BERWICK BANK WIND FARM

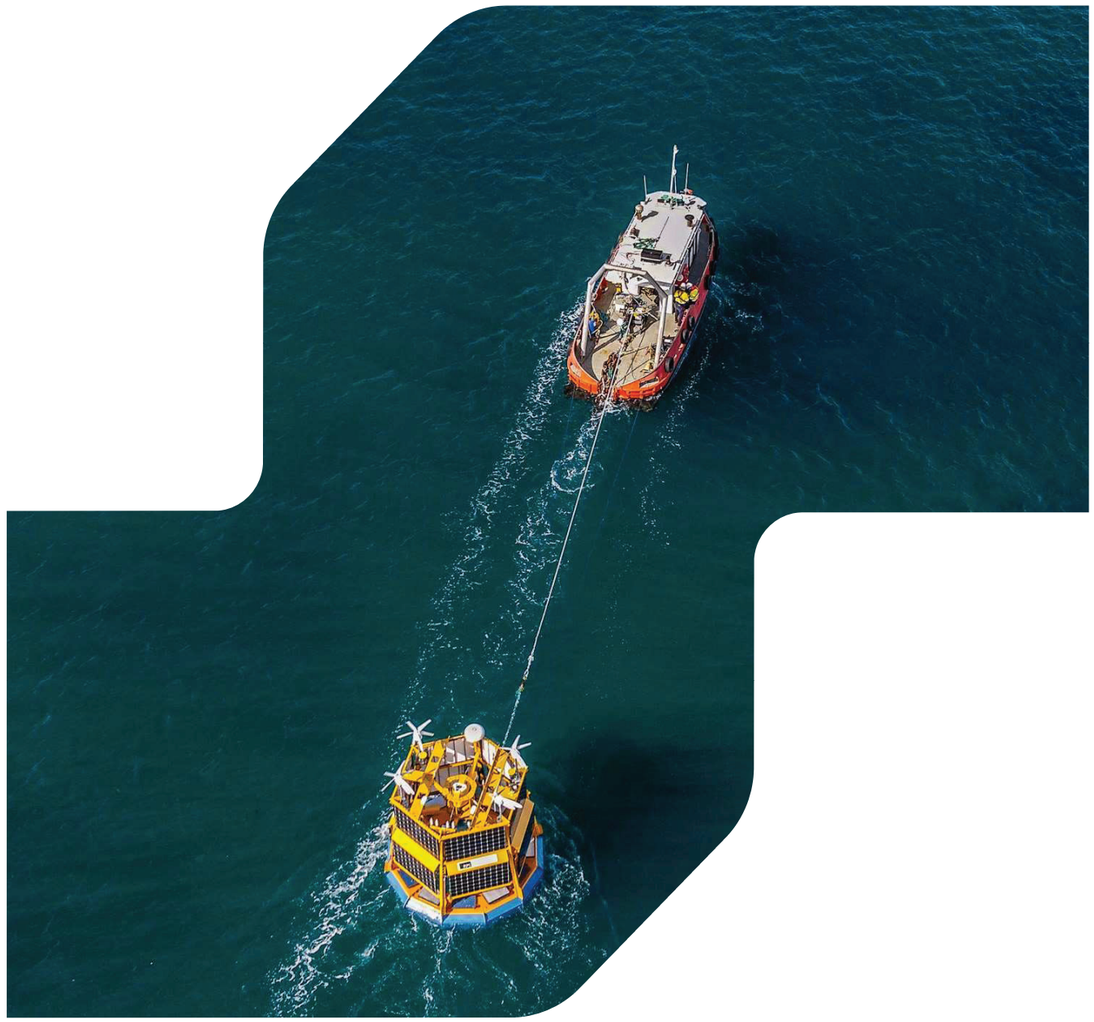
OFFSHORE ENVIRONMENTAL IMPACT ASSESSMENT

APPENDIX 11.8: OFFSHORE AND INTERTIDAL ORNITHOLOGY ROAD MAP

EOR0766
Environmental Impact Assessment – Appendix 11.8
FINAL

BERWICK BANK WIND FARM EIA AND HRA ROAD MAP

Ornithology



Document Status

Version	Purpose of document	Authored by	Reviewed by	Approved by	Review date
Rev01	SSE Review	AL	CB	SE	24/10/2022

Approval for Issue

Sarah Edwards — 9 November 2022

Prepared by:	SSE Renewables
Prepared for:	SSE Renewables
Checked by:	**Andrew Logie**
Accepted by:	**Emily Nelson**
Approved by:	**Sarah Edwards**

Contents

Tables

Figures

1 AIMS, SCOPE AND FORMAT OF THE ROAD MAP

1.1 Background and Aims

Phase 2 of the former Firth of Forth Zone includes Berwick Bank Wind Farm for which consents and licences (as set out below) are being sought. This Project includes both the offshore wind turbine generators (hereafter referred to as wind turbines) and associated offshore infrastructure, as well as onshore grid connection and associated infrastructure.

