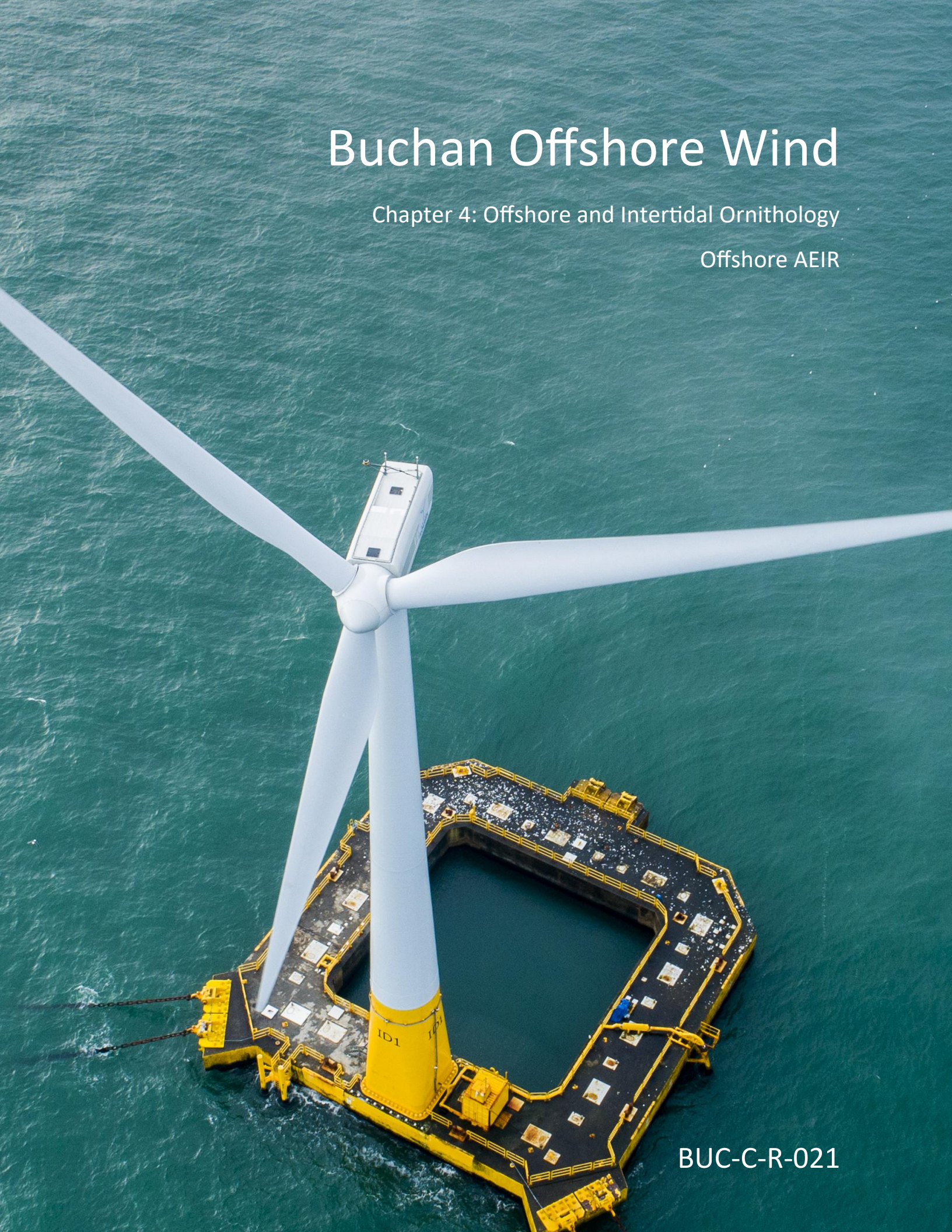
Buchan Offshore Wind

Chapter 4: Offshore and Intertidal Ornithology

Offshore AEIR



BUC-C-R-021

Buchan Offshore Wind

Additional Environmental Information Report

Chapter 4 Offshore Ornithology

QMS Review

Name	Company	Date	Reviewed	Approved
RMR	Natural Power	15/06/2026	LJN	SMM
CMO	Buchan Offshore Wind	22/06/2026	CMO	DON

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4.1 INTRODUCTION

4.1.1 Overview

4-1 This Additional Environmental Information Report (AEIR) Chapter has been prepared to provide targeted additional information in response to Requests for Additional Environmental Information (RAEI) received from Marine Directorate – Licensing Operations Team (MD-LOT), based on consultation responses from NatureScot in relation to Offshore Ornithology. An overview of the Proposed Offshore Development and Application, and approach to responding to the RAEI is presented in **AEIR, Chapter 1: Introduction.**

4-2 This report has been prepared to supplement the Environmental Impact Assessment Report (EIAR) and Report to Inform the Appropriate Assessment (RIAA) submitted in support of the Application and should be read alongside the relevant EIAR and RIAA chapter (see **Section 4.1.2**).

4.1.2 Relationship to the Environmental Impact Assessment Report

4-3 This report supplements Chapter 9 of the EIAR (Offshore and Intertidal Ornithology) and provides additional information or clarification in response to specific RAEIs raised during consultation.

4-4 Except where explicitly stated within this report, the assessment methodology, baseline information, and conclusions presented within the EIAR remain valid and unchanged.

4-5 This report should be read in conjunction with the following documents:

- EIAR Volume 2, Chapter 9: Offshore and Intertidal Ornithology;
- Report to Inform Appropriate Assessment Part 3 – Assessment on Special Protection Areas and Ramsar Sites;
- EIAR Volume 3, Appendix 9.1 Offshore and Intertidal Ornithology Baseline;
- EIAR Volume 3, Appendix 9.2 Offshore Ornithology Collision Risk Modelling (CRM);
- EIAR Volume 3, Appendix 9.3 Ornithology Distributional Responses Report;
- EIAR Volume 3, Appendix 9.4 Ornithological Impact Apportioning, Derivation of Cumulative Impacts and PVA Screening; and
- EIAR Volume 3, Appendix 9.5 Ornithology Population Viability Analysis Report

4.1.3 Scope of This Report

This report addresses those matters raised through the RAEI process that relate to offshore ornithology and that require the provision of targeted additional information or further clarification.

4.2 CONSULTATION AND REQUESTS FOR ADDITIONAL ENVIRONMENTAL INFORMATION

4.2.1 Approach to Consultation and RAEI

4-6 A summary of all consultation undertaken during the determination phase is provided in **AEIR Chapter 1: Introduction.** For detail on consultation undertaken to inform the EIAR please refer to EIAR Volume 2, Chapter 9: Offshore and Intertidal Ornithology.

4-7 In accordance with the RAEI issued by MD-LOT on 18 December 2025, this chapter of the AEIR focuses on responding to the RAEI items identified by the regulator in relation to offshore ornithology. These items form the primary basis of the additional information presented within this chapter.

4-8 Consultation matters relevant to the provision of additional information (requested by MD-LOT and informed by NatureScot) for this topic are presented in a single consolidated table (**Table 4-1**). This approach ensures consistency in how consultation feedback has been captured and addressed within this AEIR.

4-9 All items raised during the determination period by NatureScot, in their representation on the EIAR, are presented and addressed in full in **Appendix 4.1** . These matters are addressed, where relevant, through clarification, signposting to the EIAR, or provision of additional supporting information.

4.2.2 Summary of Consultation Relevant to Offshore Ornithology

4-10 **Table 4-1** presents a consolidated summary of consultation issues relevant to offshore ornithology. For each item, it provides a summary of the issue raised and sets out how and where the matter has been addressed within this AEIR.

Table 4-1. Summary of Requests for Additional Environmental Information relevant to offshore ornithology and responses provided in this AEIR

Consultee	Date / Document	Summary	Relevance to this Chapter
Distributional responses			
NatureScot & MD-LOT	18.12.2025 RAEI In consideration of the NatureScot representation 01.10.2025	NatureScot have identified issues around the SeabORD outputs used within assessment for guillemot which may have subsequent cascading effects on apportioning and PVA analyses leading to overall NatureScot conclusion of cumulative impacts being Significant for this species	The response to this topic can be found in **Section 4.3.1.** Discussion is presented on the use of SeabORD and presentation of colony information used as SeabORD inputs to demonstrate that SeabORD is considered the best available scientific information on the displacement effects to guillemot from the Proposed Offshore Development.
NatureScot & MD-LOT	18.12.2025 RAEI In consideration of the NatureScot representation 01.10.2025	Guillemot: NatureScot advise that the Matrix approach alone should be used to re-assess guillemot impacts with new PVAs being undertaken and counterfactuals updated. This should also incorporate adjustments to the Mean Seasonal Peak. Kittiwake and razorbill: NatureScot advise that the approach used in Application is more precautionary and results can therefore be used to reach conclusions regarding AEOSI. However they note that the issues raised by the Applicant regarding SeabORD (pre-application), and the potential for guillemot mortality figures to be inaccurate. Therefore NatureScot advise that it may be required to re-run kittiwake and razorbill PVAs using the Matrix approach only, similar to request for guillemot above.	The response to this topic can be found in **Section 4.3.2** where the matrix alone approach has been used to re-assess impacts, discussion on approach taken for each species (guillemot, razorbill and kittiwake) in consideration of the mean seasonal peak and the results of the predicted estimated species mortalities are presented.

Consultee	Date / Document	Summary	Relevance to this Chapter
NatureScot	31.03.2026 NatureScot Workshop (video conference meeting and NatureScot Post-Workshop Memo (28.04.2026))	Discussion re. NatureScot comments that results from SeabORD modelling of guillemot displacement appears to be inconsistent with smaller colonies that were further from the Proposed Offshore Development having larger predicted effects than larger colonies closer to the Proposed Offshore Development.	The response to this topic can be found in **Section 4.3.1.** Discussion is presented on the use of SeabORD and presentation of colony information used as SeabORD inputs to demonstrate that SeabORD is considered the best available scientific information on the displacement effects to guillemot from the Proposed Offshore Development
Cumulative Effects			
NatureScot & MD-LOT	18.12.2025 RAEI In consideration of the NatureScot representation 01.10.2025	NatureScot highlight the high sensitivity of great black-backed gull to collision and that conclusions of significant effect have been reached for other offshore wind proposals on this species on the basis of a small project alone contribution. NatureScot therefore do not support the conclusions reached in the EIAR and advise that assessment by PVA is required for this species.	The response to this topic can be found in **Section 4.4.4.** An updated assessment of impacts for great black-backed gull has been undertaken using PVA and results presented alongside proposal for mitigation given that whilst the predicted impacts for the Project alone remain Not-Significant, the updated cumulative assessment is likely to be Significant.
MD-LOT	18.12.2025 RAEI	MD-LOT advises that new in-combination data is available from projects that have updated their assessments, or new projects that have recently submitted their application.	The response to this topic can be found in **Section 4.4** where approach for updated CEA and in-combination assessment has been set out inclusive of screening approach.
NatureScot	31.03.2026 NatureScot Workshop (video conference meeting and NatureScot Post-Workshop Memo (28.04.2026))	NatureScot requested a clear indication of the version of the interim Cumulative Effects Framework (CEF) used in the EIAR	The updated cumulative and in-combination assessments can be found in **Section 4.4.** The Applicant has confirmed with NatureScot in consultation that the version information for CEF cannot be provided as

Consultee	Date / Document	Summary	Relevance to this Chapter
			there is no version control or meta-data on the software. However, the interim CEF values used in the EIA and RIAA will be compared with the interim CEF values from 2025 and shared with NatureScot, who confirmed agreement with this approach (6 May 2026).
NatureScot & MD-LOT	31.03.2026 NatureScot Workshop (video conference meeting and NatureScot Post-Workshop Memo (28.04.2026))	MD-LOT to provide position on inclusion of compensated impacts in RIAA assessments. MD-LOT followed up with advice that the Applicant can exclude impacts from consented Scottish projects where there is a conclusion of Adverse Effect on Site Integrity (AEOSI) (or unable to conclude no AEOSI) on sites/species which have resulted in the need for compensation	The response to this topic can be found in **Section 4.4** where MD-LOT confirmed that the Applicant can exclude impacts from consented Scottish projects where there is a conclusion of AEOSI (or unable to conclude no AEOSI) on sites/species which have resulted in the need for compensation.
NatureScot	02.06.2026 (email correspondence)	NatureScot confirmed agreement with approach to undertaking of CEA for kittiwake, guillemot, razorbill, puffin, gannet and herring gull.	The response to this topic can be found in **Section 4.4** where results from the re-assessment of in-combination impacts has been presented for these species.
Collision Risk Modelling (CRM)			
NatureScot	18.12.2025 RAEI In consideration of the NatureScot representation 01.10.2025	NatureScot commented that macro-avoidance rates used did not follow their guidance (Wind farm impacts on birds - Use of Avoidance Rates in the NatureScot Wind Farm Collision Risk Model, NatureScot 2025)	The response to this topic can be found in **Section 4.6.1** where it was confirmed that the guidance from March 2025 was not available at the time of the CRM and cumulative analysis being undertaken for the Application.
NatureScot & MD-LOT	18.12.2025 RAEI	NatureScot recommend that a 70% macro-avoidance rate is applied to	The response to this topic can be found in **Section 4.6.1**.

Consultee	Date / Document	Summary	Relevance to this Chapter
	In consideration of the NatureScot representation 01.10.2025	gannet within the non-breeding season only. NatureScot acknowledge that it does not appear that this has been carried through the project alone assessment inappropriately, they request clarification on how this macro-avoidance rate has been applied cumulatively.	
MD-LOT	18.12.2025 RAEI	MD-LOT requested clarification on how macro-avoidance rate was applied cumulatively	The response to this topic can be found in **Section 4.6.1**. Discussion is presented on how the cumulative impacts were estimated, with the detail being presented in Annex D of Appendix 9.4 Ornithological Impact Apportioning, Derivation of Cumulative Impacts and PVA Screening of the EIAR.
NatureScot	31.03.2026 NatureScot Workshop (video conference meeting and NatureScot Post-Workshop Memo (28.04.2026))	NatureScot requested a clear outline of the aerial density inputs used to CRM and the difference between median and mean CRM outputs	The response to this topic can be found in **Section 4.6.2** where the mean values have been calculated for each month for each species and are presented alongside the median value and the upper and lower 95% bootstrap confidence interval with the conclusions of non-significance presented within the EIAR remain valid
Sabbatical birds			
NatureScot	18.12.2025 RAEI In consideration of the NatureScot representation 01.10.2025	NatureScot note that in Volume 3, Appendix 9.4 of the EIAR, that sabbaticals have been removed in the non breeding season as well as the breeding season which is considered incorrect. NatureScot note that during the non-breeding season, all birds are non-breeders and so sabbatical birds	The response to this topic can be found in **Section 4.7** where the Applicant confirms that the apportioned impacts presented in **Section 4.9** have adjusted the sabbatical rate in the breeding season only, where necessary.

Consultee	Date / Document	Summary	Relevance to this Chapter
		do not need to be removed from estimated adult mortalities.	
Species sensitivity			
MD-LOT	18.12.2025 RAEI	MD-LOT requested clarification as to why literature sources which are more applicable to the Scottish context e.g. Wade *et al*. (2016) were not used for the purpose of defining sensitivity	The response to this topic can be found in **Section 4.8** where the Applicant has undertaken a comparison between the two methods (NatureScot interpretation of Wade et al (2016) and the original literature-derived sensitivity score assigned by the Applicant) for attributing collision and displacement sensitivity scores to the species assessed
Impact Apportioning			
NatureScot & MD-LOT	18.12.2025 RAEI In consideration of the NatureScot representation 01.10.2025	NatureScot note that in Volume 3, Appendix 9.4 of the EIAR, that sabbaticals have been removed in the non breeding season as well as the breeding season which is considered incorrect. NatureScot note that during the non-breeding season, all birds are non-breeders and so sabbatical birds do not need to be removed from estimated adult mortalities.	The response to this topic can be found in **Section 4.7** where the Applicant confirms that the apportioned impacts presented in **Section 4.9** have adjusted the sabbatical rate in the breeding season only, where necessary.
Population Viability Analysis			
NatureScot & MD-LOT	18.12.2025 RAEI In consideration of the NatureScot representation 01.10.2025	NatureScot noted that updates to the assessment has cascading effects on PVA	The response to this topic can be found in **Section 4.10** noting that as predicted impacts to guillemot, razorbill, herring gull, kittiwake and gannet at relevant SPAs has changed (presented in **Sections 4.9.1** to **4.9.5)** PVA screening was repeated for these

Consultee	Date / Document	Summary	Relevance to this Chapter
			species using the updated predicted impacts. Results of which showing little change to the outcome of screening between EIAR and AEIR.
Miscellaneous			
NatureScot & MD-LOT	18.12.2025 RAEI In consideration of the NatureScot representation 01.10.2025	NatureScot & MD-LOT requested clarification on the repeated error in which "gannet" is referred to twice in a sentence or bullet point (e.g. paras 9-434 and 9-436 of the Volume 2, Chapter 9 of the EIAR).	The response to this topic can be found in **Section 4.5** where the Applicant confirms this is an error and has provided corrected text.

4.3 DISTRIBUTIONAL RESPONSES

4.3.1 SeabORD

4-11 NatureScot have commented on the use of SeabORD to assess distributional responses of seabirds in their response to the EIAR. It was stated in NatureScots representation (01.10.2025) that:

> "*We have identified issues around the SeabORD outputs used within the assessment for guillemot. This has cascading effects on apportioning and PVA, therefore, for guillemot we are able to provide only provisional advice based on the current information within the Application. We provisionally conclude that the overall cumulative effect on guillemot is Significant in EIA terms*."
>
> "*We broadly agree with the Applicant's conclusion of no AEOSI from the Project alone. Noting that there may be an exception to this conclusion with regard to guillemot, due to issues identified around SeabORD outputs and associated effects on apportioning and PVA and therefore we are only able to provide provisional advice*."
>
> "*To assess the distributional responses of seabirds from the proposed Development, the Applicant has followed a combination of two methods; the displacement matrix approach and SeabORD*.
>
> *SeabORD has been used in assessments for guillemot, razorbill and kittiwake in the breeding season for six SPAs, the results from SeabORD have then been used in PVAs*.
>
> *During pre-application consultation, we were made aware of issues and difficulties that the Applicant was experiencing when using the SeabORD tool. Pre-application consultation regarding this is summarised within Table 1-1 of Appendix 3 and also in Table 2-1 of Part 3 of the RIAA*."
>
> "*Instances in which SeabORD outputs included predictions of positive effect were also discussed during pre-application correspondence, however, this does not appear to be captured within either Table 2-1 or Table 1-1. As highlighted in correspondence with the Applicant, we considered these positive predictions to be unexpected (advice issued 28 January 2025). Following further investigation of outputs and parameters by NatureScot the cause of these positive results remained unclear. Although we surmised that adjusting the distance decay value used may help to resolve the issue, our recommendation was that the Matrix approach should also be undertaken for kittiwake, guillemot and razorbill (NatureScot advice issued 07 April 2025)*.
>
> *While Matrix approach results have been presented for kittiwake, guillemot and razorbill, these have not been used in the PVAs. As described in Paragraph 37 of Appendix 9.3, the Applicant has manually changed any positive SeabORD outputs to zeros for further assessment and PVA, which they consider to be a precautionary approach*.
>
> *We note considerable differences between the results of the SeabORD and Matrix approaches. This is of concern, particularly in relation to guillemot*."

4-12 On 28 January 2025 NatureScot noted to the Applicant (by email),

> *"Please note that we consider predictions of positive impacts from SeabORD modelling to be unexpected. Please let us know if this has been seen in Buchans modelling. Should this occur we request further discussion and that examples/results are shared with us to inform these discussions".*

4-13 Since SeabORD model runs of guillemot, razorbill and kittiwake for the Proposed Offshore Development found positive predicted effects on some colonies, the Applicant provided NatureScot with the SeabORD output files to provide input parameters where positive effects had been predicted (by email on 28 March 2025). Information on the application of the distance decay function in SeabORD was also provided at that time. In response NatureScot stated (by email on 8 April 2025) that,

> *"We've reviewed the further information provided in your email below and it remains unclear to us what might be causing these positive results. It may be that the distance decay function used does not sufficiently account for connectivity between the development and designated sites. Should you wish to explore this further we suggest that increasing the distance decay value may help to resolve the issue. However, we can't be sure that this would be the case and, as such, we recommend that you also undertake the matrix approach for kittiwake, guillemot and razorbill."*.

4-14 As a result of this correspondence the Applicant made the decision to change all positive predicted impacts from SeabORD to zero and the matrix approach for the highlighted species (kittiwake, guillemot and razorbill) were included within Appendix 9.3 Ornithology Distributional Responses Report of the EIAR.

4-15 The Applicant notes that positive predictions from SeabORD have been raised with NatureScot in relation to other applications (e.g. Muir Mhòr 2025), where the effects of changing the foraging range and proportion of birds within this range were tested and shown to have little effect on the predicted connectivity between the Proposed Offshore Development and the relevant seabird colonies (Muir Mhòr Offshore Wind Farm. Additional Environmental Information Report. Appendix 2: Additional Information on SeabORD; Natural Power Consultants Ltd., 2025). It was also noted by Muir Mhòr that positive effects should be predicted by SeabORD in particular circumstances, where projects at the limits of foraging ranges from some colonies would only be predicted to be displaced closer to the colony (rather than displaced to space beyond the wind farm) and will consequently have smaller energetic costs than birds that were using the space occupied by the Proposed Offshore Development .

4-16 NatureScot also noted at the workshop with the Applicant on 31 March 2026 that the results from SeabORD modelling guillemot displacement appeared to be inconsistent, with smaller colonies that were further from the Proposed Offshore Development having larger predicted effects than larger colonies closer to the Proposed Offshore Development . However, the Applicant disagrees that there is inconsistency in the outputs from SeabORD. The combined effects of colony size, distance from the colony to the Proposed Offshore Development and the foraging range input used (based on NatureScot Guidance Note 3; NatureScot, 2023b) are shown in **Table 4-2**. This shows that the only positive impact prediction was from the Buchan

Ness to Collieston Coast SPA. While this was one of the largest colonies, it was also a colony where the Proposed Offshore Development location was very close to the foraging range of guillemots from mainland colonies based on NatureScot's definition in Guidance Note 3 (NatureScot 2023b). Indeed, as shown in Figure 2-1 of Appendix 9.3 of Volume 3 of the EIAR, approximately half of the Array Area was beyond the mean of the maximum foraging range plus one standard deviation of the foraging range. While the largest predicted impact was on one of the smaller colonies (Copinsay) this was the closest colony to the Proposed Offshore Development relative to its mean maximum plus one standard deviation foraging range. Overall, when the population size and distance relative to the foraging range is taken into account the predicted relative impacts to adult survival are consistent.

Table 4-2. Colony information used as SeabORD inputs and the predicted percentage point difference in adult survival from SeabORD for guillemot. Foraging range information based on NatureScot Guidance Note 3 for mainland and Northern Isles colonies.

SPA	Population size (adults)	Distance (km)	Foraging range (km)	Percentage point difference (95% C.I.)
Buchan Ness to Collieston Coast	40,762	89.6	95.2	-0.001 (-0.007 - 0.004)
Copinsay	10,966	89.0	153.7	0.045 (-0.028 - 0.118)
Fair Isle	24,516	106.6	153.7	0.006 (-0.010 - 0.023)
Hoy	12,390	117.3	153.7	0.017 (-0.047 - 0.081)
Troup, Pennan and Lion's Heads	47,718	81.5	95.2	0.004 (-0.012 - 0.019)
West Westray	40,674	136.8	153.7	0.014 (-0.011 - 0.040)

4-17 While NatureScot noted large differences between SeabORD and matrix displacement approach for guillemot, it is not stated by NatureScot why differences are not expected to occur. There are important differences in the assessment of displacement between the application of the SeabORD model and the application of the displacement matrix. SeabORD is largely based on empirical evidence of seabird survival changes due to increasing energetic costs in the breeding season. Using the distance decay function within SeabORD results in an exponential decline in the abundance of birds from any one colony with increasing distance from the colony. While the SeabORD analyses carried out for the EIAR used published information on the foraging range of guillemot (and adjusted for differences between mainland and Northern Isles data sources) the proportion of birds within this range was based on expert opinion. However, the analyses completed for Muir Mhòr showed that the predicted abundance of birds towards the limits of the foraging range was insensitive to both the foraging range value and the proportion of birds within that range used. As noted by Searle *et al*. (2018), there is evidence to support the use of the distance decay function. Wakefield *et al.* (2017) found that model predictions based on the "distance to colony" fit observed tracking data well.

4-18 Unlike SeabORD, the combination of the matrix displacement approach with colony apportioning is not based on empirical evidence. The displacement matrix assumes that all adult birds within foraging range (minus a sabbatical proportion) have connectivity to a breeding colony and apportioning only accounts for the relative distance, sea area and population size

between colonies. While, in this AEIR, these methods resulted in higher predicted impacts to some colonies than others, they fail to account for differences in the foraging range of guillemots between mainland and Northern Isles colonies and so likely overestimate impacts to mainland colonies.

4-19 As a result, the Applicant remains of the opinion that the best available scientific information in the field on the displacement effects to guillemot from the Proposed Offshore Development are to be obtained from the results from the SeabORD model. The effects of displacement to guillemot, razorbill and kittiwake calculated using the matrix displacement approach and the NatureScot apportioning methods are provided in **Section 4.3.2**, to provide NatureScot and MD-LOT with the requested additional information.

4.3.2 Matrix assessment

4-20 NatureScot have commented on the use of the matrix approach to assess distributional responses of seabirds in their response to the EIAR. It was stated that (representation on the EIAR, 01.10.2025):

> *"The comparison of SeabORD and Matrix results is also affected by an error in the use of Mean Seasonal Peaks (MSP) in the Matrix approach, which inflates breeding season impacts for guillemot. The same MSP (August 2022) was used in both breeding and non-breeding seasons. In our view, this August peak will be post-breeding dispersal and should therefore only be used in the non-breeding season."*

4-21 NatureScot further expressed that,

> *"we advise that the Matrix approach alone should be used to re-assess guillemot impacts with new PVAs being undertaken and counterfactuals updated. This should also incorporate adjustments to the Mean Seasonal Peak...This will have implications for both the EIA and RIAA assessments and therefore our advice once completed." And that, "it may be advisable to also rerun kittiwake and razorbill PVAs using the Matrix approach only".*

4-22 **Sections 4.3.2.1** to **4.3.2.3** address NatureScot's comments in this regard, outlining the approach taken for each species and the results of the predicted estimated species mortalities.

4.3.2.1 Guillemot

4-23 While NatureScot noted that there was an error in the mean seasonal peak calculation for guillemot (Appendix 9.3 Ornithology Distributional Responses Report of Volume 3 of the EIAR), the approach taken by the Applicant followed the available guidance on seasonality from NatureScot and the precedent set by application of this guidance within the industry. NatureScot's advice (representation on the EIAR, 01.10.2025) that the assessment should include August 2022 as the post-breeding dispersal period differs from previous NatureScot advice to the Applicant to either only assign data to breeding or non-breeding seasons or to follow Furness (2015).

4-24 Furness (2015) defines the non-breeding season as August to February. NatureScot Guidance Note 9 (NatureScot, 2020) defines the "winter" period as September to January, followed by

February and March as "breeding site attendance (not closely associated with the nest site)" and April to July as clearly the "breeding season (strongly associated with nest site)". This definition is followed in the first half of August, while the second half of August is also "breeding site attendance (not closely associated with the nest site)". The RAEI advice from NatureScot (representation on the EIAR, 01.10.2025) that the 2022 August peak was "post-breeding dispersal and should therefore only be used in the non-breeding season" is at odds with the NatureScot (2020) guidance that August is split between the breeding season (first half of the month) and the non-breeding season (second half of the month). In addition, the August 2022 Digital Aerial Survey (DAS) of the Proposed Offshore Development was completed on 9 August 2022, which is within the first half of the month, and therefore within the NatureScot definition on the breeding season. The August 2023 DAS was completed on 1 August 2023, so also within the defined breeding season.

4-25 The approach taken in the EIAR was to assign months split between more than one season to both seasons. Thus, if the peak month for one season was in a split month it would be applied to either season. If the same month was then the peak month in the following season it would be applied as the peak to the following season. In the case of guillemot at the Proposed Offshore Development, August was the month of peak abundance in both 2022 and 2023, so was selected as the seasonal peak for the breeding season and non-breeding season in both years.

4-26 Following NatureScot advice (representation on the EIAR, 01.10.2025), if the August surveys are assigned to the non-breeding season the breeding season peak abundances were in July in both 2022 and 2023 (**Table 4-3**), and the winter peaks in both years are from August.

Table 4-3. Predicted abundance using model-based analyses in the Array Area and two km buffer of guillemots on the sea and in flight combined for each month surveyed.

Month	Season	Array Area abundance (individuals) + 2 km (flight & sea)		
		2022	2023	2024
January	Winter	N/A	1,880.0	560.9
February	Winter	N/A	2,228.0	519.5
March	Winter	446.0	351.1	N/A
April	Breeding	1,602.0	1,964.0	N/A
May	Breeding	488.1	92.8	N/A
June	Breeding	2,154.0	808.7	N/A
July	Breeding	3,133.0	2,534.0	N/A
August	Breeding (first half) Winter (second half)	10,780.0	5,084.0	N/A
September	Winter	4,268.0	2,745.0	N/A
October	Winter	591.6	1,294.0	N/A
November	Winter	976.7	5,005.0	N/A
December	Winter	3,977.0	38.0	N/A

4-27 Based on the advice from NatureScot (representation on the EIAR, 01.10.2025) the displacement mortality using breeding season peak mean values that exclude August, the breeding season impact is predicted to be between 51.0 birds (3% mortality rate) and 85.0 birds (5% mortality

rate) (**Table 4-4**). The winter impact is predicted to be between 47.6 birds (1% mortality rate) and 142.8 birds (3% mortality rate). This results in an annual predicted mortality to guillemots in the Array Area plus a 2km buffer of between 98.6 birds (low mortality rates) and 227.8 (high mortality rates). These estimates represent a decrease in predicted mortality during the breeding season when compared to the results of the EIAR, while those of the non-breeding season remain unchanged.

Table 4-4. Calculation of seasonal and total displacement impacts based on NatureScot advice and guidance. All values are individual birds (adults and immatures).

	Mean Seasonal Peaks		Breeding			Winter		Annual	
Season	**Mean**	**S.D.**	**Displacement (60%)**	**Mortality 3%**	**Mortality 5%**	**Mortality 1%**	**Mortality 3%**	**Low**	**High**
Breeding	2,833.5	423.6	1,700.1	51.0	85.0	N/A	N/A	N/A	N/A
Winter	7,932.0	521.1	4,759.2	N/A	N/A	47.6	142.8	98.6	227.8

4-28 These results were compared with the results used in the EIAR (**Table 4-5**). This showed that the predicted impacts were larger using the matrix only approach than the approach taken in the EIAR.

Table 4-5 Comparison of predicted annual impacts from the project alone on guillemots from the EIAR (using SeabORD in the breeding season and matrix approach in the non-breeding season) and the requested additional information using the matrix only in all seasons with adjusted means seasonal peak.

Season	Region	Mortality scenario	Total displacement using SeabORD and matrix (EIAR)	Total displacement using matrix only
Breeding	Array Area + 2 km buffer	Low	22.2	51.0
		High	26.4	85.0
Non-breeding	Array Area + 2 km buffer	Low	22.8	47.6
		High	68.5	142.8
Annual	Array Area + 2 km buffer	Low	45.1	98.6
		High	94.9	227.8

4.3.2.2 Razorbill

4-29 NatureScot requested that additional information on the impacts to razorbills estimated using only the matrix approach be provided. These results are shown in **Table 4-6** which shows that the predicted impacts using the matrix only were lower than those using a combination of SeabORD in the breeding season and the matrix approach in other seasons.

Table 4-6. Comparison of predicted annual impacts from the project alone on razorbills from the EIAR (using SeabORD in the breeding season and matrix approach in the non-breeding season) and the requested additional information using the matrix only in all seasons.

Season	Region	Mortality scenario	Total displacement using SeabORD and matrix (EIAR)	Total displacement using matrix only
Breeding	Array Area + 2 km buffer	Low	15.3	4.7
		High	15.8	7.8
Autumn migration	Array Area + 2 km buffer	Low	0.4	0.4
		High	1.3	1.3
Spring migration	Array Area + 2 km buffer	Low	0.1	0.1
		High	0.4	0.4
Non-breeding	Array Area + 2 km buffer	Low	0.8	0.8
		High	2.3	2.3
Annual	Array Area + 2 km buffer	Low	16.6	6.0
		High	19.7	11.7

4.3.2.3 Kittiwake

4-30 NatureScot requested that additional information on the displacement impacts to kittiwakes estimated using only the matrix approach be provided. These results are shown in **Table 4-7** which shows that the predicted impacts using the matrix only were lower than those using a combination of SeabORD in the breeding season and the matrix approach in other seasons.

Table 4-7. Comparison of predicted annual impacts from the project alone on kittiwakes from the EIAR (using SeabORD in the breeding season and matrix approach in the non-breeding season) and the requested additional information using the matrix only in all seasons.

Season	Region	Mortality scenario	Total displacement using SeabORD and matrix (EIAR)	Total displacement using matrix only
Breeding	Array Area + 2 km buffer	Low	8.1	0.5
		High	8.3	1.6
Autumn migration	Array Area + 2 km buffer	Low	0.3	0.3
		High	0.9	0.9
Spring migration	Array Area + 2 km buffer	Low	1.0	1.0
		High	3.1	3.1
Non-breeding	Array Area + 2 km buffer	Low	9.4	1.9
		High	12.3	5.7
Annual	Array Area + 2 km buffer	Low	8.1	0.5
		High	8.3	1.6

4.4 IN-COMBINATION AND CUMULATIVE EFFECTS ASSESSMENT

4-31 MD-LOT, advised by NatureScot, requested additional environmental information on the in-combination impacts from the Proposed Offshore Development with other reasonably foreseeable projects (**Section 4.4.2**) and additional environmental information on the cumulative effects with other projects to the regional non-breeding population of great black-backed gull (**Section 4.4.3**) (RAEI 18.12.2025).

4.4.1 Compensated Impacts

4-32 MD-LOT advised (by email – 18 May 2026) that Buchan can exclude impacts from consented Scottish projects where there is a conclusion of AEOSI (or unable to conclude no AEOSI) on sites/species which have resulted in the need for compensation.

4-33 Appropriate Assessments for approved project applications, published by MD-LOT, were reviewed to identify relevant projects. This ensured that only impacts requiring compensation were excluded, and only for the SPA qualifying features subject to that compensation. Updated impacts predicted from the AEIRs from the Green Volt and Pentland projects were also amended in the in-combination assessment, where these were not compensated. The remaining impacts from these projects have been included in the in-combination assessment in this AEIR (**Section 4.4.2**).

4.4.2 In-combination assessment

4-34 NatureScot requested (email 02.06.2026) that an updated version of the in-combination assessment approach and PVA used by the Muir Mhòr, Ossian and Caledonia (hereafter MMOC) projects should be applied to kittiwake, herring gull, guillemot, razorbill, puffin and gannet.

4-35 The MMOC screening approach was applied to determine which SPA qualifying features needed a PVA to inform the Appropriate Assessment to be completed by the competent authority (MD-LOT). The SPA features with connectivity and predicted impacts from Buchan were collated and in-combination impacts from all other projects with connectivity to those SPAs were collated. In line with the agreed screening method followed by MMOC, a three step approach using a PVA screening tool was then applied:

1. Include only SPA qualifying features with connectivity with two or more of the Buchan, Aspen, Ayre, Bellrock, Marram, and Spriorad na Mara projects;

2. Include only SPA qualifying features where the predicted total in-combination impacts exceeded a change in adult survival of 0.02% points (as recommended in NatureScot Guidance Note 11); and

3. Include only SPA qualifying features where an Adverse Effect on Site Integrity has been concluded, and compensation is proposed, by at least one of the Buchan, Aspen, Ayre, Bellrock, Marram, and Spriorad na Mara projects.

4-36 MD-LOT requested (email 18.05.2026) new pending applications from Aspen, Ayre, Bellrock, Marram, and Spriorad na Mara were included in the assessment of in-combination impacts.

4.4.2.1 Screening results

4-37 The collation of SPA features with connectivity identified 54 SPA features (**Table 4-8**) which were not reduced at Step 1 of the screening process described in **Section 4.4.2**. However, the number of PVAs were reduced to 50 SPA features by Step 2. Applying Step 3 removed a further 30 SPA qualifying feature as it is not possible to conclude no AEOSI in-combination if one (or more) of the Buchan, Aspen, Ayre, Bellrock, Marram, and Spriorad na Mara projects alone already have an Adverse Effect on Site Integrity (and require compensation for that SPA qualifying feature) based on NatureScot advice to MD-LOT or from their respective project RIAAs. Consequently, 24 SPA qualifying features required a PVA. These are shown in **Table 4-9**.

4-38 The PVA Screening (selection) tool is provided as **Appendix 4.2** for reference.

4-39 The predicted impacts requiring an Appropriate Assessment and the predicted impacts from other, consented, projects and the predicted change in adult survival rate is shown in **Table 4-10**.

Table 4-8 List of 54 SPA qualifying features screened at the start of the assessment & total annual predicted adult impacts (using high displacement mortality rates from NatureScot Guidance Note 8) from each project (see PVA selection tool for source information). SnM = Spriorad na Mara.

