the definition to be used for consideration of nocturnal activity (i.e. civil twilight). Nocturnal activity scores haven't changed from those previously used, other than for gannet, where values derived from the recent review of tagged birds (Furness, 2018) should be used.</p> <p>Densities: Further discussion and agreement in consultation with Marine Scotland is needed to decide which monthly values (e.g. mean monthly or monthly max) are used for density estimates.</p>	<p>This advice has been followed on all matters as presented in Technical Appendix 12.3: Collision Risk Modelling,</p>
NS	CRM	<p>Densities: Further discussion and agreement in consultation with Marine Scotland is needed to decide which monthly values (e.g. mean monthly or monthly max) are used for density estimates.</p>	<p>As agreement on which monthly values were to be used, CRM has been undertaken for the Offshore Development using both mean and max density estimates as presented in Appendix 12.3: Collision Risk Modelling. For cumulative and in-combination assessment, the mean density CRM is used to allow a 'like-for-like' comparison with the other larger-scale wind farms included for assessment.</p>
NS	CRM	<p>Models, options and scenarios: We expect the basic and extended Band (2012) models to be used primarily with option 2 and 3 for the worst case and most likely scenario. For flight speed, we rely on published data (i.e. Pennycuik 1997; Alerstam et al. 2007), however we recognise 'in the field' measurements are contributing to new evidence so would welcome further</p>	<p>CRM model options 2 and 3 have been presented as requested. Flight speed references the published literature as requested, with 'in the field' measurements given by Skov et al. (2018) discussed for context (Technical Appendix 12.3: Collision Risk Modelling).</p>

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NS	CRM	<p>discussion on appropriate, evidence based values to be used, in consultation with Marine Scotland.</p> <p>We note and support the intention to also use the stochastic collision risk model (sCRM) developed by Masden (2015).</p>	<p>At the meeting on 16 December 2021, it was advised by NS and MSS only to use the Band (2012) spreadsheets. They reiterated that they wanted only deterministic CRM in their advice forwarded on 31 March 2022. This is presented in Technical Appendix 12.3: Collision Risk Modelling, and sCRM has not been undertaken.</p>
NS	CRM	<p>Avoidance rates: SNCB guidance (2014) on avoidance rates should be used with a standard deviation of + / - 2. For species where there are no agreed avoidance rates we recommend use of 98% as default. Where there are terrestrial estimates based on the species in question those rates should be used. Any deviations from this advice will require clear justification and evidence.</p>	<p>Advice has been followed, as presented in Technical Appendix 12.3: Collision Risk Modelling.</p>
NS	CRM	<p>Presentation of outputs: Outputs from each model should be supplied in full as appendices with input parameters stored. There is not as yet a standard approach for sCRM output reports, but as a minimum presentation of results should be accompanied by input values used. Where tables are used column titles should be standardised as far as possible to allow comparisons to be made where this is appropriate.</p>	<p>Input densities for each species are set out in Annex 1, Technical Appendix 12.3: Collision Risk Modelling. Other input parameters are presented in Table 2 of the Technical Appendix.</p>

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NS	CRM	Strategic collision risk: Potential collision risk to migratory species should be assessed qualitatively with reference to the survey results and the Marine Scotland commissioned strategic level report (Marine Scotland, 2014). To note, MS are also in the process of commissioning an updated strategic review of migratory routes via ScotMER. This update should be used if available within assessment timescales.	Consideration of collision risk to migratory species (wildfowl and waders) is given in Section 12.6.2.1.9 of the EIAR Chapter and in the RIAA. The new strategic study was not available in time for use in the assessment.
NS	Connectivity and Apportioning	Apportioning: In order to consider any population consequences arising from displacement and estimated collisions, the overall impacts will need to be apportioned by season, between SPAs and across age classes.	Apportioning by season has been done both for EIA and HRA, whereas apportioning between SPAs is only done for HRA and apportioning between age-classes is only done for PVA.
NS	Connectivity and Apportioning	Age-class apportioning should be based on stable age population models. For half months the collisions calculated for that month should be split equally between breeding and non-breeding period. In respect of sabbaticals, we recommend that all adults recorded during survey work are considered as breeding adults. This is a precautionary assumption, and it may be possible to refine it, depending on the choice and structure of population models. For the breeding season, we recommend apportioning between adults and immatures on the basis of developer's site-specific survey work.	This advice has been followed and no sabbatical rates applied. Apportioning between adults and immatures for PVA is presented in Technical Appendix 12.5: Population Modelling.
NS	Connectivity and Apportioning	Breeding season: Emerging Marine Scotland guidance (due to be published imminently) should be used for guillemot, razorbill and kittiwake (and shag, if required) and for all other species that	The MS Apportioning Tool (Wakefield option) has been used for kittiwake, guillemot and razorbill as advised, and the NS (2018) guidance for all other species,



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NS	Connectivity and Apportioning	<p>require detailed consideration in the assessment we advise use of our (2018) interim guidance.</p> <p>Non-breeding season: The BDMPS Report (Furness, 2015) should be used for species where the majority of birds are wintering elsewhere rather than in the northern North Sea. Further discussion will be needed to finalise the approach, with respect to birds who largely remain in the northern North Sea during the non-breeding season. Currently, however, if non-breeding season assessment of displacement of guillemot is required, then we would wish to see the non-breeding season population defined in terms of the mean maximum foraging range (Woodward et al. 2019). Please note that a review of tagging data for both guillemot and razorbill wintering distributions is due to be published. Once published we will consider whether our advice can be updated for these species.</p>	<p>Appendix 12.2: Connectivity and Apportioning.</p> <p>NS provided follow up advice on a guillemot non-breeding season reference population in their email of 18 March 2022 forwarded by MS-LOT on 31 March 2022. The method is described in Technical Appendix 12.2: Connectivity and Apportioning and taken through to Section 12.7 of the EIA Chapter and to the RIAA.</p>
NS	PVA	<p>Population consequences: The impacts of collision and displacement will need to be considered in the context of relevant SPA breeding colonies particularly where the assessed effects exceed a change to the adult annual survival rate of 0.2%. Where apportioned impacts are large and/or the SPA populations are small, it is likely that population models will be required to establish whether or not there could be long-term impacts on population viability.</p>	<p>Addressed for HRA (as reported in the RIAA) and, where required, PVA has been undertaken for those SPA seabird populations where estimated mortalities are above the 0.2% thresholds; kittiwake, guillemot and puffin at North Caithness Cliffs SPA (Technical Appendix 12.5: Population Modelling).</p>

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NS	PVA	We highlight that it is more difficult to make predictions over a longer timeframe as uncertainty in the model outputs increases with the length of model run. For SPA seabird species this may make it harder to conclude no long-term impacts on population viability and no adverse impact on site integrity.	Impacts have been applied in the PVAs for a 30-year period commencing in 2027 (the Offshore Development is anticipated to be commissioned in Q4, 2026). 50-year baseline models for kittiwake and puffin have also been run for context.
NS	PVA	Type of model: We recommend the NE PVA tool is used. Impacts should be applied to all ages in agreement with the age apportioning approach, and sabbatical rates of adult birds should be taken into account.	The NE PVA tool has been used to model predicted kittiwake, guillemot and puffin impacts at North Caithness Cliffs SPA, as presented in Technical Appendix 12.5: Population Modelling.
NS	PVA	PVA metrics to be presented: We advise the two ratio metrics which are generally termed 'Counterfactual (ratio) of final population size' and 'Counterfactual (ratio) of population growth-rate' should be presented.	These metrics have been provided; Technical Appendix 12.5: Population Modelling.
NS	Cumulative assessment	In addition to the list presented in section 8.5.9, cumulative assessment should include other consented wind farms in the Moray Firth. Further discussion and agreement is needed in consultation with Marine Scotland.	Cumulative assessment includes the Moray Firth offshore wind farms, as presented in Table 12-27, Section 12.7 of the EIAR Chapter and in the RIAA.  The initial list of projects to consider for cumulative / in combination assessment was presented in the NCA Screening Report (HWL, 2022), with the final long list of projects considered in relation to

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NS	Cumulative assessment	Breeding season: For the breeding season, the cumulative assessment should consider effects from projects within mean-max foraging range of the colony SPA under consideration, based on Woodward <i>et al.</i> (2019).	Marine Ornithology presented in Table 12.27 of the EIAR Chapter.
NS	Cumulative assessment	Non-breeding season: Cumulative assessment in the non-breeding season should include all relevant developments within the region defined for the species, either by BDMPS or other agreed approach.	Advice followed, as presented in Table 12-27, Section 12.7 of the EIAR Chapter and in the RIAA.
NS	Mitigation	Where significant impact pathways have been identified, we advise that the full range of mitigation techniques and published guidance is considered and discussed in the EIAR.	Advice followed as presented in Table 12-27, and Section 12.7 of the EIAR Chapter and in the RIAA.
RSPB Scotland	HRA	The Pentland Floating Offshore Wind Farm overlaps the offshore element of the North Caithness Cliffs Special Protection Area (SPA) and individual seabirds from other SPA colonies may interact with the project site. Given this proximity, this project poses significant risk to these seabird populations and therefore the potential of adverse effects on integrity of the site cannot be ruled out either in isolation or in combination.	Embedded mitigation is discussed and presented in Table 12-20, Section 12.5.5 of the EIAR Chapter. HWL is also committed to proportionate monitoring / research to help understand floating wind farm impacts on bird species. Potential impacts against SPA seabird populations (including North Caithness Cliffs) are presented in the EIAR Chapter and fully addressed in the RIAA.