The Ornithology Road Map covers assessments in relation to the Berwick Bank Wind Farm, seaward of Mean High-Water Springs (MHWS), including impacts on the inter-tidal zone. This Road Map does not consider onshore impacts of onshore infrastructure (landward of MHWS).

Consent and licence applications for the onshore and offshore components of the Project are being submitted separately. The offshore components of the Project are hereafter referred to as 'The Proposed Development'.

Key components of the Proposed Development include:

- wind turbines;
- wind turbine foundations;
- inter-array cables;
- offshore substation platforms (OSPs)/Offshore convertor station platforms; and
- offshore export cables.

The Proposed Development requires the following consents, licences and permissions:

- a Section 36 consent under the Electricity Act 1989;
- a marine licence under the Marine and Coastal Access Act (MCAA) 2009;
- a marine licence under the Marine (Scotland) Act 2010 for the part of the offshore export cables which is within 12 Nautical Miles (NM) of the coast; and
- planning permission under the Town and Country Planning (Scotland) Act 1997 for all infrastructure located landward of Mean Low Water Springs (MLWS) and seaward of MHWS.

The aim of this Ornithology Road Map is to support agreement with key stakeholders on the information provided by Berwick Bank Wind Farm Limited (BBWFL), a wholly owned subsidiary of SSE Renewables Limited (hereafter referred to as the Applicant) in relation to the Offshore and Intertidal Ornithology chapter of the Environmental Impact Assessment (EIA) and the Report to Inform the Appropriate Assessment (RIAA), as part of the Section 36 Consent Application and Marine Licence Applications for the Proposed Development. This Ornithology Road Map documents discussions and agreements between the Applicant and the key stakeholders listed in section 2.

This Ornithology Road Map seeks to ensure that the information supplied in the consent Applications listed above is compliant with the requirements of the following regulations, hereafter referred to as the EIA Regulations:

- Section 36 consent application: The Electricity Works (Environmental Impact Assessment) (Scotland) Regulations 2017;
- marine licence application: The Marine Works (Environmental Impact Assessment) (Scotland) Regulations 2017 and The Marine Works (Environmental Impact Assessment) Regulations 2007; and
- a planning application: The Town and Country Planning (Environmental Impact Assessment) (Scotland) Regulations 2017.

As well as the following regulations, hereafter referred to as the Habitats Regulations:

- the Conservation (Natural Habitats &c.) Regulations 1994 (as amended);

- the Conservation of Habitats and Species Regulations 2017 (as amended)[1]; and
- the Conservation of Offshore Marine Habitats and Species Regulations 2017 (as amended)[1] (which apply to marine licences and Section 36 applications within the Scottish Offshore region.

As part of engagement in the Ornithology Road Map process, it was envisaged that the Applicant and key stakeholders would:

- provide information in a timely manner;
- be transparent and consistent in provision of advice;
- provide effective involvement in the stakeholder engagement process;
- aim to adhere to the programme of meetings set out in this Road Map (see section 3); and
- seek to identify any issues or additional data requirements as early as possible.

The Applicant sought to provide this Road Map as an accurate record of meetings held, discussions undertaken and points of agreement relating to the offshore EIA and Habitats Regulations Appraisal (HRA) ornithology assessments.

1.2 Scope

The Ornithology Road Map was used as a tool to facilitate early and on-going engagement with key stakeholders, throughout the pre-application phase of the Proposed Development up to the point of Application submission. This included consultation on the developing baseline characterisation, approaches to data analysis, collision risk modelling and displacement methodologies, the use of modelling tools, and development of the final application documentation. An Ornithology Road Map tracker spreadsheet was developed as a 'live' document which was used to reach and record points of agreement and outcomes, for example on parameters to be used within collision risk modelling (CRM) work, and agreeing the level of assessment that were presented for impacts scoped in to the offshore EIA and RIAA, so that the focus in the assessment documents in support of the Application are on likely significant effects as defined by the EIA Regulations, and Likely Significant Effects (LSE) as defined by European case law associated with the Habitat Directive.

The Ornithology Road Map sought to agree the following as a minimum, however additional points of agreement/discussion were required, and these were discussed with key stakeholders and documented within this Road Map:

- The use of the MRSea software tool for determining baseline densities of seabirds;
- Species to be assessed for CRM and displacement assessments;
- Use of deterministic (Band) CRM model or Stochastic CRM, including CRM Options, flight heights, avoidance rates and other assessment parameters);
- Displacement rates and mortality rates for breeding and non-breeding seasons, plus the use of the SeabORD tool;
- Apportioning methods (NatureScot interim guidance and the Marine Scotland Science apportioning tool);
- Seasonal definitions;
- Approach to cumulative and in-combination assessments;
- Clarification on a number of issues raised in the Scoping Opinion; and
- Scope and methodology for the Ecosystems assessment.