Species	SPA	Buchan impact	Aspen impact	Ayre impact	Marram impact	SnM impact	Bellrock impact
Gannet	Fair Isle	0.5	0.6	1.12	1.8	0.2	
Gannet	Flamborough and Filey Coast	1.4	1.2	0.19	0.5	0.0	2.0
Gannet	Forth Islands	12.2	11.0	2.15	N/A	0.9	16.0
Gannet	Hermaness, Saxa Vord and Valla Field	2.2	1.6	1.18	3.7	0.6	2.0
Gannet	North Rona and Sula Sgeir	0.3	0.2	0.36	1.0	4.7	0.3
Gannet	Noss	1.1	1.0	0.95	2.9	0.3	1.0
Gannet	St Kilda	1.1	0.9	0.6		12.6	1.0
Gannet	Sule Skerry and Sule Stack	0.4	0.3	0.73	1.3	1.1	0.4
Guillemot	Buchan Ness to Collieston Coast	28.7	15.2	N/A	119.6	N/A	N/A
Guillemot	Calf of Eday	2.7	N/A	3.2	N/A	N/A	N/A
Guillemot	Copinsay	8.0	N/A	60.3	N/A	N/A	N/A
Guillemot	Fair Isle	9.9	N/A	6.5	N/A	N/A	N/A
Guillemot	Hoy	5.2	N/A	5.8	N/A	N/A	N/A
Guillemot	Marwick Head	3.4	N/A	5.9	N/A	N/A	N/A
Guillemot	Rousay	2.6	N/A	4.0	N/A	N/A	N/A
Guillemot	Sumburgh Head	0.9	N/A	2.7	N/A	N/A	N/A
Guillemot	Troup, Pennan and Lion's Heads	42.4	15.2	N/A	121.3	N/A	N/A
Guillemot	West Westray	10.0	N/A	14.8	N/A	N/A	N/A
Kittiwake	Buchan Ness to Collieston Coast	10	1.31	0.68	3.99	N/A	2.03
Kittiwake	Calf of Eday	0.02	0.01	0.10	0.06	0.00	N/A
Kittiwake	Cape Wrath	0.04	0.03	0.11	0.18	0.17	N/A
Kittiwake	Copinsay	0.02	0.01	0.81	0.16	0.00	0.01
Kittiwake	East Caithness Cliffs	1.46	0.82	3.21		0.24	0.36
Kittiwake	Fair Isle	0.02	0.04	0.06	0.07	N/A	0.01

Species	SPA	Buchan impact	Aspen impact	Ayre impact	Marram impact	SnM impact	Bellrock impact
Kittiwake	Farne Islands	0.08	0.09	0.10	0.39	N/A	0.54
Kittiwake	Forth Islands	0.11	0.24	0.13	0.57	N/A	0.46
Kittiwake	Foula	0.01	0.01	0.02	0.03	N/A	
Kittiwake	Fowlsheugh	0.51	1.14	0.50	N/A	N/A	2.42
Kittiwake	Handa	0.04	N/A	0.08	N/A	0.05	N/A
Kittiwake	Hermaness, Saxa Vord and Valla Field	0.01	N/A	0.01	0.02	N/A	N/A
Kittiwake	Hoy	0.01	0.02	0.05	0.04	0.00	0.02
Kittiwake	Marwick Head	0.03	0.02	0.13	0.08	0.00	N/A
Kittiwake	North Caithness Cliffs	0.37	0.50	1.05	0.94	0.06	0.31
Kittiwake	North Rona and Sula Sgeir	0.00	N/A	0.01	N/A	0.02	N/A
Kittiwake	Noss	0.01	0.0	0.02	0.02	N/A	N/A
Kittiwake	Rousay	0.04	0.06	0.11	0.08	0.01	N/A
Kittiwake	St Abb's Head to Fast Castle	0.10	0.19	0.10	0.52	N/A	0.63
Kittiwake	Sumburgh Head	0.01	0.01	0.43	0.08	N/A	N/A
Kittiwake	Troup, Pennan and Lion's Heads	0.93	0.41	0.91	3.93	N/A	1.19
Kittiwake	West Westray	0.22	0.16	0.72	N/A	0.07	0.17
Puffin	Cape Wrath	0.4	N/A	0.1	N/A	0.1	N/A
Puffin	Fair Isle	2.7	0.2	1.1	1.1	N/A	N/A
Puffin	Forth Islands	6.8	3.7	N/A	N/A	N/A	1.6
Puffin	Foula	0.7	0.4	0.2	0.4	N/A	N/A
Puffin	Hoy	0.2	N/A	0.1	0.1	0.0	N/A
Puffin	North Caithness Cliffs	1.2	0.1	0.7	0.6	0.0	0.0
Puffin	Noss	0.2	0.0	0.1	0.1	N/A	N/A
Puffin	Sule Skerry and Sule Stack	8.9	N/A	3.3	3.9	0.7	N/A
Razorbill	East Caithness Cliffs	2.2	0.0	8.2	0.2	N/A	0.1
Razorbill	Fair Isle	0.1	0.0	0.4	0.3	N/A	N/A
Razorbill	North Caithness Cliffs	0.6	0.0	1.3	0.1	N/A	0.0

Species	SPA	Buchan impact	Aspen impact	Ayre impact	Marram impact	SnM impact	Bellrock impact
Razorbill	Troup, Pennan and Lion's Heads	0.6	0.6	0.5	2.3	N/A	0.0
Razorbill	West Westray	0.1	0.0	0.7	0.0	N/A	N/A
Herring gull	Troup, Pennan and Lion's Heads	1.0	0.7	N/A	N/A	N/A	N/A

Table 4-9 List of SPA qualifying features requiring PVA.

Species	SPA
Gannet	Flamborough and Filey Coast
Gannet	North Rona and Sula Sgeir
Guillemot	Calf of Eday
Guillemot	Fair Isle
Guillemot	Hoy
Guillemot	Marwick Head
Guillemot	Rousay
Guillemot	Sumburgh Head
Guillemot	West Westray
Kittiwake	Calf of Eday
Kittiwake	Cape Wrath
Kittiwake	Foula
Kittiwake	Hermaness, Saxa Vord and Valla Field
Kittiwake	Marwick Head
Kittiwake	Noss
Kittiwake	Rousay
Kittiwake	Sumburgh Head
Puffin	Fair Isle
Puffin	Foula
Puffin	Hoy
Puffin	Noss
Puffin	Sule Skerry and Sule Stack
Razorbill	West Westray
Herring gull	Troup, Pennan and Lion's Heads

4.4.2.2 PVA models

4-40 PVA input parameters (**Table 4-11**) were based on NatureScot guidance and starting population sizes were the same as the values used in Appendix 9.5 Ornithology Population Viability Analysis Report of Volume 3 of the EIAR.

4-41 Models were run using the Natural England and JNCC seabird PVA tool (Searle *et al*. 2019).

4-42 Combined impacts from Buchan, Aspen, Ayre, Bellrock, Marram, and Spriorad na Mara were collated and summed from published Additional Environmental Information Reports and where relevant, original RIAA documents for the relevant projects (sources are provided in the PVA selection tool, **Appendix 4.2**). Predicted in-combination impacts were estimated using the in-combination values collated by Royal Haskoning DHV [version dated 3rd April 2025] on behalf of the North East and East Ornithology Group (a collective of 12 ScotWind offshore wind farm developers) with predicted impacts removed from SPA qualifying features that were already proposed to be compensated by the consented projects. Predicted impacts from the MMOC projects were added to these.

4-43 Outputs are provided as **Appendix 4.2** comprising Microsoft Excel compatible files describing the inputs and outputs for each model run for each SPA qualifying feature. These files are also provided to allow MD-LOT to reach conclusions in their Appropriate Assessment, so no inter-pretation is provided here.

Table 4-10 Final 24 SPA qualifying features requiring a PVA to inform the Appropriate Assessment. Breeding adults = population size (individuals) of each SPA feature. Impacts from Buchan, Aspen, Ayre, Bellrock, Marram, and Spriorad na Mara (SnM) and all other projects are the predicted annual mortalities from each source. Change in adult survival is the predicted percentage point change in annual adult survival.

Species	SPA	Breeding population (adults)	Buchan impact	Aspen impact	Ayre impact	Marram impact	SnM impact	Bellrock impact	All others impact	Total impact	% change in adult survival
Gannet	Flamborough and Filey Coast	26,784	1.36	1.18	0.19	0.47	0.02	2.00	399.20	404.41	1.510
Gannet	North Rona and Sula Sgeir	18,990	0.29	0.24	0.36	0.99	4.72	0.31	6.73	13.65	0.072
Guillemot	Calf of Eday	7,402	2.70	N/A	3.18	N/A	N/A	N/A	2.37	8.25	0.111
Guillemot	Fair Isle	24,515	9.90	N/A	6.46	N/A	N/A	N/A	6.95	23.31	0.095
Guillemot	Hoy	12,390	5.20	N/A	5.77	N/A	N/A	N/A	9.26	20.23	0.163
Guillemot	Marwick Head	12,800	3.40	N/A	5.91	N/A	N/A	N/A	6.99	16.30	0.127
Guillemot	Rousay	7,921	2.60	N/A	4.00	N/A	N/A	N/A	2.77	9.37	0.118
Guillemot	Sumburgh Head	3,677	0.90	N/A	2.72	N/A	N/A	N/A	0.00	3.62	0.098
Guillemot	West Westray	40,673	10.00	N/A	14.75	N/A	N/A	N/A	15.59	40.34	0.099
Kittiwake	Calf of Eday	290	0.02	0.01	0.10	0.06	0.00	N/A	4.20	4.39	1.513
Kittiwake	Cape Wrath	6,520	0.04	0.03	0.11	0.18	0.17	N/A	4.41	4.94	0.076
Kittiwake	Foula	850	0.01	0.01	0.02	0.03	N/A	N/A	1.95	2.02	0.238
Kittiwake	Hermaness, Saxa Vord and Valla Field	166	0.01	N/A	0.01	0.02	N/A	N/A	2.15	2.19	1.317
Kittiwake	Marwick Head	2,878	0.03	0.02	0.13	0.08	0.00	N/A	3.37	3.64	0.126
Kittiwake	Noss	172	0.01	0.00	0.02	0.02		N/A	2.83	2.87	1.671
Kittiwake	Rousay	962	0.04	0.06	0.11	0.08	0.01	N/A	9.38	9.68	1.006
Kittiwake	Sumburgh Head	636	0.01	0.01	0.43	0.08	N/A	N/A	1.25	1.78	0.280
Puffin	Fair Isle	13,332	2.72	0.17	1.05	1.11	N/A	N/A	12.09	17.14	0.129
Puffin	Foula	8,468	0.68	0.39	0.21	0.35	N/A	N/A	21.85	23.48	0.277
Puffin	Hoy	860	0.15	N/A	0.12	0.05	0.01	N/A	3.50	3.83	0.445
Puffin	Noss	2,348	0.20	0.01	0.05	0.10	N/A	N/A	0.79	1.15	0.049

Species	SPA	Breeding population (adults)	Buchan impact	Aspen impact	Ayre impact	Marram impact	SnM impact	Bellrock impact	All others impact	Total impact	% change in adult survival
Puffin	Sule Skerry and Sule Stack	95,484	8.93	N/A	3.26	3.92	0.67	N/A	166.10	182.87	0.192
Razorbill	West Westray	3,198	0.05	0.00	0.70	0.03	N/A	N/A	6.43	7.21	0.225
Herring gull	Troup, Pennan and Lion's Heads	1,106	1.00	0.70	N/A	N/A	N/A	N/A	0.49	2.19	0.198

Table 4-11 Input parameters used in PVA runs. Sources follow NatureScot guidance.

Species	Kittiwake	Herring gull	Guillemot	Razorbill	Puffin	Gannet
Simulations	5000	5000	5000	5000	5000	5000
Seed	52	52	52	52	52	52
Burn-in (years)	10	10	10	10	10	10
Age first breeding (years)	4	5	6	5	5	5
Maximum brood size	2	3	1	1	1	1
Productivity rate (chicks per pair)	0.69	0.920	0.629	0.57	0.617	0.698
Productivity SD	0.296	0.477	0.174	0.247	0.151	0.071
Annual adult survival (SD)	0.854 (0.051)	0.834 (0.034)	0.939 (0.015)	0.895 (0.067)	0.906 (0.083)	0.919 (0.042)
Survival years 0 - 1	0.790 (0.051)	0.798 (0.092)	0.560 (0.013)	0.630 (0.209)	0.709 (0.022)	0.424 (0.007)
Survival years 1 - 2	0.854 (0.051)	0.834 (0.034)	0.792 (0.034)	0.630 (0.209)	0.709 (0.022)	0.829 (0.004)
Survival years 2 - 3	0.854 (0.051)	0.834 (0.034)	0.917 (0.022)	0.895 (0.067)	0.709 (0.022)	0.891 (0.003)
Survival years 3 - 4	0.854 (0.051)	0.834 (0.034)	0.939 (0.015)	0.895 (0.067)	0.760 (0.019)	0.895 (0.003)
Survival years 4 - 5	N/A	0.834 (0.034)	0.939 (0.015)	0.895 (0.067)	0.805 (0.017)	0.919 (0.042)
Survival years 5 - 6	N/A	N/A	0.939 (0.015)	N/A	N/A	N/A
Impact assumed start year	2035	2035	2035	2035	2035	2035
Impact assumed end year	2094	2094	2094	2094	2094	2094

4.4.3 Cumulative Effects Assessment

4.4.4 Great black-backed gull

4-44 NatureScot noted that a cumulative effects assessment was not included in the EIAR for great black-backed gull. It was stated that (representation on the EIAR, 01.10.2025): *"Great black-backed gull also reached [the] threshold [for CEA] but have not been progressed to the CEA… conclusions of significant cumulative effect have been reached elsewhere (i.e. for other offshore wind proposals) for this species, on the basis of a small project alone contribution. In our view, the Applicant has not sufficiently considered the potential cumulative effects to great black-backed gull through collision. We are therefore unable to support the conclusion reached and advise that assessment by PVA is required."*

4-45 The predicted impact from the Project alone on the regional great black-backed gull population was zero birds in the breeding season and a maximum of 2.8 birds in the non-breeding season,

resulting in a predicted decrease in annual adult survival of 0.003% points. This predicted impact on the non-breeding Biologically Defined Minimum Population Scale (BDMPS) North Sea population (Furness, 2015) did not exceed 0.02%-point change in adult survival (as recommended in NatureScot Guidance Note 11), so a PVA was not required. Consequently, a CEA was not undertaken. NatureScot have requested further information on the cumulative effects of other offshore wind farm projects on great black-backed gull populations. The approach taken was to follow that used in the additional information provided by the Muir Mhòr project and agreed with NatureScot. That analysis provided predicted impacts from 38 additional offshore wind farms (**Table 4-12**).

Table 4-12. Predicted breeding season and non-breeding season impacts on great black-backed gulls from individual offshore wind farms, the project alone and cumulatively.

Development	Breeding	Non-breeding	Total
Beatrice	36.2	145	181.2
Blyth Demonstration Site	0	6.1	6.1
Dogger Bank A & B	0	28	28
Dogger Bank C & Sofia	0	30.6	30.6
Dogger Bank South	0	3.92	3.92
East Anglia One	0	55.2	55.2
East Anglia ONE North	0	1.4	1.4
East Anglia Three	0	41.3	41.3
East Anglia TWO	0	4.1	4.1
European Offshore Wind Development Centre (EOWDC)	0	2.9	2.9
Five Estuaries	0	1.16	1.16
Galloper	0	21.6	21.6
Greater Gabbard	0	200	200
Green Volt	0	4.3	4.3
Hornsea Four	0	10.6	10.6
Hornsea Project One	0	82.3	82.3
Hornsea Project Two	0	24	24
Hornsea Three	0	33.6	33.6
Humber Gateway	0	6.1	6.1
Hywind 2 Demonstration	0	5.4	5.4
Inch Cape	0	44.2	44.2
Kentish Flats Extension	0	0.2	0.2
Methil	0.8	0.8	1.6
Moray Firth EDA	11.4	30.6	42
Moray West	4.8	6	10.8
Neart na Gaoithe	0	4.3	4.3
Norfolk Boreas	0	34.4	34.4
Norfolk Vanguard	0	25.8	25.8

Development	Breeding	Non-breeding	Total
Rampion	0	25	25
Rampion 2	0	13.59	13.59
Salamander	0	0.1	0.1
Seagreen Alpha and Bravo	0	64.1	64.1
SEP & DEP	0	0.3	0.3
Teesside	0	41.8	41.8
Thanet	0	0.5	0.5
Triton Knoll	0	117.1	117.1
Caledonia North	0	9.66	9.66
Caledonia South	0	7.72	7.72
West of Orkney (SEI)	0.81	11.13	11.94
Muir Mhòr	0	17.4	17.4
Aspen	0.43	9.29	9.72
Ayre	0.12	21.7	21.82
MarramWind	2.84	16.66	19.5
Bellrock	0	1.14	1.14
Buchan	0	2.85	2.85
All Projects (without Buchan)	57.4	1213.92	1,271.32
All Projects (plus Buchan)	57.4	1,216.77	1,274.17

4.4.4.1 PVA screening

4-46 To compare the impact from the Proposed Offshore Development on the annual adult survival rate of the regional population (BDMPS UK North Sea (Sept to March) Adult birds = 32,070 individuals), the proportion of adults predicted to be in the non-breeding BDMPS was calculated based on the proportion of adults to immature birds in the BDMPS (Furness, 2015) (0.35). Thus, the predicted adult impact from the Project alone was 1.0 adult birds per annum, all in the non-breeding season (**Table 4-13**). Since these impacts were all in the non-breeding season no adjustment was made due to a sabbatical rate. This predicted impact results in a predicted change in the adult survival rate of a 0.003%-point change.

Table 4-13. Calculation of impact on adult survival rate on the great black-backed gull regional non-breeding population from the Project alone and cumulatively.

Demographic parameter	Value	Units
BDMPS UK North Sea (Sept to March) Adult birds	32,070	Individuals
Proportion adults (BDMPS adult to immature population ratio)	0.35	n/a
Adult survival rate	0.93	n/a
Baseline mortality rate	0.07	n/a

Demographic parameter	Value	Units
Sabbatical rate	0.00	n/a
Predicted impact from Buchan only to adults	1.0	Individuals
Annual adult baseline mortality	2,244.9	Individuals
Annual adult baseline + impact mortality (Buchan only)	2,245.9	Individuals
Impacted adult mortality rate (Buchan only)	0.0700	n/a
Change in adult survival/mortality rate (Buchan only)	**0.003**	**n/a**
Predicted impact from all projects to adults only (cumulative plus Buchan)	425.9	Individuals
Annual adult baseline + impact mortality (cumulative plus Buchan)	2,670.8	Individuals
Impacted adult mortality rate (cumulative plus Buchan)	0.0833	n/a
Change in adult mortality/survival rate (cumulative plus Buchan)	0.0133	**n/a**

4-47 The predicted impact from the Proposed Offshore Development alone was added to the predicted cumulative impacts from all other projects of 407.8 adult birds per annum in the non-breeding season (**Table 4-13**). Thus, the predicted change in the adult survival rate was 0.0133 (or a 1.328%-point change) to the non-breeding BDMPS for great black-backed gull from the Proposed Offshore Development cumulatively with the other projects shown in **Table 4-13** These predicted impacts were sufficient that a PVA was recommended due to the cumulative impacts exceeding the NatureScot advised threshold of a 0.02%-point change in adult survival.

4-48 Following the approach used in the Additional Information Report from Muir Mhòr (2025) a PVA of the cumulative impacts were based on the non-breeding season BDMPS population (32,070 individual adults, 91,399 total birds). The methods used to run the PVA were identical to those shown in the EIAR (Volume 3, Appendix 9.5: Ornithology Population Viability Analysis Report).

4.4.4.2 PVA results

4-49 The demographic information used to populate the PVA for great black-backed gull are summarised in **Table 4-14**. Due to the absence of suitable demographic information, the standard deviation for adult survival and the mean and standard deviation of age specific immature survival were based on values for herring gull (from Horswill & Robinson 2015). Herring gull was chosen as a suitable proxy as it was considered the species with the most similar life history to great black-backed gull with suitable demographic values available. Lesser black-backed gull was excluded as a suitable proxy species as it is a long-distance migrant and has a more southerly distribution in Scotland than great black-backed gull. These differences

could result in important demographic differences between lesser black-backed gull and great black-backed gull.

Table 4-14. Adult and immature mean survival rates, age at first breeding and maximum brood size used in the PVA modelling. Numbers in brackets represent the standard deviations used. All values are taken from Horswill and Robinson, 2015, in line with NatureScot guidance (NatureScot, 2023a).

Species	Adult survival rate	Productivity rate	Immature survival rate**					Age at first breeding	Maximum brood size
			0 to 1	1 to 2	2 to 3	3 to 4	4 to 5		
Great black-backed gull	0.93 (0.034)*	1.139 (0.533)	0.798 (0.092)	0.834 (0.034)	0.834 (0.034)	0.834 (0.034)	0.834 (0.034)	5	3

* SD from herring gull
** from herring gull

Table 4-15. Median simulated population sizes (breeding pairs) and counterfactual population sizes for great black-backed gull. Values are median values with 95% confidence intervals in brackets. CPS = Counterfactual of Population Size.

Population	Scenario	2035 (reference year)	2060 (25 years)		2070 (35 years)		2085 (50 years)		2095 (60 years)	
		Population size	Population size	CPS	Population size	CPS	Population size	CPS	Population size	CPS
Regional	Baseline	88,119 (57,910 - 130,049)	86,610 (57,074 - 128,018)	n/a	1,564,051 (762,424 - 3,132,655)	n/a	5,428,493 (2,388,105 - 11,751,665)	n/a	12,344,004 (5,141,948 - 28,446,649)	n/a
	Collision impact	86,610 (57,074 - 128,018)	454,310 (237,864 - 840,779)	0.661 (0.652 - 0.67)	881,813 (428,142 - 1,767,769)	0.564 (0.556 - 0.572)	2,411,274 (1,057,043 - 5,234,173)	0.444 (0.438 - 0.451)	4,733,343 (1,975,745 - 10,957,053)	0.384 (0.379 - 0.39)

Source: NEPVA outputs – the NEPVA tool generates each iteration for each scenario run independently so that there are small differences in the reference year population sizes due to the stochasticity inherent within the model.

Table 4-16. Simulated growth rates and counterfactual growth rates for great black-backed gull. Values are median values with 95% confidence intervals in brackets. CGR = Counterfactual of Growth Rate.

Population	Scenario	2060 (25 years)		2070 (35 years)		2085 (50 years)		2095 (60 years)	
		Population growth rate	CGR	Population growth rate	CGR	Population growth rate	CGR	Population growth rate	CGR
Regional	Baseline	1.086 (1.063 - 1.107)	n/a	1.086 (1.067 - 1.104)	n/a	1.086 (1.070 - 1.101)	n/a	1.086 (1.072 - 1.099)	n/a
	Collision impact	1.069 (1.047 - 1.090)	0.984 (0.984 - 0.985)	1.069 (1.051 - 1.086)	0.984 (0.984 - 0.984)	1.069 (1.053 - 1.084)	0.984 (0.984 - 0.984)	1.069 (1.055 - 1.082)	0.984 (0.984 - 0.985)

4.4.4.3 Great black-backed gull mitigation

4-50 The updated assessment of EIA impacts to the great black-backed gull regional population suggests that, while the predicted impacts from the Project alone remain Not-Significant as assessed in the EIAR, the updated cumulative assessment is likely to be Significant. Therefore, mitigation is required.

4-51 Given the very small EIA impacts from the Project alone (i.e. up to one adult bird per annum), changing the proposed engineering envelope to reduce the predicted impact below this level would be disproportionate and would not bring the residual cumulative impact to a level of being Not-Significant. Even if the predicted impact from the Project alone were mitigated to a smaller level, it would not change the significance of the cumulative impact.

4-52 Consequently, the Applicant proposes that the embedded mitigation measures proposed in the EIAR as well as the derogations proposed for other species (as required as part of the HRA) to reduce impacts from marine plastic pollution, reduce visitor disturbance in the Buchan Ness to Collieston Coast SPA (where great black-backed gulls nest – noting they are not a feature of the SPA) and marine habitat enhancement are likely to provide sufficient additional benefit to great black-backed gull to mitigate the small predicted impacts. These approaches therefore will restore damaged habitat (marine habitat restoration) and offset the remaining residual impact.

4.5 ERRATA: DUPLICATION OF "GANNET"

4-53 NatureScot have requested clarification on an errata in the EIAR. It was stated that (representation on the EIAR, 01.10.2025):

> "*Clarification is required regarding the repeated error in which gannet is referred to twice in a sentence or bullet point e.g. as within paragraphs 9-434 and 9-436. As described in the NatureScot response, it is assumed that 'kittiwake' is intended to be included however confirmation is required."*

4-54 The errata identified by MD-LOT are isolated to Section 9.12 Cumulative Effects Assessment of Volume 2, Chapter 9 of the EIAR. The Applicant has reviewed the issue identified and concurs that this is an error. Paragraph 9-434 should read as follows:

4-55 "NatureScot's advice (Row 29; Table 9 3) is for a species to be considered as part of the CEA if the project alone impact is at least 0.2 mortalities per year (i.e. an average of 1 mortality every 5 years) per the NatureScot advised higher mortality rates. The species considered are therefore kittiwake, herring gull, guillemot, razorbill, puffin, and gannet. Fulmar and great black-backed gull also have a predicted impact greater than 0.2 mortalities per year. However, these species are not progressed to the cumulative stage of assessment as detailed in Volume 3, Appendix 9.4: Offshore Ornithological Impact Apportioning, Cumulative Impact and Population Viability Analysis Technical Appendix."

4-56 And paragraph 9-436 should read as follows:

4-57 "As described in Table 9.61, two potential impacts are considered to have the potential to result in cumulative effects: Direct distributional response impacts and collision impacts. Six seabird IOFs are identified as having the potential to experience cumulative effects to their regional

populations in relation to one or both of these impacts, based on the NatureScot threshold of >0.2 mortalities per annum for each of the below impacts:

- *guillemot, razorbill and puffin may experience cumulative effects from direct distributional response impacts;*
- *herring gull may experience cumulative effects from collision impacts; and*
- *kittiwake and gannet may experience cumulative effects from both direct distributional response and collision impacts."*

4-58 The above revised paragraphs should be considered to supersede those identified with erroneous duplication of "gannet" within Section 9.12 Cumulative Effects Assessment of Volume 2, Chapter 9 of the EIAR.

4.6 COLLISION RISK MODELLING

4.6.1 Macro-avoidance rates

4-59 In their response to the EIAR, NatureScot stated (representation on the EIAR, 01.10.2025) :

> *"Within Paragraph 9-332 of Chapter 9, the Applicant states "a recent update to guidance issued by NatureScot on the assessment of collision impacts advocates for the application a 70% macro-avoidance rate of OWFs by both kittiwake and gannet (NatureScot, March 2025)." This does not follow our guidance. We recommend that a 70% macro-avoidance is applied to gannet in the non-breeding season only. While it does not appear that this has been carried through inappropriately for the project alone assessment (e.g. Paragraph 9-526), we request clarification on how this macro-avoidance rate has been applied cumulatively".*

4-60 The sentence from paragraph 9-332 of Volume 2, Chapter 9 of the EIAR does not include the full context of the wider paragraph. When the entire paragraph is considered it is apparent that the quoted sentence is in relation to the precaution in the assessment of collision risk and not stating that new guidance published by NatureScot in March 2025 was followed. Paragraph 9-332 states that,

> "*The design envelope for the Proposed Offshore Development includes three OWF design scenarios. Each of these has been assessed in Volume 3, Appendix 9.2: Offshore Ornithology Collision Risk Modelling (CRM) Technical Appendix. As per NatureScot (2023g) guidance, CRM outputs are presented for assessment against both the worst-case scenario (or maximum design scenario) and the most likely scenario. In the case of Buchan OWF for ornithology receptors, both the worst case and most likely scenarios relate to the same design scenario (Scenario 1). Resulting outputs from CRM in relation to scenario one are therefore presented within this Chapter. The OWF design parameters are presented in Table 9-23. It should be acknowledged that the following assessment of collision impacts is considered to be highly conservative.* ***For example, a recent update to guidance issued by NatureScot on the assessment of collision impacts advocates for the application a 70% macro-avoidance rate of OWFs by both kittiwake and gannet (NatureScot, March 2025)****.*

Furthermore, a 2023 study into the flight behaviours of several seabird species at the European Offshore Wind Deployment Centre (EOWDC) found that, of 2,178 video recordings of kittiwake taken within the meso-avoidance zone (i.e. within the OWF Array Area but flying between individual WTGs), no collisions or near-misses were detected."

4-61 The Applicant can confirm that updated NatureScot guidance from March 2025 was ***not*** followed for the assessment of collision risk to any species in the Proposed Offshore Development EIAR or RIAA because this guidance was not available for the Proposed Offshore Development prior to the Collision Risk Modelling (CRM) and Cumulative Analysis being completed for the Application. The change to NatureScot guidance to incorporate a 70% macro-avoidance rate in the non-breeding season was only stated within the EIAR to provide additional context to the CRM results when being discussed in the chapter and this guidance was not followed or mentioned in Appendix 9.2, Offshore Ornithology Collision Risk Modelling of Volume 3 of the EIAR where the methods and results were presented. Table 1-1 of Appendix 9.2 of Volume 3 of the EIAR (Summary of consultation point in relation to collision risk assessment with the relevant stakeholders) confirms this as it states, "*Macro avoidance was not used for any species*".

4-62 NatureScot specifically requests clarification on the cumulative assessment, which combined the Proposed Offshore Development only CRM estimates with that of all other relevant projects, thus the methods used to estimate the Proposed Offshore Development only collision also applied to the cumulative numbers. How the cumulative impacts were estimated is explained in detail in Annex D of Appendix 9.4 Ornithological Impact Apportioning, Derivation of Cumulative Impacts and PVA Screening of Volume 3 of the EIAR. It can be confirmed that no adjustment was made to the macro-avoidance rates to cumulative/in-combination assessments either.

4.6.2 Mean CRM outputs

4-63 While NatureScot did not comment on the method the Applicant used to determine predicted collisions, the Applicant is aware of the additional environmental information requested of other recent ScotWind applications for the provision of mean predicted collision predictions. This was discussed with NatureScot in a workshop on 31 March 2026 and it was agreed that more details on the approach used and any differences between mean and median CRM results would be provided. The EIAR for the Proposed Offshore Development predicted collisions based on the median value obtained from the stochastic Collision Risk Model (sCRM). When distributions are skewed the median represents a better summary statistic of the central tendency in the data distribution than the mean. Means should be used as a suitable summary statistic when the data are normally distributed (or close to this).

4-64 The input aerial density values used in the Appendix 9.2 of Volume 3 of the EIAR were based on a mix of design-based and model-based outputs (see Table A-1 in Appendix 9.2 Volume 3 of the EIAR).

4-65 Using the same CRM outputs from Appendix 9.2 of Volume 3 of the EIAR, the mean values have been calculated for each month for each species and are presented in **Table 4-17 - Table 4-21** alongside the median value and the upper and lower 95% bootstrap confidence interval (CI; i.e.

the 2.5th and 97.5th percentiles of the distribution). Scenarios used in the following tables are as defined in Section 2.1.2 of Appendix 9.2 of Volume 3 of the EIAR.

4-66 The mean predicted collisions of kittiwakes (**Table 4-17**) were slightly larger than the median values, with an annual prediction being only 1.4% larger than the median annual prediction. It is apparent from the 95% bootstrap confidence intervals that the distribution is somewhat skewed, and therefore the median value is a better summary statistic to use than the mean value, but the difference was sufficiently small that it is insignificant.

4-67 Predicted great-black-backed gull collisions only occurred in the non-breeding season (**Table 4-18**). The mean predicted collisions were slightly larger than the predicted median values, with an annual value that was 0.2 birds per annum larger, which is not biologically significant. The confidence intervals show a small skew with the median value better representing the central tendency in the distribution.

4-68 As with great black-backed gull, herring gull mean predictions were only slightly larger than the median values (**Table 4-19**). The difference of 0.12 birds per annum was not biologically significant and the skew in the data distribution was also present, so the median value was the better value to represent the central tendency in the distribution.

4-69 It was apparent that the mean prediction collisions of fulmars were greater than the median values, which was a result of clearly skewed distributions (**Table 4-20**). Lower 95% confidence intervals were all zero and the upper 95% confidence intervals were all notably larger than either the median or mean values. These distributions were very skewed with long right tails. These long right tails result in distributions that were not normally distributed and as such means were a poor summary statistic to explain the central tendency in the data.

4-70 There was relatively little difference between the mean and median collision predictions of gannets (**Table 4-21**). The annual predicted mean collisions were only 0.4 birds per annum, which is not considered biologically significant. Mean values were consistently slightly larger than the median values.

4-71 Consequently, the conclusions of non-significance presented within the EIAR remain valid and the Applicant maintains that the assessment methodology utilised is appropriate and robust. It remains concluded that the impact of collision from the Proposed Offshore Development to the relevant species is Not-Significant in EIAR terms.

Table 4-17. Predicted monthly, seasonal and annual collisions (Scenario 1) of kittiwakes. Values are mean, median and 95% bootstrap CIs from 1,000 iterations.

Month	Monthly collisions				Seasonal collisions					Annual collisions			
	Mean	Median	Lower CI (2.5%)	Upper CI (97.5%)	Season	Mean	Median	Lower CI (2.5%)	Upper CI (97.5%)	Mean	Median	Lower CI (2.5%)	Upper CI (97.5%)
January	0.17	0.07	0.00	0.69	Spring migration	3.21	3.04	1.18	6.35	8.34	8.22	5.28	12.00
February	1.50	1.76	0.00	4.14									
March	1.10	1.05	0.46	2.07									
April	0.90	0.80	0.26	2.12									
May	0.58	0.00	0.00	1.84	Breeding	3.65	3.50	1.95	6.06				
Jun	0.33	0.30	0.00	1.07									
July	1.09	1.03	0.15	2.46									
August	1.20	0.88	0.19	2.93									
September	0.32	0.29	0.00	0.75	Autumn migration	1.48	1.36	0.56	2.95				
October	0.37	0.00	0.00	1.56									
November	0.54	0.48	0.00	1.37									
December	0.25	0.00	0.00	0.93									

Table 4-18. Predicted monthly, seasonal and annual collisions (Scenario 1) of great black-backed gulls. Values are mean, median and 95% bootstrap CIs from 1,000 iterations.

Month	Monthly collisions				Seasonal collisions					Annual collisions			
	Mean	Median	Lower CI (2.5%)	Upper CI (97.5%)	Season	Mean	Median	Lower CI (2.5%)	Upper CI (97.5%)	Mean	Median	Lower CI (2.5%)	Upper CI (97.5%)
January	0.39	0.00	0.00	1.96	Non-breeding	3.08	2.85	1.09	6.44	3.08	2.85	1.09	6.44
February	0.19	0.00	0.00	1.20									
March	0.27	0.00	0.00	1.52									
April	0.00	0.00	0.00	0.00	Breeding	0.00	0.00	0.00	0.00				
May	0.00	0.00	0.00	0.00									
Jun	0.00	0.00	0.00	0.00									
July	0.00	0.00	0.00	0.00									
August	0.00	0.00	0.00	0.00									
September	0.00	0.00	0.00	0.00	Non-breeding								
October	0.28	0.00	0.00	1.46									
November	0.92	0.82	0.00	2.34									
December	1.03	0.88	0.35	2.54									

Table 4-19. Predicted monthly, seasonal and annual collisions (Scenario 1) of herring gulls. Values are mean, median and 95% bootstrap CIs from 1000 iterations.

Month	Monthly collisions				Seasonal collisions					Annual collisions			
	Mean	Median	Lower CI (2.5%)	Upper CI (97.5%)	Season	Mean	Median	Lower CI (2.5%)	Upper CI (97.5%)	Mean	Median	Lower CI (2.5%)	Upper CI (97.5%)
January	0.00	0.00	0.00	0.00	Non-breeding	2.09	2.38	0.00	6.34	2.73	2.61	0.00	6.96
February	0.00	0.00	0.00	0.00									
March	0.00	0.00	0.00	0.00									
April	0.21	0.00	0.00	1.28	Breeding	0.64	0.49	0.00	2.20				
May	0.00	0.00	0.00	0.00									
Jun	0.00	0.00	0.00	0.00									
July	0.00	0.00	0.00	0.00									
August	0.43	0.38	0.00	1.43									
September	0.00	0.00	0.00	0.00	Non-breeding								
October	0.00	0.00	0.00	0.00									
November	0.18	0.00	0.00	1.02									
December	1.91	2.10	0.00	5.73									

Table 4-20. Predicted monthly, seasonal and annual collisions (Scenario 1) of fulmars. Values are mean, median and 95% bootstrap CIs from 1000 iterations.

Month	Monthly collisions				Seasonal collisions					Annual collisions			
	Mean	Median	Lower CI (2.5%)	Upper CI (97.5%)	Season	Mean	Median	Lower CI (2.5%)	Upper CI (97.5%)	Mean	Median	Lower CI (2.5%)	Upper CI (97.5%)
January	0.23	0.03	0.00	1.21	Spring migration	0.99	0.10	0.00	5.23	3.46	0.51	0.00	16.53
February	0.25	0.01	0.00	1.90									
March	0.11	0.01	0.00	0.64									
April	0.10	0.01	0.00	0.52	Breeding	1.86	0.28	0.00	9.14				
May	0.14	0.01	0.00	0.84									
Jun	0.22	0.03	0.00	1.11									
July	0.74	0.10	0.00	3.64									
August	0.59	0.08	0.00	3.11									
September	0.14	0.02	0.00	0.84									
October	0.25	0.02	0.00	1.73	Autumn migration	0.32	0.03	0.00	2.08				
November	0.29	0.03	0.00	1.75	Winter	0.29	0.03	0.00	1.75				
December	0.40	0.01	0.00	2.54	Spring migration								

Table 4-21. Predicted monthly, seasonal and annual collisions (Scenario 1) of gannets. Values are mean, median and 95% bootstrap CIs from 1000 iterations.