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RSPB Scotland	Baseline including surveys	We note it is proposed to deviate from normal method of using two years' worth of site-specific data collected within the last five years. We have concerns with this approach as older data may increase uncertainty in the assessment of impacts.	The most recent SPA colony counts for North Caithness Cliffs SPA were undertaken in 2015 so that the survey work undertaken that year for Dounreay Tri ties into the available SPA data for this colony that's closest to the Offshore Development. Use of older survey data can be applicable when it's of equivalent age to, or more recent, than the SPA counts being used for reference in assessment. Survey effort and duration has been confirmed as appropriate by MS-LOT (based on MSS / NS advice) in their email of 24 November 2021. .
RSPB Scotland	General	We would welcome an opportunity to discuss our comments outlined in the Annex below further and would be pleased to provide additional advice on the assessment as it progresses.	RSPB Scotland attended the meetings held on 4 November 2021, 16 December 2021 and 21 February 2021, and provided helpful advice in response.
RSPB Scotland	Baseline including surveys	We consider it is best practice to undertake two full years of survey within five years of the application, even if the development size is small and there is past data. Given mobility of seabirds and their prey in response to weather, sea conditions, marine productivity and other factors, having less than two years of recent survey data risks not being sufficient enough to	Use of older survey data can be applicable when it's of equivalent age to, or more recent, than the SPA counts being used for reference in assessment. Survey effort and duration has been confirmed as appropriate by MS-LOT (based on MSS /

Consultee	Headline	Comment / Issue Raised	Offshore Development Approach and Section ID
RSPB Scotland	Baseline including surveys	<p>characterise temporal and spatial variability in seabird numbers within the survey area.</p> <p>We note that the first year of site-specific surveys were completed in December 2015. This data is now beyond the five-year limit which reduces the reliability of this dataset.</p>	<p>NS advice) in their email of 24 November 2021.</p>
RSPB Scotland	Baseline including surveys	<p>We understand there is also data from a site immediately west of the proposed development, collected between May 2015 and April 2016. This data does not appear to be presented in the scoping report and is also approaching its five-year limit. We consider that data collected at a nearby the site should only be used for context within the assessment rather than relied upon as a proxy to dedicated site survey.</p>	<p>Use of older survey data can be applicable when it's of equivalent age to, or more recent, than the SPA counts being used for reference in assessment. Most recent colony counts for North Caithness Cliffs SPA were undertaken in 2015. Survey effort and duration has been confirmed as appropriate by MS-LOT (based on MSS / NS advice) in their email of 24 November 2021.</p> <p>Technical Appendix 12.1: Baseline Data includes a short summary of the additional data made available by HIE for the DDC.</p>
RSPB Scotland	Baseline including surveys	<p>We welcome the proposal to undertake new aerial surveys between September 2020 and August 2021 and we would strongly recommend that a second full year of survey data is collected. We would also highlight that a new methodology for combining data from different survey platforms is about to be published by Marine Scotland Science, and recommend that,</p>	<p>Available survey data was discussed at the meeting held on 4 November 2021 where it was proposed to use the 2015 Dounreay Tri data in combination with the 2020 / 21 data collected for the Offshore Development, thus providing the two years of pre-consent survey work. Survey effort and duration has</p>

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		<p>where appropriate, these methods are adopted for this contextual assessment.</p>	<p>been confirmed as appropriate by MS-LOT (based on MSS / NS advice) in their email of 24 November 2021. / Both the 2015 Dounreay Tri and 2020 / 21 data for the Offshore Development were collected using the same method and provider: HiDef digital aerial video surveys.            Data analysis for the revised PFOWF Array Area is explained and presented in Technical Appendix 12.1: Baseline Data.</p>
RSPB Scotland	Baseline including surveys	<p>Notwithstanding the above, should the decision be made to continue the application using the data as proposed, we believe sufficient and scientifically robust justification for deviating from the normal best practice approach and demonstration that the baseline data set is adequate to inform the assessment must be provided.</p>	As above.
RSPB Scotland	Guidance	<p>Assessment of impacts, available information: We consider that a number of relevant papers and guidance documents are missing or need updating from the list in Section 8.5.3 Available Information. For example, Table 8-14 includes reference for the old Band model rather than the stochastic Band model and reference to the Scottish Natural Heritage (SNH) interim guidance on apportioning impacts to breeding seabirds is missing but later included in Table 8-14.</p>	<p>Key guidance used in assessment is presented in Section 12.2 of the EIAR Chapter, the full reference list is provided in Section 12.13.</p>

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RSPB Scotland	Connectivity and Apportioning	<p>SPA Connectivity: We encourage the adoption of a precautionary approach to the identification of relevant sites for seabirds with clear methodology on the exclusion of sites and species. We welcome the reference to Woodward <i>et al.</i> (2019) but would also recommend that site specific data are examined and where the maximum foraging range from the colony exceeds the generic value, the site-specific value should be used instead.</p> <p>We consider the proposed development has potential to impact SPA sites beyond those listed in Table 8-9 in section 8.5.7.1 (Designated Sites). Other SPAs that should be assessed to establish whether the qualifying interest features (species) are within foraging range include: East Caithness Cliffs SPA, Pentland Firth Islands SPA, Auskerry SPA, Copinsay SPA, Noss SPA, Foula SPA, Sumburgh Head SPA, and the Hermaness, Saxa and Valla Field SPA.</p>	<p>Site-specific data considered as per RSPB and NS advice (Technical Appendix 12.2: Connectivity and Apportioning).</p>
RSPB Scotland	HRA screening	<p>Potential impacts: We broadly agree with the potential impacts upon ornithological features to be considered within the EIA</p>	<p>As above. NCA Screening Report (HWL, 2022) submitted for consultation on 2 February 2022 including the required SPA long lists screened in for connectivity.</p> <p>In their advice for the Screening Opinion (MS-LOT, 2022b) RSPB indicated that they were satisfied with the work but requested that Caithness and Sutherland Peatlands SPA be included for red-throated diver.</p> <p>Based on the Screening Opinion (MS-LOT, 2022b), a connectivity screening has now also been undertaken for European storm petrel, Leach's petrel and Manx shearwater as SPA qualifying interests, as presented in the RIAA.</p>
RSPB Scotland	Impact pathways		<p>Impacts on nocturnally active species including shearwaters and petrels are</p>

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RSPB Scotland	Impact pathways	<p>listed in Table 8-13. However, there are a couple of additional impacts that we feel should be addressed in the EIAR.</p> <p>These are:</p> <ul style="list-style-type: none"> <li>• Collision risk to nocturnally active seabirds – some of the species recorded in the 2015 surveys of the site (Tables 8-10 to 8-12), such as fulmar and petrels, are known to fly at night; and</li> <li>• Impacts of lighting and collision with infrastructure – shearwaters and petrels are known to be attracted to artificial lights and can become disorientated, often with fatal consequences.</li> </ul> <p>We also note that 'Potential accidental release of pollutants' is scoped out due to the embedded mitigation implemented during construction and operation. It would be useful to have more detail on this provided.</p> <p>Wind Turbine Generators contain large amounts of oil, which should it leak, could have serious impacts on seabirds.</p>	addressed in Section 12.6.2.1.10 of the EIAR Chapter and in the RIAA.
RSPB Scotland	Baseline including surveys	<p>Cumulative impacts: Species such as common scoter and red-throated divers, associated with terrestrial SPAs (such as the Caithness and Sutherland Peatlands SPA) may be encountered by surveys during the breeding season as they are known to forage at sea whilst breeding.</p>	<p>Environmental Management Plans will include pollution prevention measures and are proposed as embedded mitigation, Section 12.5.5 of the EIAR Chapter, Table 12-20.</p> <p>Potential accidental release of pollutants is scoped in as an impact pathway under HRA and is addressed in the RIAA.</p>
			<p>Of the species mentioned, only red-throated diver were recorded during the digital aerial surveys and then only in minimal numbers (Technical Appendix 12.1: Baseline Data). They have been included for consideration in Section 12.4.4.11 and Section 12.6 of the EIAR Chapter.</p>



