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NATURESCOT



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17 August 2026

Our ref: CNS – REN – OSWF – E1 –  
 Morven – Application

Sent by email only

Dear [redacted]

## **MORVEN SOUTH OFFSHORE WIND FARM**

### **APPLICATION FOR CONSENT UNDER SECTION 36 OF THE ELECTRICITY ACT 1989 AND MARINE LICENCES UNDER THE MARINE (SCOTLAND) ACT AND PART 4 OF THE MARINE AND COASTAL ACCESS ACT 2009 TO CONSTRUCT AND OPERATE THE MORVEN SOUTH OFFSHORE WIND FARM**

Thank you for consulting NatureScot on the Section 36 and Marine Licence Application submitted by Morven Offshore Wind Limited (the Applicant) for the proposed Morven South Offshore Wind Array. These are accompanied by an Environmental Impact Assessment Report (EIA Report), Nature Conservation Marine Protected Area (NCMPA) Assessment, Report to Inform the Appropriate Assessment (RIAA) and a Derogation Case – submitted on a without prejudice basis.

Our advice in this letter is in relation to the offshore generating station (fixed-foundation wind turbines, inter-array cables and associated infrastructure) and the offshore transmission infrastructure (fixed-foundation Offshore Substation Platforms (OSPs), interconnector cables and associated infrastructure) for Morven South only. The two potential grid connections at Hawthorn Pit and Branxton are subject to separate Marine Licence and consent applications. However, the Morven Hawthorn Pit Grid Connection Project and the Morven Branxton Area Grid Connection Project have been considered in the Cumulative Effects Assessment of this current Application.

### **Policy context**

Working within the context of a climate emergency and a biodiversity crisis, we seek to provide advice that is enabling and secures the right development in the right place with most benefit for

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NatureScot is the operating name of Scottish Natural Heritage

climate change reduction and that which avoids damage, and where possible, achieves restoration and enhancement of biodiversity.

As a statutory consultee, NatureScot works in support of the Scottish Government's vision for a Blue Economy with its six outcomes acting as focal points to ensure the marine environment supports ecosystem health, improved livelihoods, economic prosperity, social inclusion and wellbeing. We provide advice in the spirit of Scottish Government's ambition for Offshore Wind as outlined in the Sectoral Marine Plan for Offshore Wind Energy (SMP-OWE) published in 2020 and now undergoing an Iterative Plan Review (IPR) and due to be published later this year and the Offshore Wind Policy Statement, published in January, stating an ambition of 40 GW to be delivered by 2040<sup>1</sup>. We also acknowledge the Energy Act 2023 reforms, particularly to enable strategic compensation delivery either Applicant-led or through a Scottish Marine Recovery Fund, where required. The SMP-OWE aims to balance the promotion of the sustainable development of offshore wind, whilst protecting, restoring and enhancing our biodiversity.

In response to the new Scottish Biodiversity Strategy to 2045, we support the current work of the Scottish Government in developing National Marine Plan 2, we support considerations of new policy directions for nature positive requirements for marine industries, including Offshore Wind. We seek further attention to and engagement on what might be possible in terms of biodiversity enhancement that would also align with the renewable energy production aims and objectives of this proposal, in the context of the climate emergency and biodiversity loss crisis, if this proposal is consented.

## **Background**

The Morven Site (ScotWind Option Area E1) has been divided into two distinct project areas, which will be progressed as two separate developments - Morven South and Morven North. This separation is primarily driven by the identification of two distinct grid connections - Branxton in East Lothian and Hawthorn Pit in County Durham. Separate Section 36 and Marine Licence Applications have been submitted to Marine Directorate Licencing and Operations Team (MD-LOT) for determination - simultaneously. To facilitate the determination of each project independently, we have provided advice for Morven South and Morven North separately. Our advice in this response is for Morven South. Aspects which are relevant across both applications, such as derogation, have been provided in each of our responses.

## **Morven South - The Project / Proposed development**

The Applicant proposes to develop an offshore wind farm with fixed turbines as part of the ScotWind Leasing Round in the E1 Plan Option Area, hereafter referred to as Morven South.

The Morven South Project Description is presented in Chapter 3, Volume 1 of the EIA Report. The proposed development is located approximately 86 km from the Aberdeenshire coast at its closest point and covers an area of 347.7 km<sup>2</sup>. Water depths range from 64 - 76 m. The export capacity is expected to be up to 1.5 GW with an operational lifespan of up to 35 years. Morven South, which is following a Project Design Envelope (PDE) approach, comprises:

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<sup>1</sup> <https://www.gov.scot/publications/update-2020-offshore-wind-policy-statement-scotlands-offshore-wind-ambition-2/>

- Up to 95 wind turbines generators (WTGs), with a maximum rotor diameter of 320 m, maximum rotor blade tip height of 363 m above sea surface, and minimum blade clearance above sea surface of 34 m.
- Up to five OSPs, including:
  - up to four High Voltage Alternating Current (HVAC) collector substation platforms.
  - up to one High Voltage Direct Current (HVDC) convertor substation (this could be a single platform or two platforms linked by a bridge).
- Three fixed foundation types are considered for both wind turbines and OSPs:
  - Monopile foundations
  - Piled jacket foundations
  - Suction bucket jacket foundations
- One fixed foundation type is considered for OSPs only:
  - Gravity base foundations
- Scour protection for wind turbine and OSP foundations, including concrete mattresses, rock placement, rock bags and frond mattresses.
- Inter-array cabling, linking the individual wind turbines to each other and to the OSPs, with a maximum total length of approximately 420 km and a burial depth of 0.5 – 3 m.
- Up to 10 interconnector cables, connecting OSPs to each other, with a maximum total length of approximately 264 km and a burial depth of 0.5 – 3 m.
- Cable protection where minimum burial depth not achieved, including concrete mattresses, rock placement, rock bags, grout bags, cement bags, sandbags, articulated pipes, cast iron shells, bend restrictors/stiffeners, cable protection systems and frond mats.

Several site preparation activities may be required, including pre-construction site investigation surveys such as geophysical and geotechnical surveys, unexploded ordnance (UXO) clearance, boulder clearance, sandwave clearance and removal of disused cables.

The construction of Morven South is estimated to occur over five years with an assumed start date of 2033. Operation and maintenance activities are assumed to commence in 2038.

Decommissioning is briefly addressed in Section 3.6 of the Project Description. We advise that that development of a Decommissioning Plan / Programme post consent should be informed by current requirements and predicated on full removal of all infrastructure in line with current policy<sup>2</sup>.

### **Assessment approach**

The maximum design scenario (MDS) presented is for monopile diameters of 16 m, which is one of the largest diameter piles for any ScotWind project to date. Despite this, auditory injury ranges for marine mammals and fish receptors are smaller than anticipated, and we highlight uncertainty in the underwater noise modelling approach presented.

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<sup>2</sup> <https://www.gov.scot/publications/offshore-renewable-energy-decommissioning-guidance-scottish-waters/>

Issues with transparency combined with deviation from our ornithological impact assessment guidance has meant we have limited confidence in the ornithology assessment provided. As a result, most of our ornithological conclusions are provisional.

Four scenarios have been considered in determining cumulative effects. These have been assessed to account for the forthcoming but separate grid connection applications (Whole project assessment), the in-combination effects of Morven South and Morven North (Morven Programme assessment), and cumulative effects from relevant screened in plans / projects (Cumulative Effects Assessment). The scenarios presented are:

- **Whole project assessment**
  - Scenario 1 – Morven South + Morven Hawthorn Pit Grid Connection (MHPGC)
  - Scenario 2 – Morven South + Morven Branxton Grid Connection (MBAGC)
- **Morven Programme assessment** (relevant only to ornithology and shipping and navigation)
  - Scenario 3 – Morven South + Morven North + MHPGC + MBAGC
- **Cumulative Effects Assessment (CEA)**
  - Scenario 4 – Morven South + other Plans / Projects screened in

While we welcome an attempt at assessing whole project impacts from forthcoming grid connection applications, we highlight that those proposals lack a significant amount of detail, and as such the subsequent Marine Licence applications for these grid connection cables will need to fully address cumulative impacts, based on an understanding of the MDS for each respective cable route.

We also wish to highlight that Berwick Bank has not been considered under the CEA, likely due to the fact the original construction timelines stipulated within the Berwick Bank application (2025 – 2032) were prior to the construction of Morven South. However, it is now likely that the construction of Morven South will overlap with at least one of the phases of Berwick Bank and as such Marine Directorate may need to come to a view regarding appropriate consideration of the Berwick Bank development as part of Morven South's CEA.

## NatureScot advice

### Offshore and intertidal ornithology – RIAA and EIA

A summary of our ornithological assessment conclusions for the Report to Inform the Appropriate Assessment (RIAA) and Environmental Impact Assessment (EIA) Report is provided below respectively. These are either **final** conclusions requiring no further information from the Applicant or **provisional** pending resolution of multiple clarifications as well as requests for additional information.

#### *Offshore and intertidal ornithology – Assessment conclusions under RIAA*

All provisional conclusions below are subject to additional information / clarifications outlined in Appendix A.

We **agree** with the Morven South alone assessment conclusion of **no adverse effect on site integrity** (AEoSI) for all SPAs with fulmar and razorbill as qualifying features. **Provisionally**, we agree with the Morven South alone assessment conclusion of **no AEoSI** for all SPAs with gannet, guillemot, puffin and kittiwake as qualifying features.

We **agree** with the conclusion of **no AEoSI** for all SPAs with fulmar as a qualifying feature assessed for the Morven Programme assessment. **Provisionally**, we agree with the conclusion of **no AEoSI** for all SPAs with gannet, guillemot, kittiwake (except at Forth Islands SPA), puffin and razorbill assessed for the Morven Programme assessment. We have been **unable to reach a conclusion** on the Morven Programme assessment of kittiwake at Forth Islands SPA due to insufficient information in the assessment.

We **provisionally disagree** with the in-combination assessment conclusion of **no AEoSI** for all SPA and qualifying features assessed. Instead, we **provisionally** conclude **AEoSI** for the following SPA features:

- Guillemot, kittiwake and the breeding seabird assemblage at Buchan Ness to Collieston Coast SPA
- Kittiwake and the breeding seabird assemblage at East Caithness Cliffs SPA
- Guillemot, razorbill, kittiwake and the breeding seabird assemblage at Fowlsheugh SPA
- Guillemot, razorbill and the breeding seabird assemblage at Forth Islands SPA
- Guillemot, razorbill, kittiwake and the breeding seabird assemblage at St Abb's Head to Fast Castle SPA
- Guillemot, kittiwake and the breeding seabird assemblage at Troup, Pennan and Lion's Heads SPA.
- Guillemot at the functionally linked Outer Firth of Forth and St Andrews Bay Complex SPA

We are **provisionally unable to conclude no AEoSI** for the following SPA features:

- Razorbill at East Caithness Cliffs SPA
- Puffin and gannet at Forth Islands SPA
- Puffin at Foula SPA
- Puffin and gannet at the functionally linked Outer Firth of Forth and St Andrews Bay Complex SPA

We have been **unable to reach a conclusion** on the in-combination assessment of kittiwake at Forth Islands SPA due to insufficient information in the assessment.

#### *Offshore and intertidal ornithology – Assessment conclusions under EIA*

All provisional conclusions below are subject to additional information / clarifications outlined in Appendix A.

We **agree** with the conclusions of **No Significant** effects to the regional population of fulmar, great black-backed gull, puffin, razorbill and migratory waterbirds under EIA as a result of project alone impacts. **Provisionally**, we agree with the conclusion of **No Significant** effects to the regional population of Arctic tern, gannet, guillemot and kittiwake under EIA as a result of project alone impacts.

We **agree** with the conclusion of **No Significant** effects to the regional population of fulmar, great black-backed gull, razorbill and puffin under EIA as a result of Morven Programme. **Provisionally**, we agree with the conclusion of **No significant** effects to the regional population of gannet, guillemot, and kittiwake under EIA as a result of the Morven Programme.

We **provisionally disagree** with the conclusion of No Significant impacts to the regional population of all species under EIA as a result of cumulative impacts and instead **Significant** effects were concluded for:

- Collision impacts for great black-backed gull
- Displacement impacts for guillemot
- Displacement impacts for razorbill
- Displacement impacts for puffin
- Combined collision and displacement impacts for kittiwake
- Combined collision and displacement impacts for gannet.

Without prejudging the outcome of the Appropriate Assessment, we anticipate, should consent be granted, that compensatory measures would need to be secured for gannet, kittiwake, guillemot, razorbill, and puffin. We also consider that agreed compensation measures could be sufficient to address significant effects predicted under EIA for these species. Impacts to great black-backed gull will need to be discussed separately.

Further advice is provided in Appendix A.

#### **Marine mammals – EIA & RIAA**

The assessment for marine mammals concludes **No Significant Effects** for Morven South alone, or cumulatively. However, our advice below highlights issues in the assessment and subsequent implications to Sensitivity and Magnitude scoring. As such we disagree with several outcomes of the assessment.

Instead, we conclude **Significant Effects** for injury (cumulative PTS) from piling:

- For Morven South alone for **minke whale**

And we conclude **Significant Effects** for disturbance from piling:

- For Morven South alone for **bottlenose dolphin from the Greater North Sea Management Unit (GNS MU); white-beaked dolphin; and grey seal**
- Cumulatively for **harbour porpoise; bottlenose dolphin from the GNS MUs; white-beaked dolphin; and grey seal**

Overall, we agree with the conclusions reached in the EIA Report whereby there is **no adverse effect on site integrity** for any European sites screened into appraisal from Morven South.

Further advice is provided in Appendix B.

#### **Fish and shellfish ecology – EIA**

The assessment for fish and shellfish ecology concludes **No Significant Effects**, both Morven South alone and cumulatively. While we broadly support most of these conclusions, we provide comments on aspects where there remains uncertainty such as regarding underwater noise impact ranges and suggest potential measures to reduce impacts. We advise that if consented, in developing the Piling Strategy, further consideration will require to be given to potential impacts to buried sandeel and spawning herring areas with possible mitigation measures identified where practicable.

Further advice is provided in Appendix C.

### **Benthic ecology – EIA**

The assessment for Benthic Ecology concludes **No Significant Effects**, both Morven South alone and cumulatively, which we support.

Further advice is provided in Appendix D.

### **Physical processes – EIA**

The assessment in Chapter 7 concludes **No Significant Effects**, both Morven South alone and cumulatively - we broadly agree, however **with two exceptions** outlined below. Our assessment identifies the potential for a change to the wave regime and notes gaps in the available cumulative assessment for this.

In considering this aspect, we have sought and included advice from JNCC on the implications to the subtidal sands and gravels feature of the Montrose Bank component of the adjacent Firth of Forth Banks Complex Nature Conservation Marine Protected Area (NCMPA).

Advice on seasonal stratification should be sought from MD SEDD as we have no expertise on this aspect.

Further advice is provided in Appendix E.

### **Blue carbon – EIA**

The assessment for blue carbon concludes **No Significant Effects**, which we support.

Further advice is provided in Appendix F.

### **Derogation – RIAA**

Two compensation measures are proposed, comprising:

- Rat eradication on the Muck Island Group (Muck, Lamb Island, Horse Island and Eagamol) to address predicted annual impacts to guillemot, razorbill, puffin and kittiwake.
- Gannet measures - details have not yet been provided for gannet measures and instead are to be provided later in the determination phase, our advice focuses on the rat eradication measure only.

Overall, there is merit in the proposed rat eradication compensation measure and benefits to target seabird species are likely based on the existing presence of target species, evidence of rat activity during the breeding season, availability of sufficient unoccupied habitat for colony expansion and location of nearby donor colonies. Limited direct evidence of rat predation on seabirds is available, however, supporting evidence from nearby cliff nesting colonies on Rum is provided.

Predictive modelling indicates the potential for significant delays in the achievement of compensation targets, particularly for guillemot and unknown for kittiwake, although we note targets are reasonably likely to be met for puffin and potentially for razorbill although only for the Morven South alone scenario. Further consideration of this by the Applicant is needed in discussion with NatureScot and Marine Directorate.

Further advice is provided in Appendix G.

We hope this advice is helpful. Please contact marine energy mailbox ([marineenergy@nature.scot](mailto:marineenergy@nature.scot)) in the first instance for any further advice.

Yours sincerely,

[redacted]

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## NATURESCOT ADVICE ON MORVEN SOUTH OFFSHORE WIND FARM

### Appendix A Offshore Ornithology

Offshore ornithological interests for Morven South are considered in Chapter 11 (Volume 2) and the following relevant supporting appendices:

- Volume 1 - Morven Option Lease Agreement Site: HRA Stage 1 Screening Report
- Volume 2 - Report to Inform Appropriate Assessment Part 1: Introduction
- Volume 2 - Report to Inform Appropriate Assessment Part 3: SPA and Ramsar Site Assessments
- Volume 2 – Annex 3.1 - Report to Inform Appropriate Assessment: Apportioning
- Volume 2 – Annex 3.2 - Report to Inform Appropriate Assessment: Population Viability Analysis
- Volume 3 – Annex 11.1 - Offshore Ornithology Baseline Characterisation Report
- Volume 3 – Annex 11.2 - Offshore Ornithology Collision Risk Modelling Report
- Volume 3 – Annex 11.3 - Offshore Ornithology Collision Risk Modelling Report: Migratory
- Volume 3 – Annex 11.4 - Offshore Ornithology Displacement Modelling Report (Matrix Approach)
- Volume 3 – Annex 11.5 - Offshore Ornithology Displacement Modelling Report (SeabORD)
- Volume 3 – Annex 11.6 - Offshore Ornithology Regional Population Viability Analysis

#### A.1 Summary of assessment conclusions

A summary of our assessment conclusions for the Environmental Impact Assessment (EIA) Report and the Report to Inform the Appropriate Assessment (RIAA) is provided below respectively. These are either **final** conclusions requiring no further information from the Applicant or **provisional** pending resolution of multiple clarifications as well as requests for additional information. There are a number of issues identified in both the EIA Report and the RIAA which reduce the confidence we have in the final conclusions presented. These issues require clarification and / or Additional Environmental Information before we can confidently make final conclusions for several species.

The following issue is identified as requiring **Additional Environmental Information** in the **EIA Report** and supporting documents:

- Seasonal definitions used by the Applicant differ from those in NatureScot guidance, and we disagree with the classification of definitions based on survey dates – subsequently impacting seasonal and annual collision mortality estimates for gannet and kittiwake.

The following issues are identified as requiring **clarification** in the **EIA** and supporting documents:

- No source was cited for regional, national and international population estimates.
- The windfarm width used in migratory collision modelling differs within the migratory collision risk modelling report and the width specified in the collision risk modelling report.
- Migratory collision mortality stated for Arctic tern appears low and modelling spreadsheets used to determine the collision estimate are not provided to validate result.
- Regional populations differ between EIA Chapter and EIA Baseline Characterisation report.
- Annual collision mortality for gannet differs between EIA Chapter and collision risk modelling report.

- NatureScot concludes significant impact under EIA to the regional population of great black-backed gull as a result of cumulative collision impacts. Great black-backed gull are not assessed under HRA and therefore significant impacts must be addressed through EIA.
- 'Updated' productivity values do not match those recommended by NatureScot and a suitable reference is not provided for these.
- Survival rates differ between EIA Chapter, EIA Baseline Characterisation report and EIA PVA report, and do not match those recommended by NatureScot.
- As these demographic rates (productivity and survival) are used to parameterise the population viability analysis (PVA) modelling for key species, **all conclusions based on PVA outputs are provisional.**
- No monitoring is proposed by the Applicant to validate the findings of the EIA.

The following issues are identified as requiring **Additional Environmental Information** in the **RIAA** and supporting documents:

- Seasonal definitions used by the Applicant differ from those in NatureScot guidance, and we disagree with the classification of definitions based on survey dates – subsequently impacting seasonal and annual collision mortality estimates for gannet and kittiwake.
- Impacts were not apportioned to kittiwake and puffin at three SPAs due to the Applicant incorrectly measuring the distance between the array area and the SPA using a centre-to-centre measurement. All SPAs with LSE identified should have impacts apportioned to them, regardless of whether the distance exceeds the recommended foraging range in the breeding season.
- Impacts to gannet were not apportioned to Hermaness, Saxa Vord and Valla Field SPA and Noss SPA in the breeding season, despite pre-application advice to do so
- Impacts to kittiwake at Forth Islands SPA were not considered in the Morven Programme and in-combination assessments, despite project-alone impacts of 0.2 to 0.3 birds per annum.
- In-combination mortality estimates have included the full, uncompensated impacts of all relevant projects, including those with a commitment to compensating impacts determined to have an adverse effect on site integrity.

The following issues are identified as requiring **clarification** in the **RIAA** and supporting documents:

- Impacts in the non-breeding season were only apportioned to SPAs constituting >1% of a species' BDMPS population which is not an approach we support.
- It is unclear how in-combination displacement mortality estimates have been calculated, specifically in relation to the apportioning of recalculated displacement mortalities for other projects.
- 'Updated' productivity values do not match those recommended by NatureScot and a suitable reference is not provided for these.
- Survival rates differ between RIAA PVA report, EIA Chapter, EIA Baseline Characterisation report, and do not match those recommended by NatureScot.
- As these demographic rates (productivity and survival) are used to parameterise the population viability analysis (PVA) modelling for key species, **all conclusions based on PVA outputs are provisional.**

Additionally, a number of other Offshore Wind Farm applications were submitted between the Applicant's cut-off date for inclusion in their EIA cumulative and RIAA in-combination assessment, and the Applicant's submission date. Many of these projects are to be located in the vicinity of Morven South and are likely to impact the same regional populations and SPA breeding colonies. As such, **all conclusions for EIA cumulative and RIAA in-combination assessments are provisional.**

#### *A.1.1 EIA Morven South alone assessment conclusions*

We **agree** with the conclusions of **No Significant Effects** to the regional population of fulmar, great black-backed gull, puffin, razorbill and migratory waterbirds under EIA as a result of project-alone impacts.

We **provisionally agree** with the conclusion of **No Significant Effects** to the regional population of Arctic tern, gannet, guillemot and kittiwake under EIA as a result of project-alone impacts.

#### *A.1.2 EIA Morven Programme assessment conclusions*

We **agree** with the conclusion of **No Significant Effects** to the regional population of fulmar, great black-backed gull, razorbill and puffin under EIA as a result of Morven Programme comprising Morven North and Morven South together – consideration of both export cable corridors (Morven Hawthorn Pit Grid Connection (MHPGC) Project and Morven Branxton Area Grid Connection (MBAGC) Project impacts) were screened out of this assessment due to no impact pathway.

We **provisionally agree** with the conclusion of **No significant Effects** to the regional population of gannet, guillemot, and kittiwake under EIA as a result of the Morven Programme as detailed above.

#### *A.1.3 EIA cumulative effects assessment conclusions - Provisional*

We **provisionally disagree** with the conclusion of No Significant impacts to the regional population of all species under EIA as a result of cumulative impacts and instead **Significant Effects** were concluded for:

- Collision impacts for great black-backed gull
- Displacement impacts for guillemot
- Displacement impacts for razorbill
- Displacement impacts for puffin
- Combined collision and displacement impacts for kittiwake
- Combined collision and displacement impacts for gannet.

Without prejudging the outcome of the Appropriate Assessment, we anticipate, should consent be granted, that compensatory measures would need to be secured for gannet, kittiwake, guillemot, razorbill, and puffin. We also consider that agreed compensation measures could be sufficient to address significant effects predicted under EIA for these species. Impacts to great black-backed gull will need to be discussed separately.

#### *A.1.4 RIAA Morven South alone assessment conclusions*

We **agree** with the Morven South project-alone assessment conclusion of **no adverse effect on site integrity** (AEoSI) for all SPAs with fulmar and razorbill as qualifying features.

We **provisionally agree** with the Morven South alone assessment conclusion of **no AEoSI** for all SPAs with gannet, guillemot, puffin and kittiwake as qualifying features.

#### *A.1.5 RIAA Morven Programme assessment conclusions*

We **agree** with the conclusion of **no AEoSI** for all SPAs with fulmar as a qualifying feature assessed for the Morven Programme assessment comprising Morven North and Morven South together – consideration of both export cable corridors (MHPGC and MBAGC Projects) was screened out of this assessment due to no impact pathway.

We **provisionally agree** with the conclusion of **no AEoSI** for all SPAs with gannet, guillemot, kittiwake (except at Forth Islands SPA), puffin and razorbill assessed for the Morven Programme assessment as detailed above.

We have been **unable to reach a conclusion** on the Morven Programme assessment of kittiwake at Forth Islands SPA due to insufficient information in the assessment.

#### *A.1.6 In-combination assessment of AEoSI - Provisional*

We **provisionally disagree** with the in-combination assessment conclusion of **no AEoSI** for all SPA and qualifying features assessed. We **provisionally** conclude **AEoSI** for the following SPA features:

- Guillemot, kittiwake and the breeding seabird assemblage at Buchan Ness to Collieston Coast SPA
- Kittiwake and the breeding seabird assemblage at East Caithness Cliffs SPA
- Guillemot, razorbill, kittiwake and the breeding seabird assemblage at Fowlsheugh SPA
- Guillemot, razorbill and the breeding seabird assemblage at Forth Islands SPA
- Guillemot, razorbill, kittiwake and the breeding seabird assemblage at St Abb's Head to Fast Castle SPA
- Guillemot, kittiwake and the breeding seabird assemblage at Troup, Pennan and Lion's Heads SPA.
- Guillemot at the functionally linked Outer Firth of Forth and St Andrews Bay Complex SPA

We are **provisionally unable to conclude no AEoSI** for the following SPA features:

- Razorbill at East Caithness Cliffs SPA
- Puffin and gannet at Forth Islands SPA
- Puffin at Foula SPA
- Puffin and gannet at the functionally linked Outer Firth of Forth and St Andrews Bay Complex SPA

We have been **unable to reach a conclusion** on the in-combination assessment of kittiwake at Forth Islands SPA due to insufficient information in the assessment.

## **A.2 Study areas**

Two study areas are defined and used to determine the conservation importance of species recorded in the site-specific digital aerial survey (DAS) campaign. The Morven South Offshore Ornithology Baseline Characterisation Study Area covers an area of 705.5 km<sup>2</sup> and consists of the Morven South boundary plus a 4 km buffer, the area where DAS flown.

The Morven South Offshore Ornithology Regional Study Area consists of a wider area covering parts of the northern and southern North Sea and for which regional DAS was undertaken by SSE / HiDef from April 2022 to August 2023. Abundance data from both study areas was used to classify the conservation importance of species recorded during surveys which we accept.

### **A.3 Baseline characterisation**

Advice following review of the Offshore Ornithology Baseline Characterisation Report (Annex 11.3, Volume 3) is set out below.

#### *A.3.1 Site-specific DAS surveys*

Digital aerial surveys were undertaken across the whole Morven Site (Morven North and Morven South), including the Morven South Offshore Ornithology Baseline Characterisation Study Area as discussed in Annex 11.3 (Volume 3). Surveys were undertaken monthly between January 2021 and September 2023, however as agreed in pre-application consultation, surveys between January 2021 and May 2021 are not considered in this Application as these data are now >5 years old. Therefore, the Application considers data from 28 surveys conducted between June 2021 and September 2023. All survey specifications are in line with our guidance and are as expected from DAS providers.

The Applicant was originally working to an incorrect lease site boundary shapefile. Upon correction of the shapefile, survey coverage fell slightly below the minimum expected to characterise the baseline environment. This issue was discussed in pre-application consultation and was highlighted as only being of potential concern in the identification of valued ornithological receptors (VORs) considering the use of abundance thresholds to determine population importance. It was agreed during pre-application that the classification of population importance should use thresholds cautiously and not definitively given issues with survey coverage.