For all the above, the Ornithology Road Map sought to record key areas of agreement and outstanding points of discussion. Full minutes of the ornithology Road Map meetings are presented in Annex A.

[1] By the Conservation of Habitats and Species Amendment (EU Exit) Regulations 2019

Agreement on Digital Area Survey and intertidal survey scopes were agreed prior to this Road Map process, and consideration of survey scopes is therefore not included further in this Road Map as no modifications were raised. However, the treatment of replacement monthly surveys was discussed.

1.3 Format

Figure outlines the key stages of the EIA and HRA processes, and how the Ornithology Road Map proposed to facilitate engagement during key stages and steps. The first stage of the Ornithology Road Map process was to agree the aims, scope and format of the Road Map, and the proposed timetable for engagement as set out in this document.

The remainder of the Ornithology Road Map is set out as follows:

- section 2: identifies the key stakeholders to the Ornithology Road Map;
- section 3: outlines the proposed offshore EIA and HRA programmes for the Proposed Development. It includes the anticipated programme of meetings and provides a record of meetings that have taken place in relation to the ornithology EIA and HRA assessments; and,
- section 4: provides a summary of discussions, areas of agreement and areas of outstanding discussion points in relation to the ornithology EIA and HRA assessments. The aim was to have as few issues as possible outstanding at the point of Application submission.