Consultee	Headline	Comment / Issue Raised	Offshore Development Approach and Section ID
RSPB Scotland	Cumulative assessment	<p>If this is the case, then in-combination impacts with onshore wind farm developments should be considered as they have the potential to cause cumulative collision and / or displacement effects. In this situation we request that the following developments are included in a cumulative impact assessment: the Limekiln wind farm extension (proposed), Ackron wind farm (proposed), Drum Hollistan 2 wind farm (proposed), Strathy North (operational), Strathy South (consented), Strathy Wood (proposed), the Strathy Wood grid connection (proposed), Space Hub Sutherland (consented), Armadale wind farm (scoping), Bettyhill Extension wind farm (scoping) and Tormsdale wind farm (scoping).</p>	<p>Requirements in respect of red-throated diver and great black-backed gull are addressed in Section 12.7 of the EIA Chapter.</p> <p>Zero impacts (collision risk or displacement) are predicted to occur from the Offshore Development on red-throated diver (the only species where impacts associated with terrestrial wind farms and offshore wind farms were recorded), therefore it will not make any contribution towards any cumulative impact on this species from other terrestrial developments, as assessed in Section 12.7 of the EIA Chapter and in relation to Caithness and Sutherland Peatlands SPA in the RIAA.</p> <p>No great black-backed gull were recorded in the PFOWF Array Area during the breeding season, therefore it is not scoped into the RIAA as a qualifying interest of any breeding seabird SPAs. Cumulative impacts in the non-breeding season are assessed in Section 12.7 of the EIA Chapter.</p> <p>The initial list of projects to consider for cumulative / in combination assessment</p>

Consultee	Headline	Comment / Issue Raised	Offshore Development Approach and Section ID
RSPB Scotland	Assessment methods	<p>Method of assessment: Table 8-14 includes description of the proposed ornithological EIA methods. We generally agree with the proposed approach but have the following comments:</p> <ul style="list-style-type: none"> <li>• Breeding Birds:           <ul style="list-style-type: none"> <li>• The assessment should also use the data from the latest Seabird Census (Seabirds Count), where available.</li> </ul> </li> <li>• Apportioning:           <ul style="list-style-type: none"> <li>• Best available methods for apportioning should be used, including consideration of the Apportioning Tool that has been developed for Scottish waters by Centre of Ecology and Hydrology (CEH) and RSPB, on behalf of Marine Scotland, where appropriate</li> </ul> </li> <li>• Collision risk:           <ul style="list-style-type: none"> <li>• We note Table 5-1 states that there will be a 22m minimum blade clearance distance from sea level, independent from tide state. Increasing this minimum distance should be considered as a key mitigation measure as 22m is relatively close to the sea level and within potential collision height for many seabirds.</li> <li>• The modelling methods (and corrigendum) presented in the Johnston et al. (2014) paper should be used</li> </ul> </li> </ul>	<p>was presented in the NCA Screening Report (HWL, 2022), with the final long list of projects considered in relation to Marine Ornithology presented in Table 12.27 of the EIAR Chapter.</p>
			<p>Latest figures were obtained from the SMP database as noted in Table 12-3. A spreadsheet of these counts was provided to MSS, NS and RSPB on 7 October 2021.</p> <p>The MS Apportioning Tool (Wakefield option) has been used for kittiwake, guillemot and razorbill as advised, and the NS (2018) guidance for all other species, Technical Appendix 12.2: Connectivity and Apportioning.</p> <p>The applicant has increased the air gap to 35 m, Section 12.5.5 of the EIAR Chapter, Table 12-20.</p> <p>CRM has been carried out using option 2 and option 3 as advised by NS and presented in Technical Appendix 12.3: Collision Risk Modelling. Option 1 has not been requested by MSS or NS and therefore HiDef have not undertaken a flight height analysis of the survey data.</p>

Consultee	Headline	Comment / Issue Raised	Offshore Development Approach and Section ID
		<p>alongside accurate information on flight heights if possible and subject to validation from the Hi-Def surveys.</p> <ul style="list-style-type: none"> <li>We recommend the use of the stochastic CRM shiny app developed by Marine Scotland Science, and that the full output reports are provided. We welcome further discussion on the model options used and parameterisation of them.</li> </ul>	<p>HiDef's flight height analysis method has been separately shared with MSS, NS and RSPB Scotland, and a manuscript is currently in the process of being peer-reviewed for publication (Humphries et al. [in review]).</p> <p>Further to the discussion at the meeting on 16 December 2021 and subsequent advice from MSS and NS forwarded 31 March 2022, a deterministic CRM has been undertaken rather than a stochastic one.</p>
RSPB Scotland	CRM	<p>We note that the avoidance rates to be used will be informed using Smart Wind (2014) and the "Joint Response from the Statutory Nature Conservation Bodies to the Marine Scotland Science Avoidance Rate Review 25<sup>th</sup> November 2014". We are in agreement with the published avoidance rates within the latter, except that for gannet during the breeding season where we advocate that the default avoidance rate of 98% should be used. This is because gannet change their flight behaviour during the breeding season, (Lane et al., 2020) which is likely to alter their avoidance behaviour. The review on which the SNCB based their guidance is almost entirely drawn from studies on non-breeding gannet (Cook et al., 2014).</p>	<p>Gannet CRM at a 98% avoidance rate is presented for context in Technical Appendix 12.3: Collision Risk Modelling.</p>
RSPB Scotland	Displacement / PVA	<ul style="list-style-type: none"> <li>Disturbance and Displacement</li> <li>We welcome the use of the SeaBORD modelling tool, supported by a matrix approach where SeaBORD is not</li> </ul>	<p>SeaBORD (v1.3) adopted as discussed above and presented in Technical Appendix 12.4: Displacement Analysis.</p>

Consultee	Headline	Comment / Issue Raised	Offshore Development Approach and Section ID
RSPB Scotland	Assessment methods	<p>applicable. We welcome further discussion around displacement and mortality values to be used in the model.</p> <ul style="list-style-type: none"> <li>Population Consequences:           <ul style="list-style-type: none"> <li>Where apportioned impacts are large and / or the SPA populations are small, it is likely that population models will be required to establish whether or not there could be long-term impacts on population viability</li> <li>We recommend that the NE PVA shiny tool is used to assess population scale impacts for both projects alone and in-combination assessments, where relevant.</li> <li>We advise the two ratio metrics which are generally termed 'Counterfactual (ratio) of final population size' and 'Counterfactual (ratio) of population growth-rate' should be presented.</li> </ul> </li> </ul> <p>Consultation on these methods should be ongoing and RSPB Scotland can participate in discussions, along with NatureScot and MSS, as to the most appropriate methods. As part of this, consideration must be given into how variability and uncertainty is incorporated and presented in the assessment. There should be an intention to refer to additional guidance as it emerges and to engage in discussion regarding the correct use of these.</p>	<p>As above. PVA undertaken for key species at North Caithness Cliffs SPA uses the NE PVA tool and the requested model outputs are presented in Technical Appendix 12.5: Population Modelling.</p>
			<p>An iterative approach was taken to pre-application consultation, as indicated in Section 1, Introduction, and by this consultation table.</p> <p>Variability and uncertainty in the underpinning survey data is discussed in Section 12.4.6 of the EIA Chapter. Section 12.5.6 notes these issues in relation to methods and input parameters for apportioning, impact modelling and PVA, but it is the</p>

Consultee	Headline	Comment / Issue Raised	Offshore Development Approach and Section ID
RSPB Scotland	Guidance / Assessment methods	We would also recommend that the findings of the Marine Bird Impact Assessment Guidance Workshop held by NatureScot on 20 February 2020 be taken into account.	Technical Appendices where these matters are discussed in more detail.
RSPB Scotland	General	The Environmental Impact Assessment should also consider the overall carbon payback period for the development, including any impacts on 'blue carbon' from habitats affected by the proposal.	Workshop attended; available presentations and workshop report reviewed. Iterative pre-application consultation undertaken with MSS, NS and RSPB Scotland on a range of issues.  Carbon payback calculations are provided in Offshore EIAR (Volume 3): Technical Appendix 20.1: Carbon Assessment (Section 6.2)  An assessment of the impact of the Offshore Development on blue carbon habitats is provided in Chapter 8: Benthic Ecology.
RSPB Scotland	Monitoring	Monitoring Programme: Many uncertainties remain around the impacts of all types of offshore wind on wildlife and birds. A condition to implement an environmental monitoring programme should be appended to any consents that may be granted and results should be made public. Such a condition is considered reasonable to better understand not only the use of the sea and airspace around the development by seabirds and other marine wildlife but also the interactions of these species with the turbine structures. Monitoring trends in seabird populations, species' distribution at sea and habitat impacts of cable laying, would also be key aspects to include in a monitoring	The applicant is committed to proportionate monitoring / research to help understand floating wind farm impacts on bird species.