Details of the rate of successful species identification have not been provided in the baseline characterisation report. By our calculations using the raw count data from June 2021 to September 2023, the mean auk identification rate across all surveys was 84.3%. The auk identification rate was highest in April 2023 (99.3%) and July 2023 (99.5%). The lowest rates of auk identification were in October 2021 (61.0%), December 2021 (47.4%) and January 2023 (65.8%). This pattern is expected given the challenges of identifying auks from DAS imagery in non-breeding plumage.

The numbers of dead birds recorded in the DAS is not provided in the baseline characterisation report which would have been useful in understanding the potential impacts of HPAI on birds using the survey area. However, this is included in the species accounts in the Morven Array Ornithology & Marine Megafauna Digital Aerial Digital Surveys - 33 Month Report (noting this is for Morven North and South combined). A peak of dead birds is recorded in July 2022 for guillemot / razorbill and gannet, which is consistent with the timing of the initial HPAI outbreak.

#### *A.3.2 Abundance estimates*

Availability bias correction factors were applied to auks to account for the proportion of birds expected to be diving under the surface of the water and not visible in DAS imagery. The correction factors used are in line with what we expect and those used in other development

proposals: guillemot 1.311, razorbill 1.211 Thaxter et al. (2010)<sup>3</sup> and puffin 1.165 Spencer, (2012)<sup>4</sup>. Though we trust that correction factors were applied correctly, abundance estimates prior to this correction are not presented, and therefore we cannot verify these, we however accept the abundance estimates and do not require further clarification. Please note we now accept use of seasonal availability bias correction factors from Dunn et al. (2024)<sup>5</sup> for relevant months and species, with Thaxter et al. (2010) and Spencer (2012) used for all other months despite the narrative set out by the Applicant in the RIAA.

#### *A.3.2.1 Design-based estimates*

The attribution / apportioning of unidentified birds from group level to species level largely appears to be in line with what we would expect. However, Paragraph 3.2.4.8 (Volume 3, Annex 11.1) is a very unclear summary of this approach, which is difficult to understand. In addition, Paragraph 3.2.4.10 describes a hierarchical approach to unidentified species apportioning, however this is also unclear and there is no context as to what the elements within the hierarchical levels mean and how they are used to apportion unidentified species.

The rest of the approach to calculating design-based abundance estimates is as we would expect.

#### *A.3.2.2 MRSea model-based estimates*

MRSea modelling was used to produce abundance estimates for species with greater than five observations – a lower threshold than we advise in our guidance, but which we can accept.

No covariates were considered in the MRSea models except spatial location. This is not the typical approach to MRSea modelling for offshore wind developments as the modelling approach is specifically intended to predict marine bird abundances using environmental covariates. Mackenzie et al. (2013)<sup>6</sup> recommend a number of environmental covariates which are also listed in NatureScot Guidance Note 2 (NatureScot, 2023)<sup>7</sup>. Mackenzie et al. (2013) also advise that using too few covariates may make for poor predictions in MRSea models.

We acknowledge that some environmental variables within the offshore environment may not have a sufficient gradient in the marine environment at the scale of an offshore wind farm to identify functional relationships with bird distribution, however other development proposals have observed significant relationships with bird distribution and variables such as distance to coast and bathymetric variables. Though we do not agree with all of the justifications given by the Applicant as to why additional environmental covariates were not used, in this instance we can accept the approach and the results of the modelling.

The explanation of post-hoc availability bias correction of fitted MRSea model estimates is not consistent with the approach taken to correct design-based estimates, making it difficult to follow

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<sup>3</sup> <https://journals.biologists.com/jeb/article/213/7/1018/10136/Influence-of-wing-loading-on-the-trade-off-between?guestAccessKey=>

<sup>4</sup> <https://scholarworks.umass.edu/entities/publication/ba06ab8e-b8c6-42fc-83b9-d34a158923c0>

<sup>5</sup> <https://besjournals.onlinelibrary.wiley.com/doi/10.1002/2688-8319.12373>

<sup>6</sup> <https://tethys.pnnl.gov/publications/statistical-modelling-seabird-cetacean-data-guidance-document>

<sup>7</sup> <https://www.nature.scot/doc/guidance-note-2-guidance-support-offshore-wind-applications-advice-marine-ornithology-baseline>

where values have been derived from. The percentages presented in Paragraph 3.2.5.18 represent the proportion of time birds spend underwater from Thaxter et al. (2010) and Spencer (2012) but differ to the correction factors in Paragraph 3.2.4.6 derived from the same sources. The percentage values of proportional time spent underwater are used in the calculation of the availability bias correction factors, see the example below.

- Guillemot proportion of time spent underwater = 0.2375 (from Thaxter et al., 2010)
- Correction factor =  $1 / (1 - \text{proportion of time spent underwater}) = 1 / (1 - 0.2375) = 1.311$

Although the correct correction factors appear to have been used, the inconsistency in explanation between design-based estimates and model-based estimates is not clear and seems to suggest a difference in approach between the two.

### A.3.3 Defining population importance

A 1% criterion is stated as a threshold of abundance within the Morven South area for which a species is classified as having local, regional, national or international importance. It is noted that there is no biological relevance to this threshold, however, it has previously been used as a standard threshold in the designation of protected areas for conservation. In the species accounts, these thresholds are rarely exceeded by the abundance estimates of species within Morven South area, suggesting the thresholds are set too high. However, as the thresholds have not been used as a definitive criterion for identifying Valued Ornithological Receptors and other appropriate factors have been considered, while we disagree with the use of the threshold, we accept the outcome.

### A.3.4 Seasonal definitions

We have identified extensive discrepancies in the seasonal definitions presented in Table 4.4 (Volume 3, Annex 11.1) which deviate from our advised definitions. We note that Paragraph 4.2.1.3 states that the definitions presented here are appropriate for the purpose of identifying population importance in the baseline characterisation report and that the definitions presented in this report differ to what is presented in the rest of the EIA and RIAA. The discrepancies are presented in Table NS.1. below. However, we do not believe the discrepancies in the baseline characterisation have any implications for the conclusions of the EIA as different seasonal definitions (different again to those below and in our guidance) were used in the assessment of impacts, as discussed in our advice below – please see section A.5.1.4 for the EIA and section A.6.2.1 for the RIAA.

*Table NS.1.: Discrepancies in the Applicant's seasonal definitions in the baseline characterisation report presented alongside NatureScot definitions based on NatureScot Guidance note 9<sup>8</sup>*

| Species     | Season       | Applicant definition | NatureScot definition |
|-------------|--------------|----------------------|-----------------------|
| Kittiwake   | Breeding     | April to August      | Mid-April to August   |
|             | Pre-breeding | January to March     | January to mid-April  |
| Little gull | Non-breeding | August to April      | August to mid-April   |

<sup>8</sup> <https://www.nature.scot/doc/guidance-note-9-guidance-support-offshore-wind-applications-seasonal-periods-birds-scottish-marine>

| Species                  | Season        | Applicant definition         | NatureScot definition                                                           |
|--------------------------|---------------|------------------------------|---------------------------------------------------------------------------------|
| Lesser black-backed gull | Post-breeding | August to October            | September to October                                                            |
|                          | Pre-breeding  | March                        | Early March                                                                     |
| Sandwich tern            | Post-breeding | July to September            | Late September                                                                  |
|                          | Pre-breeding  | March to May                 | March to mid-May                                                                |
| Little tern              | Post-breeding | Late July to early September | September                                                                       |
|                          | Pre-breeding  | Mid-April to May             | Mid-April to mid-May                                                            |
| Roseate tern             | Post-breeding | August to September          | September                                                                       |
|                          | Pre-breeding  | Late April to May            | Mid-April to mid-May                                                            |
| Common tern              | Post-breeding | Late July to early September | Season subsumed by breeding season May to mid-September                         |
|                          | Pre-breeding  | April to May                 | April                                                                           |
| Arctic tern              | Post-breeding | July to September            | Early September                                                                 |
|                          | Pre-breeding  | April to May                 | Late April                                                                      |
| Great skua               | Post-breeding | August to October            | Mid-September to October                                                        |
| Arctic skua              | Post-breeding | August to October            | September to October                                                            |
|                          | Pre-breeding  | April to May                 | April                                                                           |
| Razorbill                | Post-breeding | August to October            | Mid-August to October                                                           |
| Red-throated diver       | Post-breeding | September to November        | Mid-September to November                                                       |
| European storm petrel    | Breeding      | May to October               | Mid-May to October                                                              |
| Leach's petrel           | Breeding      | May to October               | May to mid-October                                                              |
| Fulmar                   | Breeding      | April to September           | April to mid-September                                                          |
|                          | Post-breeding | October                      | Mid-September to October                                                        |
| Sooty Shearwater         | Post-breeding | August to October            | Season subsumed by breeding season April to mid-October (using Manx shearwater) |
|                          | Pre-breeding  | March to May                 | Late March (using Manx shearwater)                                              |
| Manx shearwater          | Post-breeding | August to October            | Season subsumed by breeding season April to mid-October                         |
|                          | Pre-breeding  | March to May                 | Late March                                                                      |
| Gannet                   | Breeding      | March to September           | Mid-March to September                                                          |
|                          | Pre-breeding  | December to February         | December to mid-March                                                           |
| Cormorant                | Non-breeding  | September to February        | Mid-September to mid-February                                                   |

| Species | Season       | Applicant definition | NatureScot definition |
|---------|--------------|----------------------|-----------------------|
| Shag    | Non-breeding | September to January | October to February   |

### A.3.5 Regional populations

Table 4.5 (Volume 3, Annex 11.1) summarises all the regional, national, breeding and non-breeding population estimates relative to the baseline characterisation report. We note there are no citations to indicate where values are derived from - with national, regional, breeding and non-breeding population estimates presumably derived from different sources. Post-breeding, non-breeding and pre-breeding values are acceptable and have been verified with those given in Furness (2015)<sup>9</sup>. We have been unable to check the breeding season regional, national and international population estimates as the sources used to derive these have not been provided.

#### As such:

- **Clarification is required to confirm sources used to derive breeding season regional, national and international population estimates within Table 4.5 (Volume 3, Annex 11.1).**

We note the project-specific approach to define the non-breeding season regional population of guillemot, with Buckingham et al. (2021)<sup>10</sup> used to inform the geographical extent of breeding colonies contributing to the non-breeding season population. As such, the non-breeding season population is larger than in the breeding season. This is an agreed deviation from our advised approach which recommends using the same regional population for guillemot in both seasons, due to a lack of significant dispersal movements in the non-breeding season (Furness, 2015).

### A.3.6 Identification of valued ornithological receptors (VORs)

The identification of VORs was made based on the following criteria:

- Any species identified in site-specific surveys exceeding 1% of the regional population in any season
- Where the 1% threshold is <50 birds, a threshold of 50 birds is used as a minimum qualifying threshold
- Expert judgement is also used to identify species where these thresholds may not be applicable and species-specific criteria is outlined in the species accounts
- Abundance estimates within the Morven South study area are used to inform the population importance thresholds, with model-based estimates used where possible.\*

\*We note that there is no indication of where model-based estimates could not be produced.

The following species were identified as VORs:

- Fulmar
- Great skua
- Great black-backed gull
- Sandwich tern
- Arctic skua
- Gannet
- Little tern
- Guillemot
- European storm petrel
- Roseate tern
- Razorbill
- Leach's petrel

<sup>9</sup> <https://publications.naturalengland.org.uk/publication/6427568802627584>

<sup>10</sup> <https://www.int-res.com/journals/meps/articles/meps13960>

- Common tern
- Arctic tern
- Puffin
- Kittiwake
- Manx shearwater

We welcome the screening in of VORs which were recorded in low numbers in site-specific surveys. The Applicant also recognises that the survey method is unlikely to capture migratory movements adequately. This was the case for screening in tern species, skua species and petrel species. The use of tracking data in the discussion of connectivity in the species accounts is also welcomed, however we have concerns with determining no SPA connectivity with the project for Manx shearwater based on tracking data alone and would view the conservation importance as being international for this species as all SPA colonies in the UK have theoretical connectivity. Please see A.6.1.3. below for further advice in respect of the RIAA.

#### **A.4 Assessment approach**

Advice following review of the supporting technical appendices for collision risk, displacement effects and Population Viability Analysis (PVA) is provided below. Where this is specific to either the EIA and RIAA assessments, this has been indicated and includes the request for several clarifications and potentially additional environmental information.

The assessment approach described between the EIA Chapter, RIAA, Technical Appendices and other supporting documents has not been consistent and has made the review of the application significantly more difficult. It has taken a considerable amount of time to understand what approach was used to inform each of the EIA and RIAA, how these are different (or not) to each other, and the implications of using different approaches. For example, seasonal definitions varied between documents, multiple migratory collision risk modelling approaches are discussed across the Application, and abundance estimates of several species were different between the baseline characterisation and displacement reports.

##### *A.4.1 Collision risk modelling (CRM) assessment*

In reviewing the CRM modelling report (Volume 3, Annex 11.2) we note that CRM was undertaken using the sCRM tool (Caneco & Humphries, 2022)<sup>11</sup>. Both deterministic and stochastic modelling was undertaken using option 2 of the model, with stochastic modelling run for 5,000 iterations. Input parameters follow those in JNCC et al. (2024)<sup>12</sup> and NatureScot (2025)<sup>13</sup>. Flight height data for all species were derived from the generic dataset by Johnston et al. (2014)<sup>14</sup> within the sCRM tool. The large array correction factor was not applied to the models. All species biometric input parameters listed in Table 2.2 (Volume 3, Annex 11.2) are in line with those in our guidance NatureScot (2025). There appears to be a slight error in the labelling of the avoidance rate parameters, where the values stated as 'Avoidance rate (Basic model)' should instead be labelled 'Avoidance rate (Basic stochastic CRM)' and 'Avoidance rate (Deterministic)' should read 'Avoidance rate (Basic Band Model)'.

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<sup>11</sup> <https://github.com/dmpstats/sCRM>

<sup>12</sup> <https://jncc.gov.uk/resources/f7892820-0f84-4e96-9eff-168f93bd343d>

<sup>13</sup> <https://www.nature.scot/doc/guidance-note-7-guidance-support-offshore-wind-applications-marine-ornithology-advice-assessing>

<sup>14</sup> <https://besjournals.onlinelibrary.wiley.com/doi/full/10.1111/1365-2664.12191>

A macro-avoidance correction factor has been applied to relevant estimates of gannet collision mortality in RIAA Part 3 (not in the EIA), rather than to the input density values in the CRM report (Volume 3, Annex 11.2). The macro-avoidance rate of 70% has been applied to collision estimates in the non-breeding season only for birds predicted to originate from Scottish SPAs and in all seasons for birds from English SPAs.

Collision estimates in the collision risk modelling report (Volume 3, Annex 11.2) are presented for both the maximum wind turbine design scenario and the most likely wind turbine scenario, while the offshore ornithology EIA Chapter (Volume 2, Chapter 11) and RIAA Part 3 (Volume 2, Chapter 3) use the collision estimates from the maximum design scenario only.

Density estimates were derived from DAS data from October 2021 to September 2023 – making up the standard 24 months of site-specific surveys to characterise the baseline environment. The stochastic CRM used a 1,000-resample bootstrapped distribution per month. The bootstrapped distributions are not provided in this report or with the application so these cannot be reviewed, however this does not change our conclusions.

We note the Applicant's alternative values for flight speed and avoidance rates, and welcome that these have been presented alongside SNCB-advised values (JNCC et al. (2024) and NatureScot (2025)). The current recommended literature for flight speeds (Pennycuik (1997)<sup>15</sup> and Alerstam et al. (2007))<sup>16</sup> is dated and limited in its geographic and seasonal scope and sample size. The Skov et al. (2018)<sup>17</sup> report referenced by the Applicant provides a more recent dataset for flight behaviour in and around an active English offshore wind farm, covering all seasons. The lower flight speeds reported in Skov et al. (2018) may be more representative of bird flight behaviour in the vicinity of a wind farm. However, Skov et al. (2018) data does have some limitations. It was restricted to a single wind farm, and flight behaviour may be quite site and wind farm design specific. All data collection was carried out in good day time weather conditions, so does not reflect the variation of behaviour likely in different environmental conditions.

Updates to recommended flight speeds would be beneficial, and work is currently being undertaken using tracking data for a number of species at a range of sites, which will provide further information on flight speeds. Once this work is published, we will review it and update our guidance where appropriate.

In the meantime, we still recommend the use of flight speeds presented in Pennycuik (1997) and Alerstam et al. (2007). Any changes to flight speed would also require changes to any avoidance rates used in CRM.

#### A.4.2 *Migratory collision risk modelling*

Following review of the CRM modelling – Migratory report (Volume 3, Annex 11.3) we note that migratory collision risk modelling was undertaken in R using code from the stochastic migratory collision risk model (mCRM) shiny app by HiDef Aerial Surveying for Marine Scotland Science

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<sup>15</sup> <https://journals.biologists.com/jeb/article-abstract/200/17/2355/7571/Actual-and-optimum-flight-speeds-field-data?redirectedFrom=fulltext>

<sup>16</sup> <https://journals.plos.org/plosbiology/article?id=10.1371/journal.pbio.0050197>

<sup>17</sup> <https://tethys.pnnl.gov/publications/orjip-bird-collision-avoidance-study>

(Humphries and Caneco, 2022)<sup>18</sup>. The large array correction was applied, and the model was run for 5,000 iterations.

Wind turbine parameters in Table 2.1 (Volume 3, Annex 11.3) are consistent with the maximum design scenario wind turbine parameters in the collision risk modelling report, with the exception of wind farm width which is stated as 16.4 km in the collision risk modelling report and 15.69 km in the migratory collision risk modelling report, nor does it represent the widest part of the array which we calculate to be approx. 30 km. A crucial element of the migratory collision risk modelling tool is estimating the proportion of a migratory population predicted to pass through an offshore wind farm based on the width of both the migration front and the wind farm. This discrepancy would result in less precautionary results in the migratory collision risk modelling outputs if the parameter stated in the collision risk modelling report was used.

**As such:**

- **Clarification is required to confirm that the wind farm width used in the assessment of migratory collision is correct.**

#### *A.4.2.1 True seabird species*

With the exception of Arctic tern, all true seabird species were screened out of the initial collision risk modelling assessment based on low recorded abundance in DAS and the screening approach set out in the migratory collision risk assessment, based on the migratory corridors (distance bands from coast) set out in WWT Consulting and MacArthur Green (2014)<sup>19</sup>. This is not a common approach taken by Applicants and NatureScot have always advised against this part of the report being used for this assessment. The baseline report (Volume 3, Annex 11.1) states these seabirds' species would be included in the Application, based on pre-application advice, but they have been screened out using an approach we do not advise. The species screened out are little gull, Sandwich tern, little tern, roseate tern, common tern, great skua, Arctic skua, European storm petrel and Leach's petrel. In the absence of a suitable alternative approach to assess collision risk of true seabird species, we can accept the conclusions of the assessment. We acknowledge that the sCRM tool would not be a suitable approach to use due to the low densities of these species recorded in the DAS given the survey method is not suitable to detect one-off migration movements or nocturnal activity.

#### *A.4.2.2 Arctic tern*

Arctic tern has been included in the migratory collision risk assessment due to high numbers recorded in the August 2022 DAS (raw count of a relatively high number at 262 birds in Morven South Boundary plus 4 km buffer). The migratory collision risk of Arctic tern has been modelled using the Band (2012)<sup>20</sup> CRM rather than sCRM, with several input parameters specific to migratory collision risk.

The migratory front has been determined as the distance from the Scottish North Sea coast to the eastern edge of Morven South – a distance of 119.1 km. The width of Morven South, stated as 20.7 km, is then calculated to represent 17.4 % of the migratory front. The width of Morven South

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<sup>18</sup> <https://github.com/MarineScotlandScience/mCRM>

<sup>19</sup> <https://www.gov.scot/publications/scottish-marine-freshwater-science-volume-5-number-12-strategic-assessment/>

<sup>20</sup> <https://tethys.pnnl.gov/publications/using-collision-risk-model-assess-bird-collision-risks-offshore-wind-farms>

used here is again inconsistent with other values noted in the EIA - 16.4 and 15.69 km - therefore our clarification (noted above) is required to confirm the correct value. It's unclear where the migratory front has been measured to on the Scottish coast and no figure is provided to show this. However, when measuring the distance from Morven South to different points on the coast, 119.1 km is a relatively short distance therefore can be assumed to be precautionary as the development will represent a higher proportion of the migratory front than if a greater distance was used.

The migratory population of Arctic tern predicted to interact with Morven South is then calculated as the width of the development area / width of the migratory front \* species population (20.7 km / 119.1 km \* 163,930), which equates to a population of 28,492 birds at risk (migratory BDMPS population derived from Furness, 2015). This at-risk population is then entered into the Band (2012) CRM in a single month for each of the autumn and spring migration seasons.

Bird biometric input parameters in Table 2.5 (Volume 3, Annex 11.3) are acceptable and in line with our guidance and the parameters we have accepted in other Applications. We note that nocturnal activity factor is not included here – had the sCRM tool been used, we would have advised a value of 0.125 was used (Garthe and Hüppop, 2004)<sup>21</sup> to account for time spent flying at night. It is not clear whether the Band (2012) model enables this factor to be applied.

A range of avoidance rates have been modelled, from no avoidance (0%) to 95%, 98%, 99.02% (SNCB-advised) and 99.5%. A total of three collisions are reported annually when using no avoidance and model option 2. For all other avoidance rates and both model options, no collisions are reported for Arctic tern. However, this appears to be an unusually low estimate of collision given the large number of birds at risk of collision (28,492 per migration season). We also note that the collision estimates are reported with zero decimal places, and that a fraction of a bird collision mortality per year should have still been reported.

**As such:**

- **Clarification is required to confirm the number of collisions estimated for Arctic tern is correct and to consider whether a nocturnal activity factor should have been applied. We request that the Applicant provides the completed Band spreadsheets to allow validation of the results.**

#### *A.4.2.3 Migratory waterbirds*

The results of the mCRM tool for all 52 migratory waterbird species screened into the assessment are provided in Table 3.1 (Volume 3, Annex 11.3). For 12 species, the predicted collisions exceed one bird per year, however we do not consider this an appropriate threshold to be used in the assessment. Although the Applicant did not present it in the Application, we calculated the percentage of each species' UK population predicted to experience mortality as a result of migratory collision risk. The highest percentage of population predicted to experience mortality was for goosander, at 0.0055% of the population. This is discussed further in Section A.6.1.2 below in respect of the RIAA.

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<sup>21</sup> <https://besjournals.onlinelibrary.wiley.com/doi/full/10.1111/j.0021-8901.2004.00918.x>

### *A.4.3 Displacement assessment – matrix approach*

In review of the Displacement Modelling Report – Matrix report (Volume 3, Annex 11.4) we note the following species screened in for the assessment of displacement impacts are as follows, which we agree: kittiwake, guillemot, razorbill, puffin, fulmar and gannet.

Digital aerial surveys were undertaken between January 2021 and September 2023. With the application submission in June 2026, all data prior to June 2021 are now >5 years old, the cut-off for which we consider data to still be applicable to characterise the baseline environment. NatureScot originally advised that the Applicant use data from October 2021 to September 2023, making up the standard 24 months of DAS. After further consultation, it was agreed that data prior to October 2021 could be used (so long as it is still <5 years old) - the dataset used for the displacement assessment is July 2021 to September 2023, however it is unclear why June 2021 data was not used, when the baseline characterisation report states that this survey would be used in the impact assessment.

For guillemot and razorbill, NatureScot advised that peak abundances late in the breeding season for both species likely indicates a post-breeding dispersal. For guillemot, NatureScot advised that July and August should be included in a post-breeding season only if the abundance estimates for these months were markedly higher than those in surrounding months. For Morven South, this post-breeding season has been defined as July and August 2022 and July 2023. For razorbill, NatureScot advised extending the post-breeding season to include the months where peak abundance was recorded, this means including July and August in the post-breeding season in 2021 and 2022. The Applicant has followed pre-application advice, and we are content with the seasonal definitions used for guillemot and razorbill for this purpose.

#### *A.4.3.1 Abundance estimates*

We have identified some discrepancies between the model-based abundance estimates in Appendix A of the displacement report (Volume 3, Annex 11.4) and the values presented in the baseline characterisation report (Volume 3, Annex 11.1).

For guillemot, the abundance estimates in Table A.3 of the displacement report (Volume 3, Annex 11.4) are significantly different to those in Table D.5 of the baseline characterisation report (Volume 3, Annex 11.1). A substantial peak of over 29,000 birds is included in the displacement report, while no such peak is in the baseline characterisation report. However, it appears that the mean seasonal peak abundance estimates in Table 2.3 of the displacement report have been calculated using the monthly abundance estimates as they appear in the baseline characterisation report (i.e. it appears Table A.3 of the displacement report is incorrect) - so there are no further implications of this error.

For razorbill, the abundance estimates in Table A.4 of the displacement report (Volume 3, Annex 11.4) do not align with those in Table D.5 of the baseline characterisation report (Volume 3, Annex 11.1), there is also no estimate for August 2022 in Table A.4. We have identified that the abundance estimates in the displacement report have been copied from the baseline characterisation report incorrectly, with abundance estimates assigned to the wrong months. However, it appears that the mean seasonal peak abundance estimates in Table 2.3 of the displacement report have been calculated using the monthly abundance estimates as they appear in the baseline characterisation report - so there are no further implications of this error.

For fulmar, the abundance estimates in Table A.6 (Volume 3, Annex 11.4) are significantly different to those in Table D.14 of the baseline characterisation report (Volume 3, Annex 11.1), with no clear pattern showing the source of the error. A substantial peak of >5,000 birds in June 2022 is reported in the baseline characterisation report, however this is not included for any month in the displacement report where the peak abundance in any month is 466 birds. The mean seasonal peak abundance calculations appear to have been calculated using the monthly abundance estimates in the displacement report in this instance, though the mean seasonal peak abundance estimates still do not match the monthly estimates. We have recalculated the mean seasonal peak abundance estimates and displacement matrix mortality estimates for fulmar, as detailed below in Figure NS.1. Implication of this are discussed in A.4.3.2 below.