Month	Monthly collisions				Seasonal collisions					Annual collisions			
	Mean	Median	Lower CI (2.5%)	Upper CI (97.5%)	Season	Mean	Median	Lower CI (2.5%)	Upper CI (97.5%)	Mean	Median	Lower CI (2.5%)	Upper CI (97.5%)
January	0.05	0.00	0.00	0.34	Spring migration	0.37	0.21	0.00	1.44	4.36	3.95	1.15	9.16
February	0.16	0.04	0.00	0.82									
March	0.07	0.00	0.00	0.52									
April	0.52	0.35	0.00	1.90	Breeding	3.28	2.98	0.84	7.19				
May	0.22	0.00	0.00	1.07									
Jun	0.76	0.66	0.16	1.84									
July	0.71	0.31	0.00	2.87									
August	0.21	0.15	0.00	0.78									
September	0.83	0.57	0.00	2.81									
October	0.43	0.34	0.00	1.31	Autumn migration	0.71	0.54	0.04	2.05				
November	0.28	0.21	0.00	0.89									
December	0.12	0.04	0.00	0.53	Spring migration								

4.7 SABBATICAL BIRDS

4-72 NatureScot noted in their response to the EIAR that:

> *"it appears that sabbaticals have been removed in the non-breeding season as well as the breeding season, which is incorrect. During the non-breeding season, all birds are non-breeders and so sabbatical birds do not need to be removed from estimated adult mortalities*
>
> *We have undertaken our own calculations of mortalities in the non-breeding season and conclude that sabbaticals have been removed. The changes in mortalities resulting from this error are not significant enough to alter our conclusions*
>
> *Should other re-assessments be required, such as for displacement, then this error should be corrected as well"*

4-73 The Applicant notes that the purpose of adjusting for the sabbatical proportion in the predicted impact is to ensure that the impact prediction is matched to the relevant population size. In the breeding season, a proportion of birds that are part of the population but are not present when the colonies are counted are birds that are on sabbatical. These birds are likely to be present in the offshore environment, so would be included in the calculations of abundance within the Array Area (and buffers). Thus, to account for this difference the proportion of birds in the Array Area (and buffers) needs to be subtracted from the abundance of birds present before assessing the impact on the population count, as this does not include sabbatical birds.

4-74 In the EIA, the regional breeding population is determined through breeding colony counts that do not include sabbatical birds, so the predicted impact should be adjusted accordingly. In the non-breeding season, the regional population is determined from the relevant BDMPS in Furness (2015). As can be seen in Appendix A of Furness (2015), the adult proportion of these regional populations are provided as "breeding adults" and thus do not include sabbatical birds, so the predicted impact should, as in the breeding season, be adjusted accordingly. Furthermore, in the RIAA the population size using the assessment is always relevant to the citation feature (e.g. seabirds in the breeding season), so the comparison between the impact (in any season) and the colony size should always adjust for the presence of sabbatical birds. As such, in both the EIAR and RIAA, the proportion of estimated impacts expected to be experienced by sabbaticals were removed from both breeding and non-breeding season impacts to match the populations in breeding adults (which excludes sabbaticals) these impacts are assessed against.

4-75 In consultation on this topic, NatureScot advised that sabbatical birds should only be accounted for in the breeding season regardless of the source of the population count used to assess the significance of the predicted impact. Consequently, the apportioned impacts presented in Section 4.9 have adjusted the sabbatical rate in the breeding season only, where necessary.

4.8 SPECIES SENSITIVITY

4-76 MD-LOT requested (RAEI - 18.12.2025), "*clarification as to why literature sources which are more applicable to the Scottish context e.g. Wade et al. (2016) have not been used for the purpose of defining sensitivity*."

4-77 Species sensitivities were described in the Scoping Report using various references, including Furness & Wade (2013), Bradbury *et al*. (2014) and Furness *et al*. (2013). No reference was made to Wade *et al*. (2016) in the Scoping Report. The Scoping Opinion did not provide any further advice on species sensitivity or the use, or lack thereof, of Wade *et al*. (2016). No advice was received from NatureScot or other stakeholders prior to the Application being submitted to base species sensitivity on Wade *et al*. (2016) or to not use other sources.

4-78 Reference is made to Wade *et al*. (2016) in Table 9-25 Literature Sources Used to Derive Ecological Sensitivity Scores for Direct Distributional Response and Collision Impacts of Volume 2, Chapter 9 the EIAR, and the reader is thereafter directed to refer to Volume 3, Appendix 9.1 Offshore and Intertidal Ornithology Baseline Report in order to determine which specific sources were used to determine the sensitivities of each species to collision and displacement. The Applicant notes that no reference is made in Volume 3, Appendix 9.1 Offshore and Intertidal Ornithology Baseline Report to the aforementioned citation.

4-79 Vulnerability scores from the supplementary tables in Wade *et al*. (2016) were collated for both impact types. Collision risk vulnerability scores were derived from Supplementary Table 6 and Disturbance and displacement scores from Supplementary Table 7. Scores were then classified in order to be applicable to the EIAR assessment matrix. NatureScot provided advice to Muir Mhòr as part of an Additional Information Request (AIR) (see Natural Power, 2025) as to their preferred classification of vulnerability scores to each impact from the supplementary tables in Wade *et al*. (2016). These EIAR-applicable sensitivity classifications are presented in **Table 4-22**.

Table 4-22: Classification of vulnerability of seabirds to collision and displacement impacts

Classification	Vulnerability score	
	Collision	Displacement
High	>501	>30
Medium	101 to 500	19 to 29
Low	16 to 100	8 to 18
Negligible	0 to 15	0 to 7

4-80 Species sensitivities derived from the NatureScot-advised interpretation of Supplementary vulnerability score tables 6 (collision) and 7 (displacement) from Wade *et al*., (2016) are presented in **Table 4-23** (sensitivity to collision) and **Table 4-24** (sensitivity to displacement), below. **Table 4-23** and **Table 4-24** also compare the NatureScot sensitivity scores for each species with those considered in the original EIAR and RIAA. In both tables, un-shaded cells indicate no difference between the sensitivity classification assigned to each species using the NatureScot interpretation of Wade *et al*., (2016) and the original literature-derived sensitivity score assigned by the Applicant. Green-shaded cells indicate instances in which the EIAR was more precautionary, with higher sensitivity levels having been assigned when compared to the NatureScot interpretation of Wade *et al*., (2016).

Table 4-23: Classifications of vulnerability to collision derived from Wade *et al*. (2016) based on RAEI and those used in the EIAR

Species	NatureScot classification*	Buchan classification
Kittiwake	Medium	High
Common gull	Medium	High
Great black-backed gull	High	High
Herring gull	High	High
Lesser black-backed gull	High	High
Sandwich tern	Medium	Medium
Common tern	Low	Medium
Arctic tern	Low	Medium
Great skua	Medium	Medium
Razorbill	Negligible	Very low
Guillemot	Negligible	Very low
Puffin	Negligible	Very low
European storm petrel	Low	Very low
Leach's petrel	Low	Very low
Fulmar	Negligible	Very low
Manx shearwater	Negligible	Very low
Gannet	Medium	High
Shag	Low	Medium

**Based upon the advised NatureScot interpretation of vulnerability scores assigned by Wade et al., (2016)*

Table 4-24: Classifications of vulnerability to displacement derived from Wade *et al*. (2016) based on NatureScot advice and those used in the EIAR

Species	NatureScot classification*	Buchan classification
Kittiwake	Low	Medium
Sandwich tern	Low	Medium
Guillemot	Medium	Medium
Razorbill	Medium	Medium
Puffin	Medium	Medium[ǂ]
Gannet	Low	High
Shag	Low	Medium
Black-headed gull	Very low	Low
Common gull	Low	Low
Great black-backed gull	Low	Low
Herring gull	Very low	Low
Lesser black-backed gull	Very low	Low
Arctic tern	Low	Low
Common tern	Low	Low
Great skua	Very low	Very low
Red-throated diver	High	High
European storm petrel	Very low	Low
Leach's storm petrel	Very low	Very low
Fulmar	Very low	Low
Manx shearwater	Very low	Low

Species	NatureScot classification*	Buchan classification
Cormorant	Low	Medium

**Based upon the advised NatureScot interpretation of vulnerability scores assigned by Wade et al., (2016)*
[t]It is noted that the displacement sensitivity of puffin provided in Table 9-46 of Volume 2, Chapter 9 of the EIAR is given as "Low". This is an erratum, and the displacement sensitivity of puffin (and the value used in the assessment) is as provided in Appendix 9.1 and classified as "Medium".

4-81 In all cases, the sensitivity scores derived from the NatureScot interpretation of Wade *et al*., (2016) are the same as, or lower (and therefore less precautionary), than the sensitivity scores assigned to each species assessed for collision and direct distributional responses in the EIAR. There are no cases in which a sensitivity score derived from NatureScot interpretation of Wade *et al*., (2016) is more precautionary than the scores used in the original assessment. The Applicant therefore maintains that, in light of the comparison between the two methods for attributing collision and displacement sensitivity scores to the species assessed, the conclusions derived from the sensitivity scores used in the EIAR are sufficiently precautionary and remain valid and applicable.

4.9 APPORTIONING IMPACTS TO SPA FEATURES

4-82 Where there have been any changes made to the impact assessment in the EIAR, impacts to SPA features assessed in the RIAA have been apportioned accordingly. NatureScot noted in their advice (letter to MD-LOT 01 October 2025) that changes to predicted impacts, "has cascading effects on apportioning". Consequently, any changes made to the impact assessment from EIAR as a result of this AEIR process, have resulted in requirement to correspondingly update the impact assessment for the RIAA. The following changes listed below therefore have had cascading effects on apportioning impacts to SPA features that were assessed in the RIAA:

- Collision impacts have been changed from median CRM estimates to mean (**Section 4.4.4.3 Collision Risk Modelling**),
- Displacement impacts, where estimated using SeabORD, have been replaced with matrix-based estimates (**Section 4.3 Distributional responses**),
- The seasonal definition for guillemot has been changed so as the month of August is wholly part of the non-breeding season (**Section 4.3.2.1 Guillemot**), and
- Sabbatical corrections are only applied to estimated impacts during the breeding season (**Section 4.7 Sabbatical Birds**).

4-83 These changes were completed to inform the AEIR, and do not represent the Applicant's approach to assessment of impacts to SPA features provided in the RIAA. Impact apportioning was carried out as described in the EIAR (Volume 3, Technical Appendix 9.4: Ornithological Impact Apportioning, Derivation of Cumulative Impacts and PVA Screening) but with the above four changes made. The results of this apportioning are presented **in Sections 4.9.1** to **4.9.5**. Impacts to fulmar and great black-backed gull are not apportioned here for the same reasons as discussed in paragraphs 8 and 9 of EIAR Volume 3, Technical Appendix 9.4: Ornithological Impact

Apportioning, Derivation of Cumulative Impacts and PVA Screening. Great black-backed gull lacked breeding season connectivity to any SPAs and fulmar were not apportioned as they have very low sensitivity to impacts from operational offshore wind farms. Puffin impacts are also not apportioned here as NatureScot did not consider this a requirement in the representation on the EIAR, these are unchanged from the EIAR.

4.9.1 Guillemot

Table 4-25. Seasonal apportioned guillemot displacement impacts, partitioned between adults and immatures. Values are rounded to 1 decimal place for display purposes only.

Population name	Scenario	Impacts to Breeding Adult Birds			Impacts to Immature Birds		
		Breeding	Non-breeding	Total	Breeding	Non-breeding	Total
Buchan Ness to Collieston Coast SPA	Higher	10.2	18.5	28.7	10.3	17.3	27.6
	Lower	6.1	6.2	12.3	6.2	5.8	11.9
Calf of Eday SPA	Higher	1.0	1.7	2.7	1.0	1.6	2.6
	Lower	0.6	0.6	1.2	0.6	0.5	1.1
Copinsay SPA	Higher	2.8	5.1	8.0	2.9	4.8	7.7
	Lower	1.7	1.7	3.4	1.7	1.6	3.3
Fair Isle SPA	Higher	3.5	6.4	9.9	3.6	6.0	9.6
	Lower	2.1	2.1	4.3	2.1	2.0	4.1
Hoy SPA	Higher	1.8	3.3	5.2	1.9	3.1	5.0
	Lower	1.1	1.1	2.2	1.1	1.0	2.1
Marwick Head SPA	Higher	1.2	2.2	3.4	1.2	2.0	3.2
	Lower	0.7	0.7	1.4	0.7	0.7	1.4
Rousay SPA	Higher	0.9	1.7	2.6	0.9	1.6	2.5
	Lower	0.6	0.6	1.1	0.6	0.5	1.1
Sumburgh Head SPA	Higher	0.3	0.6	0.9	0.3	0.5	0.9
	Lower	0.2	0.2	0.4	0.2	0.2	0.4
Troup, Pennan and Lion's Heads SPA	Higher	15.1	27.3	42.4	15.2	25.6	40.8
	Lower	9.1	9.1	18.2	9.1	8.5	17.7
West Westray SPA	Higher	3.6	6.4	10.0	3.6	6.0	9.6
	Lower	2.1	2.1	4.3	2.1	2.0	4.2
Non-SPA colonies	Higher	0.3	0.5	0.8	0.3	0.5	0.8
	Lower	0.2	0.2	0.4	0.2	0.2	0.3
Regional population	Higher	40.8	73.7	114.5	41.1	69.1	110.2
	Lower	24.5	24.6	49.0	24.7	23.0	47.7

4.9.2 Razorbill

Table 4-26. Seasonal apportioned razorbill displacement impacts, partitioned between adults and immatures. Values are rounded to 3 decimal places for display purposes only.

Population name	Scenario	Impacts to Breeding Adult Birds					Impacts to Immature Birds				
		Spring migration	Breeding	Autumn migration	Non-breeding	Total	Spring migration	Breeding	Autumn migration	Non-breeding	Total
East Caithness Cliffs SPA	Higher	0.015	2.078	0.054	0.078	2.226	0.010	1.764	0.037	0.020	1.830
	Lower	0.005	1.247	0.018	0.026	1.296	0.003	1.058	0.012	0.007	1.080
Fair Isle SPA	Higher	0.001	0.078	0.004	0.006	0.089	0.001	0.066	0.003	0.001	0.071
	Lower	0.000	0.047	0.001	0.002	0.050	0.000	0.040	0.001	0.000	0.041
North Caithness Cliffs SPA	Higher	0.002	0.567	0.007	0.011	0.586	0.001	0.481	0.005	0.003	0.490
	Lower	0.001	0.340	0.002	0.004	0.346	0.000	0.288	0.002	0.001	0.291
Troup, Pennan and Lion's Heads SPA	Higher	0.002	0.609	0.008	0.011	0.629	0.001	0.517	0.005	0.003	0.526
	Lower	0.001	0.365	0.003	0.004	0.372	0.000	0.310	0.002	0.001	0.313
West Westray SPA	Higher	0.001	0.046	0.002	0.003	0.053	0.000	0.039	0.002	0.001	0.042
	Lower	0.000	0.028	0.001	0.001	0.030	0.000	0.024	0.001	0.000	0.025
Non-SPA colonies	Higher	0.012	0.679	0.043	0.062	0.798	0.008	0.577	0.029	0.016	0.630
	Lower	0.004	0.408	0.014	0.021	0.447	0.003	0.346	0.010	0.005	0.364
Regional population	Higher	0.033	4.057	0.118	0.171	4.380	0.022	3.443	0.080	0.043	3.589
	Lower	0.011	2.434	0.039	0.057	2.542	0.007	2.066	0.027	0.014	2.115

4.9.3 Herring Gull

Table 4-27. Seasonally apportioned herring gull collision impacts, partitioned between adults and immatures. Values are rounded to 3 decimal places for display purposes only.

Colony / SPA name	Impacts to Breeding Adult Birds			Impacts to Immature Birds		
	Breeding	Non-breeding	Total	Breeding	Non-breeding	Total
Troup, Pennan and Lion's Heads SPA	0.229	0.774	1.003	0.249	0.546	0.795
Non-SPA colonies	0.015	0.051	0.067	0.017	0.036	0.053
Regional population	0.245	0.825	1.070	0.266	0.582	0.848

4.9.4 Kittiwake

Table 4-28. Seasonally apportioned kittiwake collision and displacement impacts, partitioned between adults and immatures. The higher scenario is comprised of the higher displacement estimate plus the collision estimate and, the lower is the lower displacement estimate plus the collision estimate. Values are rounded to 3 decimal places for display purposes only.

Population name	Scenario	Impacts to Breeding Adult Birds				Impacts to Immature Birds			
		Spring migration	Breeding season	Autumn migration	Total	Spring migration	Breeding season	Autumn migration	Total
Buchan Ness to Collieston Coast SPA	Higher	0.151	0.594	0.044	0.790	0.067	0.288	0.026	0.381
	Lower	0.102	0.471	0.032	0.605	0.045	0.229	0.019	0.293
Calf of Eday SPA	Higher	0.009	0.003	0.003	0.015	0.004	0.002	0.002	0.007
	Lower	0.006	0.003	0.002	0.011	0.003	0.001	0.001	0.005
Cape Wrath SPA	Higher	0.002	0.033	0.001	0.035	0.004	0.016	0.003	0.022
	Lower	0.001	0.026	0.000	0.028	0.002	0.013	0.002	0.017
Copinsay SPA	Higher	0.008	0.014	0.002	0.024	0.004	0.007	0.001	0.012
	Lower	0.005	0.011	0.002	0.018	0.002	0.005	0.001	0.009
East Caithness Cliffs SPA	Higher	0.488	0.831	0.142	1.461	0.215	0.404	0.083	0.701
	Lower	0.328	0.659	0.105	1.092	0.144	0.320	0.061	0.526
Fair Isle SPA	Higher	0.009	0.012	0.003	0.024	0.004	0.006	0.002	0.011
	Lower	0.006	0.009	0.002	0.017	0.003	0.004	0.001	0.008
Farne Islands SPA	Higher	0.042	0.023	0.012	0.077	0.018	0.011	0.007	0.037
	Lower	0.028	0.019	0.009	0.055	0.012	0.009	0.005	0.027
Forth Islands SPA	Higher	0.037	0.063	0.011	0.111	0.016	0.031	0.006	0.053
	Lower	0.025	0.050	0.008	0.083	0.011	0.024	0.005	0.040
Foula SPA	Higher	0.004	0.004	0.001	0.009	0.002	0.002	0.001	0.005
	Lower	0.003	0.003	0.001	0.007	0.001	0.002	0.000	0.003
Fowlsheugh SPA	Higher	0.113	0.369	0.033	0.514	0.050	0.179	0.019	0.248
	Lower	0.076	0.292	0.024	0.392	0.033	0.142	0.014	0.190
Handa SPA	Higher	0.000	0.035	0.000	0.035	0.001	0.017	0.000	0.018
	Lower	0.000	0.028	0.000	0.028	0.000	0.013	0.000	0.014
Hermaness, Saxa Ford and Valla Field SPA	Higher	0.005	0.000	0.001	0.006	0.002	0.000	0.001	0.003
	Lower	0.003	0.000	0.001	0.005	0.001	0.000	0.001	0.002
Hoy SPA	Higher	0.005	0.007	0.001	0.013	0.002	0.003	0.001	0.006
	Lower	0.003	0.006	0.001	0.010	0.001	0.003	0.001	0.005

Population name	Scenario	Impacts to Breeding Adult Birds				Impacts to Immature Birds			
		Spring migration	Breeding season	Autumn migration	Total	Spring migration	Breeding season	Autumn migration	Total
Marwick Head SPA	Higher	0.006	0.024	0.002	0.032	0.003	0.012	0.001	0.016
	Lower	0.004	0.019	0.001	0.025	0.002	0.009	0.001	0.012
North Caithness Cliffs SPA	Higher	0.123	0.212	0.036	0.370	0.054	0.103	0.021	0.178
	Lower	0.082	0.168	0.026	0.277	0.036	0.082	0.015	0.133
North Rona and Sula Sgeir SPA	Higher	0.000	0.004	0.000	0.004	0.000	0.002	0.000	0.003
	Lower	0.000	0.003	0.000	0.003	0.000	0.002	0.000	0.002
Noss SPA	Higher	0.006	0.001	0.002	0.009	0.003	0.000	0.001	0.004
	Lower	0.004	0.001	0.001	0.006	0.002	0.000	0.001	0.003
Rousay SPA	Higher	0.021	0.009	0.006	0.036	0.009	0.004	0.004	0.017
	Lower	0.014	0.007	0.005	0.026	0.006	0.003	0.003	0.012
St Abb's Head to Fast Castle SPA	Higher	0.041	0.044	0.012	0.097	0.018	0.021	0.007	0.047
	Lower	0.028	0.035	0.009	0.072	0.012	0.017	0.005	0.034
Sumburgh Head SPA	Higher	0.003	0.005	0.001	0.008	0.001	0.002	0.000	0.004
	Lower	0.002	0.004	0.001	0.006	0.001	0.002	0.000	0.003
Troup, Pennan and Lion's Heads SPA	Higher	0.180	0.694	0.052	0.926	0.079	0.337	0.031	0.447
	Lower	0.121	0.551	0.039	0.710	0.053	0.267	0.023	0.343
West Westray SPA	Higher	0.146	0.036	0.042	0.223	0.064	0.017	0.025	0.106
	Lower	0.098	0.028	0.031	0.157	0.043	0.014	0.018	0.075
Non-SPA colonies	Higher	0.845	0.302	0.245	1.392	0.372	0.146	0.144	0.662
	Lower	0.568	0.239	0.181	0.989	0.250	0.116	0.106	0.473
Regional population	Higher	2.243	3.320	0.651	6.214	0.991	1.611	0.385	2.987
	Lower	1.509	2.632	0.482	4.623	0.666	1.277	0.285	2.229

4.9.5 Gannet

Table 4-29. Seasonally apportioned gannet collision and displacement impacts, partitioned between adults and immatures. The higher scenario is comprised of the higher displacement estimate plus the collision estimate and, the lower is the lower displacement estimate plus the collision estimate. Values are rounded to 3 decimal places for display purposes only.

Population name	Scenario	Impacts to Breeding Adult Birds				Impacts to Immature Birds			
		Spring migration	Breeding season	Autumn migration	Total	Spring migration	Breeding season	Autumn migration	Total
Fair Isle	Higher	0.033	0.520	0.078	0.630	0.015	0.159	0.052	0.226
	Lower	0.016	0.312	0.028	0.356	0.008	0.095	0.022	0.125
Flamborough and Filey Coast	Higher	0.093	0.138	0.224	0.455	0.043	0.042	0.164	0.249
	Lower	0.046	0.083	0.098	0.227	0.021	0.025	0.071	0.118
Forth Islands	Higher	0.465	2.048	1.126	3.639	0.215	0.627	0.821	1.663
	Lower	0.232	1.228	0.490	1.950	0.107	0.376	0.357	0.841
Hermaness, Saxa Vord and Valla Field	Higher	0.204	0.412	0.395	1.012	0.095	0.126	0.320	0.541
	Lower	0.102	0.247	0.172	0.521	0.047	0.076	0.139	0.262
North Rona and Sula Sgeir	Higher	0.000	0.184	0.019	0.203	0.000	0.056	0.030	0.087
	Lower	0.000	0.110	0.008	0.119	0.000	0.034	0.013	0.047
Noss	Higher	0.082	0.575	0.159	0.815	0.038	0.176	0.128	0.342
	Lower	0.041	0.345	0.069	0.455	0.019	0.106	0.056	0.180
St Kilda	Higher	0.000	0.523	0.121	0.644	0.000	0.160	0.196	0.356
	Lower	0.000	0.313	0.053	0.366	0.000	0.096	0.085	0.181
Sule Skerry and Sule Stack	Higher	0.000	0.381	0.009	0.391	0.000	0.117	0.015	0.132
	Lower	0.000	0.229	0.004	0.233	0.000	0.070	0.007	0.077
Non-SPA colonies	Higher	0.050	1.009	0.122	1.181	0.023	0.309	0.089	0.421
	Lower	0.025	0.605	0.053	0.683	0.012	0.185	0.039	0.236
Regional population	Higher	0.928	5.791	2.253	8.971	0.429	1.773	1.815	4.017
	Lower	0.462	3.473	0.975	4.910	0.214	1.063	0.790	2.067

4.10 PROJECT ALONE POPULATION VIABILITY ANALYSIS

4.10.1 Project Alone Population Viability Analysis Overview

4-84 As the predicted impacts to guillemot, razorbill, herring gull, kittiwake and gannet at relevant SPAs have changed (presented in **Sections 4.9.1** to **4.9.5** above), PVA screening was repeated for these species following the same methods as the EIAR (Volume 3, Technical Appendix 9.4: Ornithological Impact Apportioning, Derivation of Cumulative Impacts and PVA Screening) but using the updated predicted impacts presented above (**Section 4.9 Impact Apportioning**)

4-85 As discussed in the EIAR (Volume 3, Technical Appendix 9.4: Ornithological Impact Apportioning, Derivation of Cumulative Impacts and PVA Screening), project-only PVA is required if the apportioned additional mortality rate increases the baseline mortality of breeding adults by 0.02%. In **Sections 4.10.1.1** to **4.10.1.5**, the increases in baseline mortality have been calculated by dividing the total apportioned impact to breeding adults by the population of breeding adults and multiplying this value by 100. The increase in baseline mortality from the EIAR is presented alongside this updated increase in baseline mortality and any change to the outcome of PVA screening highlighted.

4-86 These results show very little change to the outcome of screening between the EIAR and updated assessment for this AEIR. Some guillemot SPA populations would be screened in based on NatureScot recommended lower displacement mortality value, but for all of these there would be no change in SPAs screened into the assessment based on the higher displacement mortality value (**Table 4-30**). Therefore, there is no difference between the EIAR and AEIR in the SPA screened into assessment where guillemot is a feature. Screening was based only on NatureScot recommended higher displacement mortality to ensure that all relevant SPA features were captured.

4-87 There were two changes to the outcome of the PVA screening of razorbill SPA populations, where the two SPAs that had been screened in for PVAs in the EIAR are now screened out of the assessment based on a reduction in updated baseline mortality (i.e., East Caithness Cliffs SPA and West Westray SPA **Table 4-31**).

4-88 There were no changes in PVA screening for herring gull (**Table 4-32**), kittiwake (**Table 4-33**) or gannet (**Table 4-34**).

4.10.1.1 Guillemot

Table 4-30. Guillemot breeding adult mortality rate increase presented as Percent point change (PPC). PPC values in bold highlight that a PVA is required as the value is 0.02 or greater.

Population name	Breeding adult population	Scenario	Breeding adult total impact	Updated PPC (%)	EIAR PPC (%)	Change in screening outcome
Buchan Ness to Collieston Coast SPA	40,763	Higher	28.667	**0.0703**	**0.0421**	No
		Lower	12.280	**0.0301**	0.0140	Yes
Calf of Eday SPA	7,402	Higher	2.705	**0.0365**	**0.0583**	No
		Lower	1.159	0.0157	**0.0292**	Yes
Copinsay SPA	10,967	Higher	7.990	**0.0729**	**0.0883**	No
		Lower	3.423	**0.0312**	**0.0592**	No
Fair Isle SPA	24,515	Higher	9.922	**0.0405**	**0.0303**	No
		Lower	4.250	0.0173	0.0142	No
Hoy SPA	12,390	Higher	5.151	**0.0416**	**0.0418**	No
		Lower	2.207	0.0178	**0.0253**	Yes
Marwick Head SPA	12,800	Higher	3.352	**0.0262**	**0.0418**	No
		Lower	1.436	0.0112	**0.0209**	Yes
Rousay SPA	7,921	Higher	2.620	**0.0331**	**0.0528**	No
		Lower	1.123	0.0142	**0.0264**	Yes
Sumburgh Head SPA	3,677	Higher	0.910	**0.0248**	**0.0395**	No
		Lower	0.390	0.0106	0.0198	No
Troup, Pennan and Lion's Heads SPA	47,719	Higher	42.374	**0.0888**	**0.0567**	No
		Lower	18.152	**0.0380**	**0.0213**	No
West Westray SPA	40,673	Higher	9.964	**0.0245**	**0.0289**	No
		Lower	4.268	0.0105	0.0192	No
Regional	209,982	Higher	114.486	**0.0545**	**0.0452**	No
		Lower	49.042	**0.0234**	**0.0215**	No

4.10.1.2 Razorbill

Table 4-31. Razorbill breeding adult mortality rate increase presented as Percent point change (PPC). PPC values in bold highlight that a PVA is required as the value is 0.02 or greater.

Population name	Breeding adult population	Scenario	Breeding adult total impact	Updated PPC (%)	EIAR PPC (%)	Change in screening outcome
East Caithness Cliffs SPA	45,194	Higher	2.226	0.0049	**0.0213**	Yes
		Lower	1.296	0.0029	**0.0211**	Yes
Fair Isle SPA	2,888	Higher	0.089	0.0031	0.0107	No
		Lower	0.050	0.0017	0.0105	No
North Caithness Cliffs SPA	14,982	Higher	0.586	0.0039	0.0188	No
		Lower	0.346	0.0023	0.0187	No
Troup, Pennan and Lion's Heads SPA	9,852	Higher	0.629	0.0064	0.0093	No
		Lower	0.372	0.0038	0.0092	No
West Westray SPA	3,198	Higher	0.053	0.0016	**0.0315**	Yes

Population name	Breeding adult population	Scenario	Breeding adult total impact	Updated PPC (%)	EIAR PPC (%)	Change in screening outcome
		Lower	0.030	0.0009	**0.0313**	Yes
Regional	89,448	Higher	4.380	0.0049	0.0173	No
		Lower	2.542	0.0028	0.0168	No

4.10.1.3 Herring Gull

Table 4-32. Herring gull breeding adult mortality rate increase presented as Percent point change (PPC). PPC values in bold highlight that a PVA is required as the value is 0.02 or greater.

Population name	Breeding adult population	Breeding adult total impact	Updated PPC (%)	EIAR PPC (%)	Change in screening outcome
Troup, Pennan and Lion's Heads SPA	1,106	1.003	**0.0907**	**0.0678**	No
Regional	1,176	1.070	**0.0910**	**0.0712**	No

4.10.1.4 Kittiwake

Table 4-33. Kittiwake breeding adult mortality rate increase presented as Percent point change (PPC). PPC values in bold highlight that a PVA is required as the value is 0.02 or greater.

Population name	Breeding adult population	Scenario	Breeding adult total impact	Updated PPC (%)	EIAR PPC (%)	Change in screening outcome
Buchan Ness to Collieston Coast SPA	27,094	Higher	0.790	0.0029	0.0043	No
		Lower	0.605	0.0022	0.0041	No
Calf of Eday SPA	290	Higher	0.015	0.0052	0.0047	No
		Lower	0.011	0.0037	0.0033	No
Cape Wrath SPA	6,520	Higher	0.035	0.0005	0.0005	No
		Lower	0.028	0.0004	0.0004	No
Copinsay SPA	592	Higher	0.024	0.0041	0.0038	No
		Lower	0.018	0.0030	0.0028	No
East Caithness Cliffs SPA	52,702	Higher	1.461	0.0028	0.0036	No
		Lower	1.092	0.0021	0.0033	No
Fair Isle SPA	896	Higher	0.024	0.0026	0.0024	No
		Lower	0.017	0.0020	0.0018	No
Farne Islands SPA	7,166	Higher	0.077	0.0011	0.0010	No
		Lower	0.055	0.0008	0.0007	No
Forth Islands SPA	13,708	Higher	0.111	0.0008	0.0021	No
		Lower	0.083	0.0006	0.0020	No
Foula SPA	850	Higher	0.009	0.0011	0.0010	No
		Lower	0.007	0.0008	0.0007	No
Fowlsheugh SPA	40,156	Higher	0.514	0.0013	0.0054	No

Population name	Breeding adult population	Scenario	Breeding adult total impact	Updated PPC (%)	EIAR PPC (%)	Change in screening outcome
		Lower	0.392	0.0010	0.0053	No
Handa SPA	9,178	Higher	0.035	0.0004	0.0004	No
		Lower	0.028	0.0003	0.0003	No
Hermaness, Saxa Vord and Valla Field SPA	166	Higher	0.006	0.0039	0.0034	No
		Lower	0.005	0.0027	0.0024	No
Hoy SPA	532	Higher	0.013	0.0025	0.0023	No
		Lower	0.010	0.0019	0.0017	No
Marwick Head SPA	2,878	Higher	0.032	0.0011	0.0011	No
		Lower	0.025	0.0009	0.0008	No
North Caithness Cliffs SPA	15,860	Higher	0.370	0.0023	0.0018	No
		Lower	0.277	0.0017	0.0015	No
North Rona and Sula Sgeir SPA	1,424	Higher	0.004	0.0003	0.0003	No
		Lower	0.003	0.0002	0.0002	No
Noss SPA	172	Higher	0.009	0.0051	0.0045	No
		Lower	0.006	0.0036	0.0031	No
Rousay SPA	962	Higher	0.036	0.0038	0.0034	No
		Lower	0.026	0.0027	0.0024	No
St Abb's Head to Fast Castle SPA	11,204	Higher	0.097	0.0009	0.0008	No
		Lower	0.072	0.0006	0.0006	No
Sumburgh Head SPA	636	Higher	0.008	0.0013	0.0012	No
		Lower	0.006	0.0010	0.0009	No
Troup, Pennan and Lion's Heads SPA	27,344	Higher	0.926	0.0034	0.0075	No
		Lower	0.710	0.0026	0.0073	No
West Westray SPA	4,838	Higher	0.223	0.0046	0.0041	No
		Lower	0.157	0.0033	0.0029	No
Regional	255,111	Higher	6.214	0.0024	0.0051	No
		Lower	4.623	0.0018	0.0047	No

4.10.1.5 Gannet

Table 4-34. Gannet breeding adult mortality rate increase presented as Percent point change (PPC). PPC values in bold highlight that a PVA is required as the value is 0.02 or greater.

Population name	Breeding adult population	Scenario	Breeding adult total impact	Updated PPC (%)	EIAR PPC (%)	Change in screening outcome
Fair Isle SPA	9,654	Higher	0.630	0.0065	0.0062	No
		Lower	0.356	0.0037	0.0034	No
Flamborough and Filey Coast SPA	26,784	Higher	0.455	0.0017	0.0015	No
		Lower	0.227	0.0008	0.0007	No
Forth Islands SPA	150,518	Higher	3.639	0.0024	0.0022	No
		Lower	1.950	0.0013	0.0011	No

Population name	Breeding adult population	Scenario	Breeding adult total impact	Updated PPC (%)	EIAR PPC (%)	Change in screening outcome
Hermaness, Saxa Vord and Valla Field SPA	37,478	Higher	1.012	0.0027	0.0024	No
		Lower	0.521	0.0014	0.0012	No
North Rona and Sula Sgeir SPA	18,990	Higher	0.203	0.0011	0.0010	No
		Lower	0.119	0.0006	0.0006	No
Noss SPA	24,670	Higher	0.815	0.0033	0.0031	No
		Lower	0.455	0.0018	0.0017	No
St Kilda SPA	120,580	Higher	0.644	0.0005	0.0005	No
		Lower	0.366	0.0003	0.0003	No
Sule Skerry and Sule Stack SPA	18,130	Higher	0.391	0.0022	0.0021	No
		Lower	0.233	0.0013	0.0012	No
Regional	433,394	Higher	8.971	0.0021	0.0019	No
		Lower	4.910	0.0011	0.0010	No

4.10.2 Population Viability Analysis Results

4-89 Following the PVA screening detailed above, all the species specific populations which had a predicted increase in baseline mortality of 0.02% or more, as indicated by a **bold** value in the "Updated PPC (%)" column of **Table 4-30 -Table 4-34**, had PVA undertaken. This meant PVAs were run for all guillemot and herring gull SPA populations. These PVAs were undertaken as described in the EIAR (Volume 3, Technical Appendix 9.5: Ornithology Population Viability Analysis Report) but using the updated apportioned impacts presented above in **Section 4.9** and with guillemot impacts to productivity rate set to 0, to provide a precautionary assessment. Where impacts to productivity rates were not 0 in the EIAR, this impact was predicted from SeabORD displacement modelling and as such is removed/set to 0 in this AEIR. For both guillemot and herring gull, simulated population sizes and counterfactual population sizes for these updated project-only PVAs after 25, 35, 50, and 60 years of operation are presented in **Table 4-35** to **Table 4-38**, as are growth rates and counterfactual growth rates for the same years.

4-90 The results presented here are during operation-only as no additional environmental information was requested for the construction phase assessment. In the EIAR (Volume 3, Technical Appendix 9.5: Ornithology Population Viability Analysis Report) an additional scenario was run where impact years included 2030 – 2094 to present precautionary insight as distributional effects may occur during construction. PVAs including this construction period were also run using the updated impacts presented above for guillemot only. These were run as described in the EIAR (Volume 3, Technical Appendix 9.5: Ornithology Population Viability Analysis Report) and the results are presented in **Appendix 4.3** – Project only guillemot PVA results including construction period. PVAs for herring gull which included a construction period were not undertaken as herring gull only have collision impacts predicted. A visual

representation of the population projections from the PVA modelling are provided in **Appendix 4.4** – Project only population trajectories predicted from PVA modelling**.**

4.10.2.1 Guillemot

Table 4-35. Median simulated population sizes (number of breeding adults) and counterfactual population sizes for guillemot Proposed Offshore Development only impacts. Values are median values with 95% confidence intervals in brackets. Years represent: reference year, 25 years of operation, 35 years (the intended lease period), 50 years, and 60 years of operation.