Consultee	Headline	Comment / Issue Raised	Offshore Development Approach and Section ID
		<p>package, particularly as there are no other offshore sites in this region. We would also strongly support tagging and tracking of seabirds in the monitoring package for this reason.</p> <p>Such efforts could help improve certainty in environment assessments and prove vital as a means to inform decision-making around any future proposals for larger scale projects in nearby locations or elsewhere in Scottish or United Kingdom (UK) waters.</p>	
The Highland Council	General	<p>The presence of protected species such as Schedule 1 Birds or European Protected Species must be included and considered as part of the planning application process, not as an issue which can be considered at a later stage. Any consent given without due consideration to these species may breach European Directives with the possibility of consequential delays or the project being halted by the EC.</p> <p>Please refer to the comments of NatureScot and RSPB in this respect.</p>	<p>Peregrine are the only Schedule 1 bird species relevant to assessment of the Offshore Development. They are a qualifying interest of North Caithness Cliffs SPA and have therefore been addressed in the RIAA where it is relevant to consider potential impacts arising from installation of the export cable(s) close to shore and associated HDD for the cable landfall.</p>
The Highland Council	CRM / Displacement	<p>An assessment of the impacts to birds through collision, disturbance and displacement from foraging / breeding / roosting habitat will be required for both the proposed development site and cumulatively with other proposals. The EIAR should be clear on the survey methods and any deviations from guidance on ornithology matters.</p>	<p>Noted.          This advice is addressed in the EIAR Chapter and in the RIAA.</p>
<b>Scoping Opinion Addendum</b>			

Consultee	Headline	Comment / Issue Raised	Offshore Development Approach and Section ID
MS-LOT (on behalf of Scottish Ministers)	General	<p>Within table 6.1 of the Scoping Report the Developer summarises the potential impacts to ornithology associated with the change in parameters. The Scottish Ministers agree with the conclusion of the Scoping Report that no changes to the methodology for ornithological assessment are required however, highlight the representation from the RSPB that due consideration be given to increasing the 'air gap' as a key mitigation measure. The Scottish Ministers further advise that the Developer clarifies in the EIA Report how the potential increase in spread of the WTG moorings relates to the ornithological survey area being expanded from 2 km to 4 km and how far the moorings are to extend into the buffer zone, as per the RSPB representation.</p>	<p>Noted.</p> <p>The Scottish Ministers have not required updates to methodologies further to the advice given in the Scoping Opinion (MS-LOT, 2021).</p> <p>With regard to the two issues raised by RSPB Scotland, the applicant has increased the minimum air gap to 35 m (Section 12.5.5, Table 12-20 of the EIA Chapter) and has confirmed that no moorings will extend beyond the footprint of the PFOWF Array Area, not into either the 2 km or 4 km buffer zones.</p>
MSS	General	<p>Regarding ornithology, MSS have considered the 'Pentland Floating Offshore Wind Farm EIA Scoping Addendum' and the response from NatureScot (email 1 February 2022). Given the updated worst case parameters presented in Table 2.1 Key Offshore Project Parameters, the subsequent potential for increase impacts from proposed project changes in Table 6.1 Summary of the potential impacts upon ornithological features to be considered within the EIA and whether there is potential for increased impacts from proposed project changes and that the method of assessment remains unchanged from that presented in the scoping report, MSS have nothing further to add to the original response sought from the original scoping request.</p>	<p>Noted.</p> <p>MSS have nothing further to add to the Scoping Opinion (MS-LOT, 2021) in respect of Marine Ornithology.</p>

Consultee	Headline	Comment / Issue Raised	Offshore Development Approach and Section ID
RSPB Scotland	Mitigation	We note that the air gap between the lowest sweep of the rotor blades and the sea will remain the same at 22m, despite the proposed increases in turbine dimensions. We ask that the Applicant consider increasing this as a key mitigation measure as 22m is relatively close to the sea level and within potential collision height for many seabirds.	The applicant has increased the minimum air gap to 35 m, Section 12.5.5, Table 12-20 of the EIAR Chapter.
RSPB Scotland	Impact pathways	We also note that the radius spread of the turbine moorings is proposed to be doubled to 1250m. It is unclear from the report how this relates to the ornithological survey area that was expanded from 2 km to 4 km for all surveys from April 2021 (halfway through the survey period) following MS advice, and how far the mooring would be extending into the buffer zone. This should be clarified in the EIA report.	No moorings will extend beyond the footprint of the PFOWF Array Area, not into either the 2 km or 4 km buffer zones.
<b>Screening Opinion</b>			
MS-LOT (on behalf of Scottish Ministers)	CRM	We agree with the use of a qualitative narrative in assessing migratory collision risk due to the MS commissioned project assessing migratory collision risks not yet being published, as set out in the NatureScot representation and MSS advice.	Migratory collision risk (wildfowl and waders) is addressed in Section 12.6.2.1.9 of the EIAR Chapter and in the RIAA.
MS-LOT (on behalf of Scottish Ministers)	Impact pathways	As regards impact pathways, we request that the Developer screen in the potential pathway of entanglement in secondary interactions diving birds may have with discarded fishing gear, as supported by MSS advice.	Potential for entanglement with debris caught on mooring lines is addressed in Section 12.6.2.4 of the EIAR Chapter and in the RIAA.



Consultee	Headline	Comment / Issue Raised	Offshore Development Approach and Section ID
MS-LOT (on behalf of Scottish Ministers)	HRA screening	<p>The approach of using apportioning to assess likely significant effects at screening stage is not acceptable. We support the approach recommended by NatureScot advice provided by NatureScot and MSS to define the 'long-list' of Special Protected Areas ("SPAs") and features that have connectivity which can then be revised by consideration of 'at-sea' distances as a biological sense-check for species that are known to fly around land. The MS Apportioning Tool should be used where applicable.</p>	<p>All the required SPA long lists following NS advice on determining connectivity (as above) were presented in the NCA Screening Report (HWL, 2022), submitted for consultation on 2 February 2022.</p> <p>As stated in the report, these SPA long lists had been biologically 'sense-checked' prior to submission and were determined based on 'at sea' distances.</p> <p>In the Screening Opinion (MS-LOT, 2022b) received on 17 June 2022, no advice was provided by either MSS or NS on how to screen for LSE (if they did not accept the use of apportioning weightings) therefore the RIAA is based on the original SPA long lists.</p> <p>The MS Apportioning Tool (Wakefield option) has been used for kittiwake, guillemot and razorbill as requested.</p>
MS-LOT (on behalf of Scottish Ministers)	Connectivity and Apportioning	<p>When undertaking apportioning, the most up-to-date data available on the Seabird Monitoring Database highlighted by RSPB and MSS should be included if relevant to the species and sites being examined. We also advise that the Caithness and Sutherland Peatlands SPA for red-throated diver detailed by RSPB should be included in the HRA.</p>	<p>Latest figures were obtained from the SMP database and a spreadsheet of these counts was provided to MSS, NS and RSPB on 7 October 2021.</p>

Consultee	Headline	Comment / Issue Raised	Offshore Development Approach and Section ID
MS-LOT (on behalf of Scottish Ministers)	HRA screening	With respect to the qualifying features to be considered in Table 4.7, impacts to storm petrels and shearwaters should be assessed qualitatively within the HRA, including a discussion of these species' biology and ecology in relation to detection and impact pathways, as outlined in the RSPB representation and MSS advice. We also draw your attention to the incorrect listing of several species as SPA qualifying features in Table 4.7 – these species should be considered in apportioning as non-SPAs per the NatureScot representation and MSS advice.	Red-throated diver as a qualifying interest of Caithness and Sutherland Peatlands SPA are addressed in the RIAA.  Impacts on nocturnally active species including shearwaters and petrels are addressed in Section 12.6.2.1.10 of the EIAR Chapter and in the RIAA.  Noted on the SPA listings.
MS-LOT (on behalf of Scottish Ministers)	HRA screening	With regards to wader and wildfowl species (and other migratory species / taxa) such as red-throated divers, these should be considered in a migration assessment alone and in combination in line with the RSPB representation and MSS advice.	Consideration of collision risk to migratory species (wildfowl and wader species, including red-throated diver) is given in Section 12.6.2.1.9 of the EIAR Chapter and in the RIAA.  This considers potential collision risk arising from the Offshore Development alone and in combination with other offshore wind farms, making reference to available literature (Wright <i>et al.</i> , 2012 and WWT, 2014).
MSS	HRA screening	With respect to HRA screening for ornithology, MSS note that it is unlikely the MS-commissioned strategic assessment of migratory species will be available to inform on this	Noted.

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MSS		application and as such MSS support NS's conclusions of a qualitative assessment, highlighting the previous report (2014) as guidance.	Migratory collision risk (wildfowl and waders) is addressed in Section 12.6.2.1.9 of the EIAR Chapter and in the RIAA.
MSS	Impact pathways	With respect to impact pathways, MSS seek to highlight the potential pathway of entanglement in secondary interactions with discarded fishing gear to diving birds for consideration.	Noted. Entanglement is addressed in Section 12.6.2.4 of the EIAR Chapter and in the RIAA.
MSS	HRA screening	MSS, together with NS, support the application of the LSE () test to be undertaken in advance of apportioning approaches. NatureScot articulate the main reasons for this in their response. MSS support the revision of the long-list by at-sea distances, where appropriate.	Noted. The SPA long lists provided in the NCA Screening Report (HWL, 2022) were based on 'at sea' distances. The RIAA is now based the original long lists as no advice from MSS was received on how to screen for LSE.
MSS	HRA screening	MSS, with NS, also note the errors in Table 4.7 regarding species not named as SPA features. MSS agree with RSPB comments that, where available, updated counts for seabirds, available on the Seabird Monitoring Database should be used. RSPB highlight that an SPA for red-throated diver, 'Caithness and Sutherland peatlands SPA' has not been included in the long list but does have connectivity to the proposed cable corridor.	Noted. Red-throated diver from Caithness and Sutherland Peatlands SPA are considered in Section 12.4.4.11 of the EIAR Chapter and are addressed in the RIAA. Latest counts were obtained from the SMP database as advised at scoping and noted in Table 12-2 of the EIAR Chapter. A spreadsheet of these counts was