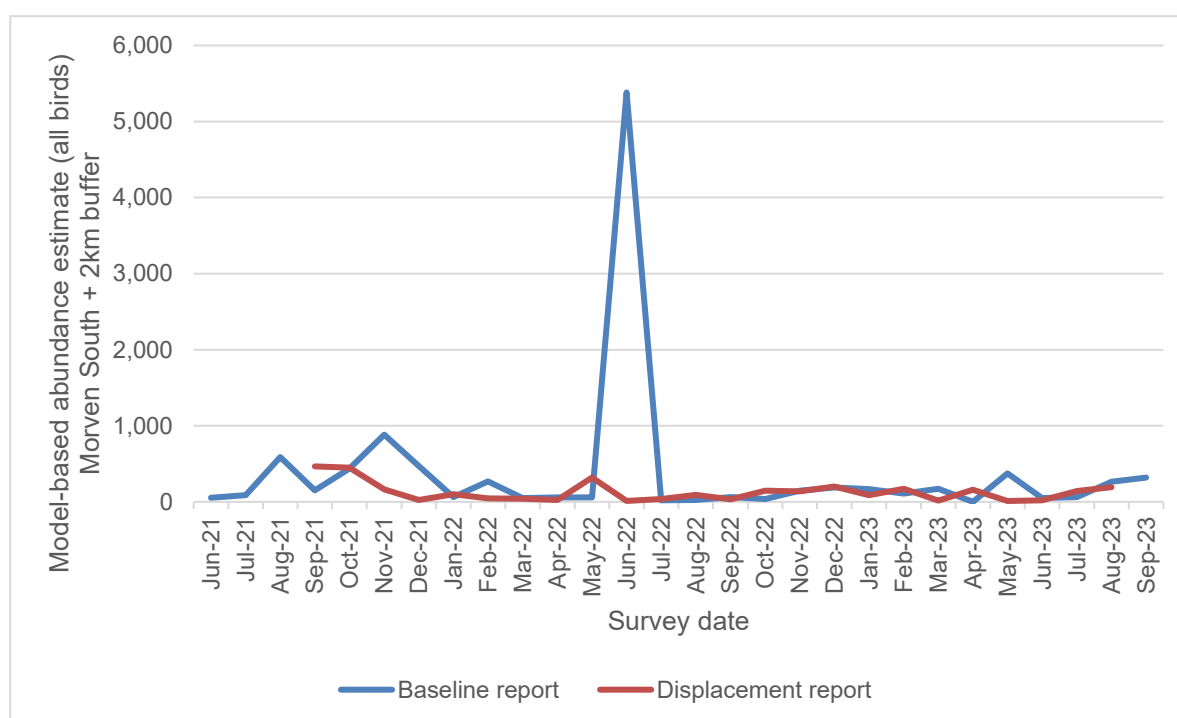


Figure NS.1: Mean MRSea abundance estimates of fulmar as presented in Table D.14 of the baseline characterisation report (Vol 3, Annex 11.1) and Table A.6 of the displacement report (Vol 3, Annex 11.4)

For kittiwake, puffin and gannet, the monthly abundance estimates in Appendix A of the displacement report match the corresponding values in Appendix D of the baseline characterisation report (Volume 3, Annex 11.1).

#### A.4.3.2 Mean seasonal peak abundance estimates

Mean seasonal peak abundance estimates (MSPs) are presented in Table 2.3 (Volume 3, Annex 11.4). We identify some issues with the values presented. We have calculated the guillemot post-breeding season MSP to be 8,996 whereas this is presented as 8,980 in Table 2.3. This is a minor issue which we do not expect to affect any conclusions in the EIA or RIAA. The errors identified for fulmar (as discussed above in A.4.3.1), and subsequently, our recalculated MSP and mortalities are summarised in Table NS.2. No significant impacts are predicted for fulmar in the EIA and no AEoSI is predicted in the RIAA. We do not expect these conclusions to change as a result of our

recalculations, largely due to the large foraging range and regional population of fulmar, and the large number of SPA colonies in breeding season foraging range.

*Table NS.2: Recalculation of fulmar displacement mortalities using corrected mean seasonal peak abundance estimates from monthly abundance estimates in the baseline characterisation report*

| Season        | Mean seasonal peak abundance |               | Matrix displacement mortalities |             |
|---------------|------------------------------|---------------|---------------------------------|-------------|
|               | Morven South                 | NatureScot    | Morven South                    | NatureScot  |
| Pre-breeding  | 182                          | 331           | 0.4 to 1.1                      | 0.7 to 2.0  |
| Breeding      | 257                          | <b>2, 879</b> | 0.5 to 1.5                      | 5.8 to 17.3 |
| Post-breeding | 249                          | 239           | 0.5 to 1.5                      | 0.5 to 1.4  |
| Non-breeding  | 299                          | 515           | 0.6 to 1.8                      | 1.0 to 3.1  |
| Annual        | -                            | -             | 2.0 to 5.9                      | 7.9 to 23.8 |

#### *A.4.3.3 Displacement and mortality rates*

The NatureScot displacement and mortality rates in Table 2.4 (Volume 3, Annex 11.4) are in line with our guidance. This guidance does not currently advise displacement and mortality rates for fulmar, despite this the Applicant has followed our advice from 11 July 2025 in which we advised using the rates in West of Orkney Windfarm Offshore Ornithology Additional Information (20% displacement, 1 to 3% mortality).

An Applicant approach has also been presented alongside the NatureScot approach, with alternative displacement and mortality rates. A mortality rate of 1% is used for all species and all seasons, while displacement rates for auks and fulmar are reduced from 60% to 50% and 20% to 10%, respectively.

The discussion in Section 4.1 (Volume 3, Annex 11.4) around alternative mortality rates refers to JNCC et al. (2022)<sup>22</sup> which, according to the Applicant, includes a recommendation to use a 10% mortality rate in displacement assessments. JNCC et al. (2022) does not recommend a 10% mortality rate for any species, instead recommending that displacement matrices present a full range of mortality rates from 0-100% at 10% increments, as well as 1% increments from 0-5%. It is also stated that Van Kooten et al. (2019)<sup>23</sup> suggest a 1% mortality rate is a more appropriate value. We are aware of conflicting and uncertain evidence of the rate of mortality experienced by birds when displaced from offshore wind farms, and the recommended rates in our guidance are based on the best available evidence at this time (and include a rate of 1% mortality for all species, except auks in the breeding season only).

The discussion around the Applicant's choice of alternative displacement rates is welcome, however this discussion also highlights the conflicting evidence from post-consent and post-construction monitoring which detail wide-ranging variation in the rates of displacement between studies. It is our view that the recommended rates in our guidance (and those used in the

<sup>22</sup> <https://data.jncc.gov.uk/data/9aecb87c-80c5-4cfb-9102-39f0228dcc9a/joint-sncb-interim-displacement-advice-note-2022.pdf>

<sup>23</sup> <https://research.wur.nl/en/publications/the-consequences-of-seabird-habitat-loss-from-offshore-wind-turbi-2/>

NatureScot approach in Morven South EIA and RIAA) include an adequate level of precaution while still being based on the best available evidence currently.

#### *A.4.4 Displacement assessment - SeabORD*

The impact of displacement was also modelled using the SeabORD individual-based model. We acknowledge the Applicant's efforts to use SeabORD noting it was agreed during pre-application consultation that the results of the SeabORD modelling would be presented alongside the results of the displacement matrix approach to provide additional context, with the displacement matrix results being the main approach used to inform both the EIA and RIAA.

#### *A.4.5 Population viability analysis (PVA)*

As outlined in the Offshore Ornithology Regional Population Viability Analysis report (Volume 3, Annex 11.6), Population viability analysis (PVA) was undertaken using the Natural England PVA Tool, accessed through the Shiny App interface. PVA modelling was undertaken for each species, season and impact scenario which surpassed a threshold of 0.02 percentage point increase in baseline mortality / decrease in adult annual survival rate. The following scenarios surpassed this threshold and required PVA in EIA:

- Morven South project-alone assessment:
  - Guillemot – post-breeding season, non-breeding season, annual
- Morven Programme assessment (Morven North + Morven South):
  - Guillemot – all seasons, annual
  - Razorbill – post-breeding season, annual
- Cumulative assessment:
  - Kittiwake – all seasons, annual
  - Great black-backed gull – non-breeding season, annual
  - Guillemot – all seasons, annual
  - Razorbill – all seasons, annual
  - Puffin – all seasons, annual
  - Gannet - all seasons, annual

The PVA modelling approach and model parameter options are in line with NatureScot guidance (NatureScot, 2023)<sup>24</sup>:

- Run type: simulation
- No density-dependence model applied
- Environmental stochasticity was applied with beta/gamma model
- Demographic stochasticity was included in the model
- 5,000 model runs
- Models run for 35-year lifespan of project plus 25 and 50 years
- Burn-in period = 5 years
- Impacts applied from start of operation (2038) to end of operational lifespan (2072)
- Impacts applied proportionally to immature age-classes (not calculated/applied separately)

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<sup>24</sup> <https://www.nature.scot/doc/guidance-note-11-guidance-support-offshore-wind-applications-marine-ornithology-recommendations>

- Impacts specified as relative harvest

Demographic rates for use in the PVA model were derived from Horswill & Robinson (2015)<sup>25</sup>, with national rates used where possible. Paragraph 2.5.1.1 (Volume 3, Annex 11.6,) states that updated productivity values were derived from the JNCC and BTO, specifically from 'Table 2.1 of JNCC (2024)'. This entry in the reference list directs to the seabird monitoring programme online database, which does not have permanent tables on the website. If the productivity rates were derived from entries of breeding success for specific colonies accessed through the SMP database, we would expect the report to include details of the colonies and count years used to calculate productivity. The Applicant also states that the updated productivity rates from JNCC (2024) match the default values in the NE PVA Tool, however we have not found this to be the case. The productivity values in Table 2.2 (Volume 3, Annex 11.6) do not match those in Horswill & Robinson (2015) or the PVA Tool, and we have been unable to locate the values stated here in the associated reference. With the exception of gannet, the productivity rate used by the Applicant is always less precautionary than the NE PVA Tool default but more precautionary than Horswill & Robinson (2015). For gannet, the productivity rate used by the Applicant is less precautionary than both Horswill & Robinson (2015) and the NE PVA Tool default.

**As such:**

- **Clarification is required to understand what source was used to derive productivity values for all species in Volume 3, Annex 11.6 and why these do not match those in Horswill & Robinson (2015) as recommended by NatureScot**

We note several discrepancies in the survival rates in Table 2.2 (Volume 3, Annex 11.6):

- The survival rate of all age classes for great black-backed gull are incorrect. The Applicant has used a survival rate of 0.798 for age class 0-1 and 0.834 for all other age classes, including adult. Both Horswill & Robinson (2015) and the NE PVA Tool default for great black-backed gull is 0.93 for all age classes.
- For razorbill and puffin, the Applicant has applied a cumulative survival rate to single-year age classes. For razorbill, Horswill & Robinson (2015) report a survival rate of 0.63 from age 0-2. This rate describes the proportion of birds expected to survive from age 0 to age 2 and it is incorrect to apply this as an annual survival rate for age 0-1 and 1-2. Assuming a constant survival rate for each age class between 0 and 2, the annual survival rate is  $0.63^{(1/2)} = 0.794$ . Similarly, the cumulative survival rate for puffin between age 0 and 3 is 0.709, which converts to a constant annual survival rate of  $0.709^{(1/3)} = 0.892$  for age classes 0-1, 1-2 and 2-3.

Notably, the input files for the NE PVA Tool (which are automatically downloaded to the user's device) are not provided in the PVA Report. As such, we are unable to check whether the survival rates above were entered into the PVA Tool incorrectly, or if the default values of the tool were used, which would be correct.

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<sup>25</sup> <https://jncc.gov.uk/resources/897c2037-56d0-42c8-b828-02c0c9c12d13>

As such:

- **Clarification is required to confirm the correct demographic rates were used in the PVA model for all species, by providing the original input files from the PVA Tool. If the Applicant cannot confirm that demographic rates used in the model follow those recommended by NatureScot, we expect the PVA to be rerun with the correct input parameters and subsequent results provided (including input files) which would form part of the Additional Environmental Information request.**

Paragraph 2.5.2.2 (Volume 3, Annex 11.6) states that for guillemot, the non-breeding season population is defined as the colonies within a region determined by tracking data from Buckingham et al. (2022)<sup>26</sup>. This was discussed during pre-application, and it was agreed this approach was acceptable. The Applicant also confirmed that this approach would screen in the same SPA populations as would be screened in using the guillemot recommended foraging range including data from Fair Isle in NatureScot guidance<sup>27</sup> (from Woodward et al. 2019)<sup>28</sup>.

Full PVA inputs and outputs are provided in the PVA report (Volume 3, Annex 11.6). Inputs include the species-season impact on adult annual survival rate as a result of the displacement and / or collision impacts quantified in the relevant EIA Annex documents, summarised in Table 2.5 of the PVA report. Results in section 3 of the PVA report will be discussed below in the advice on the EIA Assessment (A.5), where PVA outputs are interpreted to reach conclusions of impact magnitude and significance in EIA terms.

## **A.5 EIA Assessment – Chapter 11 – Offshore Ornithology**

Advice is outlined below following review of the Volume 2, Chapter 11: Offshore Ornithology, initially discussing the assessment approach and subsequently presenting provisional assessment conclusions. These are provisional pending resolution of several clarifications as well as a request for additional information.

### *A.5.1 Assessment approach*

#### *A.5.1.1 Impact pathways*

All impact pathways scoped into and out of the EIA for offshore ornithology are as agreed at Scoping. Those scoped in are:

- Direct temporary habitat loss/disturbance (including increased vessel activity) – all phases
- Changes in prey availability due to temporary habitat loss/disturbance – all phases
- Collision – operation and maintenance phase only
- Displacement – operation and maintenance phase only
- Combined collision and displacement – operation and maintenance phase only
- Barrier effects – operation and maintenance phase only
- Attraction to light – all phases

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<sup>26</sup> <https://www.int-res.com/journals/meps/articles/meps13960>

<sup>27</sup> <https://www.nature.scot/doc/guidance-note-3-guidance-support-offshore-wind-applications-marine-birds-identifying-theoretical>

<sup>28</sup> <https://www.bto.org/our-work/science/publications/reports/bto-research-reports/00724-woodward-seabird-foraging-ranges>

### A.5.1.2 Regional populations

Table 11.17 (Volume 2, Chapter 11) summarises regional, national and international populations. Regional breeding populations have not been corrected to 'breeding adults only' by removing immature and sabbatical birds. The quantitative assessments of displacement impacts and collision risk impacts have also not been corrected to breeding adults only, therefore the EIA assessment considers all birds in the regional population. There are no implications of this approach in the EIA, considering that any adjustment of impact mortalities and regional population counts would be proportional, using the same known proportion of adult birds to remove immature birds from the impact mortalities and regional population.

The regional populations in the EIA Report Chapter (Volume 2, Chapter 11) have been derived from SMP database colony counts from the survey years most contemporaneous with the project DAS – which is in line with our guidance. However, there is a difference in the regional populations between the EIA Chapter and the baseline report (Volume 3, Annex 11.1) which we assume is due to the baseline report deriving colony counts from Seabirds Count (Burnell et al. 2023) only.

**As such:**

- **Clarification is required to confirm the reason why the regional populations differ between Chapter 11 and the baseline report (Volume 3, Annex 11.1).**

Table 11.17 (Volume 2, Chapter 11) states that there are no breeding great black-backed gull within foraging range of Morven South, however this was not the case in the baseline report. However, the closest breeding colonies of great black-backed gull appear outwith the NatureScot advised breeding season foraging range of Morven South, therefore we can accept the statement in Table 11.17.

### A.5.1.3 Demographic rates

Table 11.18 (Volume 2, Chapter 11) contains similar discrepancies with survival rates compared to Horswill & Robinson (2015) as were found in the PVA report as discussed in Section A.4.5 above. For razorbill and puffin, cumulative survival rates are again stated here instead of annual rates for immature age classes. The cumulative survival rate of 0.26 is also stated for immature fulmar in age class 0-1, rather than the annual survival rate of  $0.26^{(1/8)} = 0.845$  for all age classes from 0-1 to 7-8.

For great black-backed gull, the immature survival rates from age 1-2 to 4-5 are correct in Table 11.18 (Volume 2, Chapter 11) - they are assumed to be equal to that of adults - while they were incorrect in the PVA report (Volume 2, Annex 11.6). It is not clear if the incorrect values stated in the PVA report were indeed used in the PVA (as PVA input files are not provided) and if the values stated in Table 11.18 of Chapter 11 were correctly used in the stable age-structure modelling to determine age ratios. Also, for great black-backed gull, a survival rate of 0.798 is stated for age class 0-1 which we assume was taken from herring gull as a proxy species which we accept, as a survival rate for this age class is not provided in Horswill & Robinson (2015).

**As such:**

- **Clarification is required to confirm that the correct survival rates were used in PVAs for great black-backed gull and to understand which values were used in the stable age-structure modelling for great black-backed gull and fulmar.**

The proportion of adults in the population for each species was calculated using a matrix population model, parameterised by the demographic rates in Table 11.18 (Volume 2, Chapter 11). Despite discrepancies in these rates and uncertainty in the source of productivity rates, the proportion of adults for each species is within the range we expect and in line with other Applications. Age class proportions for the EIA have not been calculated using DAS observations for any species, though this was done for some species in the RIAA to inform the Applicant's approach to apportioning.

#### *A.5.1.4 Implications of seasonal definition discrepancies*

The implications of seasonal definition discrepancies in the RIAA and impact assessments are introduced in A.3.4 and further discussed in A.6.2.1.1. We concluded that there would be implications for kittiwake and gannet seasonal and annual collision mortality estimates as a result of seasonal definition discrepancies, this applies to both the EIA and RIAA. There are no implications for the displacement assessment of any species due to the timing of seasonal peak abundance estimates. This is discussed further in A.6.2.1.1 including an outline of the work undertaken to understand the extent of the issue at an SPA level.

**As such:**

- **Additional information is required whereby we request the Applicant recalculates seasonal collision mortality estimates for gannet and kittiwake following NatureScot seasonal definitions (NatureScot, 2020) and recalculates the percentage point change in adult annual survival for the regional population. The requirement for PVA should be reviewed for the project-alone, Morven Programme and cumulative assessments and PVA undertaken where required with relevant metrics presented.**

#### *A.5.2 NatureScot advice – Assessment of significant effects – Morven South alone*

Our assessment of the predicted effects of Morven South alone (i.e. array area only) are discussed below.

##### *A.5.2.1 Direct temporary habitat loss / disturbance*

The Applicant concludes no significant effect for any receptor screened into the assessment of this impact pathway in any project phase. We agree with the Applicant's conclusion of 'negligible' Magnitude, 'medium' Sensitivity and therefore the conclusion for **Not Significant** for guillemot, razorbill and puffin (as the only species screened in for assessment of this impact pathway).

The indirect impacts of UXO clearance have also been considered under this impact pathway. Direct effects of UXO clearance should also be assessed, given the risk of injury and mortality to diving seabird species in the vicinity of detonations. While we do not expect a significant impact, diving species (notably gannet, guillemot, razorbill and puffin) should be scoped in for consideration of the risk of direct impact from UXO clearance by future Applicants. However, we agree with the conclusion of **Not significant** to all species scoped into the EIA, based on the temporary, localised nature of this impact.

##### *A.5.2.2 Changes in prey availability due to temporary habitat loss / disturbance*

The Applicant concludes **No Significant** effect for any ornithology receptor screened into the assessment of changes in prey availability due to temporary habitat loss / disturbance in any

project phase, which we agree with, based on our acceptance of a No Significant effect conclusions in the assessment of impacts to Fish and Shellfish receptors in Chapter 9 and as advised in Appendix C of this letter.

#### A.5.2.3 Collision with rotating blades

The Applicant concludes no significant effect for any receptor screened into the assessment of this impact pathway in the operation and maintenance phase.

We **agree** with the Applicant's conclusion of 'negligible' Magnitude, 'medium to high' Sensitivity and therefore a conclusion of **Not Significant** for great black-backed gull and migratory waterbirds.

We **provisionally** agree with the Applicant's conclusion of 'negligible' Magnitude, 'high' Sensitivity and therefore a **provisional** conclusion of **Not Significant** for Arctic tern— subject to the clarification requested in A.4.2 and A.4.2.2 above. Quantitative collision impacts and conclusions are summarised in Table NS.3. below.

Advice on species assessed for both collision and displacement impacts (kittiwake and gannet) is provided under combined collision and displacement impacts (in section A.5.2.5 below), and not for each impact separately.

*Table NS.3: EIA conclusions for species impacted by project-alone collision impacts only*

| Species                 | Morven South mortalities per year | Decrease in adult annual survival rate (% point) | Median counterfactuals of population size/growth rate after 35 years of impacts |     | Morven EIA conclusion | NatureScot EIA conclusion |
|-------------------------|-----------------------------------|--------------------------------------------------|---------------------------------------------------------------------------------|-----|-----------------------|---------------------------|
|                         |                                   |                                                  | CPS                                                                             | CGR |                       |                           |
| Great black-backed gull | 1.5                               | 0.002                                            | PVA not required                                                                |     | Minor                 | Minor – not significant   |
| Arctic tern             | 0.0                               | <0.001                                           | PVA not required                                                                |     | Minor                 | Minor – not significant†  |

†**Provisional** conclusion

#### A.5.2.4 Displacement impacts

The Applicant concludes no significant effect for any receptor screened into the assessment of displacement impact pathway in the operation and maintenance phase.

For razorbill, puffin and fulmar, we **agree** with the Applicant's conclusion of 'negligible' Magnitude, 'medium to high' Sensitivity and the resulting **Not Significant** conclusion.

For guillemot, we **provisionally disagree** with the conclusion of 'negligible' Magnitude, instead concluding 'low' Magnitude but still **provisionally** concluding minor significance which is **Not significant** in EIA terms – subject to the clarification requested in section A.4.5. Displacement impacts and conclusions are summarised in Table NS.4.

Table NS.4: EIA conclusions for species impacted by project-alone displacement impacts only

| Species   | Morven South mortalities per year | Decrease in adult annual survival rate (% point) | Median counterfactuals of population size/growth rate after 35 years of impacts |        | Morven EIA conclusion | NatureScot EIA conclusion    |
|-----------|-----------------------------------|--------------------------------------------------|---------------------------------------------------------------------------------|--------|-----------------------|------------------------------|
|           |                                   |                                                  | CPS                                                                             | CGR    |                       |                              |
| Guillemot | 83.9 to 231.7                     | 0.018 to 0.049                                   | 0.981                                                                           | 0.9995 | Minor                 | Minor – not significant†     |
| Razorbill | 21.6 to 63.4                      | 0.004 to 0.011                                   | PVA not required                                                                |        | Minor                 | Minor – not significant      |
| Puffin    | 4.5 to 11.0                       | 0.001 to 0.002                                   | PVA not required                                                                |        | Negligible            | Negligible – not significant |
| Fulmar    | 2.0 to 5.9                        | <0.001 to 0.001                                  | PVA not required                                                                |        | Negligible            | Negligible – not significant |

†Provisional conclusion

#### A.5.2.5 Combined collision and displacement impacts

The Applicant concludes no significant effect for any receptor screened into the assessment of combined collision and displacement impact pathway in the operation and maintenance phase. We **provisionally** agree with the Applicant's conclusion of 'negligible' Magnitude, 'high' Sensitivity and therefore a **Not significant** conclusion for kittiwake and gannet. Combined collision and displacement impacts and conclusions are summarised in Table NS.5 below. The mortality estimates for gannet are, by our calculations erroneous.

As such:

- **Clarification is required to confirm the correct mortality values per year for gannet for annual displacement, annual collision and combined impacts.**

We also expect mortality estimates for both gannet and kittiwake are also incorrect due to the implications of seasonal definition discrepancies (see A.5.1.4). Our conclusions are subject to clarification of these errors.

Table NS.5: EIA conclusions for species impacted by project-alone collision and displacement impacts

| Species   | Morven South mortalities per year | Decrease in adult annual survival rate (% point) | Median counterfactuals of population size/growth rate after 35 years of impacts |     | Morven EIA conclusion | NatureScot provisional EIA conclusion |
|-----------|-----------------------------------|--------------------------------------------------|---------------------------------------------------------------------------------|-----|-----------------------|---------------------------------------|
|           |                                   |                                                  | CPS                                                                             | CGR |                       |                                       |
| Kittiwake | 12.6 to 17.3                      | 0.002                                            | PVA not required                                                                |     | Minor                 | Minor – not significant               |
| Gannet    | 16.9 to 23.6                      | 0.003 to 0.004                                   | PVA not required                                                                |     | Minor                 | Minor – not significant               |

#### *A.5.2.6 Barrier effects*

The Applicant concludes no significant effect for any receptor screened into the assessment of barrier effects in the operation and maintenance phase. We agree with the Applicant's conclusion of 'negligible' Magnitude, 'low to high' Sensitivity and therefore a conclusion of **Not Significant** for all receptors assessed.

#### *A.5.2.7 Attraction to light*

The assessment of impacts to seabirds from artificial light is discussed in Section 11.11.8 (Volume 2, Chapter 11) with a very good level of detail. There has been a thorough assessment detailing the characteristics of light sources from the project in different phases, the sensitivities of each species to impacts from artificial light, and a well-referenced discussion of the available literature. We highlight the quality of this section to future Applicants. We agree with the Applicant's conclusion of 'negligible' Magnitude for all species and 'medium' Sensitivity for European storm petrel, Leach's petrel and fulmar. We disagree with the conclusion of 'low' Sensitivity of Manx shearwater and instead conclude 'medium' Sensitivity, however this does not change the conclusion of significance which we agree is **Not Significant** for all receptors assessed.

### *A.5.3 NatureScot advice – Assessment of cumulative significant effects*

The cumulative assessment for Morven South has been split into four scenarios:

1. Whole Project: Morven South with the export cable MHPGH Project
2. Whole Project: Morven South with the export cable MBAGC Project
3. Morven Programme: Morven South together with Morven North and both MHPGC and MBAGC export cable projects.
4. Cumulative Effects Assessment: Scenario 3 above plus Tier 1, Tier 2 and Tier 3 plans / projects screened in.

#### *A.5.3.1 Projects and impact pathways screened in and out*

Several operational offshore wind farm projects have been screened out of the cumulative effects assessment as their operational consent ends before Morven South would become operational (if consented). These are: Greater Gabbard, Gunfleet Sands 1 and 2, Humber Gateway, Inner Dowsing, Lynn, London Array, Methil Demo, Scroby Sands and Sheringham Shoal.

The cut-off date for projects to be screened in for the quantitative cumulative effects assessment was six months prior to the submission of the Morven South Application. An additional screening exercise was undertaken three months prior to submission which the Applicant states identified only one project which had not been included in the original screening: Ayre offshore wind farm. Additionally, we have identified a number of other offshore wind projects which have submitted applications between the 6-month cut-off and the submission of the Morven South Application. Notably, the nearby Bellrock and Bowdun offshore wind farm Applications, and the additional information submissions for the nearby Muir Mhor and Ossian wind farms – note this list is not exhaustive. We acknowledge that the cut-off period for inclusion in the in-combination assessment is an industry standard, however the issue arising from multiple submissions in a short timeframe, and exacerbated when Application submissions are subsequently delayed, creates

significant uncertainty in the assessment process and without an audit / assessment, we cannot be sure that potentially significant effects have been assessed and not been missed.

**As such:**

- **We request MD LOT advises the Applicant which wind farms should be included to inform the request for Additional Environmental to ensure a robust cumulative assessment is provided.**

Impacts considered in the cumulative assessments are a subset of those in the project-alone assessment. Those considered to be highly localised and temporary in nature or where the project alone assessment reached a conclusion of no significant effects have been screened out. While this is not necessarily in line with what we would expect, we are content with how impacts have been screened in and out as summarised in Table NS.6 below.

*Table NS.6: Summary of impact pathways screened in and out of the cumulative assessment under EIA*

| Screened out                                                                                                          | Screened in                                                                                                       |
|-----------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------|
| Direct temporary habitat loss / disturbance<br>Changes in prey availability<br>Barrier effects<br>Attraction to light | Collision with rotating blades*<br>Displacement <sup>§</sup><br>Combined collision and displacement* <sup>§</sup> |

\* As there is no collision risk associated with either MHPGC or MBAGC Projects, only scenarios 3 & 4 have been assessed cumulatively for this impact pathway. Noting that scenario 3 does not include either of the export cable project (MHPGC and MBAGC) either.

§ As there is no displacement impacts associated with either MHPGC or MBAGC Projects, only scenarios 3 & 4 have been assessed cumulatively for this impact pathway. Noting that scenario 3 does not include either of the export cable project (MHPGC and MBAGC) either.

**With respect to the export cable projects (MHPGC and MBAGC) we expect within any forthcoming marine licence applications, the provision of a robust cumulative assessment and that this should include assessment of vessel disturbance from construction activities and consideration of those impacts screened out above.**

#### *A.5.3.2 Quantifying impacts from cumulative projects*

To quantify cumulative impacts from projects screened in for the cumulative assessment, mortality estimates for quantitative impacts were derived from individual project application documents.