Population	Year	Baseline	Higher Scenario		Lower Scenario	
		Unimpacted population size	Impacted population size	Counterfactual population size	Impacted population size	Counterfactual population size
Buchan Ness to Collieston Coast SPA	2035 (reference)	57,497 (49,911 - 66,017)	57,484 (49,805 - 65,834)	0.999 (0.989 - 1.010)	57,495 (49,809 - 65,952)	1.000 (0.989 - 1.010)
	2060 (25 years)	121,051 (95,549 - 151,884)	118,516 (93,648 - 148,682)	0.980 (0.965 - 0.995)	120,047 (94,805 - 150,321)	0.991 (0.976 - 1.010)
	2070 (35 years)	162,040 (124,412 - 209,742)	157,382 (120,807 - 204,103)	0.972 (0.956 - 0.988)	160,036 (122,667 - 207,500)	0.988 (0.972 - 1.000)
	2085 (50 years)	253,320 (185,992 - 339,980)	243,229 (178,339 - 326,869)	0.960 (0.943 - 0.977)	249,119 (182,698 - 334,586)	0.983 (0.966 - 1.000)
	2095 (60 years)	340,292 (243,520 - 471,827)	324,728 (232,239 - 449,451)	0.953 (0.936 - 0.971)	333,715 (238,660 - 462,477)	0.980 (0.963 - 0.997)
Calf of Eday SPA	2035 (reference)	12,136 (10,418 - 13,948)	12,135 (10,424 - 13,930)	1.000 (0.972 - 1.030)	12,137 (10,428 - 13,957)	1.000 (0.972 - 1.030)
	2060 (25 years)	25,414 (19,662 - 32,340)	25,144 (19,430 - 32,055)	0.990 (0.952 - 1.030)	25,269 (19,562 - 32,118)	0.995 (0.958 - 1.030)
	2070 (35 years)	34,109 (25,697 - 44,743)	33,573 (25,226 - 44,094)	0.985 (0.947 - 1.020)	33,880 (25,417 - 44,450)	0.993 (0.955 - 1.030)
	2085 (50 years)	53,290 (38,732 - 72,455)	52,210 (37,846 - 70,666)	0.979 (0.939 - 1.020)	52,844 (38,273 - 71,861)	0.990 (0.951 - 1.030)
	2095 (60 years)	71,649 (50,758 - 99,249)	70,040 (49,467 - 96,549)	0.975 (0.935 - 1.020)	70,913 (49,949 - 98,494)	0.989 (0.948 - 1.030)
Copinsay SPA	2035 (reference)	15,481 (13,394 - 17,752)	15,472 (13,381 - 17,761)	0.999 (0.980 - 1.020)	15,468 (13,373 - 17,717)	0.999 (0.979 - 1.020)
	2060 (25 years)	32,577 (25,687 - 40,801)	31,896 (25,101 - 40,004)	0.979 (0.951 - 1.010)	32,252 (25,434 - 40,545)	0.991 (0.963 - 1.020)
	2070 (35 years)	43,583 (33,423 - 56,443)	42,401 (32,526 - 54,982)	0.971 (0.940 - 1.000)	43,017 (32,943 - 55,780)	0.987 (0.957 - 1.020)

Population	Year	Baseline	Higher Scenario		Lower Scenario	
		Unimpacted population size	Impacted population size	Counterfactual population size	Impacted population size	Counterfactual population size
	2085 (50 years)	68,226 (49,987 - 91,611)	65,346 (47,916 - 88,080)	0.959 (0.928 - 0.992)	66,960 (48,873 - 90,158)	0.982 (0.950 - 1.020)
	2095 (60 years)	91,443 (65,431 - 127,277)	87,142 (62,377 - 120,875)	0.951 (0.920 - 0.985)	89,512 (64,089 - 124,290)	0.979 (0.945 - 1.010)
Fair Isle SPA	2035 (reference)	36,740 (31,498 - 42,385)	36,706 (31,501 - 42,334)	1.000 (0.985 - 1.010)	36,736 (31,508 - 42,346)	0.999 (0.986 - 1.010)
	2060 (25 years)	77,146 (60,462 - 97,961)	76,321 (59,439 - 96,606)	0.988 (0.969 - 1.010)	76,677 (59,935 - 97,322)	0.995 (0.975 - 1.010)
	2070 (35 years)	103,941 (79,165 - 134,961)	102,194 (78,164 - 132,292)	0.984 (0.962 - 1.000)	103,153 (78,743 - 133,670)	0.993 (0.972 - 1.010)
	2085 (50 years)	162,157 (118,138 - 217,121)	158,228 (115,562 - 212,149)	0.977 (0.954 - 0.999)	160,418 (117,037 - 214,629)	0.990 (0.968 - 1.010)
	2095 (60 years)	217,776 (155,128 - 298,284)	211,583 (150,967 - 290,306)	0.973 (0.951 - 0.995)	214,784 (153,136 - 295,041)	0.988 (0.965 - 1.010)
Hoy SPA	2035 (reference)	20,883 (17,927 - 24,133)	20,880 (17,919 - 24,105)	1.000 (0.978 - 1.020)	20,891 (17,930 - 24,079)	1.000 (0.978 - 1.020)
	2060 (25 years)	43,871 (33,700 - 56,013)	43,342 (33,172 - 55,314)	0.988 (0.960 - 1.020)	43,666 (33,508 - 55,763)	0.995 (0.966 - 1.020)
	2070 (35 years)	58,817 (43,849 - 77,156)	57,786 (43,113 - 75,952)	0.984 (0.953 - 1.010)	58,370 (43,371 - 76,501)	0.993 (0.963 - 1.020)
	2085 (50 years)	91,916 (65,634 - 125,735)	89,569 (64,052 - 122,719)	0.977 (0.946 - 1.010)	90,780 (64,920 - 124,074)	0.989 (0.958 - 1.020)
	2095 (60 years)	123,512 (86,753 - 171,906)	120,113 (84,254 - 167,897)	0.973 (0.941 - 1.010)	122,138 (85,608 - 170,147)	0.988 (0.956 - 1.020)
Marwick Head SPA	2035 (reference)	18,064 (15,623 - 20,678)	18,046 (15,612 - 20,733)	0.999 (0.981 - 1.020)	18,051 (15,634 - 20,739)	1.000 (0.981 - 1.020)
	2060 (25 years)	37,991 (30,007 - 47,678)	37,737 (29,698 - 47,342)	0.992 (0.965 - 1.020)	37,875 (29,969 - 47,649)	0.997 (0.969 - 1.020)
	2070 (35 years)	50,890 (39,052 - 65,945)	50,334 (38,580 - 65,312)	0.989 (0.961 - 1.020)	50,703 (38,721 - 65,731)	0.995 (0.966 - 1.020)

Population	Year	Baseline	Higher Scenario		Lower Scenario	
		Unimpacted population size	Impacted population size	Counterfactual population size	Impacted population size	Counterfactual population size
	2085 (50 years)	79,476 (58,195 - 107,100)	78,324 (57,263 - 105,637)	0.985 (0.955 - 1.020)	79,089 (58,005 - 106,511)	0.993 (0.962 - 1.020)
	2095 (60 years)	106,827 (76,572 - 147,918)	105,020 (75,163 - 145,731)	0.982 (0.951 - 1.010)	106,051 (76,071 - 146,692)	0.992 (0.960 - 1.020)
Rousay SPA	2035 (reference)	13,004 (11,173 - 14,955)	12,990 (11,156 - 14,899)	1.000 (0.974 - 1.030)	12,984 (11,170 - 14,940)	1.000 (0.973 - 1.030)
	2060 (25 years)	27,181 (21,039 - 34,614)	26,915 (20,925 - 34,284)	0.991 (0.955 - 1.030)	27,067 (20,992 - 34,481)	0.996 (0.961 - 1.030)
	2070 (35 years)	36,454 (27,405 - 47,921)	36,031 (26,991 - 47,200)	0.987 (0.950 - 1.030)	36,296 (27,167 - 47,523)	0.995 (0.958 - 1.030)
	2085 (50 years)	56,990 (41,251 - 77,420)	56,019 (40,503 - 75,899)	0.982 (0.941 - 1.020)	56,579 (40,815 - 77,097)	0.992 (0.954 - 1.030)
	2095 (60 years)	76,665 (54,437 - 106,220)	75,099 (52,905 - 103,860)	0.978 (0.938 - 1.020)	75,907 (53,625 - 105,552)	0.991 (0.952 - 1.030)
Sumburgh Head SPA	2035 (reference)	5,511 (4,704 - 6,375)	5,510 (4,715 - 6,372)	1.000 (0.963 - 1.040)	5,504 (4,721 - 6,373)	1.000 (0.963 - 1.040)
	2060 (25 years)	11,576 (8,993 - 14,684)	11,499 (8,952 - 14,649)	0.992 (0.942 - 1.050)	11,524 (8,994 - 14,631)	0.997 (0.947 - 1.050)
	2070 (35 years)	15,558 (11,803 - 20,174)	15,384 (11,740 - 19,994)	0.989 (0.936 - 1.050)	15,500 (11,830 - 20,157)	0.995 (0.942 - 1.050)
	2085 (50 years)	24,240 (17,617 - 32,825)	23,920 (17,380 - 32,239)	0.985 (0.931 - 1.050)	24,155 (17,447 - 32,461)	0.994 (0.938 - 1.050)
	2095 (60 years)	32,703 (23,210 - 45,064)	32,056 (22,807 - 44,157)	0.983 (0.927 - 1.050)	32,382 (22,982 - 44,453)	0.993 (0.935 - 1.050)
Troup, Pennan and Lion's Heads SPA	2035 (reference)	67,310 (58,314 - 77,215)	67,219 (58,203 - 77,157)	0.999 (0.990 - 1.010)	67,275 (58,313 - 77,182)	1.000 (0.990 - 1.010)
	2060 (25 years)	141,784 (111,967 - 177,730)	138,091 (108,896 - 172,937)	0.974 (0.960 - 0.988)	140,103 (110,691 - 175,509)	0.989 (0.975 - 1.000)

Population	Year	Baseline	Higher Scenario		Lower Scenario	
		Unimpacted population size	Impacted population size	Counterfactual population size	Impacted population size	Counterfactual population size
	2070 (35 years)	189,752 (145,544 - 245,642)	182,950 (140,309 - 237,124)	0.965 (0.950 - 0.979)	186,757 (143,468 - 242,533)	0.984 (0.970 - 0.999)
	2085 (50 years)	296,776 (217,606 - 398,435)	281,719 (206,441 - 379,353)	0.950 (0.935 - 0.965)	290,072 (212,652 - 389,589)	0.978 (0.963 - 0.994)
	2095 (60 years)	398,607 (285,401 - 553,260)	375,053 (268,412 - 519,567)	0.941 (0.926 - 0.957)	387,876 (277,335 - 536,075)	0.974 (0.959 - 0.990)
West Westray SPA	2035 (reference)	57,385 (49,729 - 65,932)	57,371 (49,683 - 65,787)	1.000 (0.989 - 1.010)	57,370 (49,709 - 65,753)	1.000 (0.989 - 1.010)
	2060 (25 years)	120,719 (95,417 - 151,500)	119,811 (94,619 - 150,203)	0.993 (0.978 - 1.010)	120,441 (95,117 - 150,685)	0.997 (0.982 - 1.010)
	2070 (35 years)	161,694 (124,183 - 209,064)	160,044 (122,762 - 207,137)	0.990 (0.974 - 1.010)	160,949 (123,544 - 208,416)	0.996 (0.980 - 1.010)
	2085 (50 years)	252,795 (185,656 - 340,508)	249,280 (182,820 - 334,849)	0.986 (0.969 - 1.000)	251,454 (183,852 - 338,568)	0.994 (0.977 - 1.010)
	2095 (60 years)	339,599 (242,875 - 471,216)	333,864 (239,494 - 463,424)	0.983 (0.966 - 1.000)	337,187 (241,094 - 467,536)	0.993 (0.975 - 1.010)
Regional	2035 (reference)	296,139 (256,582 - 339,789)	295,799 (256,431 - 339,398)	0.999 (0.995 - 1.000)	296,180 (256,696 - 339,941)	1.000 (0.995 - 1.000)
	2060 (25 years)	623,627 (492,894 - 782,223)	601,380 (475,156 - 753,226)	0.965 (0.958 - 0.972)	612,100 (482,901 - 766,686)	0.982 (0.975 - 0.988)
	2070 (35 years)	835,374 (641,546 - 1,080,516)	793,359 (610,634 - 1,027,376)	0.951 (0.944 - 0.958)	813,158 (624,027 - 1,053,191)	0.974 (0.967 - 0.981)
	2085 (50 years)	1,306,183 (958,520 - 1,750,375)	1,214,274 (890,733 - 1,629,541)	0.931 (0.924 - 0.938)	1,257,342 (921,128 - 1,686,811)	0.963 (0.956 - 0.970)
	2095 (60 years)	1,753,964 (1,258,498 - 2,427,477)	1,610,211 (1,154,365 - 2,233,694)	0.918 (0.911 - 0.926)	1,676,637 (1,200,997 - 2,314,470)	0.956 (0.948 - 0.964)

Table 4-36. Simulated growth rates and counterfactual growth rates for guillemot Proposed Offshore Development only impacts. Values are median values with 95% confidence intervals in brackets.

Population	Year	Baseline	Higher Scenario		Lower Scenario	
		Unimpacted population growth rate	Impacted population growth rate	Counterfactual population growth rate	Impacted population growth rate	Counterfactual population growth rate
Buchan Ness to Collieston Coast SPA	2060 (25 years)	1.030 (1.022 - 1.038)	1.029 (1.021 - 1.037)	0.999 (0.999 - 1.000)	1.030 (1.021 - 1.038)	1.000 (0.999 - 1.000)
	2070 (35 years)	1.030 (1.023 - 1.037)	1.029 (1.022 - 1.036)	0.999 (0.999 - 1.000)	1.030 (1.023 - 1.037)	1.000 (0.999 - 1.000)
	2085 (50 years)	1.030 (1.024 - 1.036)	1.029 (1.023 - 1.035)	0.999 (0.999 - 1.000)	1.030 (1.024 - 1.035)	1.000 (0.999 - 1.000)
	2095 (60 years)	1.030 (1.025 - 1.035)	1.029 (1.024 - 1.035)	0.999 (0.999 - 0.999)	1.030 (1.024 - 1.035)	1.000 (0.999 - 1.000)
Calf of Eday SPA	2060 (25 years)	1.030 (1.021 - 1.038)	1.030 (1.021 - 1.038)	1.000 (0.999 - 1.000)	1.030 (1.021 - 1.038)	1.000 (0.999 - 1.000)
	2070 (35 years)	1.030 (1.023 - 1.037)	1.030 (1.022 - 1.036)	1.000 (0.999 - 1.000)	1.030 (1.023 - 1.037)	1.000 (0.999 - 1.000)
	2085 (50 years)	1.030 (1.024 - 1.036)	1.030 (1.024 - 1.035)	1.000 (0.999 - 1.000)	1.030 (1.024 - 1.035)	1.000 (0.999 - 1.000)
	2095 (60 years)	1.030 (1.025 - 1.035)	1.030 (1.024 - 1.035)	1.000 (0.999 - 1.000)	1.030 (1.024 - 1.035)	1.000 (0.999 - 1.000)
Copinsay SPA	2060 (25 years)	1.030 (1.022 - 1.038)	1.029 (1.021 - 1.038)	0.999 (0.998 - 1.000)	1.030 (1.021 - 1.038)	1.000 (0.999 - 1.000)
	2070 (35 years)	1.030 (1.023 - 1.037)	1.029 (1.022 - 1.036)	0.999 (0.998 - 1.000)	1.030 (1.023 - 1.037)	1.000 (0.999 - 1.000)
	2085 (50 years)	1.030 (1.024 - 1.036)	1.029 (1.023 - 1.035)	0.999 (0.999 - 1.000)	1.030 (1.024 - 1.035)	1.000 (0.999 - 1.000)
	2095 (60 years)	1.030 (1.025 - 1.035)	1.029 (1.024 - 1.035)	0.999 (0.999 - 1.000)	1.030 (1.024 - 1.035)	1.000 (0.999 - 1.000)
Fair Isle SPA	2060 (25 years)	1.030 (1.021 - 1.038)	1.030 (1.021 - 1.038)	1.000 (0.999 - 1.000)	1.030 (1.021 - 1.038)	1.000 (0.999 - 1.000)
	2070 (35 years)	1.030 (1.023 - 1.037)	1.030 (1.023 - 1.037)	1.000 (0.999 - 1.000)	1.030 (1.023 - 1.037)	1.000 (0.999 - 1.000)

Population	Year	Baseline	Higher Scenario		Lower Scenario	
		Unimpacted population growth rate	Impacted population growth rate	Counterfactual population growth rate	Impacted population growth rate	Counterfactual population growth rate
	2085 (50 years)	1.030 (1.024 - 1.036)	1.030 (1.024 - 1.035)	1.000 (0.999 - 1.000)	1.030 (1.024 - 1.036)	1.000 (0.999 - 1.000)
	2095 (60 years)	1.030 (1.025 - 1.035)	1.030 (1.024 - 1.035)	1.000 (0.999 - 1.000)	1.030 (1.024 - 1.035)	1.000 (0.999 - 1.000)
Hoy SPA	2060 (25 years)	1.030 (1.021 - 1.038)	1.030 (1.021 - 1.038)	1.000 (0.999 - 1.000)	1.030 (1.021 - 1.038)	1.000 (0.999 - 1.000)
	2070 (35 years)	1.030 (1.023 - 1.037)	1.030 (1.022 - 1.037)	1.000 (0.999 - 1.000)	1.030 (1.022 - 1.037)	1.000 (0.999 - 1.000)
	2085 (50 years)	1.030 (1.024 - 1.036)	1.030 (1.023 - 1.035)	1.000 (0.999 - 1.000)	1.030 (1.024 - 1.036)	1.000 (0.999 - 1.000)
	2095 (60 years)	1.030 (1.025 - 1.035)	1.030 (1.024 - 1.035)	1.000 (0.999 - 1.000)	1.030 (1.024 - 1.035)	1.000 (0.999 - 1.000)
Marwick Head SPA	2060 (25 years)	1.030 (1.022 - 1.038)	1.030 (1.021 - 1.038)	1.000 (0.999 - 1.000)	1.030 (1.022 - 1.038)	1.000 (0.999 - 1.000)
	2070 (35 years)	1.030 (1.023 - 1.037)	1.030 (1.023 - 1.037)	1.000 (0.999 - 1.000)	1.030 (1.023 - 1.037)	1.000 (0.999 - 1.000)
	2085 (50 years)	1.030 (1.024 - 1.036)	1.030 (1.024 - 1.035)	1.000 (0.999 - 1.000)	1.030 (1.024 - 1.036)	1.000 (0.999 - 1.000)
	2095 (60 years)	1.030 (1.025 - 1.035)	1.030 (1.024 - 1.035)	1.000 (0.999 - 1.000)	1.030 (1.025 - 1.035)	1.000 (0.999 - 1.000)
Rousay SPA	2060 (25 years)	1.030 (1.021 - 1.038)	1.030 (1.021 - 1.038)	1.000 (0.999 - 1.000)	1.030 (1.021 - 1.038)	1.000 (0.999 - 1.000)
	2070 (35 years)	1.030 (1.023 - 1.037)	1.030 (1.022 - 1.036)	1.000 (0.999 - 1.000)	1.030 (1.022 - 1.037)	1.000 (0.999 - 1.000)
	2085 (50 years)	1.030 (1.024 - 1.036)	1.030 (1.024 - 1.035)	1.000 (0.999 - 1.000)	1.030 (1.024 - 1.036)	1.000 (0.999 - 1.000)
	2095 (60 years)	1.030 (1.025 - 1.035)	1.030 (1.024 - 1.035)	1.000 (0.999 - 1.000)	1.030 (1.024 - 1.035)	1.000 (0.999 - 1.000)
Sumburgh Head SPA	2060 (25 years)	1.030 (1.021 - 1.038)	1.030 (1.021 - 1.038)	1.000 (0.998 - 1.000)	1.030 (1.021 - 1.038)	1.000 (0.998 - 1.000)

Population	Year	Baseline	Higher Scenario		Lower Scenario	
		Unimpacted population growth rate	Impacted population growth rate	Counterfactual population growth rate	Impacted population growth rate	Counterfactual population growth rate
	2070 (35 years)	1.030 (1.023 - 1.037)	1.030 (1.023 - 1.037)	1.000 (0.998 - 1.000)	1.030 (1.023 - 1.037)	1.000 (0.999 - 1.000)
	2085 (50 years)	1.030 (1.024 - 1.036)	1.030 (1.024 - 1.035)	1.000 (0.999 - 1.000)	1.030 (1.024 - 1.036)	1.000 (0.999 - 1.000)
	2095 (60 years)	1.030 (1.025 - 1.035)	1.030 (1.024 - 1.035)	1.000 (0.999 - 1.000)	1.030 (1.024 - 1.035)	1.000 (0.999 - 1.000)
Troup, Pennan and Lion's Heads SPA	2060 (25 years)	1.030 (1.022 - 1.038)	1.029 (1.021 - 1.037)	0.999 (0.999 - 0.999)	1.030 (1.021 - 1.038)	1.000 (0.999 - 1.000)
	2070 (35 years)	1.030 (1.023 - 1.037)	1.029 (1.022 - 1.036)	0.999 (0.999 - 0.999)	1.030 (1.023 - 1.037)	1.000 (0.999 - 1.000)
	2085 (50 years)	1.030 (1.024 - 1.036)	1.029 (1.023 - 1.035)	0.999 (0.999 - 0.999)	1.030 (1.024 - 1.035)	1.000 (0.999 - 1.000)
	2095 (60 years)	1.030 (1.025 - 1.035)	1.029 (1.024 - 1.034)	0.999 (0.999 - 0.999)	1.030 (1.024 - 1.035)	1.000 (0.999 - 1.000)
West Westray SPA	2060 (25 years)	1.030 (1.022 - 1.038)	1.030 (1.022 - 1.038)	1.000 (0.999 - 1.000)	1.030 (1.022 - 1.038)	1.000 (0.999 - 1.000)
	2070 (35 years)	1.030 (1.023 - 1.037)	1.030 (1.023 - 1.037)	1.000 (0.999 - 1.000)	1.030 (1.023 - 1.037)	1.000 (1.000 - 1.000)
	2085 (50 years)	1.030 (1.024 - 1.036)	1.030 (1.024 - 1.036)	1.000 (0.999 - 1.000)	1.030 (1.024 - 1.036)	1.000 (1.000 - 1.000)
	2095 (60 years)	1.030 (1.025 - 1.035)	1.030 (1.024 - 1.035)	1.000 (0.999 - 1.000)	1.030 (1.025 - 1.035)	1.000 (1.000 - 1.000)
Regional	2060 (25 years)	1.030 (1.022 - 1.038)	1.029 (1.020 - 1.037)	0.999 (0.998 - 0.999)	1.029 (1.021 - 1.037)	0.999 (0.999 - 0.999)
	2070 (35 years)	1.030 (1.023 - 1.037)	1.029 (1.022 - 1.035)	0.999 (0.998 - 0.999)	1.029 (1.022 - 1.036)	0.999 (0.999 - 0.999)
	2085 (50 years)	1.030 (1.024 - 1.036)	1.029 (1.023 - 1.034)	0.999 (0.998 - 0.999)	1.029 (1.023 - 1.035)	0.999 (0.999 - 0.999)
	2095 (60 years)	1.030 (1.025 - 1.035)	1.029 (1.023 - 1.034)	0.999 (0.998 - 0.999)	1.029 (1.024 - 1.035)	0.999 (0.999 - 0.999)

4.10.2.2 Herring Gull

Table 4-37. Median simulated population sizes (breeding adults) and counterfactual population sizes for herring gull Proposed Offshore Development only impacts. Values are median values with 95% confidence intervals in brackets. Years represent: reference year, 25 years of operation, 35 years (the intended lease period), 50 years, and 60 years of operation.

Population	Year	Baseline	Collision	
		Population size	Population size	Counterfactual population size
Troup, Pennan and Lion's Head SPA	2035 (reference)	1,184 (792 - 1,719)	1,181 (785 - 1,728)	0.999 (0.910 - 1.100)
	2060 (25 years)	1,331 (671 - 2,573)	1,292 (646 - 2,526)	0.970 (0.826 - 1.140)
	2070 (35 years)	1,399 (639 - 2,975)	1,346 (608 - 2,848)	0.959 (0.805 - 1.150)
	2085 (50 years)	1,519 (614 - 3,642)	1,427 (567 - 3,439)	0.942 (0.766 - 1.150)
	2095 (60 years)	1,603 (596 - 4,230)	1,497 (551 - 3,894)	0.933 (0.749 - 1.160)
Regional	2035 (reference)	1,259 (845 - 1,834)	1,259 (840 - 1,831)	0.998 (0.910 - 1.090)
	2060 (25 years)	1,421 (712 - 2,747)	1,383 (696 - 2,648)	0.971 (0.832 - 1.140)
	2070 (35 years)	1,490 (681 - 3,155)	1,433 (657 - 3,018)	0.960 (0.809 - 1.140)
	2085 (50 years)	1,609 (644 - 3,902)	1,530 (618 - 3,703)	0.946 (0.777 - 1.140)
	2095 (60 years)	1,696 (628 - 4,425)	1,593 (595 - 4,176)	0.935 (0.757 - 1.150)

Table 4-38. Simulated growth rates and counterfactual growth rates for herring gull Proposed Offshore Development only impacts. Values are median values with 95% confidence intervals in brackets.

Population	Year	Baseline	Collision	
		Unimpacted population growth rate	Impacted population growth rate	Counterfactual population growth rate
Troup, Pennan and Lion's Head SPA	2060 (25 years)	1.005 (0.980 - 1.029)	1.004 (0.979 - 1.028)	0.999 (0.994 - 1.000)
	2070 (35 years)	1.005 (0.984 - 1.024)	1.004 (0.983 - 1.023)	0.999 (0.994 - 1.000)
	2085 (50 years)	1.005 (0.988 - 1.021)	1.004 (0.987 - 1.020)	0.999 (0.995 - 1.000)
	2095 (60 years)	1.005 (0.990 - 1.020)	1.004 (0.989 - 1.019)	0.999 (0.996 - 1.000)
Regional	2060 (25 years)	1.005 (0.980 - 1.028)	1.004 (0.980 - 1.027)	0.999 (0.994 - 1.000)
	2070 (35 years)	1.005 (0.984 - 1.024)	1.004 (0.983 - 1.024)	0.999 (0.995 - 1.000)
	2085 (50 years)	1.005 (0.988 - 1.021)	1.004 (0.987 - 1.020)	0.999 (0.995 - 1.000)
	2095 (60 years)	1.005 (0.990 - 1.020)	1.004 (0.989 - 1.019)	0.999 (0.996 - 1.000)

4.10.3 Comparison between EIAR and AEIR PVA results

4-91 The key outputs from the PVAs were compared with the outputs from the PVAs presented in the EIAR Appendix 9.5 Ornithology Population Viability Analysis Report. These differences show there was very little change due to the updated impact assessment for the Project alone. Note that differences in growth rates and counterfactual of population growth rates cannot be shown for the reference year (2035) as growth rates require two different years to be calculated.

4-92 For guillemot, changes in the impact assessment for the AEIR resulted in smaller projected population sizes for the Buchan Ness to Collieston Coast SPA, Troup, Pennan and Lion's Heads SPA and the regional population (**Table 4-39**). The difference in the counterfactual of population sizes was small for these populations and the other populations that were modelled. There was no difference in the projected population growth rates between the EIAR and RIAA and only very small differences in the counterfactual of populations growth rates.

4-93 For herring gull changes in the impact assessment for the AEIR resulted in only very slightly smaller projected populations sizes for the Troup, Pennan and Lion's Heads SPA and the regional population (**Table 4-40**). This was reflected in the very small change in the counterfactual of population size for both populations modelled. There was no difference in the projected population growth rates between the EIAR and RIAA and only very small differences in the counterfactual of populations growth rates.

4-94 The changes requested to the impact assessment did not result in sufficient differences between the EIAR or RIAA and AEIR to result in a change to the conclusions of the EIAR or RIAA.

Table 4-39 The difference in PVA outputs between the EIAR and AEIR for guillemot. Positive impacted population size values show a larger predicted population size and negative impacted population size values show a smaller predicted populations size. Positive counterfactual values show higher values in the EIAR, negative values show a higher value in the AEIR. Shaded cells show where no comparison is possible for growth rate (see text).

Population	Year	Impacted population size	Counterfactual population size	Unimpacted population growth rate	Impacted population growth rate	Counterfactual population growth rate
Buchan Ness to Collieston Coast SPA	2035 (reference)	1	-0.001			
	2060 (25 years)	-1,028	-0.007	0	-0.001	-0.001
	2070 (35 years)	-1,750	-0.011	0	-0.001	-0.001
	2085 (50 years)	-3,909	-0.015	0	-0.001	-0.001
	2095 (60 years)	-5,678	-0.018	0	-0.001	-0.001
Calf of Eday SPA	2035 (reference)	3	0			
	2060 (25 years)	148	0.007	0	0.001	0.001
	2070 (35 years)	291	0.009	0	0.001	0.001
	2085 (50 years)	698	0.013	0	0.001	0.001
	2095 (60 years)	1,064	0.015	0	0.001	0.001
Copinsay SPA	2035 (reference)	6	0			
	2060 (25 years)	136	0.005	0	0	0
	2070 (35 years)	319	0.007	0	0	0
	2085 (50 years)	688	0.01	0	0	0
	2095 (60 years)	1,043	0.01	0	0	0
Fair Isle SPA	2035 (reference)	0	0			
	2060 (25 years)	-237	-0.003	0	0	0
	2070 (35 years)	-417	-0.003	0	0	0
	2085 (50 years)	-895	-0.005	0	0	0
	2095 (60 years)	-1,582	-0.006	0	0	0
Hoy SPA	2035 (reference)	-4	0			
	2060 (25 years)	34	0	0	0	0.001
	2070 (35 years)	-18	0.001	0	0	0.001
	2085 (50 years)	183	0.002	0	0	0.001

Population	Year	Impacted population size	Counterfactual population size	Unimpacted population growth rate	Impacted population growth rate	Counterfactual population growth rate
	2095 (60 years)	185	0.003	0	0	0
Marwick Head SPA	2035 (reference)	-4	0			
	2060 (25 years)	145	0.005	0	0	0
	2070 (35 years)	317	0.007	0	0	0
	2085 (50 years)	802	0.009	0	0	0
	2095 (60 years)	1,228	0.01	0	0	0
Rousay SPA	2035 (reference)	2	0.001			
	2060 (25 years)	125	0.006	0	0.001	0.001
	2070 (35 years)	333	0.008	0	0.001	0.001
	2085 (50 years)	633	0.012	0	0.001	0.001
	2095 (60 years)	1,094	0.013	0	0.001	0.001
Sumburgh Head SPA	2035 (reference)	2	0.001			
	2060 (25 years)	62	0.004	0	0	0
	2070 (35 years)	80	0.006	0	0	0
	2085 (50 years)	240	0.009	0	0	0
	2095 (60 years)	330	0.011	0	0	0
Troup, Pennan and Lion's Heads SPA	2035 (reference)	-15	0			
	2060 (25 years)	-1,305	-0.009	0	-0.001	0
	2070 (35 years)	-2,496	-0.012	0	-0.001	0
	2085 (50 years)	-5,233	-0.018	0	0	0
	2095 (60 years)	-7,858	-0.021	0	0	0
West Westray SPA	2035 (reference)	18	0			
	2060 (25 years)	55	0.002	0	0	0
	2070 (35 years)	312	0.002	0	0	0
	2085 (50 years)	540	0.003	0	0	0
	2095 (60 years)	1,299	0.003	0	0	0
Regional	2035 (reference)	-39	0			
	2060 (25 years)	-736	0	0	0	0

Population	Year	Impacted population size	Counterfactual population size	Unimpacted population growth rate	Impacted population growth rate	Counterfactual population growth rate
	2070 (35 years)	-701	-0.001	0	0	0
	2085 (50 years)	-1,795	-0.001	0	0	0
	2095 (60 years)	-1,242	-0.001	0	0	0

Table 4-40 The difference in PVA outputs between the EIAR and AEIR for herring gull. Positive impacted population size values show a larger predicted population size and negative impacted population size values show a smaller predicted populations size. Positive counterfactual values show higher values in the EIAR, negative values show a higher value in the AEIR. Shaded cells show where no comparison is possible for growth rate (see text).

Population	Year	Baseline population size	Counterfactual population size	Impacted population growth rate	Counterfactual population growth rate
Troup, Pennan and Lion's Head SPA	2035 (reference)	-1	0		
	2060 (25 years)	-2	-0.004	0	0
	2070 (35 years)	-2	-0.004	0	0
	2085 (50 years)	-15	-0.005	0	0
	2095 (60 years)	-9	-0.007	0	0
Regional	2035 (reference)	0	0		
	2060 (25 years)	-2	-0.004	0	0
	2070 (35 years)	-6	-0.005	0	0
	2085 (50 years)	-6	-0.005	0	0
	2095 (60 years)	-5	-0.007	0	0

4.11 SUMMARY OF CONCLUSIONS

4-95 This AEIR has provided targeted additional information relating to offshore ornithology, specifically: collision risk modelling, distributional responses, sabbatical birds, cumulative effects on great black-backed gulls, compensated impacts and the interim CEF outputs. The information presented confirms the robustness of the assessment undertaken within the EIAR and RIAA and supports the conclusions previously reported.

4-96 On distributional responses, the Applicant presented discussion on the use of SeabORD and matrix displacement approaches. the Applicant remains of the opinion that the best available scientific information in the field on the displacement effects to guillemot in the breeding season from the Proposed Offshore Development are to be obtained from the results from the SeabORD model. Notwithstanding this, the effects of displacement to guillemot, razorbill and kittiwake calculated using the matrix displacement approach and the NatureScot apportioning methods. The results show that predicted impacts using the matrix only approach were lower than or comparable to those using a combination of SeabORD in the breeding season and the matrix approach in other seasons.

4-97 On in-combination assessment, the Applicant presented an updated version of the in-combination assessment with the approach and PVA used by MMOC projects applied to kittiwake, herring gull, guillemot, razorbill, puffin and gannet. Results have been presented to allow MD-LOT to reach conclusions in their Appropriate Assessment.

4-98 On cumulative effects assessment, great black-backed gull was assessed. The updated assessment of impacts to the great black-backed gull regional non-breeding population suggests that, while the predicted impacts from the Project alone remain Not-Significant, the updated cumulative assessment is likely to be Significant leading to a requirement for mitigation.

4-99 The Applicant confirms that the duplication of “gannet” was a typographical error in the EIAR and correct text has now been presented.

4-100 On collision risk modelling, discussion is presented on the use of the macro-avoidance rate presented in NatureScot guidance. Additional information is also presented on the mean collision risk modelling outputs and the conclusions of non-significance presented within the EIAR remain and the Applicant maintains that the assessment methodology utilised is appropriate and robust. It remains concluded that the impact of collision from the Proposed Offshore Development to the relevant species is Not Significant in EIAR terms.

4-101 Apportioning of impacts was completed for guillemot, razorbill, herring gull, kittiwake and gannet presented as a result of any changes made to the impact assessment in the EIAR to capture “cascading effects on apportioning”. The Applicant confirms the apportioned impacts have adjusted the sabbatical rate in the breeding season only, where necessary. PVA screening was also completed for these species following the same methods as the EIAR to capture the updated predicted impacts following the apportioning of impacts. The changes requested to the impact assessment did not result in sufficient differences between the EIAR or RIAA and AEIR to result in a change to the conclusions of the EIAR or RIAA.

4.12 REFERENCES

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APPENDIX 4.1 – CONSULTATION LOG

This appendix provides a comprehensive record of consultation undertaken with NatureScot during the determination phase relevant to the offshore ornithology AEIR.

Consultee's response	**Response from Applicant**
At present, elements of our advice in relation to marine ornithology interests are provisional only. We provide this provisional advice based on our appraisal; however, we have not been able to reach definitive conclusions for some species based the information currently supplied within the assessment(s) and supporting documents. The advice summary below briefly highlights issues that we have identified within the ornithology assessment. In Appendix A, we provide detailed advice and set out which aspects of the assessment need to be updated in order for us to finalise our provisional conclusions.	Responses requested will be provided in the Additional Environmental Information Report.
The EIA assessment for offshore and intertidal ornithology concludes no significant impacts from the proposal alone, which we broadly agree with.	Responses requested will be provided in the Additional Environmental Information Report.
We conclude that cumulative effects from this proposal with other offshore wind farms are Significant in EIA terms, for the following: *• Kittiwake through collision and displacement* *• Gannet through collision and displacement* *• Razorbill through displacement* *• Puffin through displacement.*	Responses requested will be provided in the Additional Environmental Information Report.
We have identified issues around the SeabORD outputs used within the assessment for guillemot. This has cascading effects on apportioning and PVA, therefore, for guillemot we are able to provide only provisional advice based on the current information within the Application. We provisionally conclude that the overall cumulative effect on guillemot is Significant in EIA terms.	Responses requested will be provided in the Additional Environmental Information Report.
Further consideration of cumulative effects on great black-backed gull through collision is also required.	Responses requested will be provided in the Additional Environmental Information Report.