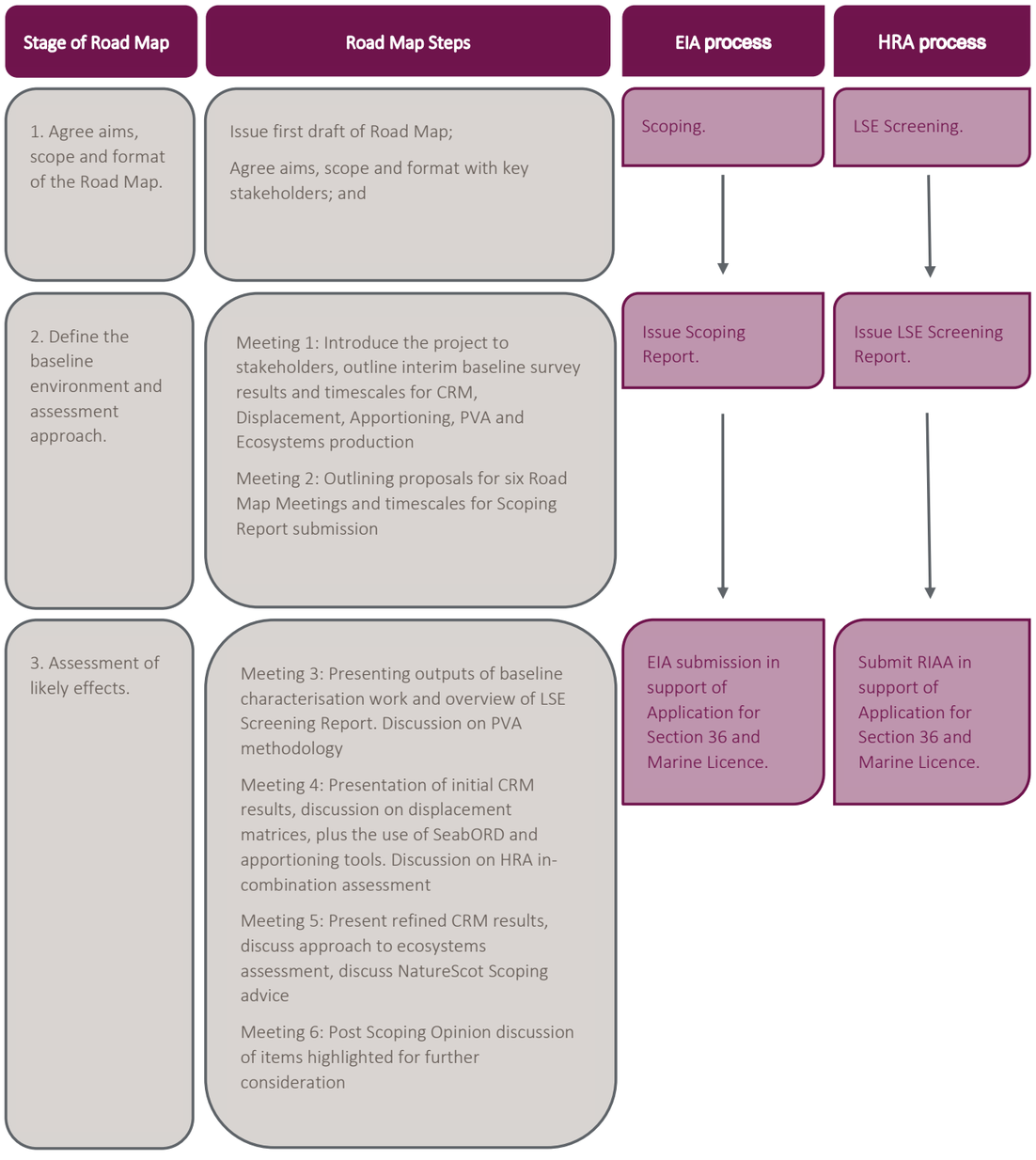


Figure 1.1 Key Stages of the Proposed Development

2 KEY STAKEHOLDERS

It was proposed that the aims of the Ornithology Road Map would be achieved through engagement with the following key statutory stakeholders:

- Marine Scotland Licencing and Operations Team (MS-LOT);
- Marine Scotland Science (MSS);
- NatureScot; and,
- The Royal Society for the Protection of Birds (RSPB).

The aforementioned key stakeholders attended all six meetings held.

Table 2.1 sets out the remit, role in the offshore EIA/HRA processes and the key contact for each of the stakeholders listed above.

Consultation with Natural England was undertaken through the offshore EIA Scoping and offshore LSE screening stages, not directly through the Road Map process.

Table 2.1: Remit, Role and Contact for Key Stakeholders Associated with the Offshore and Intertidal Ornithology EIA and HRA Road Map

Stakeholder	Remit	Role in Offshore EIA/HRA process	Contact
MS-LOT	Authority responsible for issue of Marine Licences for licensable activities in Scottish Waters	Regulatory Authority under the EIA regulations, and Competent Authority under the HRA regulations.	Gayle Holland/Kerry Bell
MSS	Supporting Scottish Government in managing marine and coastal environments to meet the long-term needs of both nature and people.	Statutory Advisor to MS-LOT	Tom Evans
NatureScot	Lead advisory body to Scottish Government on nature, wildlife management and landscape management across Scotland	Nature Conservation advisor to Regulator and Competent Authority (HRA process) Scottish Government (Marine Scotland).	Erica Knott/Karen Taylor/Glen Tyler/Caitlin Cunningham
RSPB	Charitable organisation working to promote conservation and protection of birds and the wider environment	Non-Statutory consultee	Catherine Kelham/Aly McClusky

3 PROGRAMME

3.1 Ornithology EIA and HRA programme for the Proposed Development

Table 3.1 below sets out the programme for key stages of the pre-application process in relation to the Berwick Bank Wind Farm.

Table 3.1: EIA and HRA Project Programme for Proposed Development

Detail	2020					2021												2022								
	AUG	SEP	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV
Submission of the 2020 Berwick Bank Wind Farm EIA Scoping Report																												
Submission of the 2021 Berwick Bank Wind Farm EIA Scoping Report																												
Submission of the 2020 Berwick Bank Wind Farm LSE Screening Report																												
Submission of the 2021 Berwick Bank Wind Farm LSE Screening Report																												
Submission of the Berwick Bank Wind Farm Consent Application																												

3.2 Programme of Ornithology Road Map Meetings

Table 3.2 sets out the programme for stakeholder meetings in relation to key aspects of ornithological technical assessments. These were scheduled to take place at key points of the pre-application phase and were in line with the key deliverables set out in Table 3.1 and the Ornithology Road Map process. The meetings listed in Table 3.2 are also listed within Figure. All meetings were held via conference calls unless otherwise specified. This was due to Covid-19 pandemic restrictions throughout the pre-Application phase.

The Applicant has presented an overview of the consenting and Road Map process and the points of discussion that have taken place as part of this Ornithology Road Map, with full details given in the Road Map meeting minutes, Annex A. In addition, as requested by MS-LOT an Audit Document for Post-Scoping Discussions has also been provided in volume 3, appendix 5.1, summarising key points of advice received subsequent to receipt of the Berwick Bank Scoping Opinion in February 2022 and LSE screening advice, and how these have been addressed in the Application documents.