Consultee	Headline	Comment / Issue Raised	Offshore Development Approach and Section ID
MSS	HRA screening	MSS agree with RSPB that impacts to storm petrels and shearwaters should be considered qualitatively within the assessment, including discussion of their biology and ecology, for example as it may relate to detection and impact pathways.	provided to MSS, NS and RSPB Scotland on 7 October 2021.  In this regard, note that the MS Apportioning Tool (Wakefield option), references Seabird 2000 data rather than most recent counts.
MSS	HRA screening	In MSS' response from 01 April 2022, it is noted that "RSPB highlight that an SPA for red-throated diver, 'Caithness and Sutherland peatlands SPA' has not been included in the long list but does have connectivity to the proposed cable corridor". For the avoidance of doubt, could MSS please confirm whether or not it believes this should be addressed in the HRA Screening Opinion, per RSPB's request? MSS confirm that this should be addressed.	Baseline characterisation for these species is presented in Section 12.4.4.12 of the EIAR Chapter with potential impacts assessed in Section 12.6.2.1.10 as well as in the RIAA.  Red-throated diver from Caithness and Sutherland Peatlands SPA are considered in Section 12.4.4.11 of the EIAR Chapter and in the RIAA.
MSS	HRA screening	MSS consider that it is appropriate for species such as red-throated diver to be assessed both alone and in-combination. Waders and wildfowl (and other migratory species / taxa) should be considered in a migration assessment alone and in-combination. Red-throated divers breed terrestrially but forage offshore in the breeding season and overwinter coastally (although their distribution can change from	MSS provided their advice on consideration of collision risk to migratory species (wildfowl and waders) in the Scoping Opinion, as further discussed at the meeting held on 16 December 2021. This matter is

Consultee	Headline	Comment / Issue Raised	Offshore Development Approach and Section ID
NS		breeding season). The Caithness and Sutherland Peatlands SPA, with designated red-throated diver breeding population, has foraging distance connectivity with the proposed project, therefore it should be assessed alone and in-combination.	addressed in Section 12.6.2.1.9 of the EIAR Chapter and in the RIAA. Impacts on red-throated diver as a qualifying interest of Caithness and Sutherland Peatlands SPA are assessed in the RIAA.
NS	CRM	We are aware that the MS commissioned project for migratory collision risk has not yet been completed. We therefore agree with using a qualitative narrative for this part of the assessment.	Noted. Migratory collision risk (wildfowl and waders) is addressed in Section 12.6.2.1.9 of the EIAR Chapter and in the RIAA.
NS	HRA screening	We have raised concerns with the approach adopted in the NCA screening report for screening ornithological features, which we have previously raised (meeting on the 16 December 2021). Our main concern is the introduction of apportioning as part of screening for LSE. We consider this introduces an assessment of magnitude to this test. The purpose of screening is to identify those European sites for which an Appropriate Assessment is required. The HRA process requires that this comprises those sites and features where an LSE is expected to arise from the project. The approach taken within Scotland and elsewhere in the UK is that this is a coarse filter; LSE will be assumed to arise where there is the potential presence of an impact pathway. The screening process, therefore, examines potential connectivity between the activities assumed to occur through the development and the qualifying features of European site(s). We acknowledge this approach to screening is highly	Noted. All the required SPA long lists were presented in the NCA Screening Report (HWL, 2022) following the NS advice on determining connectivity (as above). As stated in the report, these SPA long lists were biologically 'sense-checked' prior to submission and were determined based on 'at sea' distances. In the Screening Opinion (MS-LOT, 2022b) no advice was provided by either MSS or NS on how to screen for LSE (if they did not accept the use of apportioning weightings) therefore the RIAA is based on the original SPA long lists.

Consultee	Headline	Comment / Issue Raised	Offshore Development Approach and Section ID
		<p>precautionary as no judgement is made about the likely magnitude of any impact arising from the project, just that a pathway for an impact to occur is assumed to exist. However, this is being applied UK-wide and follows European case law. The extent to which that connectivity will lead to an adverse effect on each site is then considered in more detail at a later stage of the HRA process. Our recommended approach to screening is that of defining the 'long-list' of SPAs and features that have connectivity (as defined by mean-max foraging range plus on standard deviation presented in Woodward et al. 2019; with exceptions for gannet, razorbill and guillemot). This long list can be revised by consideration of 'at-sea' distances as a biological sense-check for species that are known to fly around land.</p>	
NS	HRA screening	<p>Consistency in screening and provision of the long list is an important part of providing transparency in the assessment process. As we move forward with ScotWind this is increasingly important.</p>	As above.
NS	Connectivity and Apportioning	<p>We also noticed that in the apportioning approach used there were several species that were incorrectly listed as SPA qualifying features but would need to be considered in apportioning as non-SPAs (e.g. puffin at East Caithness Cliffs and gannet at Troup Head).</p>	<p>Noted. Gannet were identified in Table 4.7 as an SSSI interest rather than an SPA qualifier. They had been included for apportioning based on advice previously provided by NS for other wind farms.</p>

Consultee	Headline	Comment / Issue Raised	Offshore Development Approach and Section ID
RSPB Scotland	Connectivity and Apportioning	<p>We are content with the apportioning work undertaken, based on NatureScot guidance for all species except guillemot, razorbill, shag, and kittiwake. This because a new tool is now available for these species. In our scoping response, we recommended that this tool is used, which builds on the NS guidance methods.</p> <p>We understand that an attempt was made to use the MS apportioning tool, but it raised a number of queries which need to be resolved and this was recently discussed at a meeting between Marine Scotland, NatureScot, RSPB and HiDef on 22nd February 2022. Once these issues have been addressed, we would strongly recommend that this tool is used for guillemot, razorbill, shag and kittiwake.</p>	<p>The MS Apportioning Tool (Wakefield option) has been utilised for kittiwake, guillemot and razorbill apportioning (shag were not recorded on-site) Technical Appendix 12.2: Connectivity and Apportioning.</p>
RSPB Scotland	Connectivity and Apportioning	<p>We note that the Report states that “the ‘most recent counts’ obtained during the Seabirds Count census, 2015-2019” were used for apportioning. We welcome this but note that surveys for the census were completed in 2021, and 2020 and 2021 data is now available on the Seabird Monitoring Database. This data should be included if relevant to the species and sites being examined.</p>	<p>This is a typo from the JNCC website where the census title had not been updated at the time it was referred to for use in the report. 2020 and 2021 counts have been obtained where relevant from the SMP database.</p>
RSPB Scotland	Connectivity and Apportioning	<p>Tables for Arctic tern and red-throated diver are not presented in the SPA long-list nor the apportioning calculations “as there are no SPAs within respective foraging range for each species”. We would like to highlight that the subsea cable of the development within the 9 km foraging range for red-throated</p>	<p>There are no Arctic tern SPAs located within foraging range of the Offshore Development, so this species is screened out of HIRA (as reported in the RIAA). Potential impacts on local colonies of Arctic tern (as identified by</p>

Consultee	Headline	Comment / Issue Raised	Offshore Development Approach and Section ID
RSPB Scotland	Connectivity and Apportioning	diver from the Caithness and Sutherland Peatlands SPA. This should be addressed within the HRA.  Lastly, it would have been useful to include a column showing the number of birds from each SPA on the development site in the apportioning calculation tables as per the NS interim guidance note. We request this is included in subsequent documents as appropriate.	RSPB Scotland) are addressed in the E/AR Chapter.  Impacts on red-throated diver as a qualifying interest of Caithness and Sutherland Peatlands SPA are assessed in the R/AA.  In terms of process, impacts have been apportioned for assessment rather than SPA numbers.
<b>Ornithology Meetings</b>			
MS-LOT) / MSS / NS / RSPB Scotland	General	Ornithology stakeholder meeting with MS-LOT, MSS, NS and RSPB Scotland, 4 November 2021.	Meeting to discuss Scoping Opinion and stakeholder scoping advice: in depth discussion on survey data, survey buffers and apportioning; briefer discussion around collision risk and displacement rates, some initial discussion around cumulative issues.
General	General	Ornithology stakeholder meeting with MS-LOT, MSS, NS and RSPB Scotland, 16 December 2021.	Meeting to discuss Scoping Opinion and stakeholder scoping advice: to agree species for assessment, seasonal periods, MS Apportioning Tool for the breeding season, non-breeding season impacts, collision risk queries, assessment approach (addressing EIA / HRA



Consultee	Headline	Comment / Issue Raised	Offshore Development Approach and Section ID
			overlap), further discussion of cumulative issues.
	General	Ornithology stakeholder meeting with MS-LOT, MSS, NS and RSPB Scotland, 21 February 2021.	Meeting to discuss scope of cumulative impact assessment and to pick up on outstanding matters from previous meetings.
<b>Advice Notes and Emails</b>			
RSPB Scotland 19 November 2021	Baseline including surveys	We understand that the survey buffer was expanded from 2 km to 4 km for all surveys from April 2021 (halfway through the survey period) following MS advice, and that the design-based analysis for displacement will exclude all data beyond 2 km for the population estimates. We do have some concerns about this, particularly with regards to gannet as they are strongly displaced in the non-breeding season. However, we are happy to align with MS and NS advice with respect to this issue.	Noted. Data analysis methods are explained in Technical Appendix 12.1: Baseline Data.
	Baseline including surveys	RSPB are concerned that the 2015 data is too old to be used in the assessment. We always prefer two full years of data within 5 years of an application. We understand that new data collection should be proportionate to requirements i.e. the project is a relatively small demonstration site. However, its positioning not far from the coast, within close proximity to breeding seabird colonies renders it essential to ensure best practice is followed with regards to impact assessments. We	As above. Use of older survey data can be applicable when it's of equivalent age to, or more recent, than the SPA counts being used for reference in assessment. Survey effort and duration has been confirmed as appropriate by MS-LOT (based on MSS / NS advice) in their email of 24 November 2021.