Consultee's response	Response from Applicant
We broadly agree with the Applicant's conclusion of no AEOSI from the Project alone. Noting that there may be an exception to this conclusion with regard to guillemot, due to issues identified around SeabORD outputs and associated effects on apportioning and PVA and therefore we are only able to provide provisional advice.	Responses requested will be provided in the Additional Environmental Information Report.
For the following qualifying species and sites, we have concluded AEOSI in-combination with other offshore wind farm projects for both scenarios – in-combination including Berwick Bank Offshore Wind Farm and in-combination excluding Berwick Bank Offshore Wind Farm: *• Guillemot at Buchan Ness to Collieston Coast SPA (provisional advice only)* *• Kittiwake at Buchan Ness to Collieston Coast SPA* *• Razorbill at East Caithness Cliffs SPA* *• Kittiwake at East Caithness Cliffs SPA* *• Gannet at Forth Islands SPA* *• Gannet at Hermaness, Saxa Vord & Valla Field SPA* *• Puffin at North Caithness Cliffs SPA* *• Kittiwake at North Caithness Cliffs SPA* *• Kittiwake at Troup, Pennan & Lion's Heads SPA* *• Kittiwake at West Westray SPA*	Responses requested will be provided in the Additional Environmental Information Report.
For the following qualifying species and sites, we are unable to conclude No AEOSI in-combination with other offshore wind farm projects for both scenarios – in-combination including Berwick Bank Offshore Wind Farm and in-combination excluding Berwick Bank Offshore Wind Farm: *• Gannet at Fair Isle SPA* *• Gannet at Sule Skerry & Sule Stack SPA* *• Gannet at Noss SPA* *• Guillemot at Troup, Pennan & Lion's Heads SPA (provisional advice only*	Responses requested will be provided in the Additional Environmental Information Report.
For the following qualifying species and sites, we have concluded AEOSI in-combination with other wind farm projects including Berwick Bank Offshore Wind Farm proposal, but we are unable to conclude No AEOSI in-combination with other wind farm projects excluding Berwick Bank: *• Kittiwake at Forth Islands SPA*	Responses requested will be provided in the Additional Environmental Information Report.

Consultee's response	Response from Applicant
• *Puffin at Forth Islands SPA* • *Kittiwake at Fowlsheugh SPA*	
In order to update our provisional advice, we require an updated assessment of impacts to guillemot through displacement. This will have implications for assessments in both the EIA and RIAA. Further advice with respect to Ornithological interests is provided in Appendix A	Responses requested will be provided in the Additional Environmental Information Report.
In our appraisal of the RIAA, we have reached conclusions of AEOSI to seabird species from a number of European sites in-combination between this proposal and other offshore wind farms, noting our conclusions are provisional in some instances. In addition, there are some species / sites where we are unable to reach a definitive conclusion in-combination with other offshore wind farms, noting our conclusions are provisional in some instances. As a result, Marine Directorate will be required to undertake an Appropriate Assessment	Responses requested will be provided in the Additional Environmental Information Report.
Offshore and intertidal ornithological interests are considered in Chapter 9 (Volume 2) of the Buchan EIA Report and the following supporting Appendices: • *Offshore and Intertidal Ornithology Baseline, Appendix 9.1* • *Offshore Ornithology Collision Risk Modelling (CRM), Appendix 9.2* • *Ornithology Distributional Responses Report, Appendix 9.3* • *Ornithological Impact Apportioning, Derivation of Cumulative Impacts and PVA Screening, Appendix 9.4* • *Ornithology Population Viability Analysis Report, Appendix 9.*	Noted.
Ornithological interests are also considered in the Report to the Inform Appropriate Assessment (RIAA), specifically Part 3 – Assessment on Special Protection Areas and Ramsar Sites. We include our advice on the RIAA within this Appendix.	Noted.

Consultee's response	Response from Applicant
The RIAA is accompanied by a HRA Derogation Case (provided on a without prejudice basis) and associated Offshore Ornithology Compensation Evidence Plan and Outline Offshore Ornithology Implementation and Monitoring Plan. Our advice regarding the Derogation Case and related documents is included within Appendix G	Noted.
The EIA assessment for offshore and intertidal ornithology concludes no significant impacts from the proposal alone. We broadly agree with the Applicant's conclusions in relation to the proposal alone impacts under EIA	Noted.
We conclude that cumulative effects from this proposal with other offshore wind farms are significant in EIA terms, for the following: *• Kittiwake through collision and displacement* *• Gannet through collision and displacement* *• Razorbill through displacement* *• Puffin through displacement*	Noted, additional information will be included in AEIR Chapter 4: Offshore & Intertidal Ornithology.
However, we have identified issues around the SeabORD outputs used within the assessment for guillemot. This has cascading effects on apportioning and PVA, therefore, for guillemot we are able to provide only provisional advice based on the current information within the Application. We provisionally conclude that the overall cumulative effect on guillemot is significant in EIA terms	Noted, additional information will be included in AEIR Chapter 4: Offshore & Intertidal Ornithology.
In addition, we do not consider cumulative effects on great black-backed gull through collision to be considered sufficiently. As such, we are unable to support the conclusion reached and advise that assessment by PVA is required.	Noted, additional information will be included in AEIR Chapter 4: Offshore & Intertidal Ornithology.
The RIAA concludes there will be no Adverse Effect on Site Integrity (AEOSI), either from the Project alone or in-combination for all of the protected sites and effect pathways considered. We broadly agree with the Applicant's conclusion of no AEOSI from the Project alone, noting that there may be an exception to this conclusion with regard to guillemot (as below)	Noted.

Consultee's response	Response from Applicant
Following our own appraisal of the information provided, we disagree with the conclusion that there will be no AEOSI in-combination.	Following consultation with NatureScot and agreement of approach on 2nd June 2026, BOW confirms that PVAs are being re-run for kittiwake, guillemot, razorbill, puffin, gannet and herring gull in order to update the in-combination assessment for the Proposed Offshore Development. BOW provides this updated information as part of AEIR Chapter 4: Offshore and Intertidal Ecology
We have identified issues around the SeabORD outputs used within the assessment for guillemot. This has cascading effects on apportioning and PVA, therefore, for guillemot we are able to provide only provisional advice. This provisional advice is discussed within this Appendix and conclusions indicated in italics within the bullet points below.	Noted.
For the qualifying species and sites listed below, we have concluded AEOSI in-combination with other offshore wind farm projects for both scenarios – in-combination including Berwick Bank Offshore Wind Farm and in-combination excluding Berwick Bank Offshore Wind Farm: • *Guillemot at Buchan Ness to Collieston Coast SPA (provisional advice only)* • *Kittiwake at Buchan Ness to Collieston Coast SPA* • *Razorbill at East Caithness Cliffs SPA* • *Kittiwake at East Caithness Cliffs SPA* • *Gannet at Forth Islands SPA* • *Gannet at Hermaness, Saxa Vord & Valla Field SPA* • *Puffin at North Caithness Cliffs SPA* • *Kittiwake at North Caithness Cliffs SPA* • *Kittiwake at Troup, Pennan & Lion's Heads SPA* • *Kittiwake at West Westray SPA*	Following consultation with NatureScot and agreement of approach on 2nd June 2026, BOW confirms that PVAs are being re-run for kittiwake, guillemot, razorbill, puffin, gannet and herring gull in order to update the in-combination assessment for the Proposed Offshore Development. BOW provides this updated information as part of AEIR Chapter 4: Offshore and Intertidal Ecology. Additional Environmental Information is provided on compensation measures to address project alone predicted impacts on SPAs where NatureScot have concluded and AEOSI, or cannot conclude there is no AEOSI.

Consultee's response	Response from Applicant
For the qualifying species and sites listed below, we are unable to conclude No AEOSI in-combination with other offshore wind farm projects for both scenarios – in-combination including Berwick Bank Offshore Wind Farm and in-combination excluding Berwick Bank Offshore Wind Farm: *• Gannet at Fair Isle SPA* *• Gannet at Sule Skerry & Sule Stack SPA* *• Gannet at Noss SPA* *• Guillemot at Troup, Pennan & Lion's Heads SPA (provisional advice only)*	Following consultation with NatureScot and agreement of approach on 2nd June 2026, BOW confirms that PVAs are being re-run for kittiwake, guillemot, razorbill, puffin, gannet and herring gull in order to update the in-combination assessment for the Proposed Offshore Development. BOW provides this updated information as part of AEIR Chapter 4: Offshore and Intertidal Ecology. Additional Environmental Information is provided on compensation measures to address project alone predicted impacts on SPAs where NatureScot have concluded and AEOSI, or cannot conclude there is no AEOSI.
For the qualifying species and sites listed below, we have concluded AEOSI in-combination with other wind farm projects including Berwick Bank Offshore Wind Farm proposal but we are unable to conclude No AEOSI in-combination with other wind farm projects excluding Berwick Bank: *• Kittiwake at Forth Islands SPA* *• Puffin at Forth Islands SPA* *• Kittiwake at Fowlsheugh SPA*	Following consultation with NatureScot and agreement of approach on 2nd June 2026, BOW confirms that PVAs are being re-run for kittiwake, guillemot, razorbill, puffin, gannet and herring gull in order to update the in-combination assessment for the Proposed Offshore Development. BOW provides this updated information as part of AEIR Chapter 4: Offshore and Intertidal Ecology. Additional Environmental Information is provided on compensation measures to address project alone predicted impacts on SPAs where NatureScot have concluded and AEOSI, or cannot conclude there is no AEOSI.
The Offshore and Intertidal Ornithology Baseline report is provided in Volume 3, Chapter 9, Appendix 9.1. The Applicant undertook two years of Digital Aerial Surveys between March 2022 and February 2024, with a total of 24 surveys covering the Array Area plus a 4km buffer. Correction factors of 0.67 for guillemot (Harris, 1989) and 0.75 for razorbill (Burnell et al., 2023) were agreed to previously.	Noted.
In reviewing the supporting information in the EIA Report, we have noted minor errors in transposing values from one Table to another or between documents, where possible we have corrected for this in our analyses. We highlight some issues with the Applicant's approach which are discussed in the specific comments section below. Where this occurred, we have provided an overview on whether	Noted.

Consultee's response	Response from Applicant
the issues encountered have an impact on our conclusions.	
The Applicant has largely followed our advice and guidance through the first stages of the EIA ornithology assessment, including the Zone of Influence and density estimation. As set out in Paragraph 9-26, MRSea was used to produce density estimates for some species, noting it was not possible to run for all species in all seasons. Design-based densities were calculated for all species.	Noted.
However, in Paragraph 9-47 and Table 9-10, for Arctic skua, we note the Applicant has used a more precautionary foraging range of 80.2km (MM+SD; Thaxter et al., 2012), rather than the recommended 2.7km (mean+SD; Woodward et al., 2019). We are content with this and the reasoning for this more precautionary approach being taken	Noted.
Table 9-11, which sets out Designated sites and Relevant Qualifying Interest Features for Breeding Seabirds, is largely accurate. With an appropriate closest by-sea distance to the Array Area reported and the relevant qualifying breeding seabirds identified. Although the Applicant presents a more precautionary approach, connectivity with marine SPAs is generally assessed differently to other SPAs and only needs to be considered when within a 15km buffer of the proposed development.	Noted.
As set out in Table 9-6, conservation values have been based on, amongst others, conservation status (Birds of Conservation Concern (BoCC), EU Birds Directive, Wildlife and Countryside Act 1981), number of individuals recorded during baseline surveys, and species that are (or form a part of) a cited interest of an internationally designated site (i.e. SPA or Ramsar site). We are mostly content with this approach; however, we highlight that the BoCC 5 (Stanbury et al., 2021) has been superseded by an addendum (BoCC5a; Stanbury et al., 2024), which incorporates effects of Highly Pathogenic Avian Influenza (HPAI).	Noted.

Consultee's response	Response from Applicant
A number of species listed in Table 9-7 have been recorded as being Amber listed when they are now Red listed. These include common gull, great black-backed gull, and great skua. Shag have been revised as amber. Table 9-7 does not include the BoCC status of puffin, which is Red. However, we do not consider these make a material difference to the conclusions presented by the Applicant	Noted.
We welcome the consideration of difficult to observe species (e.g. storm petrels, terns, Manx shearwater) in categorising their status.	Noted.
Sensitivity is discussed within the species accounts, set out in the Baseline Report (Volume 3, Appendix 9.1). Bradbury et al. (2014) is referenced throughout the species accounts; however, we note that this paper largely focusses on English territorial waters. Bradbury et al. (2014) incorporates the conservation value for each species into the assessment of sensitivity. This is in turn derived from the percentage of population in England and so is not appropriate to use in a Scottish context. The summary of literature sources provided in Section 9.10.1 (Table 9-25) includes literature which are more applicable to the Scottish context e.g. Wade et al. (2016). It is not clear why these other sources have not been used for the purpose of defining sensitivity.	Noted, additional information will be included in AEIR Chapter 4: Offshore & Intertidal Ornithology.
The methodology of how the Applicant undertook Collision Risk Modelling for seabirds, and results of this, are presented within Volume 3, Appendix 9.2: Offshore Ornithology Collision Risk Modelling (CRM). The following species were included in the CRM assessment as requested in the Scoping Opinion: *• Herring gull* *• Great black-backed gull* *• Gannet* *• Kittiwake* *• Fulmar*	Noted.

Consultee's response	Response from Applicant
At Scoping we advised that the avoidance rates from the Joint SNCB guidance note (2014) were to be used in the collision assessment. However, these were superseded by avoidance rates published by Ozsanlev-Harris et al. (2023) which have subsequently been adopted in our interim advice. These more up-to-date avoidance rates have been used in the collision assessment. We agree with the use of these parameters, and the others presented in Table 2-4.	Noted.
Within Paragraph 9-332 of Chapter 9, the Applicant states "a recent update to guidance issued by NatureScot on the assessment of collision impacts advocates for the application a 70% macro-avoidance rate of OWFs by both kittiwake and gannet (NatureScot, March 2025)." This does not follow our guidance. We recommend that a 70% macro-avoidance is applied to gannet in the non-breeding season only. While it does not appear that this has been carried through inappropriately for the project alone assessment (e.g. Paragraph 9-526), we request clarification on how this macro-avoidance rate has been applied cumulatively.	Noted, additional information will be included in AEIR Chapter 4: Offshore & Intertidal Ornithology.
Distributional responses and related mortality rates included for consideration in the assessments are detailed in Volume 3, Appendix 9.3: Ornithology Distributional Responses Report.	Noted.
To assess the distributional responses of seabirds from the proposed Development, the Applicant has followed a combination of two methods; the displacement matrix approach and SeabORD. SeabORD has been used in assessments for guillemot, razorbill and kittiwake in the breeding season for six SPAs, the results from SeabORD have then been used in PVAs. *During pre-application consultation, we were made aware of issues and difficulties that the Applicant was experiencing when using the SeabORD tool. Pre-application consultation regarding this is summarised within Table 1-1 of Appendix 3 and also in Table 2-1 of Part 3 of the RIAA.*	Noted.

Consultee's response	Response from Applicant
For puffin, SeabORD simulations were not able to complete successfully and so it was agreed that the displacement Matrix approach should be used for puffin in the breeding season (as per our advice issued 24 March 2025 – noting that Table 2-1 and Table 1-1 incorrectly references NatureScot advice from 24 December 2024 and 24 December 2025 respectively).	Noted, additional information will be included in AEIR Chapter 4: Offshore & Intertidal Ornithology.
Instances in which SeabORD outputs included predictions of positive effect were also discussed during pre-application correspondence, however, this does not appear to be captured within either Table 2-1 or Table 1-1. As highlighted in correspondence with the Applicant, we considered these positive predictions to be unexpected (advice issued 28 January 2025). Following further investigation of outputs and parameters by NatureScot the cause of these positive results remained unclear. Although we surmised that adjusting the distance decay value used may help to resolve the issue, our recommendation was that the Matrix approach should also be undertaken for kittiwake, guillemot and razorbill (NatureScot advice issued 07 April 2025)	Noted, additional information will be included in AEIR Chapter 4: Offshore & Intertidal Ornithology.
While Matrix approach results have been presented for kittiwake, guillemot and razorbill, these have not been used in the PVAs. As described in Paragraph 37 of Appendix 9.3, the Applicant has manually changed any positive SeabORD outputs to zeros for further assessment and PVA, which they consider to be a precautionary approach. We note considerable differences between the results of the SeabORD and Matrix approaches. This is of concern, particularly in relation to guillemot as explained below.	Noted.

Consultee's response	Response from Applicant
Noting the considerable differences between results presented from the SeabORD and Matrix approaches for guillemot, we have undertaken a comparison and further analysis of the displacement data. This has involved:• Calculating the matrix displacement mortalities for the SeabORD SPAs in the breeding season, using data presented in the Application and correcting to breeding adult mortalities; and • Comparing the approach used by the Applicant (SeabORD+Matrix) with the seasonal and annual mortalities using the Matrix-only. Table 1 presents our comparison of SeabORD and Matrix approach results for guillemot	Noted.
From this comparison, it is clear that: Matrix mortality values for the SPAs where SeabORD was used are all significantly higher than the equivalent SeabORD values.	BOW presents within AEIR Chapter 4, detail on the different methodological approaches underpinning the two assessment methods. BOW considers that SeabORD represents the best available scientific approach for assessing breeding season displacement effects where applicable. However, the additional matrix-only assessments were provided in response to NatureScot's request in order to support comparison between approaches and provide additional context for determination. BOW notes that the higher mortality estimates generated by the matrix approach informed the updated assessments presented within the AEIR.
SeabORD outputs for guillemot are disproportionately low for some SPAs despite relatively high apportioning rates, i.e. closer SPAs have less impact, when we would expect the reverse	Noted. Additional information regarding guillemot displacement assessment and interpretation of SeabORD outputs is provided within AEIR Chapter 4: Offshore and Intertidal Ornithology.
SeabORD values of 0 mortalities for Buchan Ness to Collieston Coast SPA and 1.7 mortalities for Troup, Pennan & Lion's Heads SPA are of most concern as these two sites have the highest apportioning rates and highest mortalities using the Matrix approach	Noted. Additional information relating to guillemot displacement mortality and cumulative effects assessment is provided within AEIR Chapter 4: Offshore and Intertidal Ornithology.

Consultee's response	Response from Applicant
SeabORD results may be affected by edge effects for SPAs close to mean max foraging range.	Noted. Additional information relating to displacement assessment methodology and supporting assessment outputs is provided within AEIR Chapter 4: Offshore and Intertidal Ornithology.
The comparison of SeabORD and Matrix results is also affected by an error in the use of Mean Seasonal Peaks (MSP) in the Matrix approach, which inflates breeding season impacts for guillemot. The same MSP (August 2022) was used in both breeding and non-breeding seasons. In our view, this August peak will be post-breeding dispersal and should therefore only be used in the non-breeding season.	Noted.
To investigate how the MSP affects our SeabORD/Matrix comparison we have recalculated the Matrix approach mortalities taking this into account and using a July peak in the breeding season. This adjustment reduces the Matrix approach mortalities, but they are still greater than the SeabORD results.	Noted. Additional information regarding displacement assessment and interpretation of modelling outputs is provided within AEIR Chapter 4: Offshore and Intertidal Ornithology.
As such, our concerns regarding the use of SeabORD results in the guillemot impact assessment remain and we conclude that: • It is likely that guillemot displacement impacts are underestimated in the assessments, especially for Buchan Ness to Collieston Coast and Troup, Pennan & Lion's Heads SPAs	Noted. Additional information relating to displacement effects and cumulative assessment is provided within AEIR Chapter 4: Offshore and Intertidal Ornithology.
We have considered this underestimation in our determination of AEOSI by taking a more precautionary approach to guillemot impacts.	Noted.
While reaching AEOSI conclusions is possible, we do not have confidence in the mortality values presented and their use in deriving compensation requirements where AEOSI is concluded.	Noted. Additional information relating to mortality estimates, displacement assessment and cumulative effects assessment is provided within AEIR Chapter 4: Offshore and Intertidal Ornithology.

Consultee's response	Response from Applicant
Therefore, we advise that the Matrix approach alone should be used to re-assess guillemot impacts with new PVAs being undertaken and counterfactuals updated. This should also incorporate adjustments to the Mean Seasonal Peak, as set out above. This will have implications for both the EIA and RIAA assessments and therefore our advice once completed.	Noted, additional information will be included in AEIR Chapter 4: Offshore & Intertidal Ornithology.
As for guillemot, we have also undertaken a comparison and further analysis of the displacement assessment for both kittiwake and razorbill. For these species, the results from the SeabORD approach are more precautionary than those from the Matrix approach	Noted.
The approach used in the Application is the more precautionary and therefore we can use the results to reach conclusions regarding AEOSI. However, given the pre-application issues raised by the Applicant regarding SeabORD and our doubts above regarding guillemot (i.e. the potential for mortality figures to be inaccurate), it may be advisable to also rerun kittiwake and razorbill PVAs using the Matrix approach only.	Noted, additional information will be included in AEIR Chapter 4: Offshore & Intertidal Ornithology.
From our understanding of Appendix 9.4 Ornithological Impact Apportioning, Derivation of Cumulative Impacts and PVA Screening it appears that sabbaticals have been removed in the non-breeding season as well as the breeding season, which is incorrect. During the non-breeding season, all birds are non-breeders and so sabbatical birds do not need to be removed from estimated adult mortalities.	Noted.
In Section 2.3 of Appendix 9.4 it states: "in order to estimate the impacts to the breeding adult population for all seasons, the non-breeding (sabbatical) birds were excluded by multiplying the predicted impact by 1 minus the species-specific sabbatical rate." Use of Equation 4: Calculation used to apportion non-breeding season impacts to breeding adults during the non-breeding season(s) also implies removal of sabbaticals in the non-breeding season (see Paragraph 24).	Noted.

Consultee's response	Response from Applicant
We have undertaken our own calculations of mortalities in the non-breeding season and conclude that sabbaticals have been removed. The changes in mortalities resulting from this error are not significant enough to alter our conclusions. Should other re-assessments be required, such as for displacement, then this error should be corrected as well.	BOW acknowledges NatureScot's comments regarding the treatment of sabbatical behaviour within the non-breeding season mortality calculations. BOW confirms that apportioned impacts presented in the AEIR Chapter 4: Offshore and Intertidal Ornithology have adjusted the sabbatical rate in the breeding season only, where necessary.
The Digital Aerial Surveys coincided with an outbreak of Highly Pathogenic Avian Influenza (HPAI). The baseline DAS occurred between March 2022 and February 2024, and therefore the mean seasonal peaks in abundance occur for some species and seasons during the HPAI outbreak. HPAI has been considered qualitatively within the assessment, and the Applicant has detailed the species-specific impacts of HPAI within the baseline characterisation report. Population counts published in Burnell et al. (2023) were undertaken prior to the HPAI outbreak and therefore the Applicant has included counts derived from Seabird Monitoring Programme (SMP)where more recent data were available. This has attempted to account for changes in populations due to HPAI where possible. Updated colony counts from Tremlett et al. (2024) have been used to provide additional context when considering a species magnitude of impact. We are content with this approach	Noted.
The Applicant has not identified any significant project alone EIA impacts for offshore ornithology. For the project alone we are largely in agreement that impacts are small and unlikely to be significant in EIA terms. However, we will provide further advice on guillemot pending an updated assessment of distributional responses, as discussed above.	Noted.
The percentage point change in mortality from total annual adult mortalities was above the 0.02 threshold for guillemot, razorbill and herring gull and as such PVAs were required for the project alone assessment. However, we conclude that the counterfactuals for both population size and growth rate for these three species are Not Significant in EIA terms, as concluded in the EIA Report	Noted.

Consultee's response	Response from Applicant
The Buchan Offshore Wind Farm EIA was prepared prior to Berwick Bank receiving consent in August 2025. As it has been concluded that compensation measures submitted by Berwick Bank are insufficient, we have assessed both of the scenarios presented by Buchan (i.e. including / excluding Berwick Bank) below.	Noted.
We note a repeated error in which gannet is referred to twice in a sentence or bullet point. We assume the second 'gannet' should be 'kittiwake' and have proceeded as if this is the case (e.g.Paragraphs 9-434 and 9-436).	Noted, this repeated error is addressed in AEIR Chapter 4: Offshore & Intertidal Ornithology.
For cumulative assessments in the EIA the following species were assessed using PVA: *• Guillemot (distributional responses)* *• Razorbill (distributional responses)* *• Puffin (distributional responses)* *• Herring gull (collision)* *• Kittiwake (distributional responses and collision)* *• Gannet (distributional responses and collision)*	Noted.
The above species have been included within the CEA on the basis of our pre-application advice that species should be considered if the project alone impacts are at least 0.2 mortalities per year (see Paragraph 9-434). While our advice has since been updated, we accept the approach presented as it stood at time of Scoping and pre-application consultation.	Noted.
Great black-backed gull also reached this threshold and but have not been progressed to the CEA (see Appendix 9.4: Offshore Ornithological Impact Apportioning, Cumulative Impact and Population Viability Analysis Technical Appendix). We highlight the high sensitivity of great black-backed gull to collision. In addition, conclusions of significant cumulative effect have been reached elsewhere (i.e. for other offshore wind proposals) for this species, on the basis of a small project alone contribution. In our view, the Applicant has not sufficiently considered the potential cumulative effects to great black-backed gull through collision. We are therefore unable to support the conclusion reached and advise that assessment by PVA is required	Noted, additional information will be included in AEIR Chapter 4: Offshore & Intertidal Ornithology.

Consultee's response	Response from Applicant
Noting our advice above regarding the guillemot displacement assessment and required re-assessment, we provisionally conclude that the overall cumulative effect on guillemot is Significant in EIA terms. However, we are unable to provide advice on the magnitude of this due to the issues raised around the distributional response assessment	Noted. Additional information regarding guillemot displacement assessment, including consideration of SeabORD outputs and interpretation of cumulative effects, is provided within AEIR Chapter 4: Offshore and Intertidal Ornithology.
We advise the estimates used are likely an underestimate of mortality: • the low CPS and CGR, which suggest a significant decline (9.2 – 17.6%) in population size and growth rate (0.3 – 0.5%) after 35 years with Berwick Bank and the 31% decline in the population size of guillemot in Scotland between Seabird 2000 and Seabirds Count.	Noted. Additional information is provided within AEIR Chapter 4: Offshore and Intertidal Ornithology.
We conclude the overall cumulative effect on razorbill to be Moderate and therefore Significant in EIA terms. Our conclusion was reached by considering: *• the medium sensitivity of razorbill to displacement;* *• the low CPS and CGR, which suggest a significant decline (9.2 – 17.6%) in population size and growth rate (0.3 – 0.5%) after 35 years with Berwick Bank;* *• the 2% decline in the population size of razorbill in Scotland between Seabird 2000 and Seabirds Count; and* *• the moderate predicted contribution from this project*	Noted. Additional information is provided within AEIR Chapter 4: Offshore and Intertidal Ornithology.
We conclude that the overall cumulative effect on puffin to be Moderate and therefore Significant in EIA terms. Our conclusion was reached by considering: *• the medium sensitivity of puffin to displacement;* *• the low CPS and CGR, which suggest a significant decline (9.2 – 17.6%) in population size and growth rate (0.2 – 0.3%) after 35 years with Berwick Bank;* *• the 32% decline in the population size of puffin in Scotland between Seabird 2000 and Seabirds Count; and* *• the moderate predicted contribution from this project*	Noted. Relevant cumulative assessment information is provided within AEIR Chapter 4: Offshore and Intertidal Ornithology.

Consultee's response	Response from Applicant
We conclude that the overall cumulative effect on kittiwake to be Major and therefore Significant in EIA terms. Our conclusion was reached by considering: *• the medium sensitivity of kittiwakes to offshore wind developments;* *• the very low CPS and low CGR, which suggest a substantial decline in population size (23.7 –32.7%) and growth rate (1.1 – 1.3%) after 35 years with Berwick Bank;* *• the 57% decline in the population size of kittiwake in Scotland between Seabird 2000 and Seabirds Count, suggesting that recovery following the cessation of the development activity would likely be slow;* *• the effects of the recent HPAI outbreak on kittiwake. NatureScot's Avian Influenza report on the impacts of HPAI estimated the 2022 HPAI outbreak to have been of high impact and with a moderate recovery rate predicted for kittiwake; and* *• the moderate predicted contribution from this project.*	Noted. Additional information relating to cumulative ornithological effects is provided within AEIR Chapter 4: Offshore and Intertidal Ornithology.
We conclude that the overall cumulative effect on gannet to is Moderate and therefore Significant in EIA terms. Our conclusion was reached by considering: *• the medium sensitivity of gannet to offshore wind developments;* *• the low CPS and CGR, which suggest a significant decline (11-16.3%) in population size and growth rate (0.3 – 0.5%) after 35 years with Berwick Bank; NatureScot is the operating name of Scottish Natural Heritage* *• the 40% increase in the population size of gannet in Scotland between Seabird 2000 and Seabirds Count;* *• the effects of the recent HPAI outbreak on gannet. NatureScot's Avian Influenza report on the impacts of HPAI estimated the 2022 HPAI outbreak to have been of high impact, and with a slow recovery rate predicted. Furthermore, Gannet colonies surveyed after the HPAI outbreak by Tremlett et al. (2024) had declined by 22% in Scotland, and 33% across the UK; and* *• the minor predicted contribution from this project.*	Noted. Additional information relating to cumulative ornithological effects is provided within AEIR Chapter 4: Offshore and Intertidal Ornithology.

Consultee's response	Response from Applicant
We conclude that the overall cumulative effect on herring gull to be minor and Not Significant in EIA terms.	Noted.
The Applicant has downgraded the kittiwake in-combination significance of effect from Major and Significant in EIA terms to Minor and Not Significant by lowering both magnitude and sensitivity by one level. They provide a rationale for this based on some recent studies, however wider post-consent monitoring for kittiwake has shown conflicting results. While the reasons for this are explored in the narrative provided, we are as yet unable to update our approach. Therefore, our Guidance approach must be followed to ensure consistency between Applications. As such, we concluded effects on kittiwake are Major and Significant in EIA terms.	Noted. Additional information relating to cumulative ornithological effects is provided within AEIR Chapter 4: Offshore and Intertidal Ornithology.
The in-combination significance has also been adjusted for gannet due to application of macro-avoidance at other projects. However, we cannot accept a conclusion of non-significance for gannet (for collision and displacement) in-combination, as concluded within Paragraph 9-528, as the justification provided for this adjustment is insufficient. Without this adjustment a conclusion of Moderate significance (as per Paragraph 9-525) would be reached.	Noted. Additional information relating to cumulative ornithological effects is provided within AEIR Chapter 4: Offshore and Intertidal Ornithology.
The calculations set out in Paragraph 9-526 do not match the numbers presented in the referenced Table 9-77. Therefore, it is not clear whether some of the projects presented have included macro-avoidance in their collision assessment. Clarity is needed around this point as multiplying the total spring and autumn migration by 0.3 may include some projects that have already accounted for macro-avoidance in the non-breading season	Noted. Additional information relating to cumulative ornithological effects is provided within AEIR Chapter 4: Offshore and Intertidal Ornithology.

Consultee's response	Response from Applicant
We therefore cannot accept the annual mortality reduction of 143.99 birds, which is used to justify the reduction in significance. We can accept a 70% reduction to the 'project own' collision effects in the non-breeding season, bringing the total to 2.826 mortalities, a reduction of 0.247 birds. We conclude that the effects on gannet are therefore Moderate and Significant in EIA terms.	Noted. Additional information relating to cumulative ornithological effects is provided within AEIR Chapter 4: Offshore and Intertidal Ornithology.
In addition, we have reached the following conclusions for other species:	Noted.
• *Minor, Not Significant effects to herring gull due to collision in-combination.25*	BOW notes NatureScot's conclusion that cumulative collision effects on herring gull are Minor and therefore Not Significant in EIA terms. BOW welcomes agreement that cumulative effects for this receptor are not considered significant.
• *Moderate, and therefore Significant in EIA terms, adverse effects to razorbill due to displacement in-combination.*	Noted. Additional information relating to cumulative ornithological effects is provided within AEIR Chapter 4: Offshore and Intertidal Ornithology.
• *Moderate, and therefore Significant in EIA terms, adverse effects to puffin due to displacement in-combination.*	Following consultation with NatureScot and agreement of approach on 2nd June 2026, BOW confirms that PVAs are being re-run for kittiwake, guillemot, razorbill, puffin, gannet and herring gull in order to update the in-combination assessment for the Proposed Offshore Development. BOW provides this updated information as part of AEIR Chapter 4: Offshore and Intertidal Ecology. Additional Environmental Information is provided on compensation measures to address project alone predicted impacts on SPAs where NatureScot have concluded and AEOSI, or cannon conclude there is no AEOSI.
Please note that displacement impacts in the construction phase have been assessed as 50% of the operational phase impacts and, from the results provided, we can conclude Not Significant in EIA terms for all species for distributional responses in the construction phase.	Noted.

Consultee's response	Response from Applicant
Kittiwake, common gull, great black-backed gull, herring gull, lesser black-backed gull, Sandwich tern, common tern, Arctic tern, great skua, guillemot, razorbill, puffin, European storm petrel, Leach's storm petrel, fulmar, Manx shearwater and gannet were scoped in for assessment of indirect distributional responses within the Array Area. Due to the large foraging ranges, ability to exploit a wide range of prey species, and extensive alternate habitats, the sensitivity for all the above species is low. These effects are concluded to be Not Significant in EIA terms, which we agree with.	Noted.
Manx shearwater, European and Leach's storm petrels, and puffin were scoped in for impacts due to artificial lighting. The magnitude of impact was assessed as being negligible on account of the distance from colonies to the proposed development and lower illumination intensity of the turbines (Paragraph 9-404 - 9-405). This has resulted in the conclusion of effects being Not Significant in EIA terms which we agree with.	Noted.
Guillemot, razorbill, puffin, Manx shearwater and gannet were assessed for mortality through entanglement and were found to be minor and Not Significant in EIA terms due to mitigation and maintenance of the lines, namely via maintenance inspections to collect and remove debris from the mooring lines which we agree with.	Noted.
During the construction and decommissioning phase there are predicted to be around 2,540 return transits (5,080 total transits), dropping to a maximum of 140 return trips (280 total trips) a year during operation and maintenance (as per Table 9-23). It is unclear what ports are considered, as the Applicant states the vessel management plan will finalise ports post-consent (see PMP 3, section 4). We highlight that, if using a port with passage through a marine SPA, an assessment of the impacts on the SPA qualifying species will be required – see also our RIAA advice below	Noted. This will be carried out if necessary when port selection is complete.

Consultee's response	Response from Applicant
In line with established EIA practice, we expect mitigation to be identified where a significant adverse effect is identified. Embedded mitigation is discussed within Section 9.9 and Table 9-24; no secondary mitigation is proposed by the Applicant. Based on the Applicant's EIA conclusions, no monitoring is proposed for ornithology.	Noted.
In this instance, we can accept that no secondary mitigation or monitoring is proposed as specific requirements will instead be required through the derogation case for ornithology to ensure compensatory measures are effective (see our advice on the RIAA below and Derogation Case in Appendix G of our advice). However, we invite further discussion with MD LOT, if the proposal is consented, to consider if any monitoring may be required to validate assessment predictions given the emerging nature of existing post consent monitoring	Noted.
Our assessments of AEOSI are primarily based on the PVA results for Counterfactual of Population Size (CPS) outputs, after 35 years (reflecting the intended lease period). However, in reaching our conclusions we also consider a range of other factors including: *• Counterfactual of Population Growth Rate (CGR) outputs and the % decrease in population growth rate* *• Status of the population including short and long-term trends* *• Condition of the feature6* *• Species ecology* *• Proportional importance of species in Scotland and UK* *• Impacts of HPAI and other recent mortality event*	Noted.
Our review of the CPS output (and other factors) has generally enabled us to consider whether a conclusion can be reached (i.e. AEOSI or No AEOSI). However, in some instances this has not been the case, particularly in our appraisal of in-combination effects. This is because the range of predicted impacts is large, reflecting the uncertainty within the assessment. In such instances we provide a conclusion of 'Unable to conclude no AEOSI'	Noted.

Consultee's response	Response from Applicant
Please note that displacement impacts in the construction phase have been assessed as 50% of the operational phase impacts and, from the results provided, we can conclude No AEOSI for all species and sites for distributional responses in the construction phase	Noted.
The Applicant has considered impacts from the proposal alone, as outlined below. PVAs were carried out for: *• Guillemot at Buchan Ness to Collieston Coast, Calf of Eday, Copinsay, Fair Isle, Hoy, Marwick Head, Rousay, Sumburgh Head, Troup, Pennan & Lion's Heads, West Westray SPAs.* *• Razorbill at East Caithness Cliffs and West Westray SPAs.* *• Kittiwake at North Caithness Cliffs SPA*	Noted.
For razorbill and kittiwake at the above sites, we are in agreement with the Applicant and can conclude No AEOSI for proposal alone impacts.	Noted.
For guillemot, we provisionally agree with the Applicant's conclusion of No AEOSI, pending results of an updated assessment for this species, as discussed above.	Noted. Additional information is provided within AEIR Chapter 4: Offshore and Intertidal Ornithology.
For puffin and gannet at all SPAs assessed, the proposal alone impacts did not meet or exceed the 0.02 percentage point change in adult survival rate threshold. Therefore, no PVAs were required and for the proposal alone assessment we can conclude No AEOSI.	Noted.
In-line with pre-application advice, the Buchan proposal has been assessed in-combination with other offshore wind developments under two scenarios: *• other wind farm developments including Berwick Bank Offshore Wind Farm; and* *• other wind farm developments excluding Berwick Bank Offshore Wind Farm.* *Within our advice, we also describe these scenarios as 'with' or 'without' Berwick Bank. Unless otherwise stated, NatureScot conclusions on AEOSI as set out below applies to both scenarios*	Noted.

Consultee's response	Response from Applicant
The assessment for several SPAs and species demonstrated that the percentage point change in adult survival did not meet the 0.02 threshold and/or the mortality from the proposal was less than 0.2 birds/annum and, therefore, PVA was not undertaken. This was our Guidance at the point in time that the Applicant was undertaking their assessment. As a result, we can conclude No AEOSI for the species/sites included in Table 13 below.	Noted.
PVAs were undertaken for the remaining sites/species assessed, and we provide advice on the PVA results and our determination of AEOSI for seabird SPAs via a summary table and more detailed assessments for individual SPAs and species under the proceeding sub-sections.	Noted.
Table 14 has been compiled to provide a summary of our conclusions regarding AEOSI for sites/species for which PVAs have been undertaken. Please note we have not used a threshold to reach our conclusions, instead our assessment includes aspects of precaution as well as relevant contextual information as detailed above	Noted.
We provisionally conclude AEOSI for guillemot at Buchan Ness to Collieston Coast SPA, noting that the population of guillemot at this site is relatively stable, we have also taken into account: *• the significantly low CPS values resulting in a population decrease of up to 27% over 35 years* *• a decrease in population growth rate of up to 0.9%* *• the significant contribution from the project to the in-combination total* *• the likely underestimation of impacts due to no mortality being attributed to this site in the breeding season using SeabORD.* *The Applicant concludes for the guillemot feature is that there is no potential for AEOSI*	Following consultation with NatureScot and agreement of approach on 2nd June 2026, BOW confirms that PVAs are being re-run for kittiwake, guillemot, razorbill, puffin, gannet and herring gull in order to update the in-combination assessment for the Proposed Offshore Development. BOW provides this updated information as part of AEIR Chapter 4: Offshore and Intertidal Ecology. Additional Environmental Information is provided on compensation measures to address project alone predicted impacts on SPAs where NatureScot have concluded and AEOSI, or cannot conclude there is no AEOSI.