Table 3.2: Programme for Stakeholder Engagement: Ornithology

Detail	2020					2021												2022								
	AUG	SEP	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV
Stage 1: Agree aims, scope and format of the Road Map																												
Stage 2: Define the baseline environment and assessment approach.																												
Meeting 1: Introduce the project to stakeholders, outline interim baseline survey results and timescales for CRM, Displacement, Apportioning, PVA and Ecosystems production																												
Meeting 2: Outlining proposals for six Road Map Meetings and timescales for Scoping Report submission																												
Stage 3: Assessment of likely effects																												
Meeting 3: Presenting outputs of baseline characterisation work and overview of LSE Screening Report. Discussion on PVA methodology																												
Meeting 4: Presentation of initial CRM results, discussion on displacement matrices, plus the use of SeabORD and apportioning tools. Discussion on HRA in-combination assessment																												
Meeting 5: Present refined CRM results, discuss approach to ecosystems assessment, discuss NatureScot Scoping advice.																												
Meeting 6: Post Scoping Opinion discussion of items highlighted for further consideration																												

3.3 Record of Ornithology Meetings

Table 3.3 records the meetings that have taken place, the attendees and the key discussion points in relation to the ornithology EIA and HRA assessments. A tracker summarising key discussion points was maintained by SSE to record the key points of discussion. Table 3.3 does not record full minutes, however a meeting minute reference is provided for each meeting in this table and meeting minutes were circulated following each meeting. Meeting minutes are included in Annex A.

Table 3.3: Record of Offshore and Intertidal Ornithology Meetings Undertaken as part of the Ornithology Road Map

Meeting Reference	Stage of Offshore EIA Process	Date	Attendees	Key Discussion Points	Meeting Minutes Document Reference
RM01	Pre-Scoping Report Submission	22 July 2021	SSER NatureScot MS-LOT MSS RSPB Royal Haskoning Cork Ecology HiDef	• Berwick Bank Wind Farm project design • Project programme and key dates • Engagement and consultation including road map process • Discussion on technical ornithology elements including baseline characterisation, collision risk and displacement	LF000010&11-DEV-CON-377 BB Ornithology Road Meeting 1 Minutes
RM02	Pre-Scoping Report Submission	9 August 2021	SSER NatureScot MS-LOT MSS RSPB Royal Haskoning Cork Ecology HiDef	• Road Map Meeting 1 – review of note and actions • Update on engagement / road map process • Berwick Bank Scoping Comments • Approach to technical reporting methodology including responses to HiDef Questions.	LF000010&11-DEV-CON-394 Ornithology Road Map Meeting 2
RM03	Pre-Scoping Report Submission	28 September 2021	SSER NatureScot MS-LOT MSS RSPB Royal Haskoning Cork Ecology HiDef	• Review of actions from RM1 and RM2 • MRSea - discussion of issues and approach to baseline • Present initial outputs of baseline characterisation work • Discussion on PVA methodology • Overview of updated LSE Screening Report • Discussion on additional questions / clarifications on approach to technical work	LF000010&11-DEV-CON-400 Ornithology Road Map Meeting 3 Minutes
RM04	Pre-Scoping Opinion	23 November 2021	SSER NatureScot MS-LOT MSS RSPB Royal Haskoning Cork Ecology HiDef	• Review of actions from RM1 to RM3 • Overview of Baseline Report • Presentation of CRM results • Base case (Deterministic Band CRM, Generic Flight Height, SNCB avoidance rates) • Contextual results (sCRM, Bowgen and Cook avoidance rates, site-specific flight heights) • SeabORD • Apportioning Tool comparison • In-Combination Assessment	LF000010&11-DEV-CON-406 Berwick Bank Ornithology Road Map Meeting 4
RM05	Pre-Scoping Opinion (but following Scoping Advice from NS)	31 January 2022	SSER NatureScot MS-LOT MSS RSPB Royal Haskoning Cork Ecology HiDef	• Review of actions from RM4 • Refined CRM results • Ecosystem Approach • Outstanding issues • Baseline definition for in-combination assessment	LF000010&11-DEV-CON-417 Berwick Bank Wind Farm Ornithology Roadmap Meeting 5 Minutes
RM06	Post-Scoping Opinion	10 May 2022	SSER NatureScot MS-LOT MSS RSPB Royal Haskoning Cork Ecology SSER HiDef	• Developer Update • Review of actions from RM5 • Scoping Opinion – areas highlighted for further discussion • In-combination totals methodology	LF000010&11-DEV-CON-424 Berwick Bank Ornithology Road Map Meeting 6 Minutes

4 RECORD OF DISCUSSIONS

This section of the Ornithology Road Map summarises discussions and areas of agreement or outstanding discussion points following each meeting as set out in section 3. Further detail on key aspects of discussion are provided in meeting minutes which are appended to this Road Map (Annex A).

4.1 Key Issues and Assessment Parameters

This section aims to document and agree key areas of agreement and outstanding discussion points associated with the ornithology assessment for the Proposed Development EIA and HRA. These include the following:

- The use of modelling software, including MRSea, SeabORD and MSS Apportioning Tool; and,
- Assessment parameters to be used in CRM and Displacement assessment

Table 4.1 summarises the points of discussion, areas of agreement and outstanding discussion points in relation to the Offshore and Intertidal Ornithology assessment for the Proposed Development.