For collision impacts, avoidance rates varied between some Applications due to differences in guidance over time and between SNCBs. Where a different avoidance rate was used to what is currently recommended, a project's mortality estimates were corrected to match current guidance. Where other parameter values did not match what is currently recommended in guidance, such as flight speed and nocturnal activity, it was not possible to correct mortality estimates in this way. This is an acceptable approach.

For displacement impacts, historic approaches to calculating displacement mortalities varied with some Applications not using a mean seasonal peak (MSP) abundance estimate as an input to the displacement matrix, and differences in displacement and mortality rates between Applications due to differences in guidance over time. Where Applications did not include an MSP abundance estimate, the Applicant has calculated this using individual project data presented in Applications. Where abundance estimates for other projects were not provided for the required project array area plus 2 km buffer, the Applicant has corrected the MSP abundance estimate using the difference between the project array area and project array area plus 2 km buffer. Where projects did not split relevant species' non-breeding season into pre- and post-breeding seasons using Furness (2015) definitions, the Applicant has halved the non-breeding season MSP abundance estimate and applied this value to both pre- and post-breeding seasons.

It would have been beneficial for the Applicant to consult NatureScot on this approach, however from our own worked example it appears this approach is likely to be precautionary and therefore acceptable.

### A.5.3.3 Morven Programme Assessment (scenario 3 without export cables)

#### A.5.3.3.1 Collision with rotating blades

The Applicant concludes no significant effect for the three species screened into the collision risk assessment in the operation and maintenance phase under scenario 3. We agree with the Applicant's conclusion of 'negligible' Magnitude, 'high' Sensitivity and therefore **Not Significant** conclusion for great black-backed gull. Collision impacts from the Morven Programme Assessment and conclusions are summarised in Table for great black-backed gull. (See combined assessment below for kittiwake and gannet conclusions).

*Table NS.7: EIA conclusions for great black-backed gull through Morven Programme collision impacts only*

| Species                 | Morven Programme mortalities per year | Decrease in adult annual survival rate (% point) | Median counterfactuals of population size/growth rate after 35 years of impacts |     | Morven EIA conclusion | NatureScot EIA conclusion |
|-------------------------|---------------------------------------|--------------------------------------------------|---------------------------------------------------------------------------------|-----|-----------------------|---------------------------|
|                         |                                       |                                                  | CPS                                                                             | CGR |                       |                           |
| Great black-backed gull | 2.3                                   | 0.003                                            | PVA not required                                                                |     | Minor                 | Minor – not significant   |

#### A.5.3.3.2 Displacement impacts

The Applicant concludes no significant effect for any receptor screened into the assessment of displacement impacts in the operation and maintenance phase under scenario 3.

For guillemot, we **provisionally** disagree with the conclusion of 'negligible' Magnitude, instead concluding 'low' Magnitude which results in a **provisional** conclusion which is **Not Significant** – subject to the clarification requested in A.4.5.

For puffin and fulmar, we agree with the Applicant's conclusion of 'negligible' Magnitude, 'medium' Sensitivity and therefore **Not Significant** conclusion.

For razorbill, we disagree with the conclusion of ‘negligible’ Magnitude, instead concluding ‘low’ Magnitude and which still results in a conclusion which is **Not Significant**. Displacement impacts from the Morven Programme Assessment and conclusions are summarised in Table NS.8.

*Table NS.8: EIA conclusions for species impacted by Morven Programme displacement impacts only*

| Species   | Morven Programme mortalities per year | Decrease in adult annual survival rate (% point) | Median counterfactuals of population size/growth rate after 35 years of impacts |                  | Morven EIA conclusion | NatureScot EIA conclusion    |
|-----------|---------------------------------------|--------------------------------------------------|---------------------------------------------------------------------------------|------------------|-----------------------|------------------------------|
|           |                                       |                                                  | CPS                                                                             | CGR              |                       |                              |
| Guillemot | 335.5 to 886.9                        | 0.071 to 0.187                                   | 0.9292 to 0.9726                                                                | 0.9979 to 0.9992 | Minor                 | Minor – not significant†     |
| Razorbill | 70.3 to 202.0                         | 0.012 to 0.034                                   | 0.9861                                                                          | 0.9996           | Minor                 | Minor – not significant      |
| Puffin    | 24.1 to 54.7                          | 0.005 to 0.014                                   | PVA not required                                                                |                  | Negligible            | Negligible – not significant |
| Fulmar    | 9.9 to 29.7                           | 0.001 to 0.003                                   | PVA not required                                                                |                  | Negligible            | Negligible – not significant |

†Provisional conclusion

#### *A.5.3.3.3 Combined collision and displacement impacts*

The Applicant concludes no significant effect for any receptor screened into the assessment of combined collision and displacement in the operation and maintenance phase under scenario 3. We provisionally agree with the Applicant’s conclusion of ‘negligible’ Magnitude, ‘high’ Sensitivity and therefore **Not Significant** conclusion for both kittiwake and gannet – subject to clarifications in A.5.1.4 and A.5.2.5. Combined collision and displacement impacts from the Morven Programme Assessment and conclusions are summarised in Table NS.9.

*Table NS.9: EIA conclusions for species impacted by Morven Programme combined collision and displacement impacts*

| Species   | Morven Programme mortalities per year | Decrease in adult annual survival rate (% point) | Median counterfactuals of population size/growth rate after 35 years of impacts |     | Morven EIA conclusion | NatureScot provisional EIA conclusion |
|-----------|---------------------------------------|--------------------------------------------------|---------------------------------------------------------------------------------|-----|-----------------------|---------------------------------------|
|           |                                       |                                                  | CPS                                                                             | CGR |                       |                                       |
| Kittiwake | 46.6 to 69.5                          | 0.006 to 0.008                                   | PVA not required                                                                |     | Minor                 | Minor – not significant               |
| Gannet    | 35.3 to 58.8                          | 0.006 to 0.010                                   | PVA not required                                                                |     | Minor                 | Minor – not significant               |

#### *A.5.3.4 Cumulative Effects Assessment (scenario 4 without export cables)*

##### *A.5.3.4.1 Collision with rotating blades*

The Applicant concludes no significant effects for any receptor screened into the collision risk assessment during in the operation and maintenance phase under scenario 4. Collision impacts

and conclusions for the cumulative effects assessment are summarised in Table. below for great black-backed gull. (See combined assessment below for kittiwake and gannet conclusions).

*Table NS.10: EIA conclusions for great black-backed gull cumulative collision impacts only*

| Species                 | Cumulative mortalities per year | Decrease in adult annual survival rate (% point) | Median counterfactuals of population size/growth rate after 35 years of impacts |        | Morven EIA conclusion | NatureScot EIA conclusion  |
|-------------------------|---------------------------------|--------------------------------------------------|---------------------------------------------------------------------------------|--------|-----------------------|----------------------------|
|                         |                                 |                                                  | CPS                                                                             | CGR    |                       |                            |
| Great black-backed gull | 868.9                           | 0.951                                            | 0.6675                                                                          | 0.9885 | Minor                 | <b>Major - Significant</b> |

For great black-backed gull, we disagree with the conclusion of ‘low’ Magnitude and instead conclude ‘high’ Magnitude given the low median CPS and CGR values from the PVA after 35 years of impacts and a 59% decline in the Scottish breeding population between 1986 and 2024 (Harris et al. 2026)<sup>29</sup>. Alongside a ‘high’ Sensitivity to the impacts of collision, this results in a **provisional Significant Effect** conclusion in EIA terms – subject to the clarifications requested in A.4.5 and A.5.1.3. As great black-backed gull was not assessed in the RIAA, the predicted mortalities from Morven South must be addressed under EIA through offsetting (compensation).

**As such:**

- **We encourage the Applicant to engage with NatureScot and MD-LOT to agree a suitable approach to address the provisional significant effect to great black-backed gull as a result of collision risk. We acknowledge that predicted annual impacts from Morven South are <1 bird per annum and recommend the Applicant explores opportunities to collaborate with other Offshore Wind Farm projects in a similar situation.**

#### A.5.3.4.2 Displacement impacts

The Applicant concludes no significant effects for any receptor screened into the assessment of displacement in the operation and maintenance phase under scenario 4. Displacement impacts and conclusions for the cumulative effects assessment are summarised in Table NS.11. We do not agree with the conclusion of ‘low’ Magnitude for guillemot, razorbill or puffin.

For guillemot, we conclude ‘high’ Magnitude given the very low median CPS and CGR values and a 29% decline in the Scottish breeding population between 1986 and 2024 (Harris et al. 2026). Alongside a ‘high’ Sensitivity to the impacts of displacement, this results in a **provisional Significant effect** conclusion in EIA terms – subject to clarifications requested in A.4.5.

For razorbill, we conclude ‘high’ Magnitude given the low median CPS and CGR values and a increase in the Scottish breeding population of 63% between 1986 and 2024 (Harris et al. 2026).

<sup>29</sup> <https://www.bto.org/our-work/science/publications/reports/smp-report/seabird-population-trends-and-causes-change-1986-2024>

Alongside a ‘high’ Sensitivity to the impacts of displacement, this results in a **provisional Significant effect** conclusion in EIA terms – subject to clarifications requested in A.4.5.

For puffin, we conclude ‘medium’ Magnitude given the low CPS values and a 21% decline in the Scottish breeding population between 1986 and 2024 (Harris et al. 2026). Alongside a ‘medium’ Sensitivity classification for displacement impacts, this results in a **provisional Significant effect** conclusion in EIA terms – subject to clarifications requested in A.4.5.

*Table NS.11: EIA conclusions for species impacted by cumulative displacement impacts only*

| Species   | Cumulative mortalities per year | Decrease in adult annual survival rate (% point) | Median counterfactuals of population size/growth rate after 35 years of impacts |                  | Morven EIA conclusion | NatureScot EIA provisional conclusion |
|-----------|---------------------------------|--------------------------------------------------|---------------------------------------------------------------------------------|------------------|-----------------------|---------------------------------------|
|           |                                 |                                                  | CPS                                                                             | CGR              |                       |                                       |
| Guillemot | 3,724.5 to 7,673.6              | 0.784 to 1.616                                   | 0.5271 to 0.7340                                                                | 0.9819 to 0.9912 | Minor                 | Major - significant                   |
| Razorbill | 1,618.7 to 4,265.3              | 0.273 to 0.721                                   | 0.7415 to 0.8931                                                                | 0.9915 to 0.9968 | Minor                 | Major - significant                   |
| Puffin    | 980.7 to 1,988.1                | 0.218 to 0.443                                   | 0.8332 to 0.9138                                                                | 0.9948 to 0.9974 | Minor                 | Moderate - significant                |

#### A.5.3.4.3 Combined collision and displacement

The Applicant concludes no significant effects for any receptor screened into the assessment of combined collision and displacement in the operation and maintenance phase under scenario 4. Combined collision and displacement impacts and conclusions for the cumulative effects assessment are summarised in Table NS.12. We disagree with the conclusion of ‘negligible’ to ‘low’ Magnitude and minor significance for kittiwake and gannet.

For kittiwake we conclude ‘high’ Magnitude based on the low median CPS and CGR values and a 53% decline in the Scottish breeding population between 1986 and 2024 (Harris et al. 2026). Alongside a ‘high’ Sensitivity to the impacts of collision and ‘medium’ Sensitivity to displacement, this results in a **provisional Significant effect** conclusion in EIA terms – subject to clarifications requested in A.4.5, A.5.1.4 and A.5.2.5.

For gannet we conclude ‘high’ Magnitude based on the low median CPS and CGR values and colony SPA declines of between 3 and 37% across Scotland as a result of HPAI (Tremlett et al. 2024). Alongside a ‘high’ Sensitivity to the impacts of both collision and displacement, this results in a **provisional Significant effect** conclusion in EIA terms – subject to clarifications requested in A.4.5 and A.5.1.4.

*Table NS.12: EIA conclusions for species impacted by cumulative collision and displacement impacts only*

| Species | Cumulative mortalities per year | Decrease in adult annual survival rate (% point) | Median counterfactuals of population size/growth rate after 35 years of impacts |     | Morven EIA conclusion | NatureScot EIA provisional conclusion |
|---------|---------------------------------|--------------------------------------------------|---------------------------------------------------------------------------------|-----|-----------------------|---------------------------------------|
|         |                                 |                                                  | CPS                                                                             | CGR |                       |                                       |

|           |                    |                |                  |                  |       |                     |
|-----------|--------------------|----------------|------------------|------------------|-------|---------------------|
| Kittiwake | 4,075.1 to 5,489.1 | 0.491 to 0.661 | 0.7593 to 0.8155 | 0.9922 to 0.9942 | Minor | Major - significant |
| Gannet    | 1,486.6 to 2,380.5 | 0.265 to 0.425 | 0.8375 to 0.8953 | 0.9949 to 0.9968 | Minor | Major - significant |

Without prejudging the outcome of the Appropriate Assessment, we anticipate, should consent be granted, that compensatory measures would need to be secured for gannet, kittiwake, guillemot, razorbill, and puffin. We consider that agreed compensation measures would be sufficient to address significant effects predicted under EIA for these species. Impacts to great black-backed gull will need to be discussed separately.

#### *A.5.4 Mitigation – EIA Commitments Register*

Documents detailing mitigation measures related to offshore ornithology under EIA (and RIAA) are listed below:

- Volume 3 Annex 6.3, EIA Commitments Register
- Volume 4 Annex 1, Appendix 1.1: Marine Pollution Contingency Plan (MPCP)
- Volume 4 Annex 1, Appendix 1.2: INNSMP and Biosecurity Plan
- Volume 4 Annex 1: Environmental Management Plan (EMP)
- Volume 4 Annex 4: Lighting and Marking Plan (LMP)
- Volume 4 Annex 5: Navigation Safety Plan and Vessel Management Plan (NSPVMP)

The documents above relate to commitments MM-5, MM-6, MM-7, MM-32 and MM-34, all of which have relevance to offshore ornithology receptors. All documents are draft plans to be completed post-consent. Most of the plans contain a sufficient level of detail at this stage, and we welcome details included in the plans such as roles and responsibilities, incident reporting and control measures.

The Navigation Safety Plan and Vessel Management Plan (NSPVMP) lacks any detail required to comment on their appropriateness to prevent impacts to offshore ornithology receptors from vessel disturbance. Port selection and transit corridors have not been identified at this stage therefore it is not possible to advise on potential disturbance to offshore ornithology receptors from vessel transit to and from the Morven South area. The section 'Environmental sensitivities relevant to vessel management' has not been completed at this stage due to transit corridors not being identified.

**As such:**

- **We request further consultation to provide advice on the assessment of vessel disturbance once port selection and vessel transit route are confirmed. We acknowledge that this may be through the NSPVMP.**
- **Within the NSPVMP we expect commitments to follow the Marine Wildlife Watching Code (NatureScot, 2017)<sup>30</sup> and protocols to avoid disturbance to aggregations of birds.**

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<sup>30</sup> <https://www.nature.scot/professional-advice/land-and-sea-management/managing-coasts-and-seas/scottish-marine-wildlife-watching-code>

- **We would also recommend that protocols are included in the final plan to address monitoring, reporting and handling of any birds attracted to vessels by lighting, as was advised in NatureScot’s scoping and screening advice in August 2023.**

#### *A.5.5 Monitoring – EIA*

Post-consent monitoring of the predicted impacts of a development is necessary to validate the conclusions of the EIA and to further our collective understanding of the effects of offshore developments on the marine environment. Monitoring is also important in understanding the effectiveness of mitigation measures, and to confirm that impacts not requiring mitigation are not causing environmental damage (Scottish Natural Heritage, 2018)<sup>31</sup>. The continued monitoring of seabird breeding colonies through schemes such as the Seabird Monitoring Programme is also a crucial element of understanding the impact of offshore developments on our seabird populations at the colony level.

No site-specific monitoring has been proposed at this stage because the Applicant did not conclude any impacts to be significant in EIA terms. However, we have concluded **Significant effects** – both provisional and final – to the regional populations of several VORs as a result of the predicted impacts of Morven South cumulatively with other plans and projects.

We would have expected at least an outline of proposed monitoring to be suggested at this stage as there are clear significant impacts, though we acknowledge this is only in the cumulative impact scenario 4 with Morven contributing between 0.31% to 3.02% of cumulative impact totals, depending on the receptor species. The Applicant has committed to engage with MD-LOT, NatureScot, MD SEDD and other stakeholders to identify the need for ongoing monitoring. This will also be relevant for adverse effects (AEoSI) identified in the RIAA and discussed below is A.6 (RIAA).

**As such:**

- **If consented, monitoring requirements should be discussed and agreed with MD LOT, NatureScot, MD SEDD and other stakeholders in respect of EIA and HRA.**

#### *A.5.6 Transboundary effects*

Impacts to interests of other European Economic Area States are considered, however the assessment is very brief and lacks any detail. Displacement, collision and combined displacement and collision are all assessed to be **Not significant**, but there is no detail in how these conclusions were reached. However, from experience of similar Applications we can accept it is unlikely that there will be any significant transboundary effects from Morven South.

### **A.6 Report to Information and Appropriate Assessment (RIAA)**

Advice is provided below following review of the RIAA (Volume 2) Parts 1 and 3 together with supporting appendices on Apportioning (Annex 3.1) and PVA (Annex 3.2). Initially discussing the assessment approach and subsequently presenting provisional assessment conclusions. These are provisional pending resolution of a number of clarifications as well as a request for additional information.

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<sup>31</sup> <https://www.nature.scot/doc/archive/environmental-impact-assessment-handbook-version-5-2018>

### *A.6.1 Likely Significant Effect (LSE) Re-screening*

As noted in RIAA Part 1: Introduction (Volume 2, Chapter 1) a re-screening exercise to consider connectivity and the LSE test has been undertaken for Morven South since the original HRA Screening submission in 2023 considered the Morven lease site as a whole (i.e. Morven North and Morven South together as a single wind farm). Paragraph 5.1.1.19 states that a total of 21 SPAs have been screened in following identification of connectivity and a LSE conclusion for the proposed Morven South wind farm. Re-screening has ruled out LSE for the following features, all on the basis of being beyond foraging range of Morven South and because the SPA represents <1% of the total relevant BDMPS population (see comments in A.6.1.1 below on this approach):

- Herring gull at Buchan Ness to Collieston Coast SPA
- Kittiwake at Calf of Eday SPA – this SPA has now been screened out for all features
- Kittiwake at Fair Isle SPA
- Puffin at Hoy SPA
- Kittiwake at Marwick Head SPA – this SPA has now been screened out for all features
- Kittiwake at Rousay SPA – this SPA has now been screened out for all features
- Kittiwake and razorbill at St Kilda SPA
- Razorbill at Troup, Pennan and Lion's Heads SPA

The original HRA screening identified no LSE to any gannet colony other than Forth Islands SPA, based on tracking data from Wakefield et al. (2013)<sup>32</sup>. NatureScot advised that Hermaness, Saxa Vord and Valla Field SPA, Noss SPA and Sule Skerry and Sule Stack SPA should not be screened out as they were not included in the study. The RIAA has now included Hermaness, Saxa Vord and Valla Field SPA and Noss SPA, but not Sule Skerry and Sule Stack SPA as it was included in the study and indicated no connectivity with Morven South – which we accept.

#### *A.6.1.1 Non-breeding season connectivity*

The apportioning report (Volume 2, Annex 3.1) details the approach to determine non-breeding season connectivity and apportion impacts occurring in the non-breeding season(s) to relevant SPAs. Impacts were only apportioned to SPAs in the non-breeding season if there was connectivity in the breeding season or the SPA colony represents >1% of the BDMPS population (Furness, 2015).

This approach is not in line with our expectations, although we acknowledge that we have only recently identified this as a potential issue. Nevertheless, under this method, there are several SPAs contributing to a species' BDMPS population which in our view are not considered for LSE but should have been. While apportioned impacts to SPAs not screened in for non-breeding season connectivity are likely to be minimal (due to the threshold of >1% of BDMPS population at the SPA) and therefore use of this method is unlikely to have any significant implication for our conclusions, we cannot be certain, nor is there any audit trail of impacts to these SPAs in the non-breeding season.

**As such:**

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<sup>32</sup> <https://pubmed.ncbi.nlm.nih.gov/23744776/>

- **Clarification is required to confirm the apportioned impacts to those SPAs screened out due to no connectivity in the breeding season or because the SPA colony represents <1% of the BDMPs population. If the apportioned impacts exceed 0.02 percentage point change in adult annual survival in the project-alone, Morven Programme or in-combination assessment, any subsequent PVA required is likely to form part of the additional environmental information request.**

#### *A.6.1.2 Migratory waterbirds*

Appendix A of RIAA Part 1 (Volume 2, Chapter 1) includes a validation of the screening approach applied to migratory waterbirds for collision risk, following updated guidance on the approach to assess this impact. The original HRA Screening followed the SOSSMAT (Wright et al., 2012) excel workbook approach to assessing migratory collision risk. LSE was originally determined if the predicted collision mortalities exceeded 1% of the baseline mortality rate of the relevant biogeographic population. The re-screening exercise used the newly available mCRM tool (HiDef, 2022) and the reduced project size of Morven South only (as opposed to the original Morven Site). The results of both the SOSSMAT and mCRM approach did not exceed the 1% threshold of baseline mortality of the biogeographic for any species, therefore LSE was ruled out, and this impact was screened out of further assessment. We note that the collision estimates were not apportioned to any individual SPA and advise future Applicants that this additional step should be taken to determine LSE at the SPA level. However, given the small impacts from Morven South (percentage point change in baseline mortality of the biogeographic population is <0.001 to 0.006) we can accept that no LSE will occur for any SPA / qualifying feature for migratory waterbirds.

#### *A.6.1.3 Manx Shearwater*

Manx shearwater has been screened out on the basis that there is no connectivity with Morven South and any SPAs with Manx shearwater as a qualifying feature. This is based on the findings in Dean et al. (2012)<sup>33</sup> which provides some evidence of no connectivity for birds tagged on Copelands Islands SPA and Skomer, Skokholm and the Seas off Pembrokeshire SPA only.

The Applicant has screened out all SPAs with Manx shearwater as a qualifying feature including Rum SPA, St Kilda SPA and several SPAs in the rest of the UK. Manx shearwater were recorded in the Morven South DAS survey area in July 2021 (17 birds) and July 2023 (2 birds), suggesting there may be connectivity for breeding birds and SPAs should have been screened in using the recommended breeding season foraging range (NatureScot, 2023) to determine theoretical connectivity. However, as the main impact pathway for Manx shearwater is attraction to light and the Applicant concluded **No AEoSI** for any feature under this impact, which we accept, we also accept this would not result in any additional conclusions of AEoSI for Manx shearwater.

#### *A.6.1.4 Fulmar*

Several SPAs with fulmar as a qualifying feature have been screened out of the assessment for both breeding and non-breeding season impacts. Fulmar was screened in for the assessment of

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<sup>33</sup> <https://royalsocietypublishing.org/rsif/article-abstract/10/78/20120570/89492/Behavioural-mapping-of-a-pelagic-seabird-combining?redirectedFrom=fulltext>

displacement impact, and it is unclear why the following SPAs were not screened in: Calf of Eday, Cape Wrath, Flannan Isles, Handa, Mingulay and Berneray, Rousay, Sumburgh Head and Shiant Isles. It appears these SPAs were screened out as they constitute <1% of the UK North Sea winter and migration seasons BDMPS populations, which is not in line with our accepted approach. These SPAs are also within breeding season foraging range of Morven South and should have been screened in for both breeding and non-breeding season displacement impacts.

Given that the Applicant concluded **No AEoSI** for fulmar at any SPA, which we accept, we also accept there would be no additional conclusions of AEoSI for fulmar at any of the SPAs listed above.

#### *A.6.1.5 Great black-backed gull*

Great black-backed gull were also screened out in the 2023 HRA screening report on the basis of low abundance in the surveys area (14 raw counts over 8 months in the non-breeding season only). The predicted mortality from collision risk was 1.5 birds per year and considering the UK North Sea BDMPS population of 91,399 birds we accept this would mean **No AEoSI** at any SPA. We can therefore accept that great black-backed gull was assessed in the EIA only.

### *A.6.2 RIAA Assessment methodology*

#### *A.6.2.1 Seasonal definitions*

Seasonal definitions from NatureScot (2020) have been adjusted depending on the timing of aerial survey visits within any month which is split between two seasons. However, on some occasions the survey in the split month in one year of survey was undertaken towards the start of the month and can be assumed to be the end of the previous season, while in the second year the survey was in the middle or end of the month and the same assumption cannot be made. There is also no consideration of surveys in the middle of the month representing both seasons, even if they were undertaken exactly in the middle of the month (i.e. 15th of the month).

These discrepancies are summarised in the Table NS.13 below.

Specifically, there are a number of species seasonal definitions which are not in line with our advice or how we would expect split months to be treated:

- The breeding season for kittiwake has been defined as May to August with April surveys incorporated into the pre-breeding season. The April survey took place on the 11th of the month in 2022 and 14th of the month in 2023. As such, the density and abundance estimate for April should have been used to characterise both the pre-breeding and breeding seasons, rather than being incorporated into the pre-breeding season only.
- The breeding season for fulmar has been defined as April to September with September surveys incorporated into the breeding season. The September 2021 survey took place on the 14th of the month and should have been used to characterise both the breeding and post-breeding seasons. The September 2022 survey took place on the 1st of the month, and we can accept this to represent the breeding season only. The September 2023 survey took place on the 17th of the month and should have been used to characterise the breeding and post-breeding seasons.

- The breeding season for gannet has been defined as April to September with March surveys incorporated into the pre-breeding season. The March 2022 survey took place on the 6th and 7th of the month, and we can accept this to represent the pre-breeding season only. The March 2023 survey took place on the 15th of the month and should have been used to characterise both the pre-breeding and breeding seasons.

*Table NS.13: Discrepancies in the Applicant's seasonal definitions in the RIAA Part 3 report presented alongside NatureScot definitions based on NatureScot Guidance note 9<sup>34</sup>*

| Species   | Season        | Morven definition                                         | Corrected definition                                              |
|-----------|---------------|-----------------------------------------------------------|-------------------------------------------------------------------|
| Kittiwake | Pre-breeding  | January to April                                          | January to <b>mid-April</b>                                       |
|           | Breeding      | May to August                                             | <b>Mid-April</b> to August                                        |
|           | Post-breeding | September to December                                     | -                                                                 |
| Guillemot | Breeding      | April to June 2022 and 2023                               | -                                                                 |
|           | Post-breeding | July and August 2022<br>July 2023                         | -                                                                 |
|           | Non-breeding  | August 2021 to March 2022<br>September 2022 to March 2023 | -                                                                 |
| Razorbill | Pre-breeding  | January to March 2022 and 2023                            | -                                                                 |
|           | Breeding      | April to June 2022<br>April to July 2023                  | April to June 2022<br>April to <b>August</b> 2023                 |
|           | Post-breeding | July to October 2021 and 2022                             | -                                                                 |
|           | Non-breeding  | November to December 2021 and 2022                        | -                                                                 |
| Puffin    | Breeding      | April to August                                           | -                                                                 |
|           | Non-breeding  | September to March                                        | -                                                                 |
|           | Pre-breeding  | December to March                                         | -                                                                 |
| Fulmar    | Breeding      | April to September                                        | April to September 2022<br>April to <b>mid-September</b> 2023     |
|           | Post-breeding | October                                                   | <b>Mid-September</b> to October 2021<br>October 2022              |
|           | Non-breeding  | November                                                  | -                                                                 |
| Gannet    | Pre-breeding  | December to March                                         | December to March 2021/22<br>December to <b>mid-March</b> 2022/23 |
|           | Breeding      | April to September                                        | Apr to Sep 2022<br><b>Mid-March</b> to September 2023             |
|           | Post-breeding | October to November                                       | -                                                                 |

<sup>34</sup> <https://www.nature.scot/doc/guidance-note-9-guidance-support-offshore-wind-applications-seasonal-periods-birds-scottish-marine>

#### A.6.2.1.1 Implications of seasonal definition discrepancies

After some investigation we are confident that the seasonal definition discrepancies will not affect the mean seasonal peak abundance estimates used in the displacement assessment for any species due to the timing of these peaks, therefore there are no further implications for displacement.