Consultee's response	Response from Applicant
We conclude AEOSI for kittiwake at Buchan Ness to Collieston Coast SPA, taking into account: *• the significantly low CPS values, resulting in a population decline of up to 19%* *• a decrease in population growth rate of up to 0.6%* *• the unfavourable condition of the feature* *• a 19% population decline between Seabird 2000 and Seabirds Count. While the project contribution to the in-combination total is fairly low, the CPS values and the declining population make, even a small contribution, of concern.The Applicant concludes there is no potential for AEOSI for kittiwake at this site*	Following consultation with NatureScot and agreement of approach on 2nd June 2026, BOW confirms that PVAs are being re-run for kittiwake, guillemot, razorbill, puffin, gannet and herring gull in order to update the in-combination assessment for the Proposed Offshore Development. BOW provides this updated information as part of AEIR Chapter 4: Offshore and Intertidal Ecology. Additional Environmental Information is provided on compensation measures to address project alone predicted impacts on SPAs where NatureScot have concluded and AEOSI, or cannot conclude there is no AEOSI.
We conclude AEOSI for razorbill at East Caithness Cliffs SPA, taking into account: *• the significantly low CPS values with and without Berwick Bank, resulting in a population decrease of up to 22% over 35 years* *• a decrease in population growth rate of up to 0.7%* *• a moderate contribution from the project.* *While this feature is in favourable condition and the population has increased between Seabird 2000 and Seabirds Count, we consider that this is outweighed by the factors highlighted above.* *The Applicant concludes there is no potential for AEOSI for razorbill at this site*	Following consultation with NatureScot and agreement of approach on 2nd June 2026, BOW confirms that PVAs are being re-run for kittiwake, guillemot, razorbill, puffin, gannet and herring gull in order to update the in-combination assessment for the Proposed Offshore Development. BOW provides this updated information as part of AEIR Chapter 4: Offshore and Intertidal Ecology. Additional Environmental Information is provided on compensation measures to address project alone predicted impacts on SPAs where NatureScot have concluded and AEOSI, or cannot conclude there is no AEOSI.

Consultee's response	Response from Applicant
We conclude AEOSI for kittiwake at East Caithness Cliffs SPA, taking into account: *• the significantly low CPS values with and without Berwick Bank, resulting in a population decrease of up to 27% over 35 years* *• a decrease in population growth rate of up to 0.9%* *• the favourable condition of the feature* *• a 39% decline in population between Seabird 2000 and Seabirds count.* *The Applicant concludes there is no potential for AEOSI for kittiwake at this site.*	Following consultation with NatureScot and agreement of approach on 2nd June 2026, BOW confirms that PVAs are being re-run for kittiwake, guillemot, razorbill, puffin, gannet and herring gull in order to update the in-combination assessment for the Proposed Offshore Development. BOW provides this updated information as part of AEIR Chapter 4: Offshore and Intertidal Ecology. Additional Environmental Information is provided on compensation measures to address project alone predicted impacts on SPAs where NatureScot have concluded and AEOSI, or cannot conclude there is no AEOSI.
We are unable to conclude no AEOSI for gannet at Fair Isle SPA taking into account: *• the moderately low CPS for the high displacement value resulting in a population decline of about 11% over 35 years* *• a decrease in population growth rate of up to 0.3%* *• the impact of HPAI on gannet resulting in a recent decline in a previously increasing population. The Applicant concludes there is no potential for AEOSI for gannet at this site.*	Following consultation with NatureScot and agreement of approach on 2nd June 2026, BOW confirms that PVAs are being re-run for kittiwake, guillemot, razorbill, puffin, gannet and herring gull in order to update the in-combination assessment for the Proposed Offshore Development. BOW provides this updated information as part of AEIR Chapter 4: Offshore and Intertidal Ecology. Additional Environmental Information is provided on compensation measures to address project alone predicted impacts on SPAs where NatureScot have concluded and AEOSI, or cannot conclude there is no AEOSI.
We are unable to conclude no AEOSI for puffin at Forth Islands SPA with Berwick Bank, taking into account: *• the moderately low CPS values, resulting in a population decline of up to 13%* *• a decrease in population growth rate of up to 0.4%* *• the measurable contribution from the project* *• the favourable declining condition of the feature* *• a 39% decline between Seabird 2000 and the Seabirds Count.* *The Applicant concludes there is no potential for AEOSI for puffin at this site.*	Following consultation with NatureScot and agreement of approach on 2nd June 2026, BOW confirms that PVAs are being re-run for kittiwake, guillemot, razorbill, puffin, gannet and herring gull in order to update the in-combination assessment for the Proposed Offshore Development. BOW provides this updated information as part of AEIR Chapter 4: Offshore and Intertidal Ecology. Additional Environmental Information is provided on compensation measures to address project alone predicted impacts on SPAs where NatureScot have concluded and AEOSI, or cannot conclude there is no AEOSI.

Consultee's response	Response from Applicant
We conclude AEOSI for kittiwake at Forth Islands SPA with Berwick Bank, noting this project does not make a tangible contribution to the impacts. This is taking into account: *• the significantly low CPS values, resulting in a population decrease of 17%* *• a decrease in population growth rate of up to 0.5%* *• the unfavourable declining condition of the feature* *• a 22% population decline between Seabird 2000 and the Seabirds Count.*	Following consultation with NatureScot and agreement of approach on 2nd June 2026, BOW confirms that PVAs are being re-run for kittiwake, guillemot, razorbill, puffin, gannet and herring gull in order to update the in-combination assessment for the Proposed Offshore Development. BOW provides this updated information as part of AEIR Chapter 4: Offshore and Intertidal Ecology. Additional Environmental Information is provided on compensation measures to address project alone predicted impacts on SPAs where NatureScot have concluded and AEOSI, or cannot conclude there is no AEOSI.
We are unable to conclude no AEOSI for kittiwake without Berwick Bank at Forth Islands SPA noting this project does not make a tangible contribution to the impacts. This is taking into account: *• the moderately low CPS values, resulting in a population decrease of about 12%* *• a decrease in population growth rate of up to 0.3%* *• the unfavourable declining condition of the feature* *• a 22% population decline between Seabird 2000 and the Seabirds Count* *The Applicant concludes there is no potential for AEOSI for kittiwake at this site.*	Following consultation with NatureScot and agreement of approach on 2nd June 2026, BOW confirms that PVAs are being re-run for kittiwake, guillemot, razorbill, puffin, gannet and herring gull in order to update the in-combination assessment for the Proposed Offshore Development. BOW provides this updated information as part of AEIR Chapter 4: Offshore and Intertidal Ecology. Additional Environmental Information is provided on compensation measures to address project alone predicted impacts on SPAs where NatureScot have concluded and AEOSI, or cannot conclude there is no AEOSI.

Consultee's response	Response from Applicant
We conclude AEOSI for gannet at Forth Islands SPA, taking into account: *• the significantly low CPS values, resulting in a decrease in population size of up to 25%* *• a decrease in population growth rate of up to 0.8%* *• the moderate contribution of the project* *• although the feature is in favourable condition, the population has been heavily impacted by HPAI.* *The Applicant concludes that there would be no AEOSI for gannet at this site*	Following consultation with NatureScot and agreement of approach on 2nd June 2026, BOW confirms that PVAs are being re-run for kittiwake, guillemot, razorbill, puffin, gannet and herring gull in order to update the in-combination assessment for the Proposed Offshore Development. BOW provides this updated information as part of AEIR Chapter 4: Offshore and Intertidal Ecology. Additional Environmental Information is provided on compensation measures to address project alone predicted impacts on SPAs where NatureScot have concluded and AEOSI, or cannot conclude there is no AEOSI.
We conclude AEOSI for kittiwake at Fowlsheugh SPA with Berwick Bank, taking into account: *• the significantly low CPS, resulting in a population decrease of up to 18%* *• a decrease in population growth rate of up to 0.6 %* *• the moderate contribution of the project* *• the unfavourable declining condition of the feature* *• a 51% decline between Seabird 2000 and the Seabirds Count.*	Following consultation with NatureScot and agreement of approach on 2nd June 2026, BOW confirms that PVAs are being re-run for kittiwake, guillemot, razorbill, puffin, gannet and herring gull in order to update the in-combination assessment for the Proposed Offshore Development. BOW provides this updated information as part of AEIR Chapter 4: Offshore and Intertidal Ecology. Additional Environmental Information is provided on compensation measures to address project alone predicted impacts on SPAs where NatureScot have concluded and AEOSI, or cannot conclude there is no AEOSI.

Consultee's response	Response from Applicant
We are unable to conclude no AEOSI for kittiwake without Berwick Bank, taking into account: *• the moderately low CPS, resulting in a population decline of up to 13%* *• a decrease in population growth rate of up to 3%* *• the moderate contribution of the project* *• the unfavourable declining condition of the feature* *• a 51% decline between Seabird 2000 and the Seabirds Count.* *The Applicant concludes that there would be no AEOSI for kittiwake at this site*	Following consultation with NatureScot and agreement of approach on 2nd June 2026, BOW confirms that PVAs are being re-run for kittiwake, guillemot, razorbill, puffin, gannet and herring gull in order to update the in-combination assessment for the Proposed Offshore Development. BOW provides this updated information as part of AEIR Chapter 4: Offshore and Intertidal Ecology. Additional Environmental Information is provided on compensation measures to address project alone predicted impacts on SPAs where NatureScot have concluded and AEOSI, or cannot conclude there is no AEOSI.
We conclude AEOSI for gannet at Hermaness, Saxa Vord and Valla Field SPA, taking into account: *• the significantly low CPS, resulting in a population decrease of up to 18%* *• a decrease in population growth rate of up to 0.6 %* *• the measurable contribution of the project* *• although the feature is in favourable condition, the population has been heavily impacted by HPAI.* *The Applicant concludes that there would be no AEOSI for gannet at this site.*	Following consultation with NatureScot and agreement of approach on 2nd June 2026, BOW confirms that PVAs are being re-run for kittiwake, guillemot, razorbill, puffin, gannet and herring gull in order to update the in-combination assessment for the Proposed Offshore Development. BOW provides this updated information as part of AEIR Chapter 4: Offshore and Intertidal Ecology. Additional Environmental Information is provided on compensation measures to address project alone predicted impacts on SPAs where NatureScot have concluded and AEOSI, or cannot conclude there is no AEOSI.

Consultee's response	Response from Applicant
We conclude AEOSI for puffin at North Caithness Cliffs SPA, taking into account: *• the very low CPS, resulting in a decrease in population of up to 31%* *• a decrease in population growth rate of up to 1.0%* *• the measurable contribution of the project* *• the unfavourable condition of the feature* *• a 21% decline in the population between Seabird 2000 and Seabirds Count.* *The Applicant concludes that there would be no AEOSI for puffin at this site.*	Following consultation with NatureScot and agreement of approach on 2nd June 2026, BOW confirms that PVAs are being re-run for kittiwake, guillemot, razorbill, puffin, gannet and herring gull in order to update the in-combination assessment for the Proposed Offshore Development. BOW provides this updated information as part of AEIR Chapter 4: Offshore and Intertidal Ecology. Additional Environmental Information is provided on compensation measures to address project alone predicted impacts on SPAs where NatureScot have concluded and AEOSI, or cannot conclude there is no AEOSI.
We conclude AEOSI for kittiwake at North Caithness Cliffs SPA, taking into account: *• the significantly low CPS, resulting in a population decrease of up to 20% over 35 years* *• a decrease in population growth rate of up to 0.6%* *• the moderate contribution of the project* *• the unfavourable condition of the feature* *• a 45% decline in the population between Seabird 2000 and Seabirds Count.* *The Applicant concludes that there would be no AEOSI for kittiwake at this site.*	Following consultation with NatureScot and agreement of approach on 2nd June 2026, BOW confirms that PVAs are being re-run for kittiwake, guillemot, razorbill, puffin, gannet and herring gull in order to update the in-combination assessment for the Proposed Offshore Development. BOW provides this updated information as part of AEIR Chapter 4: Offshore and Intertidal Ecology. Additional Environmental Information is provided on compensation measures to address project alone predicted impacts on SPAs where NatureScot have concluded and AEOSI, or cannot conclude there is no AEOSI.
We are unable to conclude no AEOSI for gannet at Noss SPA, taking into account: *• the moderately low CPS, resulting in a population decline of up to 13% over 35 years* *• a decrease in population growth rate of up to 0.4%* *• the favourable condition of the feature* *• impacts of HPAI on an otherwise expanding population.* *The Applicant concludes that there would be no AEOSI for gannet at this site*	Following consultation with NatureScot and agreement of approach on 2nd June 2026, BOW confirms that PVAs are being re-run for kittiwake, guillemot, razorbill, puffin, gannet and herring gull in order to update the in-combination assessment for the Proposed Offshore Development. BOW provides this updated information as part of AEIR Chapter 4: Offshore and Intertidal Ecology. Additional Environmental Information is provided on compensation measures to address project alone predicted impacts on SPAs where NatureScot have concluded and AEOSI, or cannot conclude there is no AEOSI.

Consultee's response	Response from Applicant
We are unable to conclude no AEOSI for gannet at Sule Skerry and Sule Stack SPA, taking into account: *• the moderately low CPS, resulting in a population decline of up to 13% over 35 years* *• a decrease in population growth rate of up to 0.4%* *• the favourable condition of the feature* *• impacts of HPAI on an otherwise expanding population.* *The Applicant concludes that there would be no AEOSI for gannet at this site.*	Following consultation with NatureScot and agreement of approach on 2nd June 2026, BOW confirms that PVAs are being re-run for kittiwake, guillemot, razorbill, puffin, gannet and herring gull in order to update the in-combination assessment for the Proposed Offshore Development. BOW provides this updated information as part of AEIR Chapter 4: Offshore and Intertidal Ecology. Additional Environmental Information is provided on compensation measures to address project alone predicted impacts on SPAs where NatureScot have concluded and AEOSI, or cannot conclude there is no AEOSI.
Provisionally, we are unable to conclude no AEOSI for guillemot at Troup, Pennan and Lion's Heads SPA, taking into account: *• the moderately low CPS, resulting in a 13% decline in population after 35 years* *• a decrease in population growth rate of up to 0.4%* *• the unfavourable condition of the feature* *• the significant contribution from the project* *• a 50% decline in population between Seabird 2000 and Seabirds Count* *• the likely underestimation of impacts due to the use of SeabORD and our lack of confidence in the low number of mortalities attributed to this site.* *The Applicant concludes that there would be no AEOSI for guillemot at this site*	Following consultation with NatureScot and agreement of approach on 2nd June 2026, BOW confirms that PVAs are being re-run for kittiwake, guillemot, razorbill, puffin, gannet and herring gull in order to update the in-combination assessment for the Proposed Offshore Development. BOW provides this updated information as part of AEIR Chapter 4: Offshore and Intertidal Ecology. Additional Environmental Information is provided on compensation measures to address project alone predicted impacts on SPAs where NatureScot have concluded and AEOSI, or cannot conclude there is no AEOSI.

Consultee's response	Response from Applicant
We conclude AEOSI for kittiwake at Troup, Pennan and Lion's Heads SPA, taking into account: *• the significantly low CPS, resulting in a 19% decline in population after 35 years* *• a decrease in population growth rate of up to 0.6%* *• the unfavourable condition of the feature* *• a 44% decline in population between Seabird 2000 and Seabirds Count.* *The Applicant concludes that there would be no AEOSI for kittiwake at this site*	Following consultation with NatureScot and agreement of approach on 2nd June 2026, BOW confirms that PVAs are being re-run for kittiwake, guillemot, razorbill, puffin, gannet and herring gull in order to update the in-combination assessment for the Proposed Offshore Development. BOW provides this updated information as part of AEIR Chapter 4: Offshore and Intertidal Ecology. Additional Environmental Information is provided on compensation measures to address project alone predicted impacts on SPAs where NatureScot have concluded and AEOSI, or cannot conclude there is no AEOSI.
We conclude AEOSI for kittiwake at West Westray SPA. This is taking into account: *• the very low CPS, resulting in a population decrease of up to 47% over 35 years* *• a decrease in population growth rate of up to 1.8%* *• a decline in population of 92% between Seabird 2000 and Seabirds Count* *• the unfavourable condition of the feature.* *Although the contribution of the project to the in-combination impacts is very small, the CPS is so low that any additional mortality is of concern.* *The Applicant concludes that there would be no AEOSI for kittiwake at this site*	Following consultation with NatureScot and agreement of approach on 2nd June 2026, BOW confirms that PVAs are being re-run for kittiwake, guillemot, razorbill, puffin, gannet and herring gull in order to update the in-combination assessment for the Proposed Offshore Development. BOW provides this updated information as part of AEIR Chapter 4: Offshore and Intertidal Ecology. Additional Environmental Information is provided on compensation measures to address project alone predicted impacts on SPAs where NatureScot have concluded and AEOSI, or cannot conclude there is no AEOSI.
Any named qualifying species of an assemblage feature in an SPA is protected in its own right. The SPA Conservation Objectives are set for individual species rather than the assemblage and therefore the features should be assessed and any impacts concluded at the individual species level. This has been the established position in Scotland for quite some time, although we understand that this differs from the approach taken in England.	Noted.

Consultee's response	Response from Applicant
For those SPAs which have a seabird assemblage feature, where we have concluded AEOSI or unable to conclude no AEOSI, for at least one named species of the seabird assemblage, then that is also the conclusion for the assemblage feature. Therefore, for the seabird assemblage feature (and the conclusion for the assemblage feature. Therefore, for the seabird assemblage feature (and named species) we conclude either AEOSI or unable to conclude no AEOSI at:	Noted.
• *Buchan Ness to Collieston Coast SPA (guillemot and kittiwake)*	Following consultation with NatureScot and agreement of approach on 2nd June 2026, BOW confirms that PVAs are being re-run for kittiwake, guillemot, razorbill, puffin, gannet and herring gull in order to update the in-combination assessment for the Proposed Offshore Development. BOW provides this updated information as part of AEIR Chapter 4: Offshore and Intertidal Ecology. Additional Environmental Information is provided on compensation measures to address project alone predicted impacts on SPAs where NatureScot have concluded and AEOSI, or cannot conclude there is no AEOSI.

Consultee's response	Response from Applicant
• *East Caithness Cliffs SPA (razorbill and kittiwake)*	Following consultation with NatureScot and agreement of approach on 2nd June 2026, BOW confirms that PVAs are being re-run for kittiwake, guillemot, razorbill, puffin, gannet and herring gull in order to update the in-combination assessment for the Proposed Offshore Development. BOW provides this updated information as part of AEIR Chapter 4: Offshore and Intertidal Ecology. Additional Environmental Information is provided on compensation measures to address project alone predicted impacts on SPAs where NatureScot have concluded and AEOSI, or cannot conclude there is no AEOSI.
• *Fair Isle SPA (gannet)*	Following consultation with NatureScot and agreement of approach on 2nd June 2026, BOW confirms that PVAs are being re-run for kittiwake, guillemot, razorbill, puffin, gannet and herring gull in order to update the in-combination assessment for the Proposed Offshore Development. BOW provides this updated information as part of AEIR Chapter 4: Offshore and Intertidal Ecology. Additional Environmental Information is provided on compensation measures to address project alone predicted impacts on SPAs where NatureScot have concluded and AEOSI, or cannot conclude there is no AEOSI.

Consultee's response	Response from Applicant
• *Forth Islands SPA (gannet, kittiwake and puffin)*	Following consultation with NatureScot and agreement of approach on 2nd June 2026, BOW confirms that PVAs are being re-run for kittiwake, guillemot, razorbill, puffin, gannet and herring gull in order to update the in-combination assessment for the Proposed Offshore Development. BOW provides this updated information as part of AEIR Chapter 4: Offshore and Intertidal Ecology. Additional Environmental Information is provided on compensation measures to address project alone predicted impacts on SPAs where NatureScot have concluded and AEOSI, or cannot conclude there is no AEOSI.
• *Fowlsheugh SPA (kittiwake)*	Following consultation with NatureScot and agreement of approach on 2nd June 2026, BOW confirms that PVAs are being re-run for kittiwake, guillemot, razorbill, puffin, gannet and herring gull in order to update the in-combination assessment for the Proposed Offshore Development. BOW provides this updated information as part of AEIR Chapter 4: Offshore and Intertidal Ecology. Additional Environmental Information is provided on compensation measures to address project alone predicted impacts on SPAs where NatureScot have concluded and AEOSI, or cannot conclude there is no AEOSI.

Consultee's response	Response from Applicant
• *Hermaness, Saxa Vord & Valla Field SPA (gannet)*	Following consultation with NatureScot and agreement of approach on 2nd June 2026, BOW confirms that PVAs are being re-run for kittiwake, guillemot, razorbill, puffin, gannet and herring gull in order to update the in-combination assessment for the Proposed Offshore Development. BOW provides this updated information as part of AEIR Chapter 4: Offshore and Intertidal Ecology. Additional Environmental Information is provided on compensation measures to address project alone predicted impacts on SPAs where NatureScot have concluded and AEOSI, or cannot conclude there is no AEOSI.
• *North Caithness Cliffs SPA (kittiwake and puffin)*	Following consultation with NatureScot and agreement of approach on 2nd June 2026, BOW confirms that PVAs are being re-run for kittiwake, guillemot, razorbill, puffin, gannet and herring gull in order to update the in-combination assessment for the Proposed Offshore Development. BOW provides this updated information as part of AEIR Chapter 4: Offshore and Intertidal Ecology. Additional Environmental Information is provided on compensation measures to address project alone predicted impacts on SPAs where NatureScot have concluded and AEOSI, or cannot conclude there is no AEOSI.

Consultee's response	Response from Applicant
• *Noss SPA (gannet)*	Following consultation with NatureScot and agreement of approach on 2nd June 2026, BOW confirms that PVAs are being re-run for kittiwake, guillemot, razorbill, puffin, gannet and herring gull in order to update the in-combination assessment for the Proposed Offshore Development. BOW provides this updated information as part of AEIR Chapter 4: Offshore and Intertidal Ecology. Additional Environmental Information is provided on compensation measures to address project alone predicted impacts on SPAs where NatureScot have concluded and AEOSI, or cannot conclude there is no AEOSI.
• *Sule Skerry & Sule Stack SPA (gannet)*	Following consultation with NatureScot and agreement of approach on 2nd June 2026, BOW confirms that PVAs are being re-run for kittiwake, guillemot, razorbill, puffin, gannet and herring gull in order to update the in-combination assessment for the Proposed Offshore Development. BOW provides this updated information as part of AEIR Chapter 4: Offshore and Intertidal Ecology. Additional Environmental Information is provided on compensation measures to address project alone predicted impacts on SPAs where NatureScot have concluded and AEOSI, or cannot conclude there is no AEOSI.

Consultee's response	Response from Applicant
• *Troup, Pennan and Lion's Heads (guillemot and kittiwake)*	Following consultation with NatureScot and agreement of approach on 2nd June 2026, BOW confirms that PVAs are being re-run for kittiwake, guillemot, razorbill, puffin, gannet and herring gull in order to update the in-combination assessment for the Proposed Offshore Development. BOW provides this updated information as part of AEIR Chapter 4: Offshore and Intertidal Ecology. Additional Environmental Information is provided on compensation measures to address project alone predicted impacts on SPAs where NatureScot have concluded and AEOSI, or cannot conclude there is no AEOSI.
• *West Westray (kittiwake)*	Following consultation with NatureScot and agreement of approach on 2nd June 2026, BOW confirms that PVAs are being re-run for kittiwake, guillemot, razorbill, puffin, gannet and herring gull in order to update the in-combination assessment for the Proposed Offshore Development. BOW provides this updated information as part of AEIR Chapter 4: Offshore and Intertidal Ecology. Additional Environmental Information is provided on compensation measures to address project alone predicted impacts on SPAs where NatureScot have concluded and AEOSI, or cannot conclude there is no AEOSI.
Our assessment of impacts to the OFFSAB marine SPA breeding seabird qualifying features was undertaken with respect to the functionally linked breeding colony SPAs	Noted.
Disturbance/displacement of wintering waterfowl and breeding red-throated divers in marine SPAs could occur due to vessels passing close to or through marine SPAs when transiting to and from construction ports. A long list of indicative ports has been provided. If consented, should any of the proposed ports (when chosen after final financial investment decision) require transit through a marine SPA, then an assessment of potential impacts of the vessel movements on the qualifying features of the site will need to be carried out. NatureScot can	Noted.

Consultee's response	Response from Applicant
provide further detail on what is required if such an assessment if necessary.	
A qualitative assessment has been carried out for SPAs for qualifying features which migrate and could be at risk of collision with operating WTG's, using appropriate literature. The migratory CRM tool was not used which makes it difficult to assess the likelihood of collision with the proposed WTG's. From the information provided, we agree with the Applicant's conclusion of no adverse effect on any SPAs from this impact pathway.	Noted.
A qualitative assessment has been carried out for several impact pathways. For impact pathways not already covered within our advice above, we provide our appraisal and associated conclusions as set out below in Table 27	Noted.
Impact 2: Indirect distributional responses as a result of impacts to prey species. Although we do not support all of the conclusions reached for impacts noted in the Fish and Shellfish Ecology chapter, we can conclude No AEOSI for all SPAs from this impact pathway.	Noted.
Impact 4: Artificial Lighting. There is evidence that some species may be impacted by artificial lighting and the application provides a qualitative assessment of this. Based on the information provided and the lack of a method for assessing impacts quantitatively, we conclude No AEOSI on any SPAs from this impact pathway.	Noted.
Impact 5: Entanglement. The adoption of an Entanglement Management Plan (EM14) designed to monitor and remove debris from mooring lines should minimise impacts from this pathway and enables us to conclude No AEOSI for all SPAs.	Noted.

APPENDIX 4.2 – PVA SELECTION TOOL

The PVA selection tool is presented in the supplementary Microsoft Excel Worksheet titled “Appendix 4.2 Buchan-Ornithology-AEI incombination-PVA-selection-tool”

APPENDIX 4.3 – PROJECT ONLY GUILLEMOT PVA RESULTS INCLUDING CONSTRUCTION PERIOD

Table A-1. Median simulated population sizes (number of breeding adults) and counterfactual population sizes for guillemot Proposed Offshore Development only impacts including the construction period. Values are median values with 95% confidence intervals in brackets. Years represent: reference year, 25 years of operation, 35 years (the intended lease period),50 years, and 60 years of operation.

Population	Year	Baseline	Higher Scenario		Lower Scenario	
		Unimpacted population size	Impacted population size	Counterfactual population size	Impacted population size	Counterfactual population size
Buchan Ness to Collieston Coast SPA	2035 (reference)	57,497 (49,911 - 66,017)	57,257 (49,559 - 65,661)	0.996 (0.985 - 1.010)	57,403 (49,709 - 65,842)	0.998 (0.988 - 1.010)
	2060 (25 years)	121,051 (95,549 - 151,884)	118,161 (93,233 - 148,300)	0.976 (0.961 - 0.991)	119,731 (94,492 - 149,863)	0.989 (0.974 - 1.000)
	2070 (35 years)	162,040 (124,412 - 209,742)	156,779 (120,301 - 203,026)	0.968 (0.953 - 0.984)	159,728 (122,858 - 207,014)	0.986 (0.969 - 1.000)
	2085 (50 years)	253,320 (185,992 - 339,980)	242,402 (177,918 - 325,298)	0.957 (0.940 - 0.973)	248,477 (182,267 - 334,256)	0.981 (0.964 - 0.998)
	2095 (60 years)	340,292 (243,520 - 471,827)	323,287 (231,581 - 448,066)	0.950 (0.933 - 0.967)	332,780 (238,534 - 461,062)	0.978 (0.960 - 0.996)
Calf of Eday SPA	2035 (reference)	12,136 (10,418 - 13,948)	12,100 (10,402 - 13,941)	0.998 (0.970 - 1.030)	12,134 (10,419 - 13,926)	0.999 (0.972 - 1.030)
	2060 (25 years)	25,414 (19,662 - 32,340)	25,126 (19,393 - 31,892)	0.987 (0.951 - 1.020)	25,300 (19,575 - 32,239)	0.994 (0.957 - 1.030)
	2070 (35 years)	34,109 (25,697 - 44,743)	33,515 (25,118 - 44,023)	0.983 (0.946 - 1.020)	33,818 (25,443 - 44,340)	0.992 (0.954 - 1.030)
	2085 (50 years)	53,290 (38,732 - 72,455)	52,120 (37,831 - 70,540)	0.977 (0.938 - 1.020)	52,771 (38,317 - 71,525)	0.990 (0.949 - 1.030)
	2095 (60 years)	71,649 (50,758 - 99,249)	69,814 (49,410 - 96,624)	0.973 (0.933 - 1.020)	70,902 (50,109 - 97,958)	0.988 (0.947 - 1.030)
Copinsay SPA	2035 (reference)	15,481 (13,394 - 17,752)	15,398 (13,346 - 17,671)	0.995 (0.975 - 1.020)	15,447 (13,358 - 17,707)	0.998 (0.978 - 1.020)
	2060 (25 years)	32,577 (25,687 - 40,801)	31,767 (25,112 - 39,747)	0.975 (0.946 - 1.000)	32,263 (25,445 - 40,431)	0.989 (0.959 - 1.020)
	2070 (35 years)	43,583 (33,423 - 56,443)	42,148 (32,312 - 54,565)	0.967 (0.936 - 0.996)	42,981 (32,921 - 55,615)	0.985 (0.954 - 1.020)

Population	Year	Baseline	Higher Scenario		Lower Scenario	
		Unimpacted population size	Impacted population size	Counterfactual population size	Impacted population size	Counterfactual population size
	2085 (50 years)	68,226 (49,987 - 91,611)	65,022 (47,663 - 87,724)	0.955 (0.924 - 0.986)	66,799 (48,950 - 89,729)	0.980 (0.948 - 1.010)
	2095 (60 years)	91,443 (65,431 - 127,277)	86,776 (62,040 - 120,452)	0.948 (0.916 - 0.979)	89,415 (64,061 - 124,132)	0.977 (0.944 - 1.010)
Fair Isle SPA	2035 (reference)	36,740 (31,498 - 42,385)	36,634 (31,444 - 42,235)	0.997 (0.983 - 1.010)	36,693 (31,449 - 42,317)	0.999 (0.985 - 1.010)
	2060 (25 years)	77,146 (60,462 - 97,961)	76,075 (59,582 - 96,603)	0.986 (0.966 - 1.010)	76,716 (59,901 - 97,378)	0.994 (0.974 - 1.010)
	2070 (35 years)	103,941 (79,165 - 134,961)	101,941 (77,959 - 132,000)	0.981 (0.960 - 1.000)	103,094 (78,707 - 133,327)	0.992 (0.972 - 1.010)
	2085 (50 years)	162,157 (118,138 - 217,121)	157,792 (115,138 - 212,225)	0.974 (0.953 - 0.997)	160,237 (116,563 - 215,266)	0.989 (0.968 - 1.010)
	2095 (60 years)	217,776 (155,128 - 298,284)	211,052 (150,412 - 289,304)	0.970 (0.949 - 0.993)	214,839 (153,178 - 294,683)	0.987 (0.965 - 1.010)
Hoy SPA	2035 (reference)	20,883 (17,927 - 24,133)	20,831 (17,875 - 24,026)	0.997 (0.975 - 1.020)	20,868 (17,900 - 24,025)	0.999 (0.976 - 1.020)
	2060 (25 years)	43,871 (33,700 - 56,013)	43,239 (33,134 - 55,265)	0.986 (0.957 - 1.010)	43,549 (33,482 - 55,733)	0.994 (0.965 - 1.020)
	2070 (35 years)	58,817 (43,849 - 77,156)	57,670 (43,066 - 75,607)	0.981 (0.951 - 1.010)	58,281 (43,416 - 76,452)	0.992 (0.962 - 1.020)
	2085 (50 years)	91,916 (65,634 - 125,735)	89,403 (63,824 - 122,049)	0.974 (0.942 - 1.010)	90,743 (64,962 - 124,342)	0.989 (0.958 - 1.020)
	2095 (60 years)	123,512 (86,753 - 171,906)	119,929 (84,150 - 166,990)	0.970 (0.939 - 1.000)	121,997 (85,398 - 170,124)	0.987 (0.956 - 1.020)
Marwick Head SPA	2035 (reference)	18,064 (15,623 - 20,678)	18,030 (15,617 - 20,699)	0.998 (0.979 - 1.020)	18,039 (15,622 - 20,714)	0.999 (0.981 - 1.020)
	2060 (25 years)	37,991 (30,007 - 47,678)	37,680 (29,688 - 47,219)	0.990 (0.965 - 1.020)	37,889 (29,866 - 47,384)	0.996 (0.969 - 1.020)
	2070 (35 years)	50,890 (39,052 - 65,945)	50,303 (38,513 - 65,094)	0.988 (0.959 - 1.020)	50,641 (38,748 - 65,563)	0.995 (0.966 - 1.020)

Population	Year	Baseline	Higher Scenario		Lower Scenario	
		Unimpacted population size	Impacted population size	Counterfactual population size	Impacted population size	Counterfactual population size
	2085 (50 years)	79,476 (58,195 - 107,100)	78,227 (57,214 - 104,872)	0.983 (0.953 - 1.010)	78,982 (57,795 - 106,485)	0.993 (0.963 - 1.020)
	2095 (60 years)	106,827 (76,572 - 147,918)	104,764 (75,107 - 145,358)	0.981 (0.950 - 1.010)	105,984 (75,992 - 147,110)	0.992 (0.961 - 1.020)
Rousay SPA	2035 (reference)	13,004 (11,173 - 14,955)	12,972 (11,159 - 14,877)	0.998 (0.972 - 1.030)	12,976 (11,172 - 14,911)	0.999 (0.973 - 1.030)
	2060 (25 years)	27,181 (21,039 - 34,614)	26,879 (20,744 - 34,226)	0.989 (0.955 - 1.030)	27,084 (20,947 - 34,396)	0.995 (0.960 - 1.030)
	2070 (35 years)	36,454 (27,405 - 47,921)	35,924 (27,043 - 47,090)	0.985 (0.949 - 1.020)	36,241 (27,172 - 47,423)	0.994 (0.956 - 1.030)
	2085 (50 years)	56,990 (41,251 - 77,420)	55,977 (40,442 - 75,718)	0.979 (0.942 - 1.020)	56,580 (40,993 - 76,750)	0.991 (0.953 - 1.030)
	2095 (60 years)	76,665 (54,437 - 106,220)	74,907 (52,967 - 103,520)	0.976 (0.938 - 1.020)	75,952 (53,471 - 105,238)	0.990 (0.950 - 1.030)
Sumburgh Head SPA	2035 (reference)	5,511 (4,704 - 6,375)	5,500 (4,704 - 6,348)	0.998 (0.962 - 1.040)	5,509 (4,695 - 6,373)	0.999 (0.963 - 1.040)
	2060 (25 years)	11,576 (8,993 - 14,684)	11,471 (8,952 - 14,569)	0.991 (0.940 - 1.040)	11,520 (8,962 - 14,678)	0.996 (0.946 - 1.050)
	2070 (35 years)	15,558 (11,803 - 20,174)	15,385 (11,754 - 19,987)	0.988 (0.934 - 1.050)	15,510 (11,802 - 20,122)	0.995 (0.941 - 1.050)
	2085 (50 years)	24,240 (17,617 - 32,825)	23,871 (17,460 - 32,195)	0.983 (0.929 - 1.050)	24,089 (17,527 - 32,426)	0.992 (0.937 - 1.050)
	2095 (60 years)	32,703 (23,210 - 45,064)	32,003 (22,894 - 44,191)	0.981 (0.925 - 1.040)	32,359 (23,018 - 44,369)	0.992 (0.934 - 1.050)
Troup, Pennan and Lion's Heads SPA	2035 (reference)	67,310 (58,314 - 77,215)	66,879 (57,894 - 76,804)	0.994 (0.985 - 1.000)	67,142 (58,144 - 76,981)	0.997 (0.988 - 1.010)
	2060 (25 years)	141,784 (111,967 - 177,730)	137,323 (108,267 - 172,268)	0.970 (0.955 - 0.984)	139,772 (110,335 - 175,019)	0.987 (0.973 - 1.000)

Population	Year	Baseline	Higher Scenario		Lower Scenario	
		Unimpacted population size	Impacted population size	Counterfactual population size	Impacted population size	Counterfactual population size
	2070 (35 years)	189,752 (145,544 - 245,642)	182,150 (139,633 - 236,280)	0.960 (0.945 - 0.975)	186,366 (143,472 - 241,385)	0.982 (0.968 - 0.997)
	2085 (50 years)	296,776 (217,606 - 398,435)	280,263 (205,735 - 376,993)	0.945 (0.930 - 0.961)	289,346 (212,094 - 390,286)	0.976 (0.961 - 0.991)
	2095 (60 years)	398,607 (285,401 - 553,260)	372,960 (267,610 - 516,900)	0.937 (0.921 - 0.952)	387,734 (278,204 - 536,813)	0.972 (0.957 - 0.988)
West Westray SPA	2035 (reference)	57,385 (49,729 - 65,932)	57,303 (49,593 - 65,697)	0.998 (0.988 - 1.010)	57,335 (49,673 - 65,745)	0.999 (0.989 - 1.010)
	2060 (25 years)	120,719 (95,417 - 151,500)	119,734 (94,284 - 149,859)	0.991 (0.976 - 1.010)	120,287 (95,058 - 151,074)	0.996 (0.982 - 1.010)
	2070 (35 years)	161,694 (124,183 - 209,064)	159,851 (122,598 - 206,715)	0.989 (0.973 - 1.000)	161,005 (123,460 - 208,281)	0.995 (0.979 - 1.010)
	2085 (50 years)	252,795 (185,656 - 340,508)	249,178 (182,492 - 334,191)	0.984 (0.968 - 1.000)	251,379 (184,170 - 337,588)	0.993 (0.977 - 1.010)
	2095 (60 years)	339,599 (242,875 - 471,216)	333,411 (238,822 - 462,875)	0.982 (0.965 - 0.999)	337,228 (241,103 - 466,615)	0.992 (0.975 - 1.010)
Regional	2035 (reference)	296,139 (256,582 - 339,789)	294,047 (255,035 - 337,472)	0.993 (0.989 - 0.998)	295,215 (255,776 - 338,581)	0.996 (0.992 - 1.000)
	2060 (25 years)	623,627 (492,894 - 782,223)	597,289 (472,323 - 748,471)	0.958 (0.951 - 0.965)	609,521 (481,327 - 764,420)	0.978 (0.971 - 0.984)
	2070 (35 years)	835,374 (641,546 - 1,080,516)	788,106 (606,381 - 1,021,071)	0.944 (0.937 - 0.951)	809,907 (623,439 - 1,049,408)	0.970 (0.963 - 0.977)
	2085 (50 years)	1,306,183 (958,520 - 1,750,375)	1,206,353 (884,753 - 1,617,755)	0.924 (0.917 - 0.932)	1,251,860 (919,532 - 1,679,421)	0.959 (0.952 - 0.967)

Population	Year	Baseline	Higher Scenario		Lower Scenario	
		Unimpacted population size	Impacted population size	Counterfactual population size	Impacted population size	Counterfactual population size
	2095 (60 years)	1,753,964 (1,258,498 - 2,427,477)	1,598,023 (1,146,734 - 2,213,120)	0.912 (0.904 - 0.919)	1,670,417 (1,196,643 - 2,314,955)	0.953 (0.945 - 0.960)

Table A-2. Simulated growth rates and counterfactual growth rates for guillemot Proposed Offshore Development only impacts including construction period. Values are median values with 95% confidence intervals in brackets.