Consultee	Headline	Comment / Issue Raised	Offshore Development Approach and Section ID
		<p>would also welcome confirmation that full years of data have been collected i.e. there are no data gaps in the surveys.</p> <p>If consent is granted, we would support pre-construction surveys being carried out for 1 complete year and with a 4 km buffer to provide a robust baseline for impact monitoring.</p>	<p>Two full years (2015 and 2020 / 2021) of monthly survey data collected (Technical Appendix 12.1: Baseline Data).</p> <p>Advice noted on pre-construction surveys, and requirement set out by MS-LOT in their email of 24 November 2021. These surveys will be implemented if consent is granted.</p>
	<p>Connectivity and Apportioning</p>	<p>We are content with the apportioning work undertaken, based on NatureScot guidance, for all species except guillemot, razorbill, shag and kittiwake. This is because a new tool is now available for these species. In our scoping response, we recommended that this tool is used, which builds on the NS guidance methods. We also advise that for any colony counts older than 2015, the JNCC should be contacted for the most recent colony counts.</p>	<p>The MS Apportioning Tool (Wakefield option) has been applied to kittiwake, guillemot and razorbill; Technical Appendix 12.2: Connectivity and Apportioning.</p> <p>Latest counts were obtained from the SMP database as advised at scoping and noted in Table 12-2 of the EIA Chapter.</p> <p>A spreadsheet of these counts was provided to MSS, NS and RSPB on 7 October 2021.</p> <p>A discrepancy was found in the counts provided by the SMP for North Caithness Cliffs SPA and those presented in Swann (2018); the NS colony monitoring report for 2015 / 16.</p>

Consultee	Headline	Comment / Issue Raised	Offshore Development Approach and Section ID
			<p>The matter was flagged, and clarification sought in an email sent 16 February 2022 with the matter resolved by JNCC providing the confirmed SPA counts for kittiwake, guillemot, razorbill and puffin in their email of 9 May 2022.</p>
	Connectivity and Apportioning	<p>We understand that Woodward <i>et al.</i> (2019) was used to determine foraging distances. We are happy with this but suggest that if there is any site-specific data that exceeds the distances from this paper, then these should be used.</p>	As above.
	Connectivity and Apportioning	<p>We would like to highlight that there are a number of undesignated Arctic tern colonies (coastal and inland) within foraging range (18-30 km) of the proposal at Melvich Bay, Caol Loch, Dounreay and Georgemas (see Caithness Bird Reports). Also, Sandwich terns from the Stroma Site of Special Scientific Interest (SSSI) and St John's Loch (Dunnet), are also within foraging distance of the proposal.</p>	<p>Arctic tern addressed in Section 12.4.4.7 and Section 12.6 of the EIAR Chapter. No Sandwich terns were recorded during the two years of digital aerial survey work.</p>
MS-LOT / MSS / NS 24 November 2021	Baseline including surveys	<p>We require clarification on whether two complete years of survey data has been collected. Our understanding is that survey data has been collected from January to December in 2015, and September 2020 to August 2021, but we are unsure if these are complete years. If there are no data gaps from the two years, we are content with the duration of the survey data. We advise, however, that if consent is granted, pre-construction surveys are carried out for 1 complete year and with a 4 km buffer. This will provide a robust baseline for impact monitoring.</p>	<p>Two complete years of survey data have been collected (totalling 25 monthly surveys as an extra survey was carried out in June 2015). Further details can be found in Technical Appendix 12.1: Baseline Data. MS-LOT's requirement for pre-construction surveys (in their email of</p>

Consultee	Headline	Comment / Issue Raised	Offshore Development Approach and Section ID
	Reference populations	<p>We advise that for any colony counts older than 2015, the developer contacts JNCC to find out the most recent colony counts and present clearly the year the data is from.</p>	<p>24 November 2021) is noted and will be implemented if consent is granted.</p> <p>Latest counts were obtained from the SMP database as advised at scoping and noted in Table 12-3 of the EIA Chapter. A spreadsheet of these counts was provided to MSS, NS and RSPB on 7 October 2021.</p>
	Connectivity and Apportioning	<p>We recommend (for the long list) using foraging ranges as published in Woodward <i>et al.</i> (2019) to derive connectivity with SPA colonies and with additional colonies that may be used by seabirds foraging within the pSPA. The mean-maximum range +ISD should be used. The exceptions to this are outlined below.</p> <p>After consideration of the long-list it may be that just the mean or mean-maximum value will be used for apportioning, depending on the number of sites considered to have connectivity to the development. This is considered a precautionary approach, in that the long list is devised in such a way that it is unlikely that impacts are overlooked, but the apportioning of impacts is undertaken in a manner that does not make it an overly onerous task, nor lead to excessive dilution of impacts across multiple populations.</p> <p>We therefore advise mean max + ISD should be used to screen in connectivity to SPAs with the following exceptions:</p>	<p>As above. This MSS and NSS advice on foraging range and connectivity is the same as that presented in the Scoping Opinion and has been followed as presented in the NCA Screening Report (HWL, 2022) submitted on 2 February 2022, and presented in Technical Appendix 12.2: Connectivity and Apportioning and in the RIAA.</p>

Consultee	Headline	Comment / Issue Raised	Offshore Development Approach and Section ID
		<p>1. For guillemot and razorbill use of mean max +1SD, including data from Fair Isle for all Northern Isles designated sites. For all designated sites south of the Pentland Firth (i.e. excluding the Northern Isles), use of mean max +1SD discounting Fair Isle values. North Caithness Cliffs SPA is considered to lie south of the Pentland Firth. The reasoning for this is that tracking on Fair Isle showed foraging distances are greater than those of all other colonies, for both common guillemot and razorbill. This may relate to poor prey availability during the study. However, trends for seabirds in the Northern Isles indicate this may be becoming a more frequent occurrence.</p> <p>2. For gannet we recommend using mean max +1SD for all colonies without site specific maximum values. However, the site specific maximum should be used for the following SPA colonies:</p> <ul style="list-style-type: none"> <li>• Forth Islands,</li> <li>• Grassholm and</li> <li>• St Kilda</li> </ul> <p>3. For species with insufficient data to calculate MM +1SD then the closest metric is to be used in the following order of preference:</p> <ul style="list-style-type: none"> <li>• Mean Max,</li> <li>• Max,</li> <li>• Mean.</li> </ul>	

Consultee	Headline	Comment / Issue Raised	Offshore Development Approach and Section ID
	Connectivity and Apportioning	<p>Breeding season apportioning</p> <ul style="list-style-type: none"> <li>We advise that the MS Apportioning Tool is used in the first instance.</li> <li>We advise that establishing likely significant effect with the SPA qualifying interests is done <u>before</u> apportioning, rather than the other way around. This will provide a clearer audit trail for the HRA.</li> </ul>	<p>The MS Apportioning Tool (Wakefield option) has been applied to kittiwake, guillemot and razorbill as requested; Technical Appendix 12.2: Connectivity and Apportioning.</p> <p>The NCA Screening Report (HWL, 2022) submitted on 2 February 2022 provided all required SPA long lists. In the Screening Opinion (MS-LOT, 2022b) received 17 June 2022, no advice was provided by f / MSS or NS on how to screen for LSE (if they did not accept the use of apportioning weightings); therefore, the RIAA is based on the original long lists.</p>
Impact pathways		<p>For some crepuscular species and those that are harder to detect in current survey methods, such as storm petrels, we advise that it will be important to present contextual data for this area. This existing data (e.g. Marine Ecosystems Research Programme (MERP) maps, European Seabirds at Sea (ESAS) data, tagging studies (i.e., storm petrel tagging studies undertaken by RSPB / Mark Bolton) should be used to provide a qualitative narrative relating to species present in the area and their behaviour throughout the year.</p>	<p>As above. Impacts on nocturnally active species including shearwaters and petrels are addressed in Section 12.6.2.1.10 of the EIAR Chapter and in the RIAA.</p>

Consultee	Headline	Comment / Issue Raised	Offshore Development Approach and Section ID
RSPB Scotland 06 / 12 / 2021	Connectivity and Apportioning	We support the NS / MSS advice as outlined in their email on 24 / 11 / 21 that the mean max + 1SD should be used to screen in connectivity to SPAs and the exceptions outlined.	Addressed, as above.
	Connectivity and Apportioning	RSPB Scotland are content with the calculation of the number of SPA birds as a proportion of total birds in the BDMPS unit to allow account to be taken of non-breeding season impacts on the relevant SPA birds of concern. In answer to the question regarding whether an 'adults only' method be used, in our opinion, this depends on how many juveniles of key species have been recorded during the aerial surveys, and how reliable the aging methodology is. We note NS and MS suggest that the regional population for guillemots should be used for apportioning in the non-breeding season. We suggest that both the regional population and BDMPS unit be used.	Approaches to non-breeding season apportioning (including NS advice on guillemot) are presented in Technical Appendix 12.2: Connectivity and Apportioning.
CRM		We are concerned about collision risk to crepuscular Procellariiformes. There is strong evidence to suggest that storm petrels in particular would be missed during aerial surveys (Dr Aly McCluskie, pers. Comms.) and the OWSMRF have identified that this species is at risk from collision. The nearest protected breeding sites are the Auskerry SPA and the Sule Skerry and Sule Stack SPA and the proposed site lies within foraging range of these colonies (within 330km as per Woodward <i>et al.</i> , 2019). However, the site also lies close to the coast and storm petrels will avoid coastal areas during daylight, but there is evidence of inshore foraging at night, and movement close to the coast at night in locations that are	Impacts on nocturnally active species including shearwaters and petrels are addressed in Section 12.6.2.1.10 of the EIAR Chapter and in the RIAA.