Table 4.1: Summary of Discussion and Agreed Position on Ornithology EIA and HRA

Topic	The Applicant Proposed Approach	MS-LOT and MSS Advice/Position	NatureScot Advice/Position	Summary of Final Position
Baseline data – missing months in surveys	The aim was to have 24 consecutive months of survey but this was not always possible due to weather, Covid-19 restrictions and airport strikes. Therefore months where two surveys were undertaken were allocated to missed months. 25 monthly surveys were taken in total. An overview of baseline survey dates was presented in RM4, with a proposal made to allocate additional surveys to months, where surveys were missing. This included assigning surveys to seasons based on NatureScot (2020) seasonal definitions	During RM4 it was agreed that HiDef would provide further clarifications on the approach (refer to RM4 meeting minutes, Annex A). Note_HiDefSurveyAllocation_v02 (dated 03 January 2022) was issued by email on 10 January 2022.	NS discussed the HiDef Survey Allocation Note with MSLOT/MSS and have provided advice direct to them which was incorporated into joint advice to be issued subsequently	In an email response on the 14th Jan, MS-LOT stated they are content with this approach. However, we do not support the proposal to use the additional flight from the 12/04/21 for allocation to March 2021. The 12th is too far into April to be considered representative of March and there are already sufficient surveys allocated for March (i.e. 23/02/19 and 21/03/2020. Following this advice, the 12/04/21 survey was not allocated to March 2021.
Baseline data – density calculation/ MRSea	HiDef have been engaging with the MRSea model but overall have found it very difficult to operate for this scale of project. It takes 5-7 days to run model at times, with issues over the model crashing or errors which aren't evident to the end of the run. Issues have been noted with MRSea overestimating densities when modelling the gaps	SSER / HiDef were asked to provide and subsequently update a technical note to support reaching agreement on the use of design-based generated densities to clearly define: 1. Why the model is not working and list the issues encountered, to include the original purpose of MRSea (post-construction monitoring rather than consenting);		Significant issues still remain with the use of MRSea. During RM3, consultees acknowledged the attempts to resolve the issue and the programme difficulties this has created. In order to inform further advice and agreement on the use of densities

Topic	The Applicant Proposed Approach	MS-LOT and MSS Advice/Position	NatureScot Advice/Position	Summary of Final Position
	(density hot spots noted where the gaps in surveys are). Due to ongoing issues with the model, SSER are looking to move to design-based density figures in the Collision Risk Modelling (CRM) and displacement assessment.	2. Outline a comparison with Design Based Estimates; 3. Explain the rationale for how covariates are chosen		derived from design-based methods, HiDef/SSE updated the previous note on MRSea issues to further highlight issues, include a comparison with design-based abundance results, and supporting the use of design based estimates. Where it has been possible to generate MRSea, outputs, they are presented within Annex L to the Baseline Technical Appendix (Appendix 11.1) but MRSea abundance estimates are not used in the assessment for the reasons outlined in the Baseline Technical Appendix (Appendix 11.1)
CRM – avoidance rates	Concerns were raised over the use of Cook 2021 Avoidance rates. The proposal from SSE is that the primary ARs for use are the SNCB recommended avoidance rates			Avoidance rates used were as detailed in the Scoping Opinion. Avoidance rate of 0.98 for gannet in the breeding season was also included, as requested by RSPB.
CRM – Flight heights	Site-specific data on flight heights for use in CRM work are available from boat based (observation and rangefinder) and aerial surveys, with comparative results presented in RM4, for key species at 37m minimum airgap. There is no consensus on the best method to measure site-specific flight height and collision estimates based on generic flight height data are to be taken through to assessment . Neither boat-based range-finder or digital video aerial survey methodology has been approved or adopted for site-specific flight height modelling use. There is significant variance			CRM parameters are detailed in the Scoping Opinion. The Scottish Ministers advised that generic flight heights from Johnston et al. (2014 with the corrigendum) should be used for the primary collision risk modelling, however this should be supported with site specific data collected from the boat-based surveys for a sample species, like kittiwake, for context. CRM modelling proceeded on this basis, with comparative results