Population	Year	Baseline	Higher Scenario		Lower Scenario	
		Unimpacted population growth rate	Impacted population growth rate	Counterfactual population growth rate	Impacted population growth rate	Counterfactual population growth rate
Buchan Ness to Collieston Coast SPA	2060 (25 years)	1.030 (1.023 - 1.037)	1.029 (1.022 - 1.037)	0.999 (0.999 - 1.000)	1.030 (1.022 - 1.037)	1.000 (0.999 - 1.000)
	2070 (35 years)	1.030 (1.024 - 1.036)	1.029 (1.023 - 1.036)	0.999 (0.999 - 1.000)	1.030 (1.023 - 1.036)	1.000 (0.999 - 1.000)
	2085 (50 years)	1.030 (1.024 - 1.036)	1.029 (1.024 - 1.035)	0.999 (0.999 - 0.999)	1.030 (1.024 - 1.035)	1.000 (0.999 - 1.000)
	2095 (60 years)	1.030 (1.025 - 1.035)	1.029 (1.024 - 1.034)	0.999 (0.999 - 0.999)	1.030 (1.025 - 1.035)	1.000 (0.999 - 1.000)
Calf of Eday SPA	2060 (25 years)	1.030 (1.022 - 1.038)	1.030 (1.022 - 1.037)	1.000 (0.999 - 1.000)	1.030 (1.022 - 1.037)	1.000 (0.999 - 1.000)
	2070 (35 years)	1.030 (1.023 - 1.036)	1.030 (1.023 - 1.036)	1.000 (0.999 - 1.000)	1.030 (1.023 - 1.036)	1.000 (0.999 - 1.000)
	2085 (50 years)	1.030 (1.024 - 1.035)	1.030 (1.024 - 1.035)	1.000 (0.999 - 1.000)	1.030 (1.024 - 1.035)	1.000 (0.999 - 1.000)
	2095 (60 years)	1.030 (1.025 - 1.035)	1.030 (1.024 - 1.035)	1.000 (0.999 - 1.000)	1.030 (1.025 - 1.035)	1.000 (0.999 - 1.000)
Copinsay SPA	2060 (25 years)	1.030 (1.023 - 1.037)	1.029 (1.022 - 1.037)	0.999 (0.998 - 1.000)	1.030 (1.022 - 1.037)	1.000 (0.999 - 1.000)
	2070 (35 years)	1.030 (1.023 - 1.036)	1.029 (1.023 - 1.035)	0.999 (0.998 - 1.000)	1.030 (1.023 - 1.036)	1.000 (0.999 - 1.000)

Population	Year	Baseline	Higher Scenario		Lower Scenario	
		Unimpacted population growth rate	Impacted population growth rate	Counterfactual population growth rate	Impacted population growth rate	Counterfactual population growth rate
	2085 (50 years)	1.030 (1.024 - 1.035)	1.029 (1.024 - 1.035)	0.999 (0.999 - 1.000)	1.030 (1.024 - 1.035)	1.000 (0.999 - 1.000)
	2095 (60 years)	1.030 (1.025 - 1.035)	1.029 (1.024 - 1.034)	0.999 (0.999 - 1.000)	1.030 (1.025 - 1.035)	1.000 (0.999 - 1.000)
Fair Isle SPA	2060 (25 years)	1.030 (1.022 - 1.037)	1.030 (1.022 - 1.037)	1.000 (0.999 - 1.000)	1.030 (1.022 - 1.037)	1.000 (0.999 - 1.000)
	2070 (35 years)	1.030 (1.024 - 1.036)	1.030 (1.023 - 1.036)	1.000 (0.999 - 1.000)	1.030 (1.023 - 1.036)	1.000 (0.999 - 1.000)
	2085 (50 years)	1.030 (1.024 - 1.035)	1.030 (1.024 - 1.035)	1.000 (0.999 - 1.000)	1.030 (1.024 - 1.035)	1.000 (0.999 - 1.000)
	2095 (60 years)	1.030 (1.025 - 1.035)	1.030 (1.025 - 1.034)	1.000 (0.999 - 1.000)	1.030 (1.025 - 1.035)	1.000 (0.999 - 1.000)
Hoy SPA	2060 (25 years)	1.030 (1.022 - 1.038)	1.030 (1.022 - 1.037)	1.000 (0.999 - 1.000)	1.030 (1.022 - 1.037)	1.000 (0.999 - 1.000)
	2070 (35 years)	1.030 (1.023 - 1.037)	1.030 (1.023 - 1.036)	1.000 (0.999 - 1.000)	1.030 (1.023 - 1.036)	1.000 (0.999 - 1.000)
	2085 (50 years)	1.030 (1.024 - 1.036)	1.030 (1.024 - 1.035)	1.000 (0.999 - 1.000)	1.030 (1.024 - 1.035)	1.000 (0.999 - 1.000)
	2095 (60 years)	1.030 (1.025 - 1.035)	1.030 (1.024 - 1.035)	1.000 (0.999 - 1.000)	1.030 (1.025 - 1.035)	1.000 (0.999 - 1.000)
Marwick Head SPA	2060 (25 years)	1.030 (1.023 - 1.037)	1.030 (1.022 - 1.037)	1.000 (0.999 - 1.000)	1.030 (1.023 - 1.037)	1.000 (0.999 - 1.000)
	2070 (35 years)	1.030 (1.024 - 1.036)	1.030 (1.023 - 1.036)	1.000 (0.999 - 1.000)	1.030 (1.023 - 1.036)	1.000 (0.999 - 1.000)
	2085 (50 years)	1.030 (1.024 - 1.036)	1.030 (1.024 - 1.035)	1.000 (0.999 - 1.000)	1.030 (1.024 - 1.035)	1.000 (0.999 - 1.000)
	2095 (60 years)	1.030 (1.025 - 1.035)	1.030 (1.025 - 1.035)	1.000 (0.999 - 1.000)	1.030 (1.025 - 1.035)	1.000 (0.999 - 1.000)
Rousay SPA	2060 (25 years)	1.030 (1.022 - 1.038)	1.030 (1.022 - 1.037)	1.000 (0.999 - 1.000)	1.030 (1.022 - 1.037)	1.000 (0.999 - 1.000)

Population	Year	Baseline	Higher Scenario		Lower Scenario	
		Unimpacted population growth rate	Impacted population growth rate	Counterfactual population growth rate	Impacted population growth rate	Counterfactual population growth rate
	2070 (35 years)	1.030 (1.023 - 1.036)	1.030 (1.023 - 1.036)	1.000 (0.999 - 1.000)	1.030 (1.023 - 1.036)	1.000 (0.999 - 1.000)
	2085 (50 years)	1.030 (1.024 - 1.035)	1.030 (1.024 - 1.035)	1.000 (0.999 - 1.000)	1.030 (1.024 - 1.035)	1.000 (0.999 - 1.000)
	2095 (60 years)	1.030 (1.025 - 1.035)	1.030 (1.024 - 1.035)	1.000 (0.999 - 1.000)	1.030 (1.025 - 1.035)	1.000 (0.999 - 1.000)
Sumburgh Head SPA	2060 (25 years)	1.030 (1.022 - 1.037)	1.030 (1.022 - 1.037)	1.000 (0.998 - 1.000)	1.030 (1.022 - 1.037)	1.000 (0.998 - 1.000)
	2070 (35 years)	1.030 (1.024 - 1.036)	1.030 (1.023 - 1.036)	1.000 (0.998 - 1.000)	1.030 (1.023 - 1.036)	1.000 (0.999 - 1.000)
	2085 (50 years)	1.030 (1.024 - 1.035)	1.030 (1.024 - 1.035)	1.000 (0.999 - 1.000)	1.030 (1.024 - 1.035)	1.000 (0.999 - 1.000)
	2095 (60 years)	1.030 (1.025 - 1.035)	1.030 (1.025 - 1.035)	1.000 (0.999 - 1.000)	1.030 (1.025 - 1.035)	1.000 (0.999 - 1.000)
Troup, Pennan and Lion's Heads SPA	2060 (25 years)	1.030 (1.023 - 1.037)	1.029 (1.022 - 1.036)	0.999 (0.999 - 0.999)	1.030 (1.022 - 1.037)	1.000 (0.999 - 1.000)
	2070 (35 years)	1.030 (1.024 - 1.036)	1.029 (1.023 - 1.035)	0.999 (0.999 - 0.999)	1.030 (1.023 - 1.036)	1.000 (0.999 - 1.000)
	2085 (50 years)	1.030 (1.024 - 1.035)	1.029 (1.023 - 1.034)	0.999 (0.999 - 0.999)	1.030 (1.024 - 1.035)	1.000 (0.999 - 1.000)
	2095 (60 years)	1.030 (1.025 - 1.035)	1.029 (1.024 - 1.034)	0.999 (0.999 - 0.999)	1.030 (1.025 - 1.035)	1.000 (0.999 - 1.000)
West Westray SPA	2060 (25 years)	1.030 (1.023 - 1.037)	1.030 (1.022 - 1.037)	1.000 (0.999 - 1.000)	1.030 (1.022 - 1.037)	1.000 (0.999 - 1.000)
	2070 (35 years)	1.030 (1.024 - 1.036)	1.030 (1.023 - 1.036)	1.000 (0.999 - 1.000)	1.030 (1.023 - 1.036)	1.000 (1.000 - 1.000)
	2085 (50 years)	1.030 (1.024 - 1.035)	1.030 (1.024 - 1.035)	1.000 (0.999 - 1.000)	1.030 (1.024 - 1.035)	1.000 (1.000 - 1.000)
	2095 (60 years)	1.030 (1.025 - 1.035)	1.030 (1.025 - 1.035)	1.000 (0.999 - 1.000)	1.030 (1.025 - 1.035)	1.000 (1.000 - 1.000)

Population	Year	Baseline	Higher Scenario		Lower Scenario	
		Unimpacted population growth rate	Impacted population growth rate	Counterfactual population growth rate	Impacted population growth rate	Counterfactual population growth rate
Regional	2060 (25 years)	1.030 (1.023 - 1.038)	1.029 (1.021 - 1.036)	0.999 (0.998 - 0.999)	1.029 (1.022 - 1.037)	0.999 (0.999 - 0.999)
	2070 (35 years)	1.030 (1.024 - 1.036)	1.029 (1.022 - 1.035)	0.999 (0.998 - 0.999)	1.029 (1.023 - 1.036)	0.999 (0.999 - 0.999)
	2085 (50 years)	1.030 (1.024 - 1.035)	1.029 (1.023 - 1.034)	0.999 (0.998 - 0.999)	1.029 (1.024 - 1.035)	0.999 (0.999 - 0.999)
	2095 (60 years)	1.030 (1.025 - 1.035)	1.029 (1.024 - 1.034)	0.999 (0.998 - 0.999)	1.029 (1.024 - 1.034)	0.999 (0.999 - 0.999)

APPENDIX 4.4 – PROJECT ONLY POPULATION TRAJECTORIES PREDICTED FROM PVA MODELLING

A.1 Guillemot – operation only

A.1.1 Buchan Ness to Collieston Coast SPA

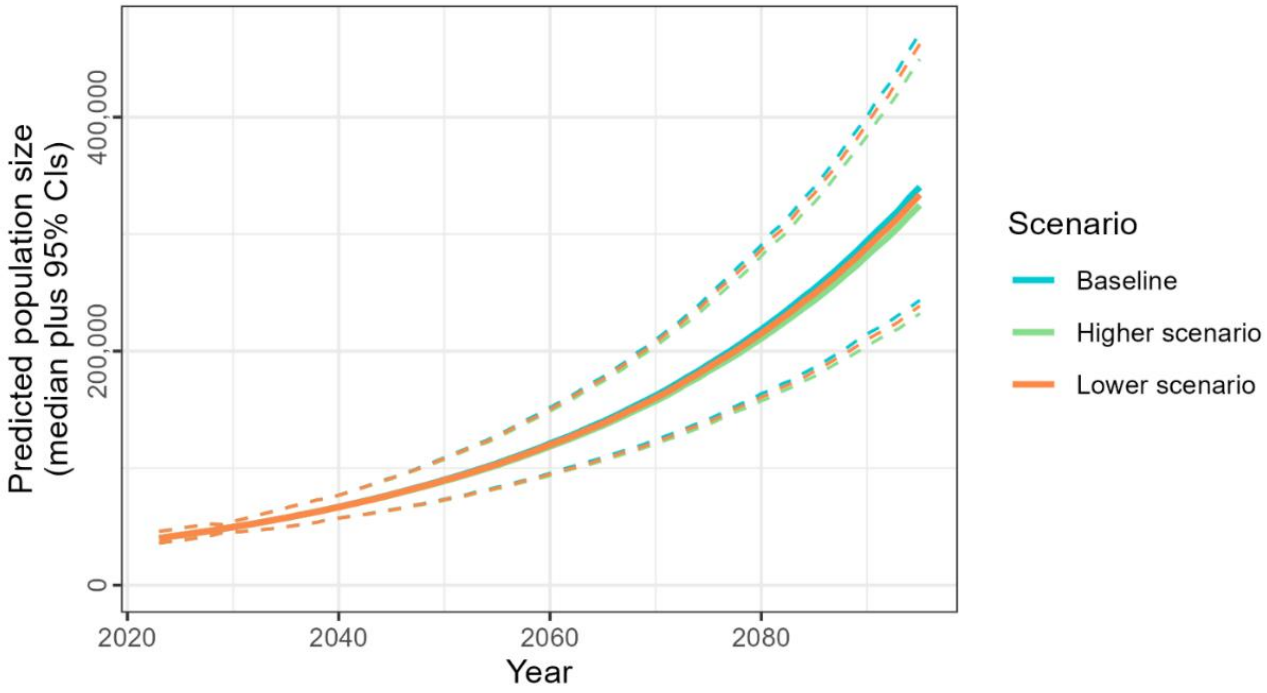

Figure A-1. Median predicted population trajectories (solid line) and 95% confidence intervals (dashed lines) for guillemot at Buchan Ness to Collieston Coast SPA. Population sizes represent breeding adults.

Source: Recreated from outputs from the NEPVA tool.

A.1.2 Calf of Eday SPA

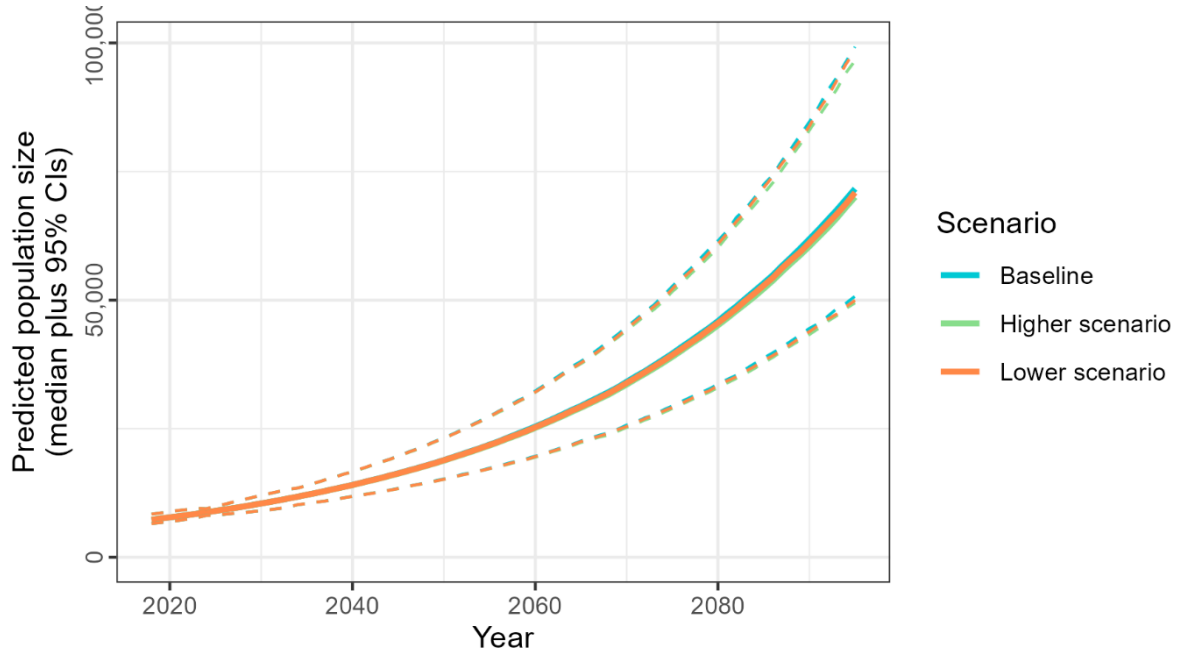

Figure A-2. Median predicted population trajectories (solid line) and 95% confidence intervals (dashed lines) for guillemot at Calf of Eday SPA. Population sizes represent breeding adults.

Source: Recreated from outputs from the NEPVA tool.

A.1.3 Copinsay SPA

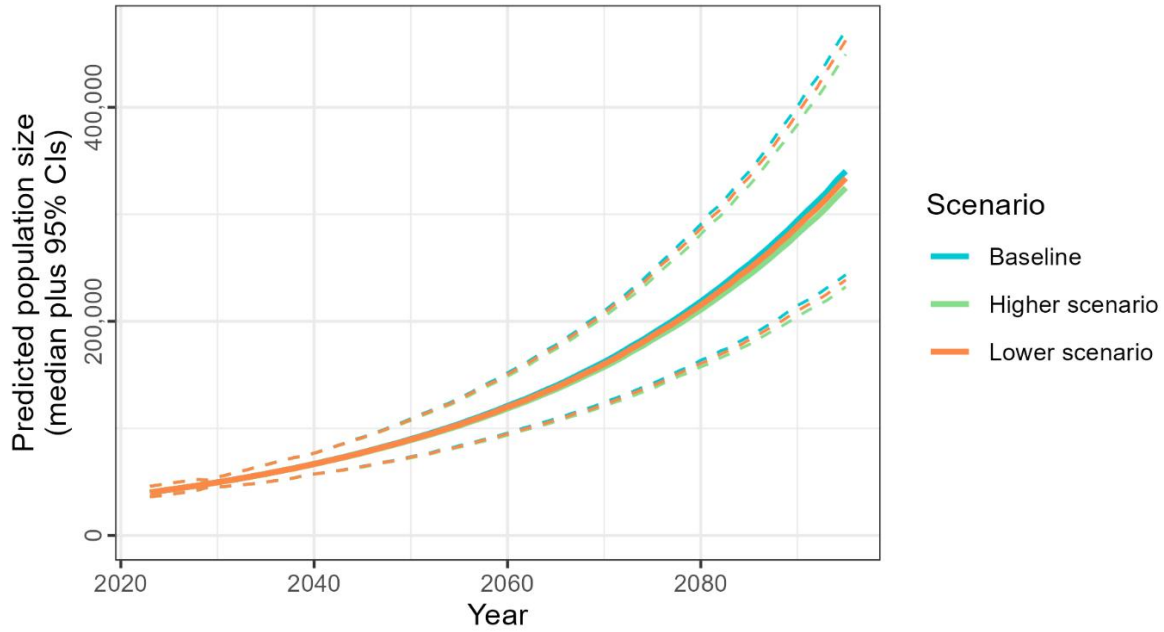

Figure A-3. Median predicted population trajectories (solid line) and 95% confidence intervals (dashed lines) for guillemot at Copinsay SPA. Population sizes represent breeding adults.

Source: Recreated from outputs from the NEPVA tool.

A.1.4 Fair Isle SPA

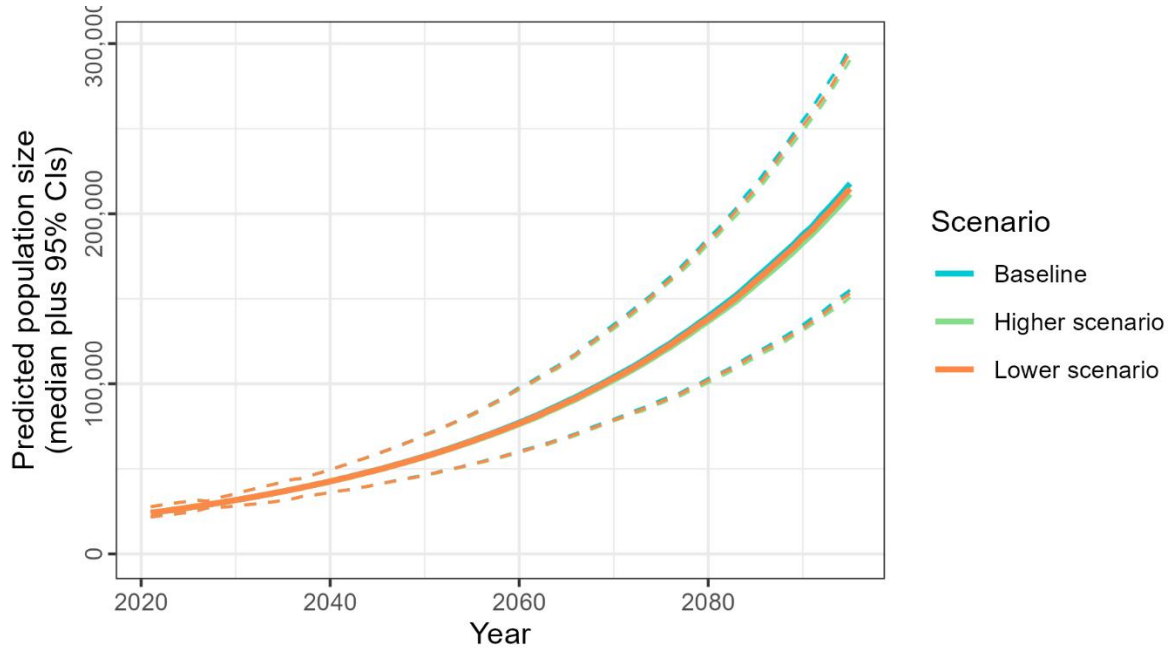

Figure A-4. Median predicted population trajectories (solid line) and 95% confidence intervals (dashed lines) for guillemot at Fair Isle SPA. Population sizes represent breeding adults.

Source: Recreated from outputs from the NEPVA tool.

A.1.5 Hoy SPA

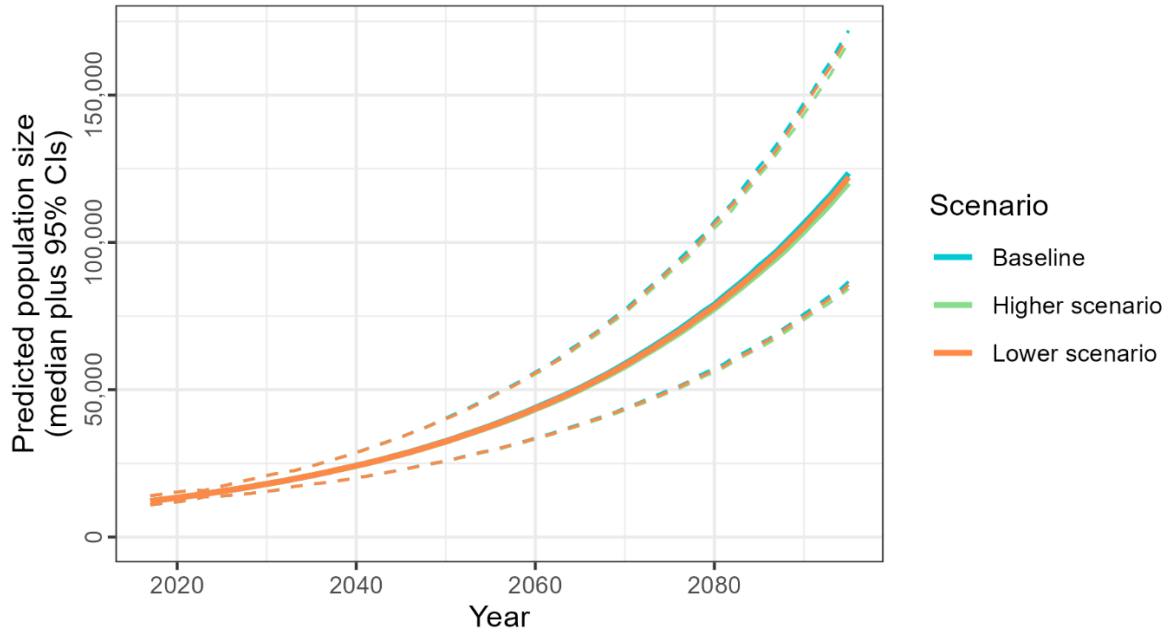

Figure A-5. Median predicted population trajectories (solid line) and 95% confidence intervals (dashed lines) for guillemot at Hoy SPA. Population sizes represent breeding adults.

Source: Recreated from outputs from the NEPVA tool.

A.1.6 Marwick Head SPA

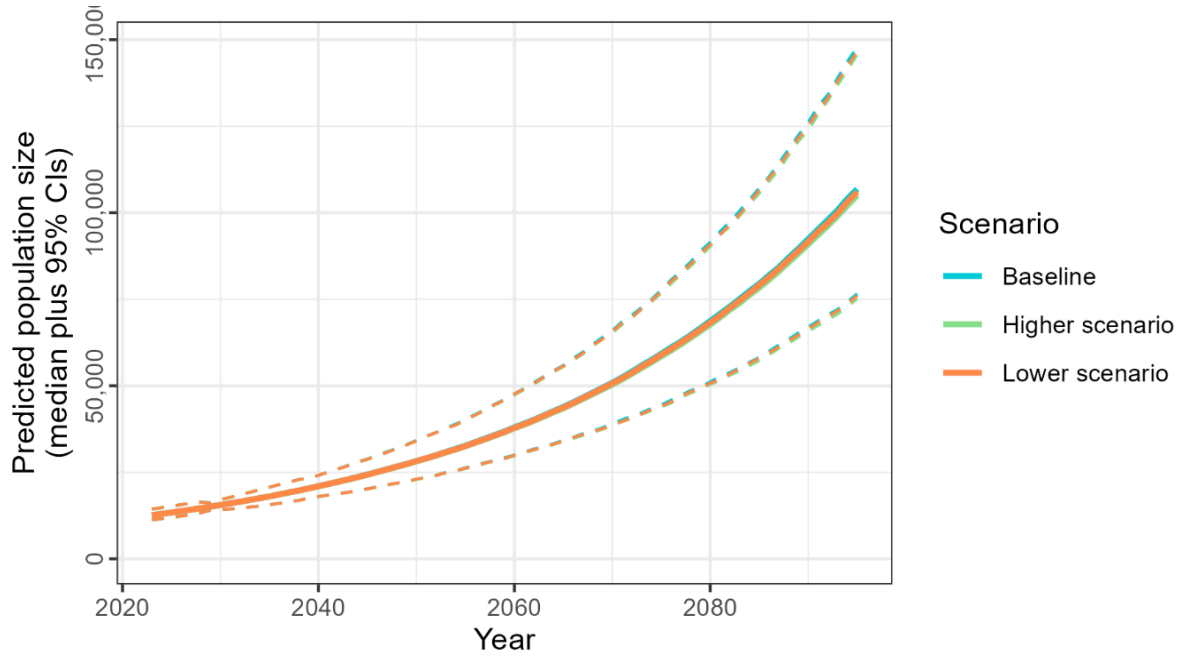

Figure A-6. Median predicted population trajectories (solid line) and 95% confidence intervals (dashed lines) for guillemot at Marwick Head SPA. Population sizes represent breeding adults.

Source: Recreated from outputs from the NEPVA tool.

A.1.7 Rousay SPA

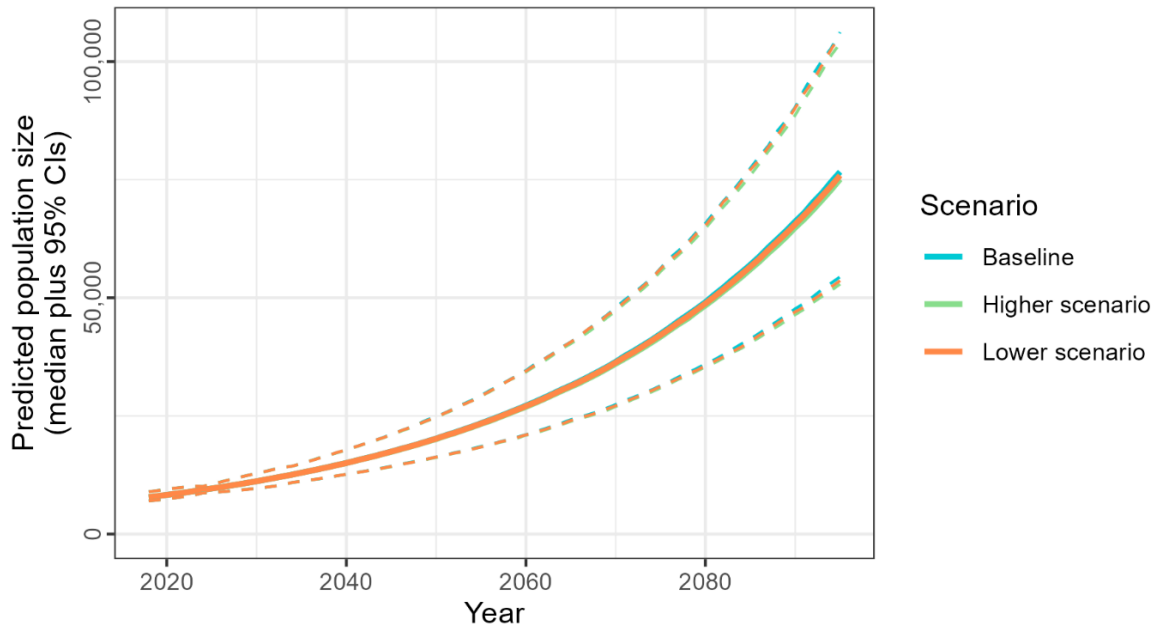

Figure A-7. Median predicted population trajectories (solid line) and 95% confidence intervals (dashed lines) for guillemot at Rousay SPA. Population sizes represent breeding adults.

Source: Recreated from outputs from the NEPVA tool.

A.1.8 Sumburgh Head SPA

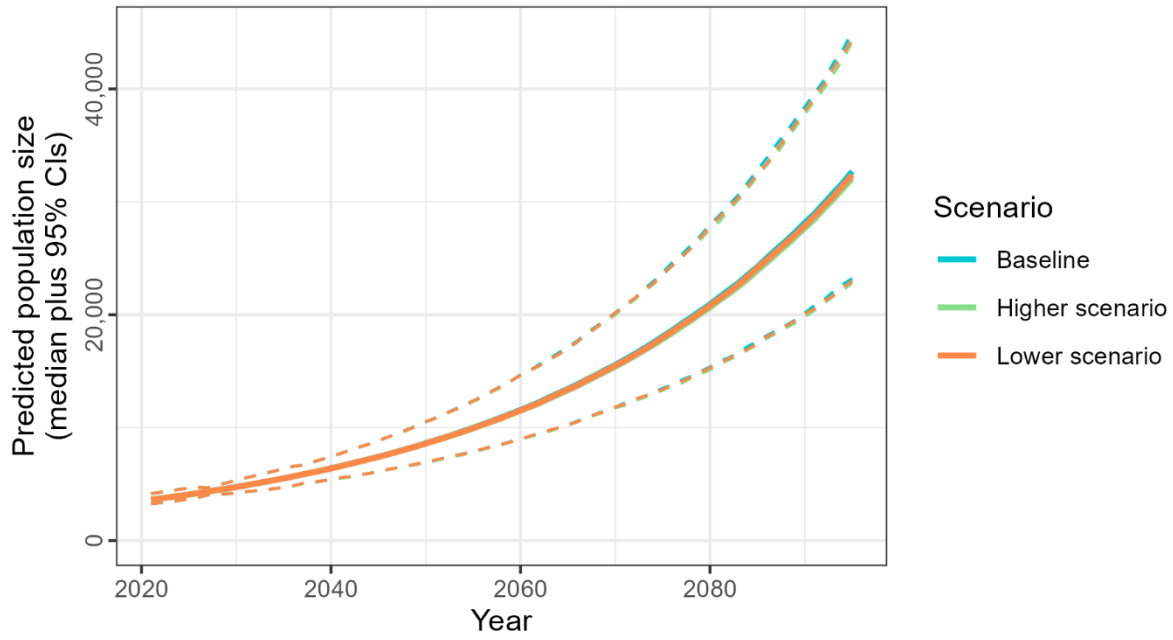

Figure A-8. Median predicted population trajectories (solid line) and 95% confidence intervals (dashed lines) for guillemot at Sumburgh Head SPA. Population sizes represent breeding adults.

Source: Recreated from outputs from the NEPVA tool.

A.1.9 Troup, Pennan and Lion's Heads SPA

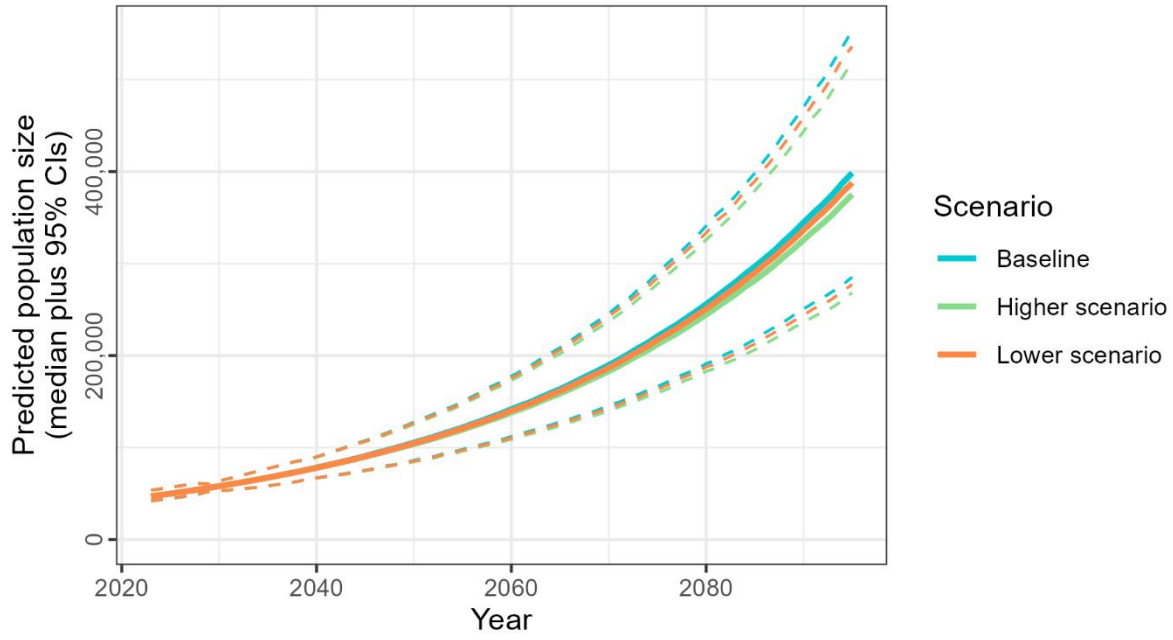

Figure A-9. Median predicted population trajectories (solid line) and 95% confidence intervals (dashed lines) for guillemot at Troup, Pennan and Lion's Heads SPA. Population sizes represent breeding adults.

Source: Recreated from outputs from the NEPVA tool.