However, we have identified an issue with the collision risk assessment and the treatment of collision mortality estimates for months split between seasons. Generally, for months split between seasons, we expect the collision mortality estimate for that month to be split evenly and applied to both seasons. The only exception to this is where a survey falls very close to the start or end of a month, particularly when the density estimate appears more representative of one season than the other.

For kittiwake, collision estimates for April (surveys undertaken 11 April 2022 and 14 April 2023) should be split between pre-breeding and breeding seasons, not applied to the pre-breeding season only as appears to be presented. The approach to attribute more collision mortalities to a non-breeding season results in the annual apportioned collision risk to SPAs being reduced, as impacts are diluted when more mortalities are considered relative to the BDMPS population consisting of both UK and non-UK birds.

For gannet, collision mortalities for March (surveys undertaken 6 to 7 March 2022 and 15 March 2023) should also be split between pre-breeding and breeding seasons, not applied to the pre-breeding season only. The 2022 survey was undertaken closer to the beginning of the month however we believe this should still be split between both seasons.

We have attempted to understand the implications of the approach taken by the Applicant by recalculating seasonal collision mortality totals and apportioning these updated totals using apportioning weightings provided by the Applicant. **This has been undertaken for kittiwake only.** We found that the apportioned mortality and percentage point change in adult annual survival rate increased for 10 out of 14 SPAs. For the project-alone assessment, this change would not necessitate additional PVAs to be undertaken (the threshold of 0.02 percentage point change in adult annual survival was not exceeded using updated numbers).

We did not repeat this for the impact values from the Morven Programme and in-combination assessment. For the Morven Programme assessment, there is potential for additional PVAs to be triggered for Fowlsheugh SPA (low displacement scenario), Buchan Ness to Collieston Coast SPA and St Abb's Head to Fast Castle SPA (low and high displacement scenarios) as the percentage point change in adult annual survival rate for these SPAs was between 0.010 and 0.018 and at risk of exceeding the threshold for PVA. For the in-combination assessment, we have concluded AEoSI for kittiwake at all SPAs where a PVA was required, with the exception for Fowlsheugh SPA. There is potential for the updated collision mortality to change this conclusion, but we have not been able to check this.

For gannet, we have not reproduced apportioned mortalities using updated seasonal collision mortality estimates therefore we do not know the scale of the issue for this species. There may be implications in terms of PVA requirements for Forth Islands SPA in the Morven Programme

assessment, and our provisional conclusions of AEoSI for Forth Islands SPA and Hermaness, Saxa Vord and Valla Field SPA may change if apportioned impacts are recalculated.

**As such:**

- **Additional information is required whereby we request the Applicant recalculates seasonal collision mortality estimates for gannet and kittiwake following NatureScot seasonal definitions (NatureScot, 2020) and recalculates apportioned impacts to all SPAs with connectivity. The requirement for PVA should be reviewed for the project-alone, Morven Programme and in-combination assessments and PVA undertaken where required with relevant metrics presented.**

For guillemot and razorbill, seasonal definitions have been refined in agreement with NatureScot due to notable abundance peaks occurring in July / August which we would consider to be post breeding season peaks rather than occurring in the breeding season – no further analysis is required for these species.

#### *A.6.2.2 Apportioning*

Cross-checking the results of the apportioning report with the EIA and RIAA documents was difficult due to the size of these documents and the unclear presentation and labelling in parts of the apportioning report. It should also be noted that the results of the apportioning report are not the apportioned mortalities to individual colonies, rather they are the proportional weighting values for each colony which is used in the apportioning calculation. Apportioned mortalities are only presented in the RIAA Part 3 (Volume 2, Chapter 3). Overall, the apportioning has been carried out correctly for most species, however we require some clarifications as a result of certain SPAs having no impacts apportioned to them in certain seasons.

The Applicant has provided the total colony count, distance to project, proportion of foraging range as sea, apportioning weight and apportioning values for SPA colonies, and the total colony count and apportioning weight for non-SPA colonies. The Applicant has not provided the distance to project, proportion of foraging range as sea and apportioning weight for non-SPA colonies making it difficult to validate the apportioning calculations.

##### *A.6.2.2.1 Screening out of sites based on centre-to-centre distances*

The Applicant has erroneously applied an apportioning value of “0” in cases where the distance between the geometric centre of the project and the centre of the SPA are greater than the mean max foraging range plus 1 standard deviation (MMFR+1SD). This approach appears to be based upon a misunderstanding of NatureScot guidance and advice.

It appears that a misunderstanding or a miscommunication has occurred since a meeting between the Applicant and NatureScot in October 2025 - we are content for centre-to-centre distances to be used in apportioning calculations, we do not support the screening out of colonies based upon the centre-to-centre distances being greater than the mean max foraging range plus 1 SD.

The applicant has therefore erroneously set the apportioning value to 0 for the following sites and species, despite being screened into the assessment in the re-screening exercise presented in RIAA Part 1: Introduction (Volume 2, Chapter 1):

- Kittiwake at Hoy SPA
- Puffin – Flamborough and Filey Coast SPA\*, North Caithness Cliffs SPA

\*SPA in England and should be assessed by Natural England

**As such:**

- **Clarification is required to recalculate apportioning weightings for all SPAs for kittiwake and puffin, due to the knock-on effect to all other SPAs in the calculation of apportioning weighting. Apportioned mortality estimates should be provided for all relevant seasons for all SPAs, any subsequent PVA required is likely to form part of the Additional Environmental Information request.**

#### *A.6.2.2.2 Gannet in the breeding season*

During pre-application consultation, the Applicant was advised in that impacts to gannet in the breeding season should be apportioned to Forth Islands SPA, Hermaness, Saxa Vord and Valla Field SPA and Noss SPA. This approach acknowledges the findings in Wakefield et al. (2013) but retains the apportioning of impacts to colonies not considered in the study where connectivity cannot be ruled out. However, in the summary of apportioned impacts to gannet in the sections of the RIAA discussing displacement, collision and combined collision and displacement impacts, there are no breeding season impacts apportioned to Hermaness, Saxa Vord and Valla Field SPA or Noss SPA. This is the case for both the Applicant and NatureScot-advised approaches.

The apportioning report (Volume 2, Annex 3.1) only states a breeding season apportioning weight for Forth Islands SPA and then a grouped weight for non-SPA colonies, with Hermaness, Saxa Vord and Valla Field SPA and Noss SPA included in the non-SPA colony list - relevant apportioning weights for each are outlined in the Appendix A of the apportioning report. However, it appears that **no impacts have been apportioned** to any SPA other than Forth Islands SPA in the breeding season in the RIAA, against NatureScot advice.

**As such:**

- **Clarification is required to confirm the apportioned impacts to all gannet colonies with the inclusion of Hermaness, Saxa Vord and Valla Field SPA, and Noss SPA, for the project-alone, Morven Programme and in-combination assessment, any subsequent PVA required is likely to form part of the Additional Environmental Information request**

#### *A.6.2.2.3 Apportioning to age classes and sabbaticals*

There are two approaches to age proportions used within the application. The Applicant's approach makes use of site-specific age class data to calculate age ratios for gannet, kittiwake and herring gull. The Applicant also presents a "NatureScot" approach using stable age proportions from Furness (2015)<sup>35</sup> for all species.

Site-specific age class proportions were only used in the Applicant approach, therefore although we accept and encourage this, we cannot make conclusions on the results of this approach

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<sup>35</sup> Furness, R.W. (2015). Non-breeding season populations of seabirds in UK waters: Population sizes for Biologically Defined Minimum Population Scales (BDMPS). Natural England Commissioned Reports, No. 164.

because the Applicant approach uses parameters throughout the assessment which we do not accept or advise.

The sabbatical rates presented in the Apportioning report matches current NatureScot guidance.

#### *A.6.2.3 Forth Islands SPA*

For kittiwake, the Morven South alone apportioned combined collision and displacement impacts to Forth Islands SPA in the RIAA Part 3 (Volume 2, Chapter 3) are reported as 0.2 to 0.3 birds per year. A project-alone PVA is not required as the percentage point change in adult annual survival does not exceed 0.02. However, the Applicant has not presented the annual mortalities to the feature as a result of the Morven Programme and in-combination impacts.

**As such:**

- **Clarification is required to provide the apportioned impacts to kittiwake at Forth Islands SPA as a result of impacts from the Morven Programme and Morven South in-combination with other plans and projects, and any subsequent PVA outputs (if required) to enable a conclusion to be reached for this feature.**

#### *A.6.3 NatureScot advice - Assessment of AEoSI – Morven South alone*

Our assessment of predicted adverse effects (AEoSI) of Morven South alone (i.e. array area only) are discussed below. This is presented firstly for impact pathways assessed qualitatively and subsequently for those assessed quantitatively – provisional conclusions for which are outlined in the summary table in section A.6.3.9 with further detail in section A.6.3.10.

##### *A.6.3.1 Direct temporary habitat loss / disturbance (construction phase)*

Noting that no significant impacts (under EIA) are predicted for fish, shellfish or benthic receptors, we are content that the main impact pathway in the construction phase for consideration in the RIAA is through disturbance and displacement. The Applicant states that the Navigation Safety and Vessel Management Plan (NSPVMP) will reduce disturbance to seabirds as far as possible, however there is no detail of how this will be achieved in the draft NSPVMP, as discussed in advice on the EIA Commitments Register (section A.5.4). In our view, LSE from disturbance cannot be ruled out for guillemot, razorbill and puffin based on a moderate vulnerability to the impact in Wade et al. (2016).

The assessment of disturbance from construction activities in the array area includes a hypothetical approach of using the mean maximum foraging range (i.e. not using mean maximum +1 standard deviation), to rule out connectivity for guillemot and razorbill, and only screening in Farne Islands SPA, Flamborough and Filey Coast SPA, Forth Islands SPA and North Caithness Cliffs SPA for puffin. There is also discussion around tracking studies for each species indicating no connectivity between any SPA and the array area, though we note that the examples provided are from one colony per species only. The Applicant acknowledges that the use of the recommended foraging ranges in NatureScot (2023) results in SPAs having connectivity in the breeding season for all species. The area of Morven South relative to the available sea area for foraging for each species and from each of these SPA colonies with connectivity is presented, ranging from 0.2% to 2.2%. Overall, we accept the **No AEoSI** conclusion for direct temporary habitat loss / disturbance during construction phase for any qualifying feature.

### *A.6.3.2 Direct temporary habitat loss / disturbance (vessel & helicopter disturbance – all phases)*

The Applicant has not decided which port(s) will be used during Construction, Operation and Maintenance and Decommissioning. Without this information a full assessment of the proposed vessel movement on the qualifying features of any marine SPAs that the vessels may travel through is not available. Whilst we would ordinarily have expected to see an outline plan within the Application documentation, we are aware that the location of the port(s) / assembly yard(s) / etc. has yet to be determined. Therefore, we are content that this can be finalised through the discharge of consent conditions as part of the NSPVMP, should consent be awarded. However, as a high-level assessment has been provided in relation to Outer Firth of Forth and St Andrews Bay Complex marine SPA, we outline advice below to help inform revision of the NSPVMP.

In addition, we note what appears to be very high number of helicopter trips per day across all phases, particularly in the operation and maintenance phase.

#### *A.6.3.2.1 Outer Firth of Forth and St Andrews Bay Complex marine SPA*

The use of a port or ports located within the Outer Firth of Forth and St Andrews Bay Complex (OFFSABC) SPA cannot be ruled out. Therefore, the maximum design scenario (MDS) provided assumes that all vessel movements required for all phases of Morven South will pass through the Outer Firth of Forth and St Andrews Bay Complex SPA.

The Applicant predicts that, during the construction phase vessel movements are likely to consist of:

- Up to 1,149 return vessel trips per year during construction.
- Construction will take up to five years with a total of 3,060 vessel movements (return trips) across the construction period.
- Across the construction period there will average 1.6 vessel movements per day.
- Impacts are likely to be highest in the construction phase.

The following wintering water bird species are qualifying features of OFFSABC SPA: Common scoter, Eider, Goldeneye, Long-tailed duck, Red-breasted merganser, Red-throated diver, Slavonian grebe, Velvet scoter.

The Applicant presents survey data maps to show the distribution of wintering waterfowl in OFFSABC SPA that could be affected by the vessel movements. However, we are **unable to conclude no AEoSI**<sup>36</sup> on the wintering waterfowl features of OFFSABC SPA for the following reasons:

- The survey data used is considerably out of date and may not represent current distributions of the qualifying features. It was based on aerial surveys carried out in 2001 / 02 and 2004 / 05 and shore-based surveys carried out in 2006 / 07 and 2010 / 11. The Applicant did not have access to any more recent data. However, new surveys of OFFSABC SPA have been carried out in 2024 / 25 and 2025 / 26 and we hope this data will be available in the near future.

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<sup>36</sup> Please note, our conclusion of 'unable to conclude' no AEoSI reflect the uncertainty in the assessment provided and is linked to the HRA legal requirements.

- The increase in vessel movements from the project is significant and no consideration has been given to in-combination impacts with other wind farms being constructed in the same timeframe.
- It is stated that construction vessels would follow existing shipping routes to / from ports as far as practicable, but no further information is provided on actual likely routes.
- It is stated there are numerous existing vessel routes through OFFSABC SPA, and the greatest concentration of these is in coastal waters - this is where the greatest numbers of the waterbirds and seabirds occur within the SPA. This statement would indicate there will be impacts on these species yet no attempt has been made to assess the % of the SPA area affected or the % of the SPA populations affected.
- It is stated that the survey maps suggest the highest concentration of birds avoid existing shipping routes to / from ports i.e. areas of high vessel movement. We do not consider that the survey data presented provides sufficient evidence to support this.
- The Applicant states that it is expected that birds present in OFFSABC, as supported by their known distribution, are to some extent habituated to such vessel movements within the existing commercial shipping routes to / from the ports. There is no evidence to support this statement, and we don't consider it is apparent from the data provided.
- The only mention of birds in the proposed Navigation Safety and Vessel Management Plan (NSPVMP) is *'the plan will reduce disturbance of seabird species as far as practicable, by avoiding bird populations or migratory routes and allow the identification of standard routes'*. Further consideration is required.

In view of the above, we recommend that implementation of the following conditions could enable us to conclude no AEoSI for the waterbird features of OFFSABC SPA:

- **A detailed reassessment of potential impacts is carried using the 2024 / 25 and 2025 / 26 wintering waterfowl survey data when this becomes available. This data is used to inform spatial and / or seasonal mitigation depending on the ports and routes used.**

For breeding shag, which are sensitive to vessel disturbance and forage mainly in OFFSABC, especially in the Isle of May area, **we advise that the above conditions should also apply**. Shag monitoring results will be included in the new survey report.

For the remaining seabird features, breeding and non-breeding - arctic tern, common tern, common gull, black-headed gull, little gull, kittiwake, puffin, razorbill, guillemot, herring gull, gannet, Manx shearwater - we can conclude **No AEoSI** in relation to vessel disturbance.

#### *A.6.3.3 Changes in prey availability due to temporary habitat loss / disturbance - all phases*

A conclusion of LSE could not be ruled out for changes in prey availability due to temporary habitat loss / disturbance for kittiwake, guillemot, razorbill and puffin based on a moderate to low habitat flexibility classification in Wade et al. (2016). A conclusion of Not Significant was reached for all impact pathways and species considered in the Fish and Shellfish Chapter of the EIA, which we accept. We agree with the Applicant's conclusion of **No AEoSI** on any SPA or feature for changes in prey availability due to temporary habitat loss / disturbance across all phases.

#### *A.6.3.4 Barrier effects*

We agree with the Applicant's conclusion of **No AEoSI** on any SPA or feature for barrier effects during the operation and maintenance phase.

#### *A.6.3.5 Attraction to light*

We agree with the Applicant's conclusion of **No AEoSI** on any SPA or feature for attraction to light effects across all phases.

#### *A.6.3.6 Collision risk*

Herring gull has been screened out of the collision risk assessment due to low abundance recorded in the survey area (5 raw counts over 5 months) and was not included in collision risk modelling. Kittiwake and gannet were assessed for collision risk alone (i.e. separate from displacement impacts) however we have made conclusions for both species based on the combined collision and displacement impacts only. Our provisional conclusions are outlined in the summary Tables in section A.6.3.8 below with further detail in section A.6.3.9.

#### *A.6.3.7 Displacement impacts*

There is extensive discussion around connectivity of guillemot from Fowlsheugh SPA with Morven South. The Applicant suggests that all guillemot recorded in the survey area (6,009 raw counts over 28 months) are non-breeding birds and that this SPA should not be screened in for breeding season impacts. While the information presented largely supports the Applicant's position, it is our view that there is insufficient evidence to rule out connectivity for breeding birds from Fowlsheugh SPA. The approach to measure the distance between the SPA and Morven South using the edge-to-edge distance was agreed during pre-application consultation and is consistent with the approach taken by other Applicants.

For guillemot at Buchan Ness SPA, Forth Islands SPA, St Abb's Head to Fast Castle SPA and Troup Head SPA, the threshold of 0.02 percentage point change in adult annual survival rate for the project-alone impacts was only surpassed in the upper displacement mortality scenario (note this was also the approach for several species and SPAs in the Morven Programme assessment, see section A.6.4). The Applicant has only presented the results of a PVA for this upper scenario, therefore not presenting the range of likely impacts. We can only base our conclusions on the PVA metrics presented from this upper displacement scenario. This means there is additional precaution in the results, but it is not clear why the Applicant took this approach when all other Applications present the range of predicted impact which we usually base our conclusions on.

Paragraph 5.4.4.56 (Volume 2, Chapter 3) states no displacement impacts exceeded the 0.02 percentage point change in adult annual survival rate threshold for PVA. This is not the case for guillemot clearly but is the case for other species for project alone. Our provisional conclusions are outlined in the summary Tables in section A.6.3.8 below with further detail in section A.6.3.9.

#### *A.6.3.8 Summary of Morven South alone conclusions (AEoSI)*

Both our **final** and **provisional** conclusions of adverse effect on site integrity (AEoSI) arising from the Morven South alone assessment of collision risk, displacement impacts and combined collision risk and displacement impacts on qualifying features of SPAs are summarised in Table NS.14. Where the Morven South alone impacts on a qualifying feature exceed the threshold of 0.02 percentage points change in adult annual survival rate, a PVA is required and the outputs of which are discussed in subsequent sections (A.6.3.9.). **Provisional conclusions subject to the issues highlighted in this advice which require clarification and / or additional information are indicated.**

Note that conclusions of impacts to qualifying features of SPAs in England are not included in this advice and should be assessed by Natural England.

Table NS.14: Summary of project-alone impact conclusions for all SPAs and features with LSE identified

| SPA                                  | Qualifying feature | Impact                     | Percentage point change in adult annual survival rate* | PVA required? | NatureScot conclusion |
|--------------------------------------|--------------------|----------------------------|--------------------------------------------------------|---------------|-----------------------|
| Buchan Ness to Collieston Coast      | Guillemot          | Displacement               | 0.015 to <b>0.044</b>                                  | Yes           | See Table NS.15       |
|                                      | Kittiwake          | Collision and displacement | 0.002 to 0.003                                         | No            | No AEoSI†             |
| Copinsay                             | Kittiwake          | Collision and displacement | 0.001                                                  | No            | No AEoSI†             |
| East Caithness Cliffs                | Fulmar             | Displacement               | <0.001 to 0.001                                        | No            | No AEoSI              |
|                                      | Kittiwake          | Collision and displacement | 0.001                                                  | No            | No AEoSI†             |
|                                      | Razorbill          | Displacement               | 0.002 to 0.006                                         | No            | No AEoSI              |
| Fair Isle                            | Fulmar             | Displacement               | <0.001 to 0.001                                        | No            | No AEoSI              |
|                                      | Gannet             | Collision and displacement | <0.001 to 0.001                                        | No            | No AEoSI†             |
|                                      | Puffin             | Displacement               | <0.001 to 0.001                                        | No            | No AEoSI†             |
| Fetlar                               | Fulmar             | Displacement               | <0.001 to 0.001                                        | No            | No AEoSI              |
| Forth Islands                        | Gannet             | Collision and displacement | 0.005 to 0.006                                         | No            | No AEoSI†             |
|                                      | Guillemot          | Displacement               | 0.015 to <b>0.044</b>                                  | Yes           | See Table NS.15       |
|                                      | Kittiwake          | Collision and displacement | 0.002 to 0.003                                         | No            | No AEoSI†             |
|                                      | Puffin             | Displacement               | 0.001 to 0.003                                         | No            | No AEoSI†             |
|                                      | Razorbill          | Displacement               | 0.003 to 0.008                                         | No            | No AEoSI              |
| Foula                                | Fulmar             | Displacement               | <0.001 to 0.001                                        | No            | No AEoSI              |
|                                      | Puffin             | Displacement               | 0.001 to 0.003                                         | No            | No AEoSI†             |
| Fowlsheugh                           | Guillemot          | Displacement               | <b>0.022 to 0.057</b>                                  | Yes           | See Table NS.15       |
|                                      | Kittiwake          | Collision and displacement | 0.003 to 0.004                                         | No            | No AEoSI†             |
|                                      | Razorbill          | Displacement               | 0.002 to 0.005                                         | No            | No AEoSI              |
| Hermaness, Saxa Vord and Valla Field | Fulmar             | Displacement               | <0.001                                                 | No            | No AEoSI              |
|                                      | Gannet             | Collision and displacement | <0.001 to 0.001                                        | No            | No AEoSI†             |
|                                      | Puffin             | Displacement               | <0.001 to 0.001                                        | No            | No AEoSI†             |
| Hoy                                  | Fulmar             | Displacement               | <0.001 to 0.001                                        | No            | No AEoSI              |
|                                      | Kittiwake          | Collision and displacement | 0.001                                                  | No            | No AEoSI†             |
| North Caithness Cliffs               | Fulmar             | Displacement               | <0.001 to 0.001                                        | No            | No AEoSI              |
|                                      | Kittiwake          | Collision and displacement | 0.001                                                  | No            | No AEoSI†             |

| SPA                            | Qualifying feature | Impact                     | Percentage point change in adult annual survival rate* | PVA required? | NatureScot conclusion |
|--------------------------------|--------------------|----------------------------|--------------------------------------------------------|---------------|-----------------------|
|                                | Puffin             | Displacement               | <0.001                                                 | No            | No AEoSI†             |
| Noss                           | Fulmar             | Displacement               | <0.001 to 0.001                                        | No            | No AEoSI              |
|                                | Gannet             | Collision and displacement | <0.001                                                 | No            | No AEoSI†             |
| St Abb's Head to Fast Castle   | Guillemot          | Displacement               | 0.015 to <b>0.044</b>                                  | <b>Yes</b>    | See Table NS.15       |
|                                | Kittiwake          | Collision and displacement | 0.003 to 0.004                                         | No            | No AEoSI†             |
|                                | Razorbill          | Displacement               | 0.003 to 0.007                                         | No            | No AEoSI              |
| St Kilda                       | Gannet             | Collision and displacement | <0.001                                                 | No            | No AEoSI†             |
| Troup, Pennan and Lion's Heads | Guillemot          | Displacement               | 0.015 to <b>0.044</b>                                  | <b>Yes</b>    | See Table 5           |
|                                | Kittiwake          | Collision and displacement | 0.002                                                  | No            | No AEoSI†             |
| West Westray                   | Kittiwake          | Collision and displacement | 0.002 to 0.003                                         | No            | No AEoSI†             |

†Provisional conclusion

The outputs of PVA modelling for relevant qualifying features are summarised in Table 5, alongside NatureScot's **provisional** conclusions of AEoSI.

*Table NS.15: Results of PVA modelling for qualifying features of SPAs where impacts exceeded 0.02 percentage point change in adult survival rate in the project-alone assessment*

| SPA                             | Qualifying feature | Median counterfactuals of population size/growth rate after 35 years of impacts |                 | Provisional conclusion |
|---------------------------------|--------------------|---------------------------------------------------------------------------------|-----------------|------------------------|
|                                 |                    | CPS                                                                             | CGR             |                        |
| Buchan Ness to Collieston Coast | Guillemot          | 0.983                                                                           | 1.000           | No AEoSI               |
| Forth Islands                   | Guillemot          | 0.983                                                                           | 1.000           | No AEoSI               |
| Fowlsheugh                      | Guillemot          | 0.978 to 0.991*                                                                 | 0.999 to 1.000* | No AEoSI               |
| St Abb's Head to Fast Castle    | Guillemot          | 0.983                                                                           | 1.000           | No AEoSI               |
| Troup, Pennan and Lion's Heads  | Guillemot          | 0.983                                                                           | 1.000           | No AEoSI               |

\*High to low displacement scenario

#### A.6.3.9 SPA specific Morven South alone conclusions (AEoSI)

Our **provisional** conclusions for AEoSI are provided for each SPA and qualifying feature for which an LSE conclusion was reached. This includes conclusions for the seabird assemblage<sup>37</sup> feature where appropriate.

##### A.6.3.9.1 Buchan Ness to Collieston Coast SPA

For guillemot at Buchan Ness to Collieston Coast SPA, we **provisionally** conclude **No AEoSI** for Morven South alone from displacement impacts as the median CPS and CGR after 35 years of impact are sufficiently high (see Table NS.16) - noting that PVA was undertaken by the Applicant for the upper displacement mortality scenario only. This conclusion is subject to the clarification requested in A.4.5.

*Table NS.16: results of PVA modelling and provisional AEoSI conclusions for project alone impacts to Buchan Ness to Collieston Coast SPA*

| Qualifying feature          | Annual adult mortality from Morven South project | Median counterfactuals of population size/growth rate after 35 years of impacts |       | Provisional conclusion |
|-----------------------------|--------------------------------------------------|---------------------------------------------------------------------------------|-------|------------------------|
|                             |                                                  | CPS                                                                             | CGR   |                        |
| Guillemot                   | 17.2                                             | 0.983                                                                           | 1.000 | No AEoSI               |
| Breeding seabird assemblage |                                                  |                                                                                 |       | No AEoSI               |

##### A.6.3.9.2 Forth Islands SPA

For guillemot at Forth Islands SPA, we **provisionally** conclude **No AEoSI** for Morven South alone from displacement impacts as the median CPS and CGR after 35 years of impact are sufficiently high (see Table NS.17) - noting that PVA was undertaken by the Applicant for the upper displacement mortality scenario only. This conclusion is subject to the clarification requested in A.4.5.

*Table NS.27: results of PVA modelling and provisional AEoSI conclusions for project alone impacts to Forth Islands SPA*

| Qualifying feature          | Annual adult mortality from Morven South project | Median counterfactuals of population size/growth rate after 35 years of impacts |       | Provisional conclusion |
|-----------------------------|--------------------------------------------------|---------------------------------------------------------------------------------|-------|------------------------|
|                             |                                                  | CPS                                                                             | CGR   |                        |
| Guillemot                   | 15.5                                             | 0.983                                                                           | 1.000 | No AEoSI               |
| Breeding seabird assemblage |                                                  |                                                                                 |       | No AEoSI               |

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<sup>37</sup> For those SPAs which have a seabird assemblage feature, where we have concluded AEoSI for at least one named species of the seabird assemblage, then the same conclusion is reached for the assemblage feature. Any named qualifying species of an assemblage feature in an SPA is protected in their 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.