Consultee	Headline	Comment / Issue Raised	Offshore Development Approach and Section ID
		<p>distant from colonies. Birds are regularly trapped in mist nets at night, well away from known breeding areas (Dr Mark Bolton, pers. Comms). Research suggests that lights on structures may attract juveniles and displace adults. There is also unpublished evidence from the Mousa tracking work undertaken by Dr Mark Bolton that, during foggy conditions, birds become disorientated and are unable to follow a direct route to the colony from the offshore feeding areas. The tracks indicate that birds become disorientated, and when they reach a coastline, they follow the coast, perhaps for tens of kilometres, to locate the colony (Mark Bolton, pers. Comms). Under these conditions, there is potential for breeding adults to occur close to the coast, away from their colony, and to be susceptible to light attraction to a wind farm. Nocturnal migrants are known to be more susceptible to attraction to artificial light (e.g. lighthouses) during foggy conditions. Between July and Sept immature birds will prospect breeding colonies across the whole of west and north Scotland. Ringing data shows that individuals travel very widely on a nightly basis – birds may be caught in locations several hundreds of km apart on successive nights, in locations far from any colony. These individuals may be susceptible to collision with turbines at the site, especially if attracted to artificial light during foggy conditions. Therefore, contextual data should be presented to inform a qualitative assessment of the potential impacts on these species.</p>	
CRM		<p>The basic stochastic model (Option 2) should be used for all species, with avoidance rates from Table 1 from the SNCB</p>	<p>At the meeting held 16 December 2021, both MSS and NS pulled back from using</p>



Consultee	Headline	Comment / Issue Raised	Offshore Development Approach and Section ID
		<p>Avoidance Rate Review 2014 (except breeding gannet – see below). Nocturnal activity factors should also be included in the collision risk modelling. When using generic flight height data from Johnston et al 2014 – the corrigendum (correction) paper should be used. For GBBG and Herring gull, the Proposed Assessment Methodology document states both the stochastic CRM and ‘extended’ offshore Band model will be used. We would welcome clarification on whether this is referring to the same or different models. We are happy for the results for the stochastic extended model for gulls to be presented alongside the basic. We still advocate that an avoidance rate of 0.98 is used for gannet in the breeding season due to the different behaviours displayed by both sexes when there is an active nest. In the non-breeding season, 0.989 should be used as per the SNCB avoidance rate review 2014.</p>	<p>stochastic CRM for assessment. Their most recent advice (31 March 2021) was to undertake a deterministic CRM. This has been done using the Band (2012) spreadsheets, which provide the same outputs as would be given by the band_crm() function in the stochLAB package.</p> <p>CRM is presented in Technical Appendix 12.3: Collision Risk Modelling, including presentation of gannet CRM outputs at a 98% avoidance rate.</p> <p>The term ‘extended’ model is used in Band (2012) guidance, referring to option 3 (and option 4, which generally isn’t used). sCRM models all these options (1-4) for both ‘basic’ and ‘extended’ models (as described in the guidance).</p>
	Displacement	<p>Thank you for providing the supporting paper on displacement assessment. We agree that great skua and fulmar need to be considered in respect of displacement impacts. We still advocate using the SeaBORD modelling tool for kittiwakes, guillemots, razorbills and shags, as it uses FAME tracking data and is more advanced than a displacement matrix. We agree with the displacement rates and percentage</p>	<p>Great skua and fulmar have been included in displacement analysis.</p> <p>As above on SeaBORD modelling, it has been undertaken for kittiwake, guillemot, razorbill and puffin at North Caithness Cliffs SPA (Technical Appendix 12.4: Displacement Analysis), with the outputs informing assessment</p>

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	CRM	<p>mortalities recommended by NS and MS for this assessment in the email dated 6<sup>th</sup> December 2021.</p> <p>We do not agree that the avoidance rates used in the CRM should be changed to reflect the displacement and macro-avoidance of gannet and kittiwake. This is because such effects are already taken into account within the model.</p>	<p>in Section 12.6.2.2 of the EIAR Chapter and in the RIAA.</p> <p>Noted.          HiDef's suggested method for combining collision risk and displacement has not been progressed. The suggestion related to reducing input density estimates for CRM to account for displacement (macro-avoidance) rather than to alteration of avoidance rates. All avoidance rates used in the CRM follow the SNCB (2014) advice (Technical Appendix 12.3: Collision Risk Modelling).</p>
PVA	Cumulative assessment	<p>We request that the NE PVA tool will be presented with the Counterfactual (ratio) of final population size' and 'Counterfactual (ratio) of population growth-rate' and density-independent formulation.</p> <p>The cumulative impact assessment needs to consider all operational and consented developments with impacts on the same SPAs as the Pentland Floating Offshore project and a quantitative assessment produced. In addition, sites within the planning system and Scotwind will need to be taken into account and require a qualitative analysis.</p>	<p>Presented in Technical Appendix 12.5 Population Modelling.</p> <p>Assessment of cumulative impacts is presented in Section 12.7 of the EIAR Chapter and in the RIAA. Table 12-27 presents the development long list including ScotWind projects.</p>

Consultee	Headline	Comment / Issue Raised	Offshore Development Approach and Section ID																				
	Cumulative assessment	<p>In addition, species such as common scoter and red-throated divers, associated with terrestrial SPAs (such as the Caithness and Sutherland Peatlands SPA) may be encountered by surveys during the breeding season as they are known to forage at sea whilst breeding. If this is the case, then in-combination impacts with onshore wind farm developments should be considered as they have the potential to cause cumulative collision and / or displacement effects.</p>	<p>Red-throated diver were recorded during the digital aerial surveys but only in minimal numbers (Technical Appendix 12.1: Baseline Data). They are addressed in Section 12.4.4.11 and Section 12.6 of the EIAR Chapter.</p>																				
MS-LOT / MSS / NS 07 / 12 / 2021	Displacement	<p>We have reviewed the information provided and in line with our current position on displacement and mortality rates we recommend that the matrix is provided but the key rates to be taken forward into the assessment are:</p> <table border="1" data-bbox="863 775 1217 1543"> <thead> <tr> <th></th> <th>Displacement</th> <th>Mortality</th> <th>Mortality</th> </tr> <tr> <th></th> <th></th> <th>Breeding Season</th> <th>Non-Breeding Season</th> </tr> </thead> <tbody> <tr> <td>Auks</td> <td>60%</td> <td>3% and 5%</td> <td>1% and 3%</td> </tr> <tr> <td>Gannet</td> <td>70%</td> <td>1% and 3%</td> <td>1% and 3%</td> </tr> <tr> <td>Kittiwake</td> <td>30%</td> <td>1% and 3%</td> <td>1% and 3%</td> </tr> </tbody> </table>		Displacement	Mortality	Mortality			Breeding Season	Non-Breeding Season	Auks	60%	3% and 5%	1% and 3%	Gannet	70%	1% and 3%	1% and 3%	Kittiwake	30%	1% and 3%	1% and 3%	<p>Displacement matrices are provided in Technical Appendix 12.4: Displacement Analysis along with SeabORD outputs, and the MSS / NS advised rates of displacement mortality discussed in relation to this.</p>
	Displacement	Mortality	Mortality																				
		Breeding Season	Non-Breeding Season																				
Auks	60%	3% and 5%	1% and 3%																				
Gannet	70%	1% and 3%	1% and 3%																				
Kittiwake	30%	1% and 3%	1% and 3%																				
CRM / Displacement		<p>We advise that collision and displacement will need to be considered as additive within the assessment – and the density should not be adjusted. We recognise that macro-avoidance is similar to displacement and there is potential for an approach that could allow for this to be taken account. However, using the current avoidance rates we are unable to</p>	<p>Noted.          HiDef's suggested method for combining collision risk and displacement has not been progressed.</p>																				