A.1.10 West Westray SPA

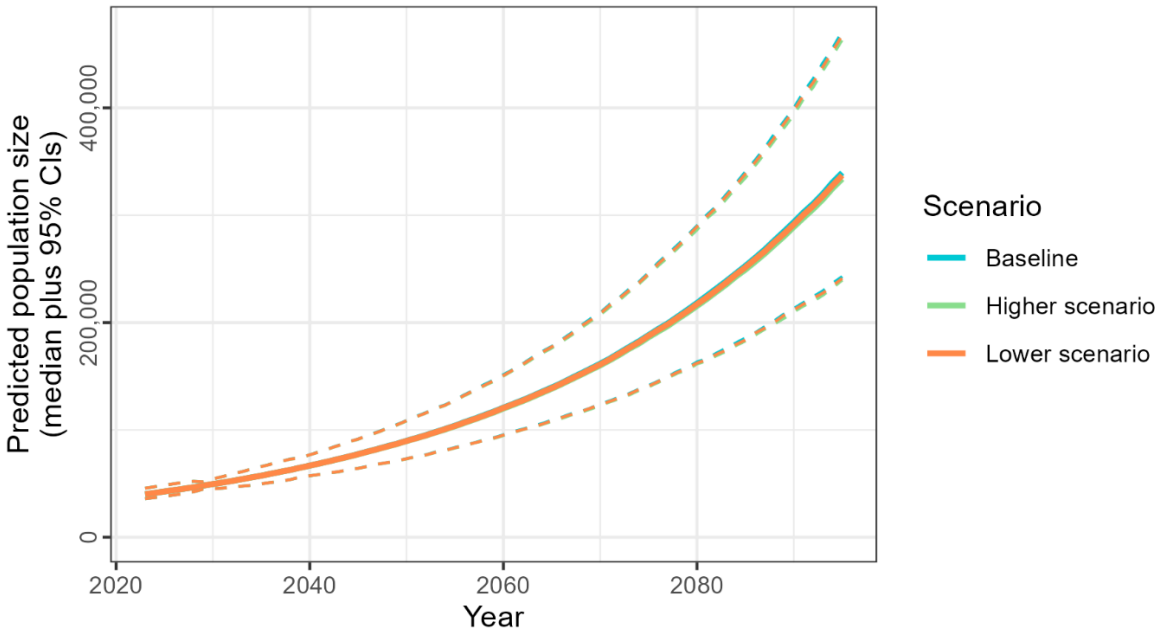

Figure A-10. Median predicted population trajectories (solid line) and 95% confidence intervals (dashed lines) for guillemot at West Westray SPA. Population sizes represent breeding adults.

Source: Recreated from outputs from the NEPVA tool.

A.1.11 Regional Population

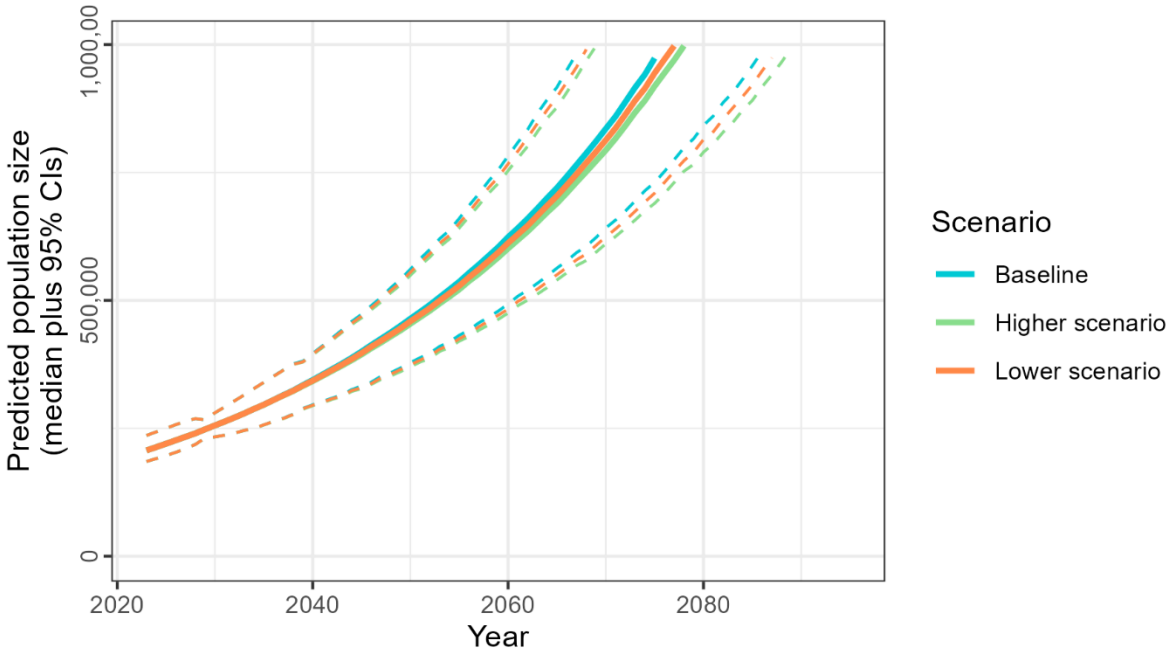

Figure A-11. Median predicted population trajectories (solid line) and 95% confidence intervals (dashed lines) for guillemot regional population. Population sizes represent breeding adults.

Source: Recreated from outputs from the NEPVA tool.

A.2 Guillemot – construction and operation

A.2.1 Buchan Ness to Collieston Coast SPA

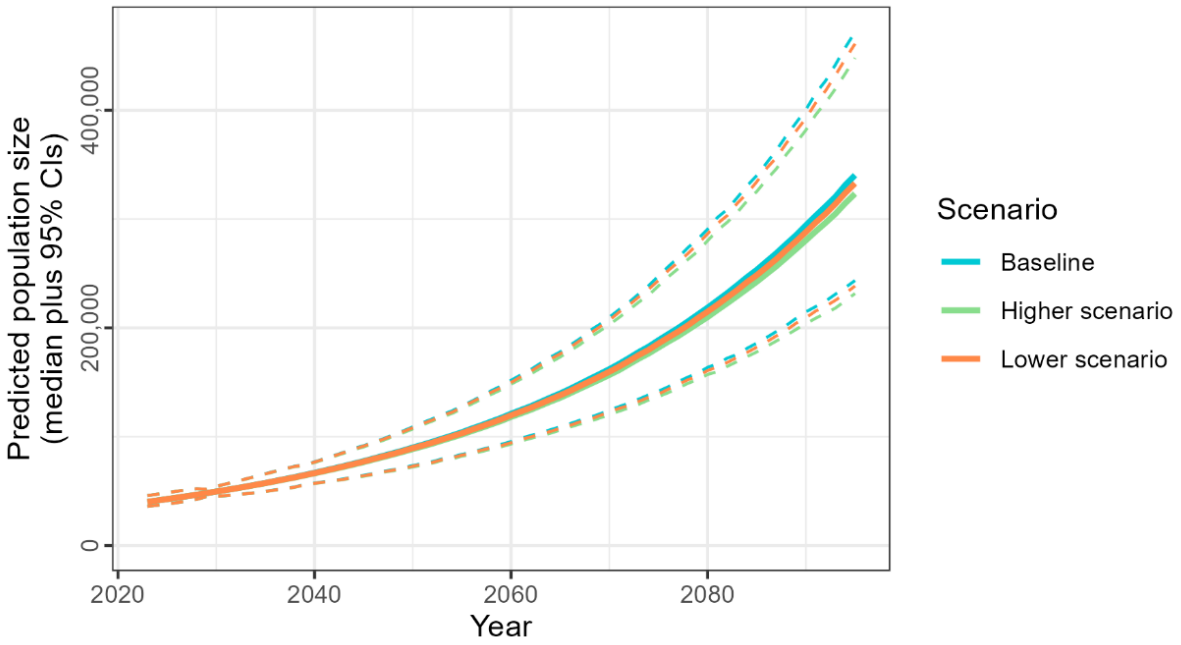

Figure A-12. Median predicted population trajectories (solid line) and 95% confidence intervals (dashed lines) for guillemot at Buchan Ness to Collieston Coast SPA including impacts during construction. Population sizes represent breeding adults.

Source: Recreated from outputs from the NEPVA tool.

A.2.2 Calf of Eday SPA

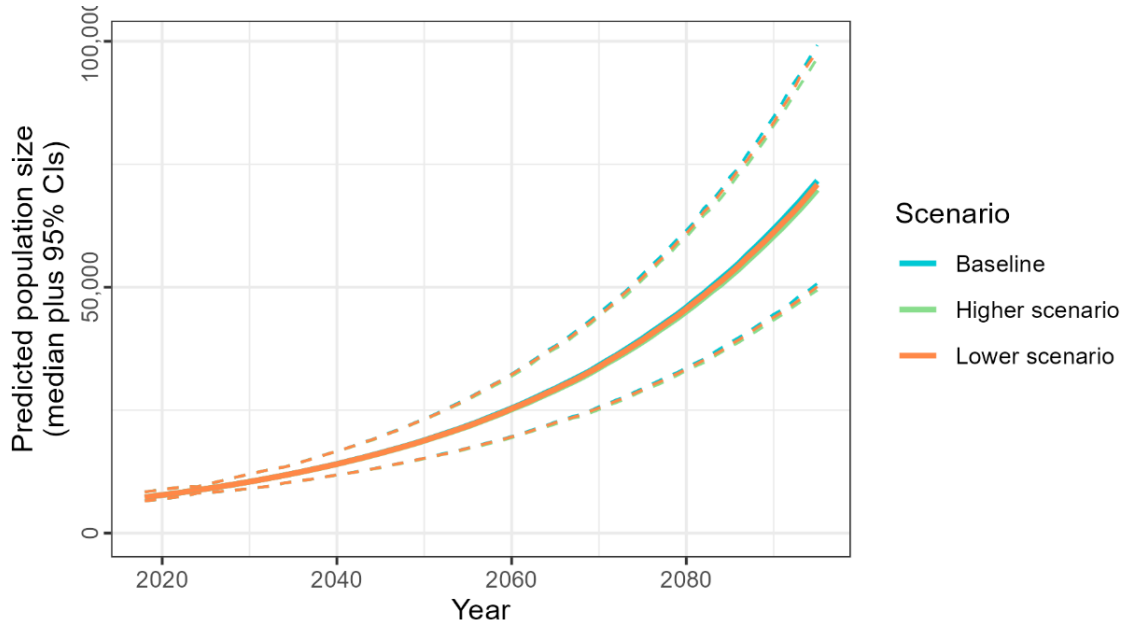

Figure A-13. Median predicted population trajectories (solid line) and 95% confidence intervals (dashed lines) for guillemot at Calf of Eday SPA including impacts during construction. Population sizes represent breeding adults.

Source: Recreated from outputs from the NEPVA tool.

A.2.3 Copinsay SPA

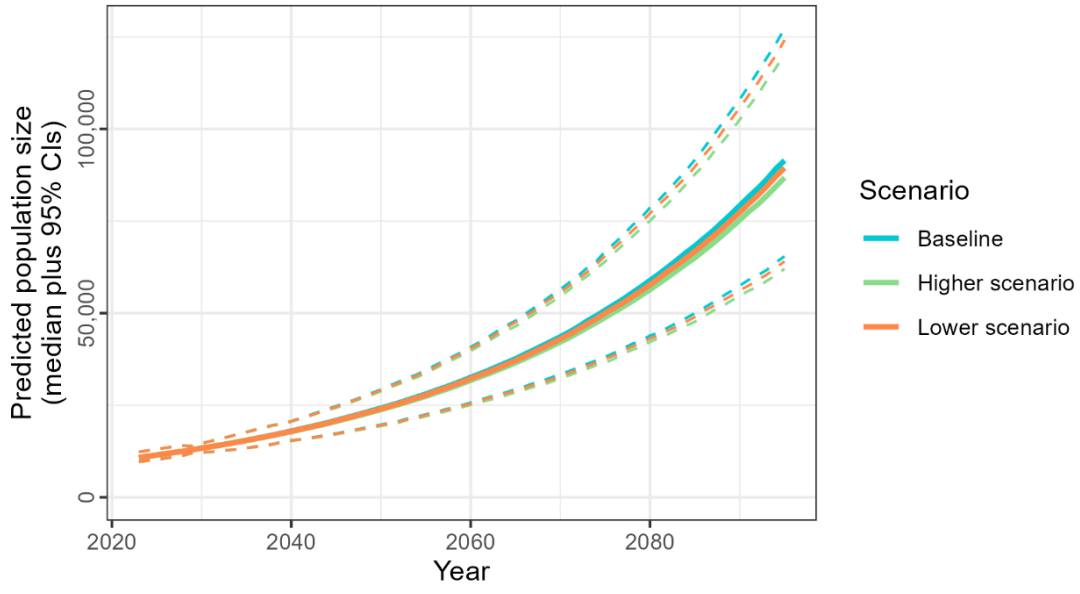

Figure A-14. Median predicted population trajectories (solid line) and 95% confidence intervals (dashed lines) for guillemot at Copinsay SPA including impacts during construction. Population sizes represent breeding adults.

Source: Recreated from outputs from the NEPVA tool.

A.2.4 Fair Isle SPA

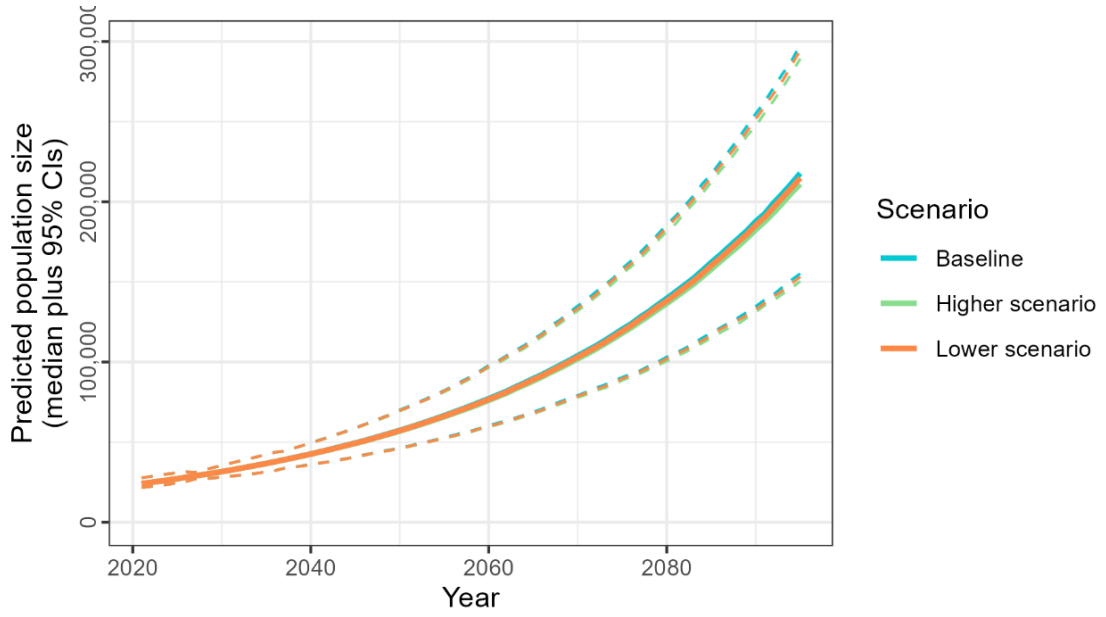

Figure A-15. Median predicted population trajectories (solid line) and 95% confidence intervals (dashed lines) for guillemot at Fair Isle SPA including impacts during construction. Population sizes represent breeding adults.

Source: Recreated from outputs from the NEPVA tool.

A.2.5 Hoy SPA

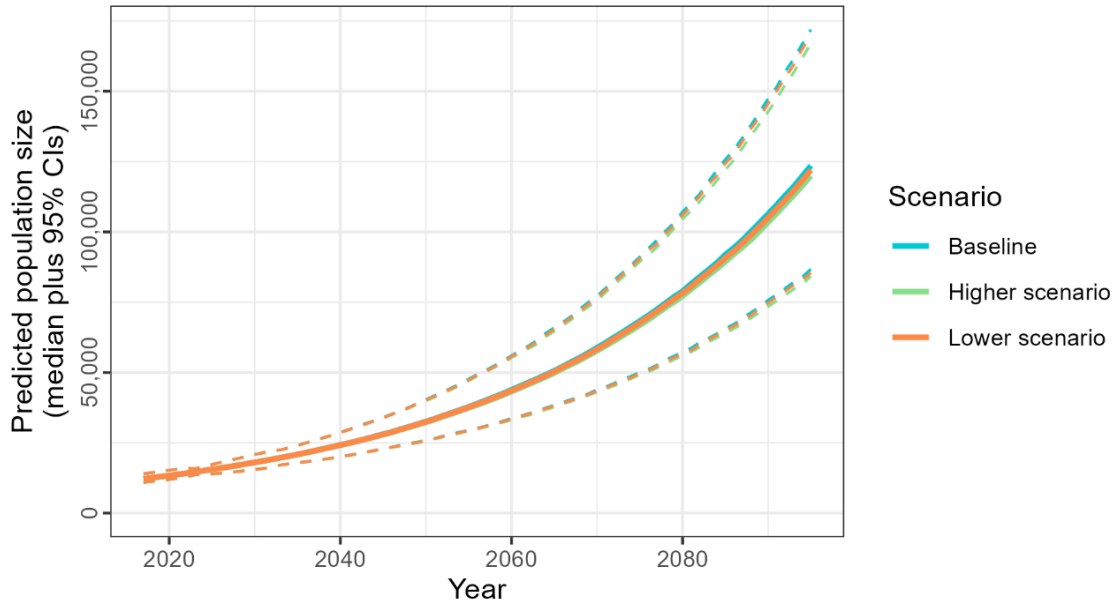

Figure A-16. Median predicted population trajectories (solid line) and 95% confidence intervals (dashed lines) for guillemot at Hoy SPA including impacts during construction. Population sizes represent breeding adults.

Source: Recreated from outputs from the NEPVA tool.

A.2.6 Marwick Head SPA

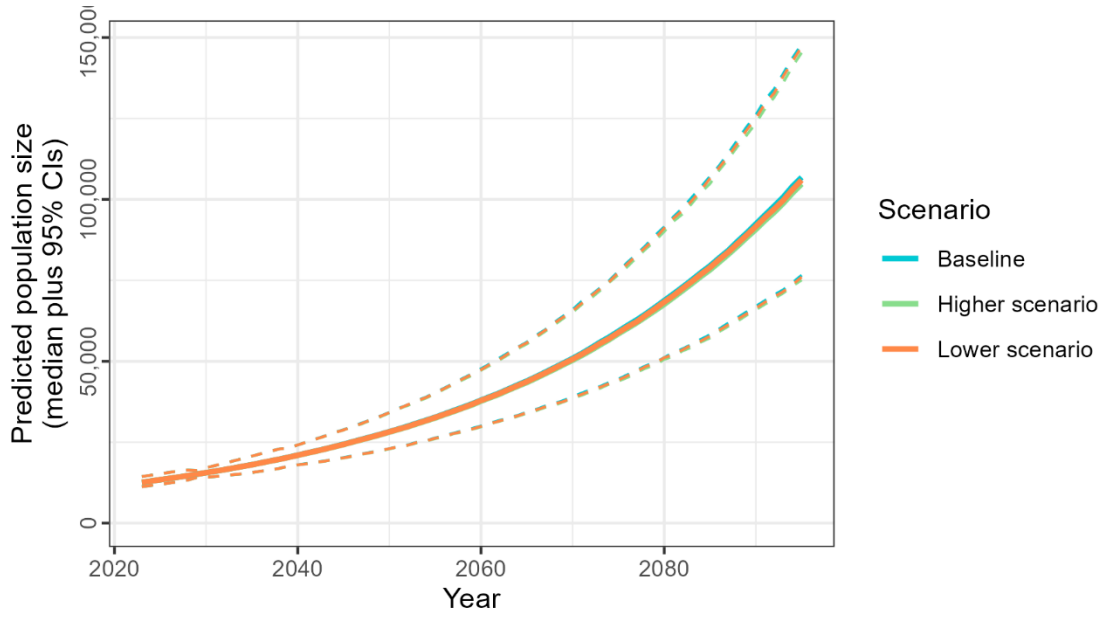

Figure A-17. Median predicted population trajectories (solid line) and 95% confidence intervals (dashed lines) for guillemot at Marwick Head SPA including impacts during construction. Population sizes represent breeding adults.

Source: Recreated from outputs from the NEPVA tool.

A.2.7 Rousay SPA

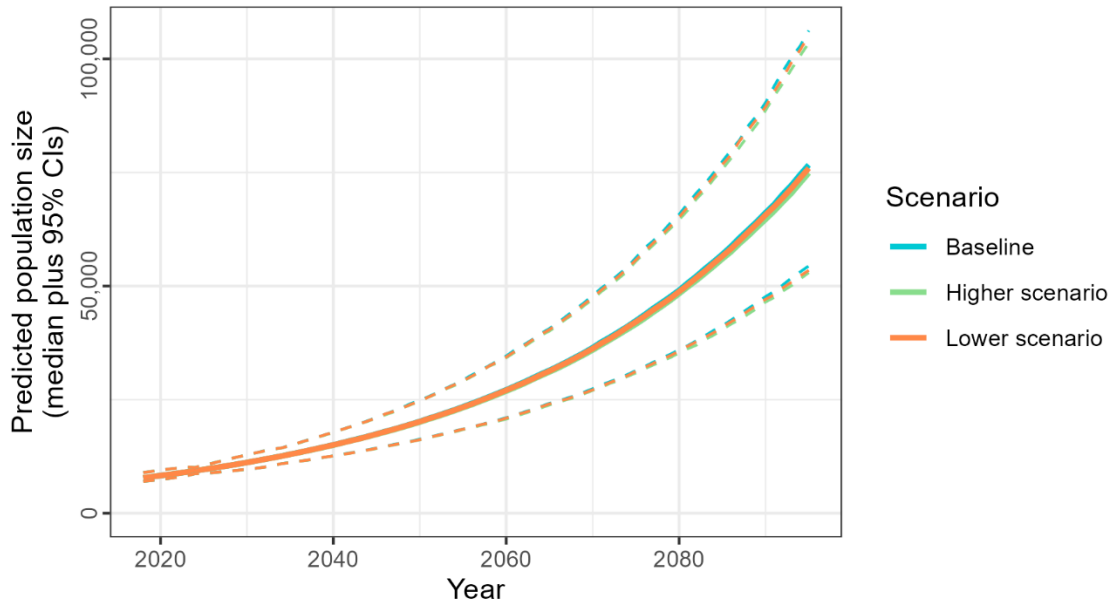

Figure A-18. Median predicted population trajectories (solid line) and 95% confidence intervals (dashed lines) for guillemot at Rousay SPA including impacts during construction. Population sizes represent breeding adults.

Source: Recreated from outputs from the NEPVA tool.

A.2.8 Sumburgh Head SPA

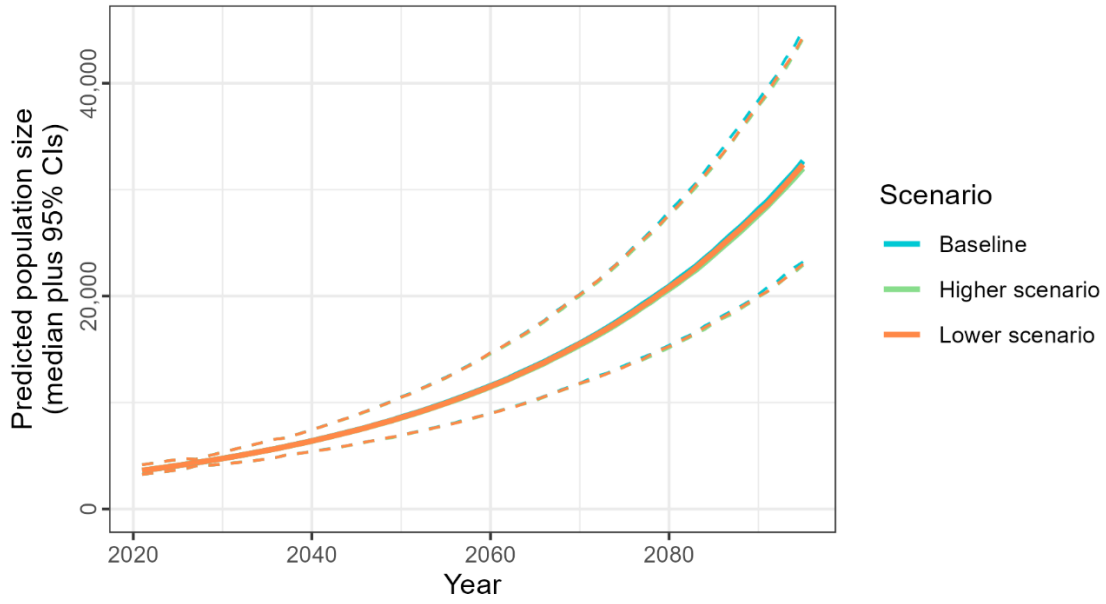

Figure A-19. Median predicted population trajectories (solid line) and 95% confidence intervals (dashed lines) for guillemot at Sumburgh Head SPA including impacts during construction. Population sizes represent breeding adults.

Source: Recreated from outputs from the NEPVA tool.

A.2.9 Troup, Pennan and Lion's Heads SPA

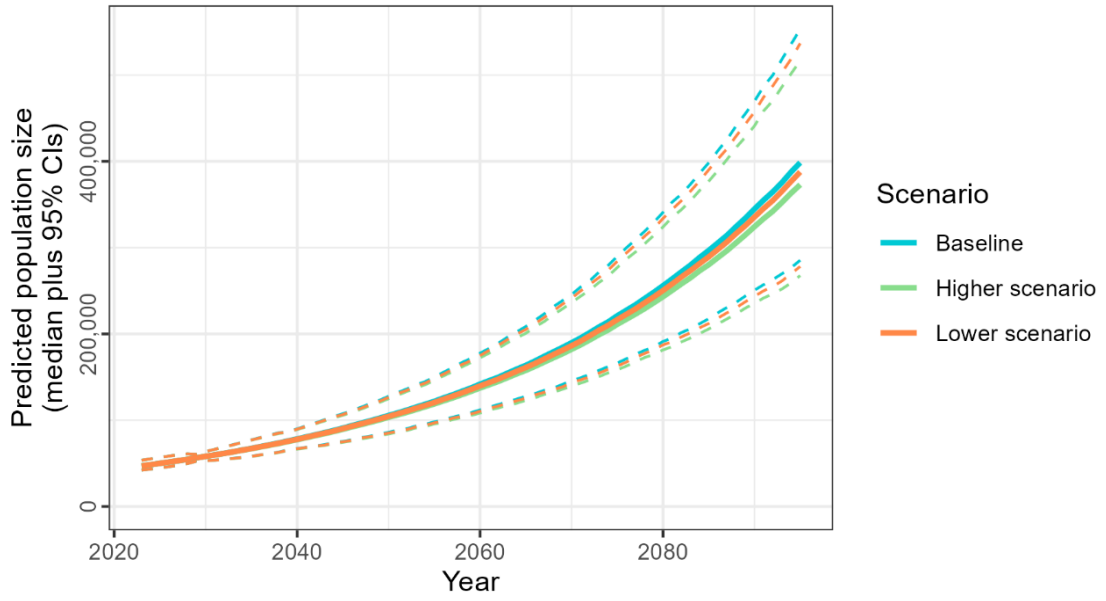

Figure A-20. Median predicted population trajectories (solid line) and 95% confidence intervals (dashed lines) for guillemot at Troup, Pennan and Lion's Heads SPA including impacts during construction. Population sizes represent breeding adults.

Source: Recreated from outputs from the NEPVA tool.

A.2.10 West Westray SPA

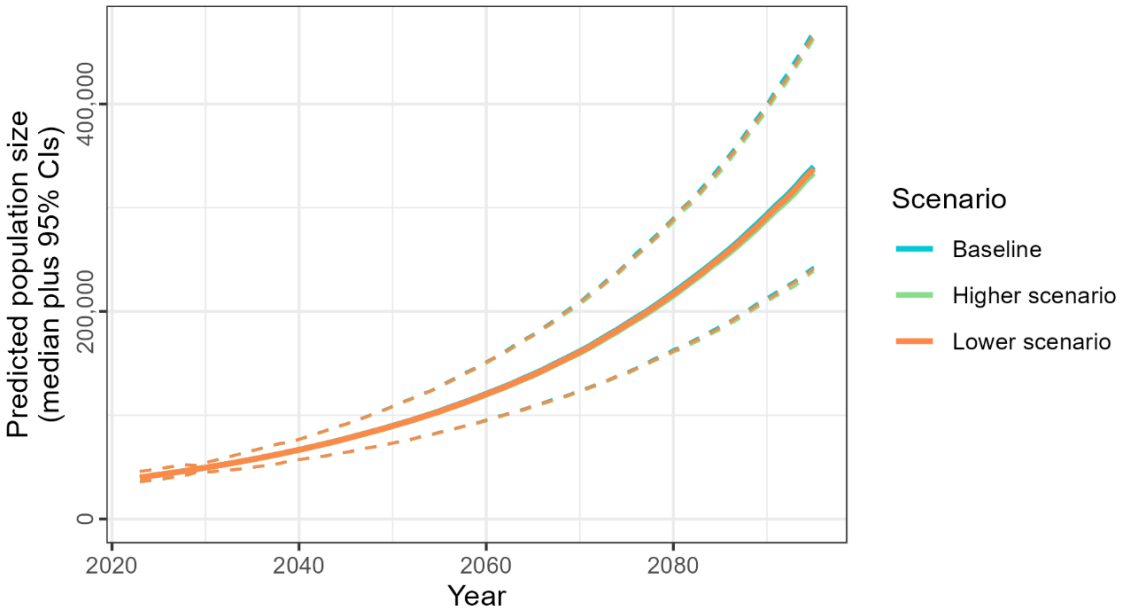

Figure A-21. Median predicted population trajectories (solid line) and 95% confidence intervals (dashed lines) for guillemot at West Westray SPA including impacts during construction. Population sizes represent breeding adults.

Source: Recreated from outputs from the NEPVA tool.

A.2.11 Regional Population

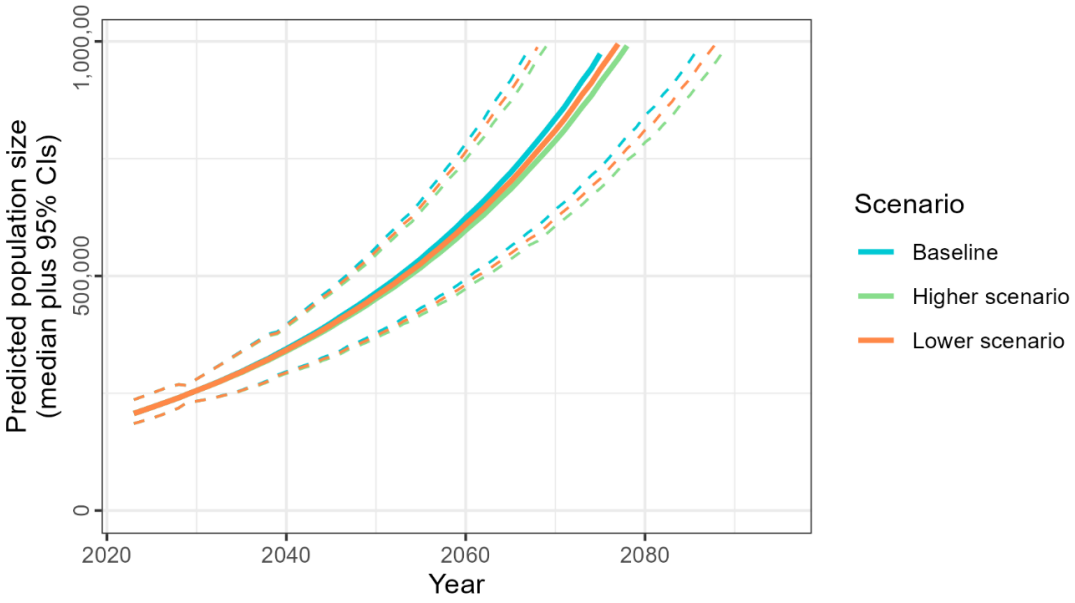

Figure A-22. Median predicted population trajectories (solid line) and 95% confidence intervals (dashed lines) for guillemot regional population including impacts during construction. Population sizes represent breeding adults.

Source: Recreated from outputs from the NEPVA tool.

A.3 Herring Gull

A.3.1 Troup, Pennan and Lion's Heads SPA

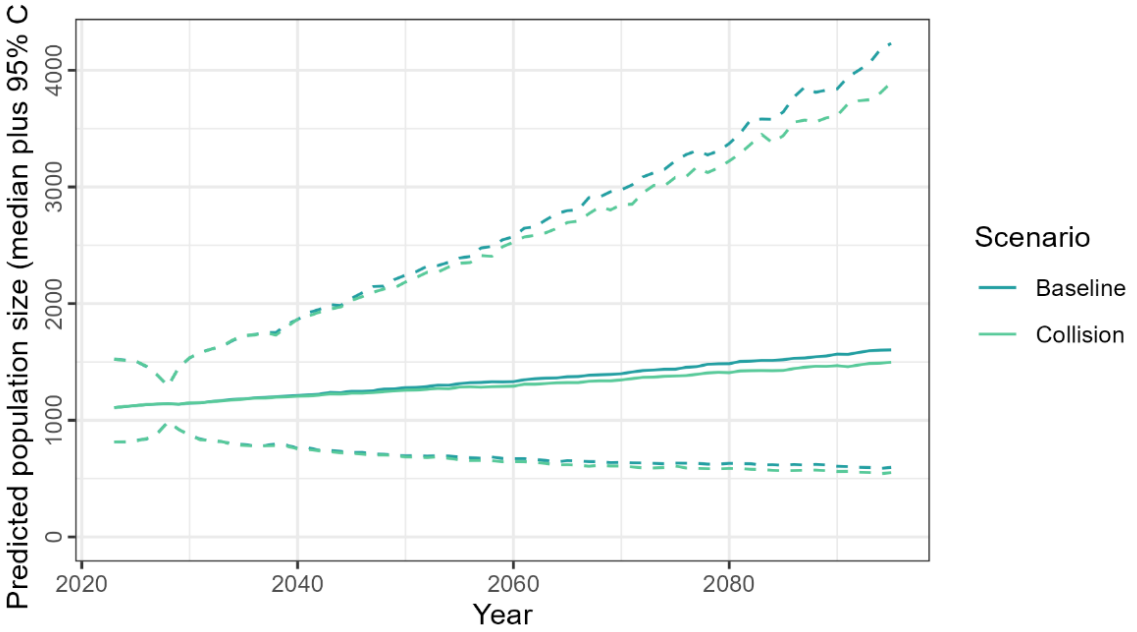

Figure A-23. Median predicted population trajectories (solid line) and 95% confidence intervals (dashed lines) for herring gull at Troup, Pennan and Lion's Heads SPA. Population sizes represent breeding adults.

Source: Recreated from outputs from the NEPVA tool.

A.3.2 Regional Population

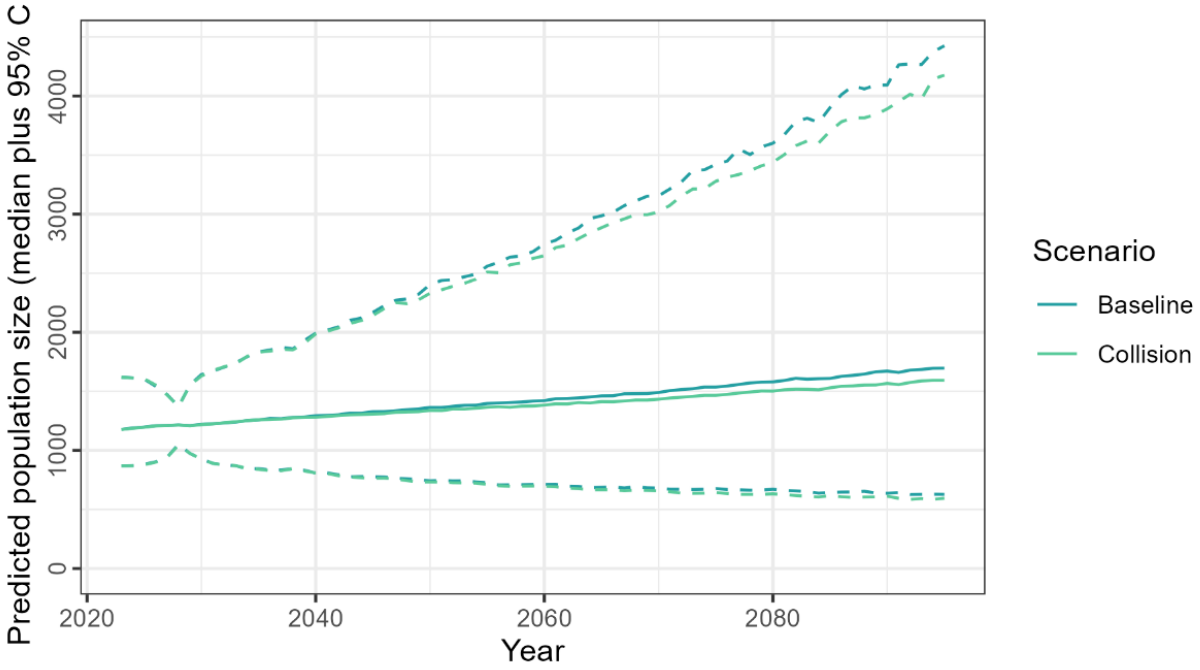

Figure A-24. Median predicted population trajectories (solid line) and 95% confidence intervals (dashed lines) for the regional herring gull population. Population sizes represent breeding adults.

Source: Recreated from outputs from the NEPVA tool.