#### A.6.3.9.3 Fowlsheugh SPA

For guillemot at Fowlsheugh SPA, we **provisionally** conclude **No AEoSI** for Morven South alone from displacement impacts as the median CPS and CGR after 35 years of impact are sufficiently high (see Table NS.18). This conclusion is subject to the clarification requested in A.4.5.

*Table NS.38: results of PVA modelling and provisional AEoSI conclusions for project alone impacts to Fowlsheugh SPA*

| Qualifying feature          | Annual adult mortality from Morven South project* | Median counterfactuals of population size/growth rate after 35 years of impacts* |                | Provisional conclusion |
|-----------------------------|---------------------------------------------------|----------------------------------------------------------------------------------|----------------|------------------------|
|                             |                                                   | CPS                                                                              | CGR            |                        |
| Guillemot                   | 20.9 to 53.0                                      | 0.978 to 0.991                                                                   | 0.999 to 1.000 | No AEoSI               |
| Breeding seabird assemblage |                                                   |                                                                                  |                | No AEoSI               |

\*High to low displacement scenario

#### A.6.3.9.4 St Abb's Head to Fast Castle SPA

For guillemot at St Abb's Head to Fast Castle SPA, we **provisionally** conclude **No AEoSI** for Morven South alone from displacement impacts as the median CPS and CGR after 35 years of impact are sufficiently high (See Table NS.19) - noting that PVA was undertaken by the Applicant for the upper displacement mortality scenario only. This conclusion is subject to the clarification requested in A.4.5.

*Table NS.49: results of PVA modelling and provisional AEoSI conclusions for project alone impacts to St Abb's Head to Fast Castle SPA*

| Qualifying feature          | Annual adult mortality from Morven South project | Median counterfactuals of population size/growth rate after 35 years of impacts |       | Provisional conclusion |
|-----------------------------|--------------------------------------------------|---------------------------------------------------------------------------------|-------|------------------------|
|                             |                                                  | CPS                                                                             | CGR   |                        |
| Guillemot                   | 26.7                                             | 0.983                                                                           | 1.000 | No AEoSI               |
| Breeding seabird assemblage |                                                  |                                                                                 |       | No AEoSI               |

#### A.6.3.9.5 Troup, Pennan and Lion's Heads SPA

For guillemot at Troup, Pennan and Lion's Heads SPA, we **provisionally** conclude **No AEoSI** for Morven South alone from displacement impacts as the median CPS and CGR after 35 years of impact are sufficiently high (see Table NS.20) - noting that PVA was undertaken by the Applicant for the upper displacement mortality scenario only. This conclusion is subject to the clarification requested in A.4.5.

*Table NS.20: results of PVA modelling and provisional AEoSI conclusions for project alone impacts to Troup, Pennan and Lion's Heads SPA*

| Qualifying feature | Annual adult mortality from Morven South project | Median counterfactuals of population size/growth rate after 35 years of impacts |     | Provisional conclusion |
|--------------------|--------------------------------------------------|---------------------------------------------------------------------------------|-----|------------------------|
|                    |                                                  | CPS                                                                             | CGR |                        |

|                             |      |       |       |          |
|-----------------------------|------|-------|-------|----------|
| Guillemot                   | 13.9 | 0.983 | 1.000 | No AEoSI |
| Breeding seabird assemblage |      |       |       | No AEoSI |

#### A.6.3.9.6 Functionally linked Marine SPAs (Scottish waters only)

For the functionally linked qualifying features of the Outer Firth of Forth and St Andrews Bay Complex marine SPA, we **provisionally** conclude **No AEoSI** for Morven South alone from displacement impacts, as summarised in Table NS.21 below. The conclusion for each species is dependent on the conclusion for the functional linked colony SPA as detailed above.

*Table NS.25: provisional AEoSI conclusions for project alone impacts to functionally linked colonies of Outer Firth of Forth and St Andrews Bay Complex SPA*

| Marine SPA                                      | Qualifying feature          | Functionally linked colony SPAs                                                                                | Linked SPA provisional conclusion | Marine SPA provisional conclusion |
|-------------------------------------------------|-----------------------------|----------------------------------------------------------------------------------------------------------------|-----------------------------------|-----------------------------------|
| Outer Firth of Forth and St Andrews Bay Complex | Guillemot                   | Forth Islands SPA<br>St Abb's Head to Fast Castle SPA<br>Fowlsheugh SPA<br>Buchan Ness to Collieston Coast SPA | No AEoSI                          | No AEoSI                          |
|                                                 | Puffin                      | Forth Islands SPA                                                                                              | No AEoSI                          | No AEoSI                          |
|                                                 | Gannet                      | Forth Islands SPA                                                                                              | No AEoSI                          | No AEoSI                          |
|                                                 | Breeding seabird assemblage |                                                                                                                | No AEoSI                          | No AEoSI                          |

#### A.6.4 NatureScot advice - Assessment of AEoSI – Morven Programme Assessment

Following our request during pre-application, and in response to the decision to split the Morven Site into two separate wind farms (Morven South and Morven North), the Applicant has assessed the predicted impact from Morven South array area in-combination with Morven North array area - referred to as the Morven Programme (Scenario 3). As is discussed above under EIA (Section A.5.3.1) this omits consideration of either export cable (MHPGC / MBAGC Projects) through no route to impact from collision risk or displacement impacts, which we accept but note the need for robust assessment of in-combination effects as part of the marine licence process for these cables.

##### A.6.4.1 Assessment approach

As for the EIA cumulative assessment detailed in section A.5.3.1 above, impacts considered in the Morven Programme in-combination assessment are a subset of those in the project-alone assessment and match those summarised in Table NS.6 above.

##### A.6.4.2 Summary of Morven Programme assessment conclusions (scenario 3 without export cables)

Our conclusions of adverse effect on site integrity (AEoSI) arising from the Morven Programme in-combination assessment of displacement impacts and combined displacement / collision risk on qualifying features of SPAs are summarised in Table NS.22.

Where the Morven Programme impacts on a qualifying feature exceed the threshold of 0.02 percentage points change in adult annual survival rate, a PVA is required and the outputs of which are discussed in subsequent sections (A.6.4.3). All **provisional** conclusions are indicated in the

table, and these are based on the issues highlighted in this advice which require clarification and / or additional information.

Note that conclusions of impacts to qualifying features of SPAs in England are not included in this advice and should be assessed by Natural England. It appears that impacts to kittiwake at Farne Islands SPA and to gannet at Flamborough and Filey Coast SPA have not been included in the SPA assessment despite project-alone mortalities of 0.2 birds per year for each SPA.

As discussed in A.6.2.3, impacts to kittiwake at Forth Islands SPA have not been considered, despite a Morven South alone impact of 0.3 mortalities per year

We note that for fulmar, the apportioned mortality and change in baseline survival rate to individual SPAs as a result of the Morven Programme are not presented in the RIAA. However, we are confident that no PVA would be required as a result of the Morven Programme impacts.

*Table NS.22: Summary of Morven Programme Assessment impact conclusions for all SPAs and features with LSE identified*

| SPA                             | Qualifying feature | Impact                     | Percentage point change in adult annual survival rate* | PVA required? | Conclusion     |
|---------------------------------|--------------------|----------------------------|--------------------------------------------------------|---------------|----------------|
| Buchan Ness to Collieston Coast | Guillemot          | Displacement               | <b>0.068 to 0.044</b>                                  | Yes           | See Table NS.6 |
|                                 | Kittiwake          | Collision and displacement | 0.011 to 0.017                                         | No            | No AEoSI†      |
| Copinsay                        | Kittiwake          | Collision and displacement | Project alone impact <0.2 birds per annum†             |               |                |
| East Caithness Cliffs           | Fulmar             | Displacement               | PVA not required                                       |               |                |
|                                 | Kittiwake          | Collision and displacement | 0.003 to 0.005                                         | No            | No AEoSI†      |
|                                 | Razorbill          | Displacement               | 0.006 to 0.018                                         | No            | No AEoSI†      |
| Fair Isle                       | Fulmar             | Displacement               | PVA not required                                       |               |                |
|                                 | Gannet             | Collision and displacement | Project alone impact <0.2 birds per annum†             |               |                |
|                                 | Puffin             | Displacement               | Project alone impact <0.2 birds per annum†             |               |                |
| Fetlar                          | Fulmar             | Displacement               | PVA not required                                       |               |                |
| Forth Islands                   | Gannet             | Collision and displacement | 0.010 to 0.015                                         | No            | No AEoSI†      |
|                                 | Guillemot          | Displacement               | <b>0.052 to 0.155</b>                                  | Yes           | See Table NS.6 |
|                                 | Kittiwake          | Collision and displacement | <b>Not presented in RIAA – see section 6.2.3</b>       |               |                |
|                                 | Puffin             | Displacement               | 0.007 to 0.015                                         | No            | No AEoSI†      |
|                                 | Razorbill          | Displacement               | 0.012 to <b>0.028</b>                                  | Yes           | See Table NS.6 |
| Foula                           | Fulmar             | Displacement               | PVA not required                                       |               |                |
|                                 | Puffin             | Displacement               | 0.004 to 0.011                                         | No            | No AEoSI†      |
| Fowlsheugh                      | Guillemot          | Displacement               | <b>0.092 to 0.223</b>                                  | Yes           | See Table NS.6 |

| SPA                                  | Qualifying feature | Impact                     | Percentage point change in adult annual survival rate* | PVA required? | Conclusion     |
|--------------------------------------|--------------------|----------------------------|--------------------------------------------------------|---------------|----------------|
|                                      | Kittiwake          | Collision and displacement | 0.018 to <b>0.027</b>                                  | <b>Yes</b>    | See Table NS.6 |
|                                      | Razorbill          | Displacement               | 0.015 to <b>0.025</b>                                  | <b>Yes</b>    | See Table NS.6 |
| Hermaness, Saxa Vord and Valla Field | Fulmar             | Displacement               | PVA not required                                       |               |                |
|                                      | Gannet             | Collision and displacement | 0.001 to 0.002                                         | No            | No AEoSI†      |
|                                      | Puffin             | Displacement               | 0.001 to 0.003                                         | No            | No AEoSI†      |
| Hoy                                  | Fulmar             | Displacement               | PVA not required                                       |               |                |
|                                      | Kittiwake          | Collision and displacement | Project alone impact <0.2 birds per annum†             |               |                |
| North Caithness Cliffs               | Fulmar             | Displacement               | PVA not required                                       |               |                |
|                                      | Kittiwake          | Collision and displacement | Project alone impact <0.2 birds per annum†             |               |                |
|                                      | Puffin             | Displacement               | Project alone impact <0.2 birds per annum†             |               |                |
| Noss                                 | Fulmar             | Displacement               | PVA not required                                       |               |                |
|                                      | Gannet             | Collision and displacement | Project alone impact <0.2 birds per annum†             |               |                |
| St Abb's Head to Fast Castle         | Guillemot          | Displacement               | <b>0.052 to 0.155</b>                                  | <b>Yes</b>    | See Table NS.6 |
|                                      | Kittiwake          | Collision and displacement | 0.010 to 0.015                                         | No            | No AEoSI†      |
|                                      | Razorbill          | Displacement               | 0.011 to <b>0.026</b>                                  | <b>Yes</b>    | See Table NS.6 |
| St Kilda                             | Gannet             | Collision and displacement | Project alone impact <0.2 birds per annum†             |               |                |
| Troup, Pennan and Lion's Heads       | Guillemot          | Displacement               | <b>0.052 to 0.155</b>                                  | <b>Yes</b>    | See Table NS.6 |
|                                      | Kittiwake          | Collision and displacement | 0.006 to 0.009                                         | No            | No AEoSI†      |
| West Westray                         | Kittiwake          | Collision and displacement | Project alone impact <0.2 birds per annum†             |               |                |

\*High to low displacement scenario

†**Provisional** conclusion

The outputs of PVA modelling for relevant qualifying features are summarised in Table NS.23, alongside NatureScot's provisional conclusions of AEoSI.

*Table NS.6: Results of PVA modelling for qualifying features of SPAs where impacts exceeded 0.02 percentage point change in adult survival rate in the Morven Programme Assessment*

| SPA                             | Qualifying feature | Median counterfactuals of population size/growth rate after 35 years of impacts* |                | Provisional conclusion |
|---------------------------------|--------------------|----------------------------------------------------------------------------------|----------------|------------------------|
|                                 |                    | CPS                                                                              | CGR            |                        |
| Buchan Ness to Collieston Coast | Guillemot          | 0.931 to 0.974                                                                   | 0.998 to 0.999 | No AEoSI               |
| Fowlsheugh                      | Guillemot          | 0.917 to 0.965                                                                   | 0.998 to 0.999 | No AEoSI               |
|                                 | Razorbill          | 0.989                                                                            | 1.000          | No AEoSI               |
|                                 | Kittiwake          | 0.990                                                                            | 1.000          | No AEoSI               |
| Forth Islands                   | Guillemot          | 0.941 to 0.980                                                                   | 0.998 to 0.999 | No AEoSI               |
|                                 | Razorbill          | 0.988                                                                            | 1.000          | No AEoSI               |
| St Abb's Head to Fast Castle    | Guillemot          | 0.941 to 0.980                                                                   | 0.998 to 0.999 | No AEoSI               |
|                                 | Razorbill          | 0.990                                                                            | 1.000          | No AEoSI               |
| Troup, Pennan and Lion's Heads  | Guillemot          | 0.941 to 0.980                                                                   | 0.998 to 0.999 | No AEoSI               |

\*High to low displacement scenario

#### *A.6.4.3 SPA-specific Morven Programme in-combination conclusions (AEoSI)*

Our **provisional** conclusions for AEoSI are provided for each SPA and qualifying feature for which an LSE conclusion was reached for the Morven Programme in-combination assessment. This includes conclusions for seabird assemblage feature where appropriate.

##### *A.6.4.3.1 Buchan Ness to Collieston Coast SPA*

For guillemot at Buchan Ness to Collieston Coast SPA, we **provisionally** conclude **No AEoSI** for the Morven Programme from displacement impacts as the median CPS and CGR after 35 years of impact are sufficiently high (see Table NS.24). This conclusion is subject to the clarification requested in A.4.5.

*Table NS.24: results of PVA modelling and provisional AEoSI conclusions for Morven Programme impacts to Buchan Ness to Collieston Coast SPA*

| Qualifying feature          | Annual adult mortality* |                  | Median counterfactuals of population size/growth rate after 35 years of impacts* |                | Provisional conclusion |
|-----------------------------|-------------------------|------------------|----------------------------------------------------------------------------------|----------------|------------------------|
|                             | Morven South            | Morven Programme | CPS                                                                              | CGR            |                        |
| Guillemot                   | 5.7 to 17.2             | 26.7 to 71.8     | 0.931 to 0.974                                                                   | 0.998 to 0.999 | No AEoSI               |
| Breeding seabird assemblage |                         |                  |                                                                                  |                | No AEoSI               |

\*High to low displacement scenario

##### *A.6.4.3.2 Fowlsheugh SPA*

For guillemot and razorbill at Fowlsheugh SPA, we **provisionally** conclude **No AEoSI** for Morven Programme from displacement impacts as the median CPS and CGR after 35 years of impact are sufficiently high (See Table NS.25). These conclusions are subject to the clarification requested in A.4.5.

For kittiwake, we **provisionally** conclude **No AEoSI** for Morven Programme from combined collision and displacement impacts as the median CPS and CGR after 35 years of impact are sufficiently high (see Table NS.25). This conclusion is subject to the clarification requested in A.4.5 and A.6.2.1.1.

*Table NS.25: results of PVA modelling and provisional AEoSI conclusions for Morven Programme impacts to Fowlsheugh SPA*

| Qualifying feature          | Annual adult mortality* |                  | Median counterfactuals of population size/growth rate after 35 years of impacts* |                | Provisional conclusion |
|-----------------------------|-------------------------|------------------|----------------------------------------------------------------------------------|----------------|------------------------|
|                             | Morven South            | Morven Programme | CPS                                                                              | CGR            |                        |
| Guillemot                   | 20.9 to 53.0            | 86.3 to 208.4    | 0.917 to 0.965                                                                   | 0.998 to 0.999 | No AEoSI               |
| Razorbill                   | 0.5 to 1.1              | 2.6 to 5.3       | 0.989                                                                            | 1.000          | No AEoSI               |
| Kittiwake                   | 0.9 to 1.2              | 5.0 to 7.5       | 0.990                                                                            | 1.000          | No AEoSI               |
| Breeding seabird assemblage |                         |                  |                                                                                  |                | No AEoSI               |

\*High to low displacement scenario

#### A.6.4.3.3 Forth Islands SPA

For guillemot and razorbill at Forth Islands SPA, we **provisionally** conclude **No AEoSI** for the Morven Programme from displacement impacts as the median CPS and CGR after 35 years of impact are sufficiently high (Table NS.26).

We have been **unable to reach a conclusion** on the Morven Programme assessment of kittiwake at Forth Islands SPA due to insufficient information in the assessment, as discussed in A.6.2.3.

*Table NS.26: results of PVA modelling and provisional AEoSI conclusions for Morven Programme impacts to Forth Islands SPA*

| Qualifying feature          | Annual adult mortality* |                  | Median counterfactuals of population size/growth rate after 35 years of impacts* |                | Provisional conclusion    |
|-----------------------------|-------------------------|------------------|----------------------------------------------------------------------------------|----------------|---------------------------|
|                             | Morven South            | Morven Programme | CPS                                                                              | CGR            |                           |
| Guillemot                   | 5.2 to 15.5             | 18.4 to 55.2     | 0.941 to 0.980                                                                   | 0.998 to 0.999 | No AEoSI                  |
| Razorbill                   | 0.3 to 0.7              | 1.0 to 2.4       | 0.988                                                                            | 1.000          | No AEoSI                  |
| Kittiwake                   | Not presented           |                  |                                                                                  |                | Cannot reach a conclusion |
| Breeding seabird assemblage |                         |                  |                                                                                  |                | No AEoSI                  |

\*High to low displacement scenario

#### A.6.4.3.4 St Abb's Head to Fast Castle SPA

For guillemot and razorbill at St Abb's Head to Fast Castle SPA, we **provisionally** conclude **No AEoSI** for the Morven Programme from displacement impacts as the median CPS and CGR after 35 years of impact are sufficiently high.

#### A.6.4.3.5 Troup, Pennan and Lion's Heads SPA

For guillemot at Troup, Pennan and Lion's Heads SPA, we **provisionally** conclude **No AEoSI** from the Morven Programme from displacement impacts as the median CPS and CGR after 35 years of impact are sufficiently high (see Table NS.27).

*Table NS.27: results of PVA modelling and provisional AEoSI conclusions for Morven Programme impacts to Troup, Pennan and Lion's Heads SPA*

| Qualifying feature          | Annual adult mortality* |                  | Median counterfactuals of population size/growth rate after 35 years of impacts* |                | Provisional conclusion |
|-----------------------------|-------------------------|------------------|----------------------------------------------------------------------------------|----------------|------------------------|
|                             | Morven South            | Morven Programme | CPS                                                                              | CGR            |                        |
| Guillemot                   | 4.6 to 13.9             | 16.5 to 49.6     | 0.941 to 0.980                                                                   | 0.998 to 0.999 | No AEoSI               |
| Breeding seabird assemblage |                         |                  |                                                                                  |                | No AEoSI               |

\*High to low displacement scenario

#### A.6.4.3.6 Functionally linked Marine SPAs

For the functionally linked qualifying features of the Outer Firth of Forth and St Andrews Bay Complex marine SPA, we **provisionally** conclude **No AEoSI** for Morven Programme from displacement impacts, as summarised in Table NS.28 below. The conclusion for each species is dependent on the conclusion for the functional linked colony SPA as detailed above.

*Table NS.28: Provisional AEoSI conclusions for Morven Programme impacts to functionally linked colonies of Outer Firth of Forth and St Andrews Bay Complex SPA*

| Marine SPA                                      | Qualifying feature          | Linked/supported colony SPAs                                                                                   | Linked SPA provisional conclusion | Marine SPA provisional conclusion |
|-------------------------------------------------|-----------------------------|----------------------------------------------------------------------------------------------------------------|-----------------------------------|-----------------------------------|
| Outer Firth of Forth and St Andrews Bay Complex | Guillemot                   | Forth Islands SPA<br>St Abb's Head to Fast Castle SPA<br>Fowlsheugh SPA<br>Buchan Ness to Collieston Coast SPA | No AEoSI                          | No AEoSI                          |
|                                                 | Puffin                      | Forth Islands SPA                                                                                              | No AEoSI                          | No AEoSI                          |
|                                                 | Gannet                      | Forth Islands SPA                                                                                              | No AEoSI                          | No AEoSI                          |
|                                                 | Breeding seabird assemblage |                                                                                                                | No AEoSI                          | No AEoSI                          |

#### A.6.5 NatureScot advice - Assessment of AEoSI – In-combination Assessment

As with the Morven Programme above, impacts considered in the Morven in-combination assessment are a subset of those in the project-alone assessment and match those summarised in Table NS.6 above. Morven South is considered in-combination with Morven North and other wind farms following the standard tiered approach – this does not include MHPGC and MBAGC Projects (as discussed above).

##### A.6.5.1 Assessment approach

We have identified several issues with the in-combination assessment which affects our ability to provide final assessment conclusions.

#### A.6.5.1.1 In-combination mortality estimates

Due to errors identified in the NEEOG Interim CEF dataset, the Applicant has sourced mortality estimates from projects included in the in-combination assessment from individual project documents. Collision estimates derived from project documents which were calculated using different avoidance rates than those recommended currently were corrected to match current guidance. Displacement mortality estimates were recalculated for all projects to align displacement and mortality rates with current guidance. Mean seasonal peak abundance estimates were calculated from survey results of individual projects which were then apportioned to individual SPAs before being used as inputs to displacement matrices. It is unclear where apportioning weights were derived, i.e. whether they were derived from project documents or recalculated by the Applicant. Paragraphs 5.5.2.10 and 5.5.3.11 (RIAA part 3) state that where individual projects did not undertake apportioning in their own assessments, apportioning values were derived from MacArthur Green (2024) however this source is not included in the reference list, and it is not clear where these values have been derived.

**As such:**

- **Clarification is required to confirm how apportioning weights were derived so that we can fully understand the methodology used to derive updated in-combination mortality estimates.**

#### A.6.5.1.2 Inclusion of mortality estimates from consented Projects requiring compensation

The Applicant has erroneously included full impacts (compensated for as well as uncompensated impacts) for all projects included in the in-combination assessment. Instead, mortality from projects which have been consented with AEoSI identified and for which compensation measures are required as a condition of consent should be removed. Under these circumstances:

- Any impacts from an individual project which amount to AEoSI on a feature of an SPA should be discounted from the in-combination mortality total, as they will be compensated for if the project is constructed.
- Any impacts from a project which do not result in AEoSI on a feature of an SPA should be included in the in-combination assessment as they will not be compensated for.

The Applicant's approach is inconsistent with other Applications, which commonly present two in-combination scenarios where impacts requiring compensation are included in one scenario and not included in the other – this is especially pertinent to the assessment of impacts from Berwick Bank. NatureScot and MD-LOT typically make conclusions of AEoSI on the scenario with compensated impacts removed from the in-combination total for relevant SPAs, which is not possible for Morven South assessment provided.

There is also a statement used throughout the SPA assessments in the RIAA Part 3 referring to AEoSI reached for SPA features by various other projects: "proposed compensatory measures will compensate for the residual effects from this project that would otherwise contribute to an in-combination effect with Morven South". This is not an approach we accept, and as such we have

only been able to make provisional conclusions of AEoSI based on the full, uncompensated impacts of all projects included in the assessment.

**As such:**

- **Additional information is required whereby we request that when the Applicant updates the in-combination assessment to address other clarification / additional information requests, mortality impacts for which compensation has been conditioned through consent is removed from the in-combination mortality total.**

#### A.6.5.1.3 Potential omission of offshore wind farms in the in-combination assessment

As discussed in section A.5.3.1. above, we have identified a number of other offshore wind projects which have submitted Applications between the 6-month cut-off and the submission of the Morven South Application. Notably, the nearby Bellrock and Bowdun offshore wind farm Applications, and the additional information submissions for the nearby Muir Mhor and Ossian wind farms – note this list is not exhaustive. We acknowledge that the cut-off period for inclusion in the in-combination assessment is an industry standard, however the issue arising from multiple submissions in a short timeframe and exacerbated when Application submission are subsequently delayed, creates significant uncertainty in the assessment process and without an audit / assessment, we cannot be sure that a potentially adverse effect impact has not been missed.

**As such:**

- **We request MD LOT advises the Applicant which wind farms should be included to inform the request for Additional Environmental to ensure a robust in-combination assessment is provided.**

#### A.6.5.1.4 Consideration of fulmar from the in-combination assessment

Fulmar has not been included in the in-combination assessment. This is based on previous NatureScot advice that other projects have not included a quantitative assessment for fulmar therefore making an in-combination assessment difficult. However, since submission of this application and the West of Orkney Addendum which included a quantitative assessment of impacts to fulmar, we consider this is now possible and future Applicants should undertake an in-combination assessment for fulmar.

#### A.6.5.2 Summary of in-combination Assessment conclusions – Provisional

Our **provisional** conclusions of adverse effect on site integrity (AEoSI) arising from the in-combination assessment of displacement impacts and combined displacement / collision risk on qualifying features of SPAs are summarised in Table NS.29.

Where the project-alone impacts on a qualifying feature exceed the threshold of 0.02 percentage points change in adult annual survival rate, a PVA is required and the outputs of which are discussed in subsequent sections. All conclusions are provisional on the basis of the issues highlighted in this advice which require clarification and / or additional information – particularly those in A.6.5.1.2 and A.6.5.1.3 for the in-combination assessment.

The Applicant has used a threshold of 0.2 bird mortalities per annum from project-alone impacts to determine whether an in-combination PVA is required. This is a threshold we no longer advise

or accept, as small contributions of mortality may accumulate for SPA features without being assessed. We still advise the threshold of 0.02 percentage point change in adult annual survival from in-combination impacts to determine when a PVA is required. We can accept the Applicant's approach to use the threshold of 0.2 bird mortalities per annum in this Application, however a reassessment of in-combination impacts should not use the threshold.

**As such:**

- **We request that when the Applicant presents an updated in-combination assessment, no threshold of bird mortalities per year from the project-alone is applied to determine whether a PVA is required. Only the threshold of 0.02 percentage point change in adult annual survival from in-combination impacts should be used. Where the threshold for PVA is exceeded but project-alone impacts are less than one bird throughout the project's operational lifetime, we request the Applicant consults NatureScot to discuss if a PVA is required.**

Note that conclusions of impacts to qualifying features of SPAs in England are not included in this advice and should be assessed by Natural England. It appears that impacts to kittiwake at Farne Islands SPA and to gannet at Flamborough and Filey Coast SPA have not been included in the SPA assessment despite project-alone mortalities of 0.2 birds per year for each SPA.

As discussed in A.6.2.3, impacts to kittiwake at Forth Islands SPA have not been considered, despite a project-alone impact of 0.3 mortalities per year.