Topic	The Applicant Proposed Approach	MS-LOT and MSS Advice/Position	NatureScot Advice/Position	Summary of Final Position
	between estimates of flight height with different methodologies, but generic flight heights of Johnson et al 2014 align more closely with boat-based methods Confirmation was sought from MS, NS and RSPB that SSE can proceed based on Band 2012 collision estimates using SNCB avoidance rates and generic flight heights only.			for kittiwake given in Annex B of the CRM Technical Report, Appendix 11.3.
CRM – densities	In accordance with standard practice for CRM assessment, the applicant proposed to use mean-monthly densities (the average of monthly densities from the two years of survey data). In the Scoping Opinion (Appendix I, Consultation Representations and Advice), NatureScot recommend a more precautionary approach, advising they expect monthly maximum density values to be used within collision risk modelling. MSS agreed with NatureScot's proposal.	MSS supports NS's recommendation that monthly maximum density values be used within collision risk modelling		CRM assessment was completed using monthly maximum density values according to the Scoping Opinion . However, the applicant believes this is an overly precautious method and has also presented CRM outputs using mean-maximum monthly density figures, as part of the 'Developer Approach' (DA) assessment. Further discussion is presented in Appendix 11.3.
Displacement - methodology	The Applicant's proposed approach was to use the Displacement Matrix using SNCB guidance 2017 interim displacement advice note and if possible to use SeabORD for guillemot, razorbill, puffin and kittiwake in the chick-rearing period where tracking data are available. During RM4 HiDef highlighted issues in terms of how the SeabORD model is parameterised in relation the prey base. Currently the model is only parameterised for 4 species from only a few colonies, so extending it to run it in its full form for these 4 species across a wider range of SPA colonies would need a lot	The position with regards the use of SeabORD was detailed in the Scoping Opinion. The Scottish Ministers have considered the scale of the Proposed Development and the sensitivity of the outer Forth for seabird species and do not consider the matrix approach to be sufficient for most of the affected species. The Scottish Ministers advise that, taking into account current knowledge and methods of assessment, the use of SeabORD is likely to be required to enable them to reach a reasoned conclusion on the significant effects of the Proposed Development on the environment.	NS stated that their preference was also for the SeabORD tool to be used if feasible Agreed that 'simplified' SeabORD model would be used and provided for context, with distance decay method used.	The matrix method was used for the displacement assessment. Acknowledging the practical difficulties associated with running SeabORD, it was agreed that the 'simplified' SeabORD model would be used and provided for context, with distance decay method used and assuming a uniform prey distribution. SeabORD analysis was provided for context noting that SSE has significant concerns about the

Topic	The Applicant Proposed Approach	MS-LOT and MSS Advice/Position	NatureScot Advice/Position	Summary of Final Position
	of input from CEH. However, it is also the case that the full model is currently under review, as part of its incorporation into the Cumulative Effects Framework (CEF) project. It was questioned whether a simplified version of SeabORD could be used, which was investigated. SSE were granted access to the underlying SeabORD R-code in June 2022, with the aim of undertaking sensitivity analysis of the model.			outputs and suggesting that given the uncertainty of the outputs, it is given limited, if any, weight. The SeabORD outputs are presented in Annex D of the Displacement Technical Report, vol 3, appendix 11.4
Displacement – mortality rates	In the Scoping Report, the Applicant proposed to use displacement rates and mortality rates as previously used in other Forth and Tay offshore wind projects. Breeding season and non-breeding rates for relevant species were discussed at various points through the Road Map process (refer to road map meeting minutes, Annex A).	MS advise that with regard to mortality rates, outputs must be presented for both the lower and upper bounds in the Scoping Opinion. MS acknowledge that whilst there is evidence that birds that are working harder during the breeding season experience a higher winter mortality, this effect may be smaller for the Isle of May, based on revised body-mass survival relationship analysis. This has not yet been incorporated in SeabORD which currently uses Norwegian Puffin data. To date there have been limited comparisons of the matrix approach and SeabORD. SeabORD estimates the mortality rate which is generally higher than mortality rates that have been recommended previously for the matrix approach. MS support the use of both the DA and SO mortality rates in the PVA modelling.	NS consider that there is a need to base the approach on the best evidence available and that there is a need to be precautionary to be certain that there are no adverse impacts on SPAs. Nature Scot are primarily requesting higher displacement mortality rates for the matrix method on the basis of making the output more closely match the SeabORD outputs. NE acknowledge that the SeabORD outputs are inferring displacement mortality rate using data from body weight - survival relationships from a single Norwegian study on puffin.	Displacement rates to be used are detailed in the Scoping Opinion and these have been used in the assessment, under the 'Scoping Approach' (where the Scoping Opinion requires a range to be assessed, this has been given as 'Scoping Approach A' (lower values of the range) and 'Scoping Approach B' (upper values of the range). For some displacement parameters, the applicant believes the Scoping Opinion gives an overly precautious basis for assessing impacts, at times without adequate justification for using higher mortality rates compared to precedent. In such cases, the Applicant has also presented a dual assessment, as part of the 'Developer Approach'. Further discussion is presented in Appendix 11.4. SSE also commissioned Natural Power to undertake a sensitivity analysis of