Consultee	Headline	Comment / Issue Raised	Offshore Development Approach and Section ID
		disentangle this element from other aspects of the avoidance rate, therefore the method proposed could result in a double counting of the macro avoidance.	All avoidance rates used in the submitted CRM follow the SNCB (2014) advice (Technical Appendix 12.3: Collision Risk Modelling).
	Connectivity and Apportioning	Apportioning should use the BDMPS approach for all species, excluding guillemots. Recent analysis of GLS tagged razorbill established that birds from Forth Islands SPA moved into the southern North Sea during winter. While guillemot movement away from the colony was more restricted. Therefore, we advise that a regional population should be considered, and this should be based on recommended breeding season foraging ranges. Please see our previous advice regarding common guillemot foraging ranges.	Non-breeding season apportioning (including NS advice on guillemot) is presented in Technical Appendix 12.2: Connectivity and Apportioning.
MS-LOT 31 March 2021	General	MS-LOT confirming and providing MSS (30 March 2022) and NS (18 March 2022) emails on various outstanding issues including use of the MS Apportioning Tool and gannet at Forth Islands SPA.	Noted. Addressed in response to the NS advice (18 March 2022) presented below.
MSS 30 March 2022	General	On all matters, MSS support the NS advice as presented in the NS email of 18 March 2022.	Noted. Addressed in response to the NS advice (18 March 2022) presented below.
NS 18 March 2022	Connectivity and Apportioning	Apportioning in the breeding season: HiDef stated: <i>Despite our concerns we are prepared to use the MSS apportioning tool (Wakefield only) for kittiwake, guillemot and razorbill at Pentland. In this regard, would you like us to</i>	The MS Apportioning Tool (Wakefield option) has been applied to kittiwake, guillemot and razorbill for the Offshore Development (Technical Appendix 12.2: Connectivity and Apportioning)

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		<p>retrospectively apply the MSS tool (Wakefield only) to kittiwake, guillemot and razorbill at Moray West, Moray East and Beatrice? We will follow the NS apportioning guidance for all other species. NS replied: We are content with this approach.</p>	<p>and retrospectively to Moray West, Moray East and Beatrice (Technical Appendix 12.5: Population Modelling).</p>
	Reference populations	<p>North Caithness Cliffs SPA population counts: we have liaised with JNCC on population counts for this site, and an update to the SMP spreadsheet is currently being undertaken to correct for this.</p>	<p>Resolved through direct correspondence with JNCC on 9 May 2022.</p>
	CRM / PVA	<p>We understand that initial CRMs suggest ~2 gannet mortalities are predicted in total, and when this is apportioned to the Forth Islands SPA this would be less than one bird per annum. On this basis we would agree that population modelling would not be required for that SPA, or that a cumulative assessment is required at this point. However, given the likely requirement for future cumulative assessments for ScotWind, we advise this calculation is made clear in the ES and included for transparency.</p>	<p>Noted.          This proportionate advice on gannet is welcomed. For cumulative assessment, the estimate of 3 annual gannet mortalities (displacement and collision mortalities added together and using mean density inputs for the CRM) has been apportioned in the RIAA to the Forth Islands SPA giving a value of 0.33 birds.</p>
CRM		<p>We are aware that updates to the CRM tool have now overcome previous issues. Therefore, we are content for this to be used in the assessment deterministically and using the previously agreed references for input parameters. We note the use of the Hornsea 4 and are content with its use for collated collision risk figures.</p>	<p>Deterministic CRM has been undertaken using the Band (2012) spreadsheets, which provide the same outputs as would be given by the band_crm() function in the stochLAB package (Technical Appendix 12.3: Collision Risk Modelling).</p>

Consultee	Headline	Comment / Issue Raised	Offshore Development Approach and Section ID
	Connectivity and Apportioning	<p>As above advise that for each SPA the annual impacts are assessed. This means the breeding season and non-breeding season impacts. The breeding season impacts are assessed against the SPA breeding adult and sabbatical adult population (i.e. there is some discount applied to the expected mortality to the breeding adults as a proportion of it occurs to non-breeding adults which would therefore not feature as part of the colony count). The impacts in the non-breeding season due to SPA breeding adults are based on the 'regionally defined' population. This is a BDMPS based on the breeding season mean-max foraging range + 1sd and includes all birds mixing equally from that defined region and should include immature birds as well as the breeding adults. The non-breeding season mortality impacts due to adults from each SPA are therefore the proportion of breeding adults at that SPA in the whole regionally defined population x the mortality derived (by matrix) of birds using the development area. This non-breeding season impact is added to the breeding season impact to give an annual mortality for each SPA.</p>	<p>As above.          This advice has been followed and non-breeding season apportioning for guillemot is presented in Section 4.3 of Technical Appendix 12.2: Connectivity and Apportioning. Although, note that SeabORD model outputs are for annual mortalities at SPAs.</p>
	Displacement	<p>We have recently been made aware that it is possible for SeabORD to be carried out at Pentland using the most basic form of the tool for several key colonies, i.e. using colony decay function and proxy colony information. We recommend this represents the best available evidence.</p>	<p>As above. SeabORD (v1.3) modelling has been undertaken for kittiwake, guillemot, razorbill and puffin at North Caithness Cliffs SPA, as reported in Technical Appendix 12.4: Displacement Analysis, with the outputs informing</p>

Consultee	Headline	Comment / Issue Raised	Offshore Development Approach and Section ID
	Climate change and ecosystem effects	<p>We advise that climate sensitivity information is incorporated qualitatively within the assessment for key species (to be determined after LSE stage) where the information on their current population trend is included. This climate information can explicitly specify if the species is considered to be sensitive to climate change and what the latest population predications are, i.e. referencing MARPAMM or CEH modelling, Johnston <i>et al.</i> 2013[1]. This can provide context for considering the projection of the population trend.</p>	<p>assessment in Section 12.6.2.2 of the EIAR Chapter and in the RIAA.</p> <p>Climate change and ecosystem effects are discussed for seabirds in general in Section 12.4.5.1 of the EIAR Chapter and specifically for kittiwake in Section 12.4.4.1.</p>
	Baseline including surveys	<p>As per our advice at the meeting on the 21 February, we are content for the seasons from NatureScot advice to be used with the population estimates from BDMPS. The differences are mainly due to the geographical coverage of the reports, but the numbers should be similar, and there is currently no suitable alternative evidence available.</p>	<p>As noted, Furness (2015) defines the relevant BDMPS populations to refer to. These defined populations relate to the BDMPS periods specified by Furness (2015) and if they are to be used for reference they cannot easily be altered or amalgamated. Kittiwake, where the issue is of most concern, has two BDMPS reference populations: one for autumn migration and one for spring. These BDMPS populations are defined separately and can't be amalgamated, therefore the defined BDMPS periods cannot be combined either. Currently it is not possible to define a single wintering period for</p>

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JNCC 09 / 05 / 2022	Reference populations	<p>The only issue now remaining with the North Caithness Cliffs SPA in the SMP database is getting Stroma added to its “sections”. However, the data for Stroma is not split between inside and outside the SPA boundary (some of the island is not actually encompassed by the SPA). This is a little difficult to disentangle, and may not be possible to disentangle, which will mean some agreed text to go in the comments will be needed. With other work priorities taking precedence it has been on my list for a while but not yet completed. You should be able to do a download of the data from North Caithness Cliffs SPA (master site) from the online database, then add a Stroma download. There would need to be caveat that for ground-nesting species on Stroma (like terns / gulls / skuas, etc.) counts may come from areas that technically fall outside the SPA boundary.</p>	<p>kittiwake assessment such as NS may prefer. Section 12.7.3.1.1 of the EIAR Chapter provides further details.</p> <p>The North Caithness Cliffs SPA counts as confirmed by JNCC have been used in relation to population modelling, Technical Appendix 12.5: Population Modelling. The SPA counts confirmed for puffin stay the same as those previously obtained from the SMP database, so no update is required to the relevant apportioning. Apportioning for kittiwake, guillemot and razorbill uses the MS Apportioning Tool (Wakefield option), and this references Seabird 2000 data rather than most recent counts.</p>
MS-LOT / MSS / NS 25 May 2022	Displacement	<p>HiDef have confirmed their intention to run the SeabORD seabird displacement assessment tool for North Caithness Cliffs SPA for those species that the tool is available for (i.e. guillemot, razorbill, puffin and kittiwake). To run the tool, population counts are required (in units of breeding pairs) but the counts available are in units of individual birds for guillemot, razorbill and puffin. HiDef have therefore queried what an appropriate conversion factor would be between individuals and breeding pairs. HiDef proposed a conversion</p>	<p>Noted.</p> <p>This confirmation is welcomed and the advice followed.</p> <p>HiDef have progressed the SeabORD modelling using an 0.67 conversion factor for the auks (guillemot, razorbill and puffin) to convert from individuals to pairs, Technical Appendix 12.4: Displacement Analysis.</p>



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		<p>factor of 0.67 following a review of the literature. NatureScot has confirmed that it supports the use of 0.67 conversion factor though note that if site specific data is available then the Developer should consider this. In the absence of site-specific information, MSS support use of the 0.67 conversion factor though note that site specific data would be preferred given potential issues with using this fixed value across the UK (see Harris 1989 and Harris <i>et al.</i> 2015).</p>	

## 2 References

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