*Table NS.29: Summary of in-combination impact conclusions for all SPAs and features with LSE identified*

| SPA                             | Qualifying feature | Impact                     | Percentage point change in adult annual survival rate* | PVA required? | Provisional conclusion |
|---------------------------------|--------------------|----------------------------|--------------------------------------------------------|---------------|------------------------|
| Buchan Ness to Collieston Coast | Guillemot          | Displacement               | <b>0.721 to 1.523</b>                                  | <b>Yes</b>    | See Table NS.3030      |
|                                 | Kittiwake          | Collision and displacement | <b>0.387 to 0.532</b>                                  | <b>Yes</b>    | See Table NS.3030      |
| Copinsay                        | Kittiwake          | Collision and displacement | Project alone impact <0.2 birds per annum              |               |                        |
| East Caithness Cliffs           | Kittiwake          | Collision and displacement | <b>0.557 to 0.783</b>                                  | <b>Yes</b>    | See Table NS.3030      |
|                                 | Razorbill          | Displacement               | <b>0.258 to 0.572</b>                                  | <b>Yes</b>    | See Table NS.3030      |
| Fair Isle                       | Gannet             | Collision and displacement | Project alone impact <0.2 birds per annum              |               |                        |
|                                 | Puffin             | Displacement               | Project alone impact <0.2 birds per annum              |               |                        |
| Forth Islands                   | Gannet             | Collision and displacement | <b>0.292 to 0.449</b>                                  | <b>Yes</b>    | See Table NS.3030      |
|                                 | Guillemot          | Displacement               | <b>0.735 to 1.604</b>                                  | <b>Yes</b>    | See Table NS.3030      |
|                                 | Kittiwake          | Collision and displacement | <b>Not presented in RIAA – see A.6.2.3</b>             |               |                        |

| SPA                                  | Qualifying feature | Impact                     | Percentage point change in adult annual survival rate* | PVA required? | Provisional conclusion |
|--------------------------------------|--------------------|----------------------------|--------------------------------------------------------|---------------|------------------------|
|                                      | Puffin             | Displacement               | <b>0.274 to 0.568</b>                                  | Yes           | See Table NS.3030      |
|                                      | Razorbill          | Displacement               | <b>0.579 to 1.121</b>                                  | Yes           | See Table NS.3030      |
| Foula                                | Puffin             | Displacement               | <b>0.104 to 0.301</b>                                  | Yes           | See Table NS.3030      |
| Fowlsheugh                           | Guillemot          | Displacement               | <b>0.774 to 1.576</b>                                  | Yes           | See Table NS.3030      |
|                                      | Kittiwake          | Collision and displacement | <b>0.459 to 0.633</b>                                  | Yes           | See Table NS.3030      |
|                                      | Razorbill          | Displacement               | <b>0.498 to 0.915</b>                                  | Yes           | See Table NS.3030      |
| Hermaness, Saxa Vord and Valla Field | Gannet             | Collision and displacement | <b>0.081 to 0.162</b>                                  | Yes           | See Table NS.3030      |
|                                      | Puffin             | Displacement               | <b>0.030 to 0.089</b>                                  | Yes           | See Table NS.3030      |
| Hoy                                  | Kittiwake          | Collision and displacement | Project alone impact <0.2 birds per annum              |               |                        |
| North Caithness Cliffs               | Kittiwake          | Collision and displacement | Project alone impact <0.2 birds per annum              |               |                        |
|                                      | Puffin             | Displacement               | Project alone impact <0.2 birds per annum              |               |                        |
| Noss                                 | Gannet             | Collision and displacement | Project alone impact <0.2 birds per annum              |               |                        |
| St Abb's Head to Fast Castle         | Guillemot          | Displacement               | <b>0.811 to 1.694</b>                                  | Yes           | See Table NS.3030      |
|                                      | Kittiwake          | Collision and displacement | <b>1.304 to 1.634</b>                                  | Yes           | See Table NS.3030      |
|                                      | Razorbill          | Displacement               | <b>0.530 to 1.024</b>                                  | Yes           | See Table NS.3030      |
| St Kilda                             | Gannet             | Collision and displacement | Project alone impact <0.2 birds per annum              |               |                        |
| Troup, Pennan and Lion's Heads       | Guillemot          | Displacement               | <b>0.628 to 1.332</b>                                  | Yes           | See Table NS.3030      |
|                                      | Kittiwake          | Collision and displacement | <b>0.409 to 0.552</b>                                  | Yes           | See Table NS.3030      |
| West Westray                         | Kittiwake          | Collision and displacement | Project alone impact <0.2 birds per annum              |               |                        |

\*High to low displacement scenario

The outputs of PVA modelling for relevant qualifying features are summarised in Table NS.30, alongside NatureScot's provisional conclusions of AEOsI.

Table NS.30: Results of PVA modelling for qualifying features of SPAs where impacts exceeded 0.02 percentage point change in adult survival rate in the in-combination assessment

| SPA                                  | Qualifying feature | Median counterfactuals of population size/growth rate after 35 years of impacts* |                | Provisional conclusion             |
|--------------------------------------|--------------------|----------------------------------------------------------------------------------|----------------|------------------------------------|
|                                      |                    | CPS                                                                              | CGR            |                                    |
| Buchan Ness to Collieston Coast      | Guillemot          | 0.549 to 0.754                                                                   | 0.983 to 0.992 | <b>AEoSI</b>                       |
|                                      | Kittiwake          | 0.802 to 0.852                                                                   | 0.994 to 0.995 | <b>AEoSI</b>                       |
| East Caithness Cliffs                | Razorbill          | 0.790 to 0.899                                                                   | 0.993 to 0.997 | <b>Unable to conclude no AEoSI</b> |
|                                      | Kittiwake          | 0.721 to 0.794                                                                   | 0.991 to 0.993 | <b>AEoSI</b>                       |
|                                      | Kittiwake          | 0.798 to 0.854                                                                   | 0.994 to 0.996 | <b>AEoSI</b>                       |
| Forth Islands                        | Guillemot          | 0.532 to 0.750                                                                   | 0.982 to 0.992 | <b>AEoSI</b>                       |
|                                      | Razorbill          | 0.630 to 0.789                                                                   | 0.987 to 0.993 | <b>AEoSI</b>                       |
|                                      | Puffin             | 0.792 to 0.893                                                                   | 0.993 to 0.997 | <b>Unable to conclude no AEoSI</b> |
|                                      | Gannet             | 0.831 to 0.886                                                                   | 0.995 to 0.997 | <b>Unable to conclude no AEoSI</b> |
| Fowlsheugh                           | Guillemot          | 0.538 to 0.738                                                                   | 0.982 to 0.991 | <b>AEoSI</b>                       |
|                                      | Razorbill          | 0.685 to 0.814                                                                   | 0.989 to 0.994 | <b>AEoSI</b>                       |
|                                      | Kittiwake          | 0.769 to 0.826                                                                   | 0.993 to 0.995 | <b>AEoSI</b>                       |
| Foula                                | Puffin             | 0.884 to 0.959                                                                   | 0.997 to 0.999 | No AEoSI                           |
| Hermaness, Saxa Vord and Valla Field | Puffin             | 0.964 to 0.988                                                                   | 0.999 to 1.000 | No AEoSI                           |
|                                      | Gannet             | 0.935 to 0.963                                                                   | 0.998 to 0.999 | No AEoSI                           |
| St Abb's Head to Fast Castle         | Guillemot          | 0.513 to 0.728                                                                   | 0.981 to 0.991 | <b>AEoSI</b>                       |
|                                      | Razorbill          | 0.654 to 0.802                                                                   | 0.988 to 0.991 | <b>AEoSI</b>                       |
|                                      | Kittiwake          | 0.504 to 0.580                                                                   | 0.981 to 0.985 | <b>AEoSI</b>                       |
| Troup, Pennan and Lion's Heads       | Guillemot          | 0.592 to 0.782                                                                   | 0.985 to 0.993 | <b>AEoSI</b>                       |
|                                      | Kittiwake          | 0.794 to 0.844                                                                   | 0.994 to 0.995 | <b>AEoSI</b>                       |

\*High to low displacement scenario

#### A.6.5.3 SPA-specific in-combination assessment conclusions – Provisional

Our **provisional** conclusions for AEoSI are provided for each SPA and qualifying feature for which an LSE conclusion was reached for the in-combination assessment. This includes conclusions for seabird assemblage feature where appropriate.

For guillemot, razorbill and puffin all conclusions are provisional subject to clarifications requested in A.4.5, A.6.5.1.1 and A.6.5.1.2. For puffin, conclusions are also provisional subject to clarification requested in A.6.2.2.1.

For kittiwake all conclusions are provisional subject to clarifications in A.4.5, A.6.2.1.1, A.6.2.2.1, A.6.5.1.1 and A.6.5.1.2.

For gannet, all conclusions are provisional subject to clarifications in A.4.5, A.5.2.5, A.6.2.1.1 and A.6.5.1.2. For gannet at Hermaness, Saxa Vord and Valla Field SPA and Noss SPA, conclusions are also provisional subject to clarification requested in A.6.2.2.2.

##### A.6.5.3.1 Buchan Ness to Collieston Coast SPA

For guillemot at Buchan Ness to Collieston Coast SPA, we **provisionally** conclude **AEoSI** from in-combination displacement impacts based on the following:

- The very low median CPS values from the PVA representing a 24.6 to 45.1% smaller population after 35 years of impacts, compared to the baseline unimpacted scenario
- The low median CGR values from the PVA representing a 0.8 to 1.7% reduced population growth rate after 35 years of impacts, compared to the baseline unimpacted scenario
- Favourable maintained feature condition at the SPA
- A 0.3% decline in the SPA population between Seabird 2000 (Mitchell et al., 2004) and Seabirds Count (Burnell et al., 2023), but a 29% decline in Scotland between 1986 and 2024 (Harris et al., 2026).

For kittiwake at Buchan Ness to Collieston Coast SPA, we **provisionally** conclude **AEoSI** from in-combination combined collision and displacement impacts based on the following:

- The low median CPS values from the PVA representing a 14.8 to 19.8% smaller population after 35 years of impacts, compared to the baseline unimpacted scenario
- The low median CGR values from the PVA representing a 0.5 to 0.6% reduced population growth rate after 35 years of impacts, compared to the baseline unimpacted scenario
- Unfavourable recovering feature condition at the SPA
- A 19% decline in the SPA population between Seabird 2000 (Mitchell et al., 2004) and Seabirds Count (Burnell et al., 2023), and a 53% decline in the Scottish breeding population between 1986 and 2024 (Harris et al., 2026).

*Table NS.31: results of PVA modelling and provisional AEoSI conclusions for in-combination impacts to Buchan Ness to Collieston Coast SPA*

| Qualifying feature          | Annual adult mortality* |                | Median counterfactuals of population size/growth rate after 35 years of impacts* |                | Provisional NS conclusion |
|-----------------------------|-------------------------|----------------|----------------------------------------------------------------------------------|----------------|---------------------------|
|                             | Morven South            | In-combination | CPS                                                                              | CGR            |                           |
| Guillemot                   | 5.7 to 17.2             | 284 to 601     | 0.549 to 0.754                                                                   | 0.983 to 0.992 | <b>AEoSI</b>              |
| Kittiwake                   | 0.5 to 0.7              | 87.5 to 120.3  | 0.802 to 0.852                                                                   | 0.994 to 0.995 | <b>AEoSI</b>              |
| Breeding seabird assemblage |                         |                |                                                                                  |                | <b>AEoSI</b>              |

\*High to low displacement scenario

#### A.6.5.3.2 East Caithness Cliffs SPA

For razorbill at East Caithness Cliffs SPA, we are **provisionally unable to conclude no AEoSI** from in-combination displacement impacts based on the following:

- The low median CPS values from the PVA representing a 10.1 to 21.0% smaller population after 35 years of impacts, compared to the baseline unimpacted scenario
- The low median CGR values from the PVA representing a 0.3 to 0.7% reduced population growth rate after 35 years of impacts, compared to the baseline unimpacted scenario
- Favourable maintained feature condition at the SPA

- A 63% increase in the SPA population between Seabird 2000 (Mitchell et al. 2004) and Seabirds Count (Burnell et al. 2023), and a 63% increase in the Scottish breeding population between 1986 and 2024 (Harris et al. 2026).

For kittiwake at East Caithness Cliffs SPA, we **provisionally** conclude **AEoSI** from in-combination combined collision and displacement impacts based on the following:

- The low median CPS values from the PVA representing a 20.6 to 27.9% smaller population after 35 years of impacts, compared to the baseline unimpacted scenario
- The low median CGR values from the PVA representing a 0.7 to 0.9% reduced population growth rate after 35 years of impacts, compared to the baseline unimpacted scenario
- Favourable maintained feature condition at the SPA
- A 39% decline in the SPA population between Seabird 2000 (Mitchell et al. 2004) and Seabirds Count (Burnell et al. 2023), and a 53% decline in the Scottish breeding population between 1986 and 2024 (Harris et al. 2026).

*Table NS.32: results of PVA modelling and provisional AEoSI conclusions for in-combination impacts to East Caithness Cliffs SPA*

| Qualifying feature          | Annual adult mortality* |                | Median counterfactuals of population size/growth rate after 35 years of impacts* |                | Provisional NS conclusion   |
|-----------------------------|-------------------------|----------------|----------------------------------------------------------------------------------|----------------|-----------------------------|
|                             | Morven South            | In-combination | CPS                                                                              | CGR            |                             |
| Razorbill                   | 0.8 to 2.5              | 116 to 257     | 0.790 to 0.899                                                                   | 0.993 to 0.997 | Unable to conclude no AEoSI |
| Kittiwake                   | 0.5 to 0.7              | 272.7 to 383.6 | 0.721 to 0.794                                                                   | 0.991 to 0.993 | AEoSI                       |
| Breeding seabird assemblage |                         |                |                                                                                  |                | AEoSI                       |

\*High to low displacement scenario

#### A.6.5.3.3 Forth Islands SPA

For guillemot at Forth Islands SPA, we **provisionally** conclude **AEoSI** from in-combination displacement impacts based on the following:

- The very low median CPS values from the PVA representing a 25.0 to 46.8% smaller population after 35 years of impacts, compared to the baseline unimpacted scenario
- The low median CGR values from the PVA representing a 0.8 to 1.8% reduced population growth rate after 35 years of impacts, compared to the baseline unimpacted scenario
- Favourable maintained feature condition at the SPA
- A 27% decline in the SPA population between Seabird 2000 (Mitchell et al. 2004) and Seabirds Count (Burnell et al. 2023), and a 29% decline in the Scottish breeding population between 1986 and 2024 (Harris et al. 2026).

For razorbill at Forth Islands SPA, we **provisionally** conclude **AEoSI** from in-combination displacement impacts based on the following:

- The low median CPS values from the PVA representing a 21.1 to 37.0% smaller population after 35 years of impacts, compared to the baseline unimpacted scenario
- The low median CGR values from the PVA representing a 0.7 to 1.3% reduced population growth rate after 35 years of impacts, compared to the baseline unimpacted scenario
- Favourable maintained feature condition at the SPA
- This conclusion was reached despite a 23% increase in the SPA population between Seabird 2000 (Mitchell et al. 2004) and Seabirds Count (Burnell et al. 2023), and a 63% increase in the Scottish breeding population between 1986 and 2024 (Harris et al. 2026).

For puffin at Forth Islands SPA, we are **provisionally unable to conclude no AEoSI** from in-combination displacement impacts based on the following:

- The low median CPS values from the PVA representing a 10.7 to 20.8% smaller population after 35 years of impacts, compared to the baseline unimpacted scenario
- The low median CGR values from the PVA representing a 0.3 to 0.7% reduced population growth rate after 35 years of impacts, compared to the baseline unimpacted scenario
- Favourable maintained feature condition at the SPA
- A 40% decline in the SPA population between Seabird 2000 (Mitchell et al. 2004) and Seabirds Count (Burnell et al. 2023), and a 21% decline in the Scottish breeding population between 1986 and 2024 (Harris et al. 2026).

For gannet at Forth Islands SPA, we are **provisionally unable to conclude no AEoSI** from in-combination combined collision and displacement impacts based on the following:

- The low median CPS values from the PVA representing a 11.4 to 16.9% smaller population after 35 years of impacts, compared to the baseline unimpacted scenario
- The low median CGR values from the PVA representing a 0.3 to 0.5% reduced population growth rate after 35 years of impacts, compared to the baseline unimpacted scenario
- Favourable maintained feature condition at the SPA
- An increasing SPA population between Seabird 2000 (Mitchell et al., 2004) and Seabirds Count (Burnell et al., 2023), followed by a 39% decline in the SPA population after HPAI (Burton et al. 2024)<sup>38</sup>

We have been **unable to reach a conclusion** on the in-combination assessment of kittiwake at Forth Islands SPA due to insufficient information in the assessment.

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<sup>38</sup> <https://www.seabird.org/conservation/bass-rock-colony-counts>

Table NS.33: results of PVA modelling and provisional AEOI conclusions for in-combination impacts to Forth Islands SPA

| Qualifying feature          | Annual adult mortality* |                | Median counterfactuals of population size/growth rate after 35 years of impacts* |                | Provisional NS conclusion          |
|-----------------------------|-------------------------|----------------|----------------------------------------------------------------------------------|----------------|------------------------------------|
|                             | Morven South            | In-combination | CPS                                                                              | CGR            |                                    |
| Guillemot                   | 5.2 to 15.5             | 261.0 to 570.0 | 0.532 to 0.750                                                                   | 0.982 to 0.992 | <b>AEoSI</b>                       |
| Razorbill                   | 0.3 to 0.7              | 49.0 to 95.0   | 0.630 to 0.789                                                                   | 0.987 to 0.993 | <b>AEoSI</b>                       |
| Puffin                      | 1.0 to 2.7              | 236.0 to 488.0 | 0.792 to 0.893                                                                   | 0.993 to 0.997 | <b>Unable to conclude no AEoSI</b> |
| Gannet                      | 7.0 to 9.7              | 438.8 to 675.5 | 0.831 to 0.886                                                                   | 0.995 to 0.997 | <b>Unable to conclude no AEoSI</b> |
| Kittiwake                   | Not presented           |                |                                                                                  |                | Cannot reach a conclusion          |
| Breeding seabird assemblage |                         |                |                                                                                  |                | <b>AEoSI</b>                       |

\*High to low displacement scenario

#### A.6.5.3.4 Fowlsheugh SPA

For guillemot at Fowlsheugh SPA, we **provisionally** conclude **AEoSI** from in-combination displacement impacts based on the following:

- The very low median CPS values from the PVA representing a 26.2 to 46.2% smaller population after 35 years of impacts, compared to the baseline unimpacted scenario
- The low median CGR values from the PVA representing a 0.9 to 1.8% reduced population growth rate after 35 years of impacts, compared to the baseline unimpacted scenario
- Favourable maintained feature condition at the SPA
- An 1% increase in the SPA population between Seabird 2000 (Mitchell et al. 2004) and Seabirds Count (Burnell et al. 2023), but a 29% decline in the Scottish breeding population between 1986 and 2024 (Harris et al. 2026).

For razorbill at Fowlsheugh SPA, we **provisionally** conclude **AEoSI** from in-combination displacement impacts based on the following:

- The low median CPS values from the PVA representing a 18.6 to 31.5% smaller population after 35 years of impacts, compared to the baseline unimpacted scenario
- The low median CGR values from the PVA representing a 0.6 to 1.1% reduced population growth rate after 35 years of impacts, compared to the baseline unimpacted scenario
- Favourable maintained feature condition at the SPA
- This conclusion was reached despite a 92% increase in the SPA population between Seabird 2000 (Mitchell et al. 2004) and Seabirds Count (Burnell et al. 2023), and a 63% increase in the Scottish breeding population between 1986 and 2024 (Harris et al. 2026).

For kittiwake at Fowlsheugh SPA, we **provisionally** conclude **AEoSI** from in-combination combined collision and displacement impacts based on the following:

- The low median CPS values from the PVA representing a 17.4 to 23.1% smaller population after 35 years of impacts, compared to the baseline unimpacted scenario
- The low median CGR values from the PVA representing a 0.5 to 0.7% reduced population growth rate after 35 years of impacts, compared to the baseline unimpacted scenario
- Unfavourable declining feature condition at the SPA
- A 51% decline in the SPA population between Seabird 2000 (Mitchell et al. 2004) and Seabirds Count (Burnell et al. 2023), and a 53% decline in the Scottish breeding population between 1986 and 2024 (Harris et al. 2026).

*Table NS.34: results of PVA modelling and provisional AEoSI conclusions for in-combination impacts to Fowlsheugh SPA*

| Qualifying feature          | Annual adult mortality* |                | Median counterfactuals of population size/growth rate after 35 years of impacts* |                | Provisional NS conclusion |
|-----------------------------|-------------------------|----------------|----------------------------------------------------------------------------------|----------------|---------------------------|
|                             | Morven South            | In-combination | CPS                                                                              | CGR            |                           |
| Guillemot                   | 20.9 to 50.3            | 724 to 1,475   | 0.538 to 0.738                                                                   | 0.982 to 0.991 | <b>AEoSI</b>              |
| Razorbill                   | 0.5 to 1.1              | 104 to 192     | 0.685 to 0.814                                                                   | 0.989 to 0.994 | <b>AEoSI</b>              |
| Kittiwake                   | 0.9 to 1.2              | 128.9 to 177.7 | 0.769 to 0.826                                                                   | 0.993 to 0.995 | <b>AEoSI</b>              |
| Breeding seabird assemblage |                         |                |                                                                                  |                | <b>AEoSI</b>              |

\*High to low displacement scenario

#### A.6.5.3.5 Foula SPA

For puffin at Foula SPA, we are **provisionally unable to conclude no AEoSI** from in-combination displacement impacts based on the following:

- The moderate median CPS values from the PVA representing a 4.1 to 11.6% smaller population after 35 years of impacts, compared to the baseline unimpacted scenario
- The moderate median CGR values from the PVA representing a 0.1 to 0.3% reduced population growth rate after 35 years of impacts, compared to the baseline unimpacted scenario
- Unfavourable, no change feature condition at the SPA
- An 81% decline in the SPA population between Seabird 2000 (Mitchell et al. 2004) and Seabirds Count (Burnell et al. 2023), and a 21% decline in the Scottish breeding population between 1986 and 2024 (Harris et al. 2026).

*Table NS.35: results of PVA modelling and provisional AEoSI conclusions for in-combination impacts to Foula SPA*

| Qualifying feature | Annual adult mortality* |                | Median counterfactuals of population size/growth rate after 35 years of impacts* |     | Provisional NS conclusion |
|--------------------|-------------------------|----------------|----------------------------------------------------------------------------------|-----|---------------------------|
|                    | Morven South            | In-combination | CPS                                                                              | CGR |                           |

|                             |            |         |                |                |                             |
|-----------------------------|------------|---------|----------------|----------------|-----------------------------|
| Puffin                      | 0.1 to 0.2 | 9 to 26 | 0.884 to 0.959 | 0.997 to 0.999 | Unable to conclude no AEoSI |
| Breeding seabird assemblage |            |         |                |                | Unable to conclude no AEoSI |

\*High to low displacement scenario

#### A.6.5.3.6 Hermaness, Saxa Vord and Valla Field SPA

For puffin at Hermaness, Saxa Vord and Valla Field SPA, we **provisionally** conclude **no AEoSI** from in-combination displacement impacts based on the following:

- The relatively high median CPS values from the PVA representing a 1.2 to 3.6% smaller population after 35 years of impacts, compared to the baseline unimpacted scenario
- The relatively high median CGR values from the PVA representing a 0.0 to 0.1% reduced population growth rate after 35 years of impacts, compared to the baseline unimpacted scenario
- Unfavourable recovering feature condition at the SPA
- A decline in the SPA population of 43% between Seabird 2000 (Mitchell et al. 2004) and Seabirds Count (Burnell et al. 2023), and a 21% decline in the Scottish breeding population between 1986 and 2024 (Harris et al. 2026).

For gannet at Hermaness, Saxa Vord and Valla Field SPA, we **provisionally** conclude **no AEoSI** from in-combination combined collision and displacement impacts based on the following:

- The relatively high median CPS values from the PVA representing a 3.7 to 6.5% smaller population after 35 years of impacts, compared to the baseline unimpacted scenario
- The relatively high median CGR values from the PVA representing a 0.1 to 0.2% reduced population growth rate after 35 years of impacts, compared to the baseline unimpacted scenario
- Favourable maintained feature condition at the SPA
- An increasing SPA population between Seabird 2000 (Mitchell et al. 2004) and Seabirds Count (Burnell et al. 2023), followed by a 37% decline in the SPA population after HPAI (Tremlett et al. 2023).

Table NS.36: results of PVA modelling and provisional AEoSI conclusions for in-combination impacts to Hermaness, Saxa Vord and Valla Field SPA

| Qualifying feature          | Annual adult mortality* |                | Median counterfactuals of population size/growth rate after 35 years of impacts* |                | Provisional NS conclusion |
|-----------------------------|-------------------------|----------------|----------------------------------------------------------------------------------|----------------|---------------------------|
|                             | Morven South            | In-combination | CPS                                                                              | CGR            |                           |
| Puffin                      | 0.1 to 0.2              | 9 to 26        | 0.964 to 0.988                                                                   | 0.999 to 1.000 | No AEoSI                  |
| Gannet                      | 0.1 to 0.3              | 47.9 to 95.5   | 0.935 to 0.963                                                                   | 0.998 to 0.999 | No AEoSI                  |
| Breeding seabird assemblage |                         |                |                                                                                  |                | No AEoSI                  |

\*High to low displacement scenario

#### A.6.5.3.7 St Abb's Head to Fast Castle SPA

For guillemot at St Abb's Head to Fast Castle SPA, we **provisionally** conclude **AEoSI** from in-combination displacement impacts based on the following:

- The very low median CPS values from the PVA representing a 27.2 to 48.7% smaller population after 35 years of impacts, compared to the baseline unimpacted scenario
- The low median CGR values from the PVA representing a 0.9 to 1.9% reduced population growth rate after 35 years of impacts, compared to the baseline unimpacted scenario
- Favourable maintained feature condition at the SPA
- A 5% increase in the SPA population between Seabird 2000 (Mitchell et al. 2004) and Seabirds Count (Burnell et al. 2023), and a 29% decline in the Scottish breeding population between 1986 and 2024 (Harris et al. 2026).

For razorbill at St Abb's Head to Fast Castle SPA, we **provisionally** conclude **AEoSI** from in-combination displacement impacts based on the following:

- The low median CPS values from the PVA representing a 19.8 to 34.6% smaller population after 35 years of impacts, compared to the baseline unimpacted scenario
- The low median CGR values from the PVA representing a 0.9 to 1.2% reduced population growth rate after 35 years of impacts, compared to the baseline unimpacted scenario
- Favourable maintained feature condition at the SPA
- A 7% decline in the SPA population between Seabird 2000 (Mitchell et al. 2004) and Seabirds Count (Burnell et al. 2023), but a 63% increase in the Scottish breeding population between 1986 and 2024 (Harris et al. 2026).

For kittiwake at St Abb's Head to Fast Castle SPA, we **provisionally** conclude **AEoSI** from in-combination combined collision and displacement impacts based on the following:

- The very low median CPS values from the PVA representing a 42.0 to 49.6% smaller population after 35 years of impacts, compared to the baseline unimpacted scenario
- The low median CGR values from the PVA representing a 1.5 to 1.9% reduced population growth rate after 35 years of impacts, compared to the baseline unimpacted scenario
- Unfavourable recovering feature condition at the SPA
- A 68% decline in the SPA population between Seabird 2000 (Mitchell et al. 2004) and Seabirds Count (Burnell et al. 2023), and a 53% decline in the Scottish breeding population between 1986 and 2024 (Harris et al. 2026).