Topic	The Applicant Proposed Approach	MS-LOT and MSS Advice/Position	NatureScot Advice/Position	Summary of Final Position
				the SeabORD model. The outcome of this work is presented in Annex E of the Displacement Technical Report, Appendix 11.4
Apportioning	During RM4, initial outputs from apportioning work were presented. For implementation of the NatureScot method for apportioning, SSE proposed to use the HiDef R code rather than the MS Tool as the latter can only be used for guillemot, razorbill and kittiwake, and because the MS Apportioning Tool is giving some unexplained results. Implementation of the NatureScot method through the MS Apportioning tool is giving different results compared to the underlying R-code, with a review failing to find the reasons why. Implementation of the MSS method in the MS Tool is also presenting issues. SSE are seeking agreement to use the NatureScot apportioning approach implemented through R instead. Further investigation was required, including discussion with the MS Tool authors at BiOSS. This was to include discussion of how sub-site and SPA level colony data are to be used within the Tool. During RM5, it was confirmed that the SNCB apportioning matrix will be used for all species except Kittiwake, Guillemot and Razorbill which will used the existing MS apportioning tool as requested by consultees		Nature Scot confirmed that the RM5-stated approach was OK but also made the point that there might be further discussion in relation to this at the February Tools Workshop.	SeabORD, MRSea and the MS apportioning tool were discussed at a wider level between the regulators, RSPB and HiDef on the 22nd February 2022, separately from the RM process. (Marine Scotland Ornithology Impact Assessment Workshop) The MSS Approach in the MS Apportioning Tool was used for guillemot, razorbill and kittiwake and the NatureScot approach was used for the other species (refer to volume 3, appendix 11.5).
Population Viability Analysis (PVA)	At RM3, the approach to PVA was presented. Proposal to use Stochastic Leslie matrix models	Scottish Ministers agree with the use of the NE PVA tool, however advise that further discussion and agreement on		PVA was run on all species where mortality exceeded 0.02 percentage

Topic	The Applicant Proposed Approach	MS-LOT and MSS Advice/Position	NatureScot Advice/Position	Summary of Final Position
	available through the NE PVA tool/R-package. At RM5, SSE proposes to use the threshold advised in NS's scoping advice – i.e. a 0.02 percentage point change in baseline mortality rate. This will be calculated as the predicted additional mortality (in terms of the number of adult birds) expressed as a percentage of the number of adult birds in the SPA population.	the threshold for running a PVA, should take place as part of the Developer's Road Map process		point threshold (agreed at RM6) calculated as per method agreed in RM5. Mortality estimates adjusted for sabbaticals as agreed in RM5
Ecosystems approach	During the earlier 2020 Scoping discussions, the need to look holistically at ecosystem-levels was identified. NatureScot's consultation response to the 2021 Scoping Report, recommended further discussion be undertaken through the road map process to agree a suitable approach. Options for assessing ecosystem-level impacts were discussed during RM5. SSE proposed the inclusion of an 'Interrelated Effects' chapter in the EIA Report, to be supplemented with a literature review focussing on seabirds, their prey species and climate change.. It was proposed that the assessment would comprise a narrative description, rather than any use of modelling.		NS agreed with the approach outlined during RM5 (refer to RM5 meeting minutes, Annex A)	The proposed approach for assessing the Ecosystem Approach was outlined, discussed and agreed between all parties during RM5. The approach will involve preparing an Inter-related Effects chapter in the EIA Report, which will include a narrative description and a literature review. The assessment will draw on a range of topics to provide a holistic overview of ecosystem level impact

4.1.1 Summary Statement of Final Position

The approach to parameters and models used in CRM, displacement and apportioning have been discussed throughout the Road Map meetings. In most cases, a consensus position was arrived at prior to the Scoping Opinion being issued. Road Map Meeting 6 was used to discuss items flagged for further discussion in the Scoping Opinion.

However, in some cases there was disagreement between the developer and Marine Scotland/NatureScot regarding some parameters and methods to be used for the ornithology assessment. As a result, the submission presented two full assessments; one based on the MS-LOT Scoping Opinion (Scoping Approach) and one based on the Developer Approach, with appropriate justification given for the latter. Further detail is

given within the Technical Reports for Collision Risk Modelling (Appendix 11.3) and Displacement (Appendix 11.4).

5 CONCLUSION

The aim of the Ornithology Road Map was to ensure that the final consent Application submitted provides MS-LOT and its statutory advisors with sufficient information with which to make a determination. This document has set out the meetings, agreements and also highlighted how differences in approaches have been presented in relation to the ornithology topic for the offshore EIA and HRA.

ANNEX A: ORNITHOLOGY ROAD MAP MEETING MINUTES

sse | For a better world of energy