*Table NS.37: results of PVA modelling and provisional AEoSI conclusions for in-combination impacts to St Abb's Head to Fast Castle SPA*

| Qualifying feature | Annual adult mortality* |                | Median counterfactuals of population size/growth rate after 35 years of impacts* |     | Provisional NS conclusion |
|--------------------|-------------------------|----------------|----------------------------------------------------------------------------------|-----|---------------------------|
|                    | Morven South            | In-combination | CPS                                                                              | CGR |                           |

|                             |             |                |                |                |              |
|-----------------------------|-------------|----------------|----------------|----------------|--------------|
| Guillemot                   | 8.9 to 26.7 | 498 to 1,040   | 0.513 to 0.728 | 0.981 to 0.991 | <b>AEoSI</b> |
| Razorbill                   | 0.1 to 0.3  | 23 to 45       | 0.654 to 0.802 | 0.988 to 0.991 | <b>AEoSI</b> |
| Kittiwake                   | 0.3 to 0.4  | 134.3 to 168.3 | 0.504 to 0.580 | 0.981 to 0.985 | <b>AEoSI</b> |
| Breeding seabird assemblage |             |                |                |                | <b>AEoSI</b> |

\*High to low displacement scenario

#### A.6.5.3.8 Troup, Pennan and Lion's Heads SPA

For guillemot at Troup, Pennan and Lion's Heads SPA, we **provisionally** conclude **AEoSI** from in-combination displacement impacts based on the following:

- The very low median CPS values from the PVA representing a 21.8 to 40.8% smaller population after 35 years of impacts, compared to the baseline unimpacted scenario
- The low median CGR values from the PVA representing a 0.7 to 1.5% reduced population growth rate after 35 years of impacts, compared to the baseline unimpacted scenario
- Unfavourable recovering feature condition at the SPA
- A 50% decline in the SPA population between Seabird 2000 (Mitchell et al. 2004) and Seabirds Count (Burnell et al. 2023), and a 29% decline in the Scottish breeding population between 1986 and 2024 (Harris et al. 2026).

For kittiwake at Troup, Pennan and Lion's Heads SPA, we **provisionally** conclude **AEoSI** from in-combination combined collision and displacement impacts based on the following:

- The low median CPS values from the PVA representing a 15.6 to 20.6% smaller population after 35 years of impacts, compared to the baseline unimpacted scenario
- The low median CGR values from the PVA representing a 0.5 to 0.6% reduced population growth rate after 35 years of impacts, compared to the baseline unimpacted scenario
- Unfavourable declining feature condition at the SPA
- A 44% decline in the SPA population between Seabird 2000 (Mitchell et al. 2004) and Seabirds Count (Burnell et al. 2023), and a 53% decline in the Scottish breeding population between 1986 and 2024 (Harris et al. 2026).

Table NS.38: results of PVA modelling and provisional AEoSI conclusions for in-combination impacts to Troup, Pennan and Lion's Heads SPA

| Qualifying feature          | Annual adult mortality* |                | Median counterfactuals of population size/growth rate after 35 years of impacts* |                | Provisional NS conclusion |
|-----------------------------|-------------------------|----------------|----------------------------------------------------------------------------------|----------------|---------------------------|
|                             | Morven South            | In-combination | CPS                                                                              | CGR            |                           |
| Guillemot                   | 4.6 to 13.9             | 200 to 425     | 0.592 to 0.782                                                                   | 0.985 to 0.993 | <b>AEoSI</b>              |
| Kittiwake                   | 0.4 to 0.5              | 86.9 to 117.3  | 0.794 to 0.844                                                                   | 0.994 to 0.995 | <b>AEoSI</b>              |
| Breeding seabird assemblage |                         |                |                                                                                  |                | <b>AEoSI</b>              |

\*High to low displacement scenario

#### A.6.5.3.9 Functionally linked Marine SPAs

For the functionally linked qualifying features of the Outer Firth of Forth and St Andrews Bay Complex marine SPA, we provide **provisional** conclusions of **AEoSI** for guillemot and the seabird assemblage and are **provisionally unable to conclude no AEoSI** for puffin and gannet in-combination from displacement impacts or displacement impacts / collision risk, as summarised in Table NS.40 below. The conclusion for each species is dependent on the conclusion for the functionally linked colony SPA as detailed above.

*Table NS39: provisional AEoSI conclusions for in-combination impacts to functionally linked colonies of Outer Firth of Forth and St Andrews Bay Complex SPA*

| Marine SPA                                          | Qualifying feature          | Linked/supported colony SPAs                                                                                   | Linked SPA provisional conclusion  | Marine SPA provisional conclusion  |
|-----------------------------------------------------|-----------------------------|----------------------------------------------------------------------------------------------------------------|------------------------------------|------------------------------------|
| Outer Firth of Forth and St Andrews Bay Complex SPA | Guillemot                   | Forth Islands SPA<br>St Abb's Head to Fast Castle SPA<br>Fowlsheugh SPA<br>Buchan Ness to Collieston Coast SPA | <b>AEoSI</b>                       | <b>AEoSI</b>                       |
|                                                     | Puffin                      | Forth Islands SPA                                                                                              | <b>Unable to conclude no AEoSI</b> | <b>Unable to conclude no AEoSI</b> |
|                                                     | Gannet                      | Forth Islands SPA                                                                                              | <b>Unable to conclude no AEoSI</b> | <b>Unable to conclude no AEoSI</b> |
|                                                     | Breeding seabird assemblage |                                                                                                                | <b>AEoSI</b>                       | <b>AEoSI</b>                       |

## NATURESCOT ADVICE ON MORVEN SOUTH OFFSHORE WIND FARM

### Appendix B Marine mammals

Marine mammals are considered in Volume 3, Chapter 10: Marine Mammals and the following relevant supporting appendices:

- Volume 3, Annex 10.1 Marine Mammal Shared Baseline Technical Report
- Volume 3, Annex 10.2 Underwater Sound Shared Technical Report
- Volume 3, Annex 10.3 Marine Mammals Shared Digital Aerial Survey Report
- Volume 3, Annex 10.4 Marine Mammals Shared Seal Telemetry and Haul-out Data Study Technical Report
- Volume 3, Annex 10.5 Marine Mammals iPCoD Modelling Report

### B.1 EIA Summary

The assessment for marine mammal receptors predicted no significant adverse effects, for project alone or cumulatively. We disagree with these conclusions and highlight our revised assessment predictions where we have been able to do so.

We identify several key issues with the assessment, which are summarised below to provide context to our advice.

#### *B.1.1 Underwater noise modelling (injury and disturbance ranges)*

We highlight that the injury ranges outlined in the EIA Report are significantly smaller than other developments in similar locations and with similar input parameters (pile energy, pile diameter, water depths). Upon review, we believe this to be due to methodological differences in deriving SPL-peak, ultimately reducing the instantaneous peak values. While the approach adopted is not necessarily incorrect, **it is significantly less precautionary** based on our experience of similar developments. While this approach is less precautionary, for instantaneous Permanent Threshold Shift (PTS), we are content that with standard mitigation, **this can be reduced to acceptable, not significant levels.**

Similarly, the disturbance ranges presented by the Applicant are significantly smaller (by an order of magnitude) than other similar development proposal approaches. In addition, there are some inconsistencies in describing which approach has been used for the assessment between the EIA (Chapter 10) (citing Graham et al., 2017) and the Underwater Sound Shared Technical Report (Annex 10.2) (citing Heinis et al., 2022). This means it is unclear which behavioural model has been used for the assessment and has an impact on interpretation of predicted disturbance ranges (and thus number of animals impacted).

As such:

- **Clarification on the underwater noise modelling approach used for predicting disturbance is required.**

#### *B.1.2 Density estimates*

The Applicant has used less precautionary, smaller density estimates for bottlenose dolphin (BND) of the Coastal East Scotland (CES) and Greater North Sea (GNS) Management Units (MUs) as well as for white-beaked dolphin (WBD)

We highlight preferred densities for these species below, which is in line with our principle to use the most up-to-date and precautionary estimate where available. As a result, our advice and subsequent conclusions on significance are based on these higher densities..

### *B.1.3 Dose response – low frequency cetaceans*

We also highlight an issue regarding the use of the dose-response curve (Graham *et al.*, 2017) capped at 140 dB and its suitability for minke whale (and thus humpback as proxy). For low frequency cetaceans, we recommend using the 120dB dose-response approach, due to their high sensitivity to low frequency sound and uncertainties around their behavioural response to underwater noise.

In the absence of iPCoD modelling using the full 120 dB dose-response curve, we have based our appraisal solely on the estimated number of animals within the UK portion of the MU impacted using the full 120 dB dose-response curve for minke whale. However, we require the following as **additional information**:

- **updated iPCoD modelling for minke whale using the full 120 dB dose-response curve.**

### *B.1.4 Coastal East Scotland bottlenose dolphin – disturbance assessment*

The CES bottlenose dolphin MU has not been assessed for the proposal's project alone disturbance as the Proposed Development's modelled SELs contours do not overlap with the MU. While we raise uncertainties with the disturbance modelling, given the distance of Morven South to the MU, we are content that this impact pathway is scoped out for the CES MU for project alone and cumulative/in combination assessment of Moray Firth SAC.

### *B.1.5 Summary of NatureScot assessment*

The assessment for marine mammals concludes no Significant Effects for project alone or cumulatively. However, our advice below highlights issues in the assessment and subsequent implications to Sensitivity and Magnitude scoring. As such we disagree with several outcomes of the assessment.

Instead, we conclude **Significant Effects for injury (cumulative PTS) from piling**:

- **For Morven South alone for minke whale**

And we conclude **Significant Effects for disturbance from piling**:

- **For Morven South alone for bottlenose dolphin of the GNS MU; white-beaked dolphin; and grey seal**
- **Cumulatively for harbour porpoise; bottlenose dolphin of the GNS MU; white-beaked dolphin; and grey seal**

In addition, due to uncertainties with the UWN modelling approach as outlined above in B.1.1 and based on the current capping of the dose response to 140dB, we have **been unable to reach a conclusion on effect significance for disturbance from piling for minke whale**. The following is required as **additional information**:

- **following clarification on UWN approach adopted for disturbance, numbers of animals disturbed should be presented out to 120dB dose response curve from Graham et al 2017, using the UK portion of the MU.**

- iPCoD should be run using this amended number of disturbed animals out to 120dB.

## B.2 RIAA summary

Overall, we agree with the conclusions reached in the EIA Report whereby there is no potential for adverse effect on site integrity for any European sites screened into appraisal from Morven South.

## B.3 Baseline characterisation

We are broadly content with the species carried through to assessment and the sources used in characterising the baseline. However, we provide specific comments regarding density estimates used for certain species in the sections below.

### B.3.1 Common dolphin

Eight common dolphin were reported across the Morven Site Marine Mammal Study Area in June 2022 (Annex 10.3 – Marine Mammal shared Digital Aerial Survey Report, Page 18, Table 3.1), however this species has not been selected for further review in the Species Accounts (Annex 10.1, Pg 41, Section 4). We would expect all species detected in DAS to be assessed either quantitatively or qualitatively if no suitable density outputs are available.

### B.3.2 Bottlenose dolphin

Table 4.2 cites IAMMWG (2023) as a source for the density estimate of 0.010/km<sup>2</sup> for the Coastal East Scotland Management Unit MU. However, we note this paper does not provide density estimates for the MU.

We advise the Applicant to use a population of 226 for the CES MU for bottlenose dolphin. It is accepted that 52.5% of the 226 CES bottlenose dolphins typically frequent coastal areas south of the Moray Firth (Arso Civil et al., 2021). To calculate the density within this region, approximately half of this population (52.5%), 118 animals are divided by the area between Peterhead and the Farne Islands (assuming uniform spread across an area bounded by the 2-20 m depth contour; Quick et al., 2014), to give a density of 0.2 animals km<sup>2</sup>.

As regards the Greater North Sea (GNS) population, we note that a density estimate of 0.005/km<sup>2</sup> (Lacey et al., 2022) has been selected over a more precautionary value of 0.0298 (Hammond et al., 2021).

As a general principle, we advise using the most up-to-date and precautionary estimate where available. This should ideally be between project specific DAS estimates and SCANS IV (modelled surfaces or averages estimates). Where there is no SCANS IV estimate for a species, or it is significantly smaller, then the SCANS III estimate should be used. For species not recorded at all in SCANS, then Waggitt et al. (2019) is acceptable.

For the CES and GNS populations, we have provided advice on the impact assessment in the context of the higher densities that we would expect to see.

### B.3.3 White-beaked dolphin

A density of 0.08/km<sup>2</sup> for white-beaked dolphin has been selected which appears to be based off the most recent SCANS survey effort (Gilles et al., 2023). This is similar to the project site specific DAS model-based figure of 0.088. However, this value is an order of magnitude lower than all

three of the site specific, meteorological season DAS design-based estimates (highest being 0.256) or 0.243 (SCANS III average density).

As above, we advise using the most up-to-date and precautionary estimate where available. This should ideally be between project specific DAS estimates and SCANS IV (modelled surfaces or averages estimates). Where there is no SCANS IV estimate for a species, or it is significantly smaller, then the SCANS III estimate should be used.

We note in Paragraph 4.4.5.1, Annex 10.1 that the Applicant has justified not using the density-based DAS estimates due to their high coefficient of variations (CV) (range: 0.586-1.708) which “suggest there is some uncertainty with the values” and instead apply lower density value from SCANS-IV (Gilles et al., 2023) as the value corresponds with the overall mean absolute abundance from design based analysis of DAS data (Paragraph 4.4.5.11, Annex 10.1). However, we also note in Table 3.10 of Annex 10.3, and Table 4.3 of Annex 10.1 that the CV for this corresponding mean absolute abundance is 4.972 – a CV which is 3 factors larger than the next highest value (1.708) and indicates even greater uncertainty. We therefore advise use of either the most precautionary site-specific DAS design-based estimate (0.256), or the SCANS III design-based estimate (0.243).

Similar to our advice on bottlenose dolphin, we have provided advice on the impact assessment in the context of the higher density we would expect to see for this species.

#### *B.3.4 Other cetacean species*

We note the rationale in relation to a qualitative assessment of humpback whale, and we agree with this approach. While the following doesn't affect the outcome of our advice, we note the following aspects for future reference / consideration.

Reviewed data sources in Table 3.2 (Pg 31, Annex 10.1) categorise orca – killer whale occurrence in the North Sea as ‘occasional’, with distribution predominantly in the northern North Sea. The ORCA database shows records of orca in the general area of the Morven Marine Mammal Study Area as recently as 2025. In the absence of SCANS data, the whole Scottish killer whale ID catalogue could have been used as part of a qualitative assessment for this species (PDF) Scottish Killer Whale Photo Identification Catalogue 2021).

Based on the data sources reviewed in Table 3.2; long-finned pilot whale and Risso's dolphin occurrence in the North Sea are categorised respectively as ‘rare’ and ‘occasional’. While rarer on the east coast of Scotland, both species have been sighted in recent years from Scottish and/or English coastlines within the wider Morven North and Morven South Regional Marine Mammal Study Area (MNMSRMMSA) (HWDT Whale Track, ORCA & Joint Cetacean Data Programme, as of June 2026). In the absence of SCANS data, based on recent sightings of the species in the MNMSRMMSA, both species could have been included qualitatively in this baseline assessment.

We note that a species account for basking shark has been included within Chapter 9: Fish and Shellfish Ecology, and Annex 9.1 – Fish and Shellfish Ecology Shared Technical Report.

We wish to highlight that, should Morven South be granted consent, the post-consent plans (i.e. Piling Strategy and MMMP), should be based on the most up to date information available at that time. For example, we would expect the most precautionary density estimates available across recent SCANS surveys and Carter et al 2026 to be utilised.

### *B.3.5 Pinnipeds*

For both seal species, the reference populations were based on scalars from SCOS (2022 and 2023). We highlight that there are likely more recent figures, for example the new SCOS (2025) report and updated figures for Orkney and North Sea colonies is also available, which we recommend is used for any updated assessments that may be required post-consent. For future assessments of grey seal, we advise using the PBR (Nmin column) from SCOS (2024) for Seal Management Units (SMUs) of relevance.

NatureScot can be approached for the most up to date information sources to be used to inform any post-consent plans.

#### *B.3.5.1 Harbour seal*

Section 4.3.8.2 describes the most recent August harbour seal counts based on surveys carried out in 2021 across both East Scotland and Northeast England MU and also refers to scaled August population estimates of 364 and 124 harbour seals respectively, drawn from Annex 10.4 (Stevens, 2023). More recent estimates drawn from SCOS (2025) from surveys conducted in 2023 note population estimates of 383 and 147 respectively which are largely comparable.

#### *B.3.5.2 Grey seal*

Section 4.7.3.3 describes the most recent August grey seal counts based on surveys carried out in 2021 across both East Scotland and Northeast England MU, and refer to scaled August population estimates of 10,783 and 25,913 grey seals respectively, drawn from Annex 10.4 (Stevens, 2023). These values are accurate as of the 2021 surveys, however since SCOS (2022), further grey seal breeding and August counts, as well as additional tagging activities within both the East Scotland and Northeast England Monitoring Units have been conducted by SMRU and integrated into more recent SCOS advice. Current scaled August counts for these two MUs are **6,298 and 21,396 respectively (SCOS, 2025), which are ~3500 individuals lower in both MUs.**

## **B.4 Assessment approach**

Table 10.26 shows the definitions of Magnitude based on the extent, duration and frequency of an impact. We are content that while there are no thresholds presented, the proportion of the MU is included. Table 10.27 shows the description of each sensitivity assignment which is based on resilience, adaptability and recoverability of a species experiencing an impact as expected, although conservation value has not been included. Table 10.28 shows the matrix used for the significance of effect.

We are content with the use of the NMFS 2024 hearing thresholds presented in Table 10.29 and the swim speeds presented in Table 10.30. While the swim speeds are slightly higher, they are comparable to those recommended by NatureScot.

There are several aspects of the assessment which are not in line with advice provided pre-application, or which are less precautionary than we advised.

### *B.4.1 Maximum Design Scenario*

Table 10.32 sets out the Maximum Design Scenario (MDS) specific to marine mammals. The Applicant has outlined both spatial and temporal worst-case scenarios. The concurrent scenario

results in the spatial worst case, with 48 days of piling using 16 m monopiles. The temporal worst-case results from 5.3 m pin piles installed over 264 days of piling for Morven North.

For UXOs, we note from Table 10.32 and from the UWN report that a maximum charge weight of 554 kg was used. We are content with this approach for this assessment, but we wish to flag that UXOs of 700kg have been documented recently in the North Sea. We are content with what has been modelled as we recognise that post consent, impacts from UXOs would be reassessed based on in situ survey data. Any bespoke mitigation would be developed based on what UXOs are found.

We note from paragraph 10.11.1.2, that the assessment of both auditory injury and disturbance from piling is based on the temporal MDS. We do not disagree with this approach, however the justification provided does not indicate in detail why the temporal MDS would result in a larger impact, especially given it does not use the 16 m diameter piles.

From Table 10.37, we note that the 'best estimate' (R95%) realistic values were taken from the UWN modelling report and used in the assessment of disturbance and cumulative auditory injury. The justification provided for this is that it reduces the potential to overestimate the effect ranges, which we do not agree with- the justification is limited and suggests more of a biased/selective approach to quantifying impacts.

#### *B.4.2 Underwater noise modelling*

The PTS ranges predicted for Morven South are significantly smaller than other developments in similar locations and with similar input parameters (pile energy, pile diameter, water depths). Upon review, we understand this to be due to methodological differences in deriving SPL-peak, ultimately reducing the instantaneous peak values. While the approach adopted is not necessarily incorrect, the results are less precautionary than for other similar developments. While less precautionary, for instantaneous PTS, we are content that through standard mitigation, this can be reduced to acceptable, non-significant levels.

Similarly, the disturbance ranges presented by the Applicant are significantly smaller than other offshore wind proposals we have recently advised on. The Applicant has used the Heinis et al., (2022) dose-response curve, anchored to the 143 dB SELss reaction threshold to derive disturbance ranges, where other proposals have traditionally used Graham et al., 2017 capped at 140dB. While these methodological differences will result in different disturbance footprints, the ranges reported for Morven result in an order of magnitude lower than what we would have anticipated. Furthermore, inconsistencies in describing which approach has been adopted between the EIA Chapter (Graham et al., 2017) and the Underwater Noise (UWN) modelling report (Heinis et al., 2022), further reduce confidence in how disturbance ranges have been determined, and why they are lower than anticipated. As a result, to provide confidence in the assessment, we require:

- **Clarification on the UWN approach adopted for determining disturbance.**

#### *B.4.3 Dose response*

In paragraph 10.8.3.12, the Applicant states that the assessment has applied several disturbance thresholds along with the dose-response approach, "*as supported in the Morven Site Scoping Opinion (MD-LOT, 2023)*". This is misleading as the Applicant has based the assessment on the dose response cut off at 140dB for all cetacean species, which was not an approach presented at

Scoping, and it was advised against in the latest consultation with the Applicant, whereby NatureScot recommended presenting and basing the assessment on the 120dB dose response numbers.

However, we are content with the approaches set out in Table 10.31, and broadly agree with the justifications set out from paragraphs 10.8.3.13 to 10.8.3.18, with the exception of capping the dose response at 140dB SELss for minke and humpback whale for disturbance from piling (see section B.4.3.1 below). We are content with the approach set out to assess disturbance to seal species, using the dose response from Whyte et al 2020 applied to both seal species.

We wish to flag an inconsistency in paragraph 10.11.1.17 where the Applicant explains that the dose response is used to calculate the maximum numbers of animals predicted to experience auditory injury (based on the PK and SEL<sub>24h</sub> metrics). It is our position and understanding that dose response should only be used to calculate the number of animals at risk of disturbance, using the SELss metric. It is not advised to mix different metrics and methods of calculating the number of animals at risk of disturbance and auditory injury.

#### *B.4.3.1 Low frequency cetaceans*

NatureScot has advised recent offshore wind applications for low frequency cetaceans, we recommend using the 120dB dose-response approach for these receptors due to their high sensitivity to low frequency sound and uncertainties around their behavioural response to underwater noise. Therefore, we do not accept the use of a 140 dB capped dose-response for low frequency cetaceans.

In the absence of iPCoD modelling using the 120 dB dose-response curve, we have based our conclusions solely on the estimated number of animals and the UK proportion of the MU impacted using the full 120 dB dose-response curve for minke whale. However, we require the following **additional information**

- **Updated iPCoD modelling for minke whale using the 120 dB dose-response curve.**

#### *B.4.4 iPCoD*

##### *B.4.4.1 Input parameters*

For the worst-case spatial scenario parameters inputted into iPCoD modelling, the appendix states that an average of 1 or 2 piles installed per day were modelled. NatureScot **request clarification how this variable installation schedule was inputted into the modelling to ensure concurrent piling has been adequately assessed.**

As a general point, any species in which a request is made for iPCoD to be re-run should be carried out using the UK portion of the MU population - this then should be the reference MU population inputted into the model.

##### *B.4.4.2 iPCoD for harbour porpoise and minke whale*

We note the whole MU, not the UK portion, has been fed into iPCoD for harbour porpoise and minke whale, (paragraph 10.11.1.15 and Table 10.38). The MUs for harbour porpoise and minke whale also have large spatial scales, so it is unclear why the Applicant has chosen an inconsistent approach of using the UK portion for bottlenose of the GNS, but not for the other two species. As above, **we require iPCoD to be rerun using the UK portion for minke whale (with numbers of**

animals disturbed out to 120dB/the full dose response) as additional information for the Morven South alone, and cumulatively.

## **B.5 Impact assessment**

Table 7 provides a summary of our conclusions for each impact for Morven South alone for those receptors where we are able to provide final advice and our conclusions differ to the Applicant's.

Table 7 EIA Report conclusions and NatureScot conclusions based on our assessment for Morven South alone. Cells are shaded where our conclusions differ and significant conclusions are in bold. Yellow shading indicates provisional conclusions. Receptor codes are as follows: BND – bottlenose dolphin; WBD – white-beaked dolphin; MW – minke whale; GS - grey seal.

| Effect                      | Receptor          | EIA Report assessment conclusions |             |              | NatureScot revised conclusions |                    |                               |
|-----------------------------|-------------------|-----------------------------------|-------------|--------------|--------------------------------|--------------------|-------------------------------|
|                             |                   | Magnitude                         | Sensitivity | Significance | Magnitude                      | Sensitivity        | Significance                  |
| Auditory injury from piling | Minke whale       | Low                               | Medium      | Minor        | Medium                         | High               | <b>Moderate</b> (significant) |
|                             | All other species | Negligible                        | Medium      | Negligible   | Negligible                     | High               | Negligible/Minor              |
| Disturbance from piling     | BND GNS           | Low                               | Low         | Minor        | Medium                         | Medium             | <b>Moderate</b> (significant) |
|                             | WBD               | Medium                            | Low         | Minor        | Medium                         | Medium             | <b>Moderate</b> (significant) |
|                             | MW                | Low                               | Low         | Minor        | Unable to conclude             | Unable to conclude | Unable to conclude            |
|                             | GS                | Low                               | Low         | Minor        | Medium                         | Medium             | <b>Moderate</b> (significant) |

### *B.5.1 Auditory injury from piling*

We confirm that the density estimates used in this assessment shown in Table 10.48, follow our standard advice for all species except bottlenose and white-beaked dolphin, as outlined in Section B.23. However, assuming the full PTSpeak range would be mitigated, and no bottlenose or white-beaked dolphins should experience cumulative PTS, therefore this does not affect our advice for this impact.

The instantaneous auditory injury ranges in Table 10.40 are smaller than expected, as discussed in Section B.4.2, particularly for pile sizes of 16 m diameter. Assuming that there are no issues with the UWN modelling, we note from Table 10.40 that all instantaneous auditory injury ranges from any pile size should be mitigated using standard soft start, ramp up, MMOs, PAM and ADDs.

We disagree with the approach of taking the representative numbers, rather than the most conservative outputs from the UWN modelling report as this could downplay the cumulative auditory injury range when compared to similar developments with similar pile sizes. We recognise that there is a lack of consensus on cumulative auditory injury due to the precaution built into the modelling and the uncertainties around the impulsiveness of noise with distance. Consequently, we do not expect the full ranges to be mitigated, however when assigning the Magnitude as we follow through the assessment, we have considered that the maximum cumulative auditory injury ranges presented in the UWN report from the conservative scenario have not been used as the basis of the assessment.

For both instantaneous and cumulative auditory injury, it would be useful to aid our understanding, if the Applicant could clarify why the auditory injury ranges might be larger for the 3.7m pin pile vs the 5.3m pin pile. We note from Table 10.40 and Table 10.41, that there is an asterisk where it explains that the 5.3 m pin pile captures the other piles the Applicant plan to use for the OSPs which are of 4.5 m and 5 m in diameter, though this is not justified. We advise that any/all piles intended to be used in the proposed development should be modelled in the UWN report and each have their own distinct impact ranges rather than using the 5.3m pin pile as a proxy for a 4.5 m and a 5 m pile, especially to understand why smaller piles might be having larger impact ranges. Regardless, we do not need this modelling to be provided as additional information as we are content to use the 16 m impact ranges as the worst case spatially.

We disagree with the assignment of Sensitivity of Medium, as we consider auditory injury to be a non-recoverable impact, so our advice is based on a Sensitivity of High for both instantaneous and cumulative PTS.

For the assessment of auditory injury from piling, the Applicant has combined instantaneous and cumulative PTS rather than assess them as separate impacts. We advise that as part of further modelling when undertaken post consent, these impacts should be considered and assessed separately. Furthermore, cumulative PTS results are based on UWN model scenario outputs which result in a maximum range of 6,240 m (Table 10.46), when possible injury ranges of up to 10.6 km and 6.49km with ADDs are presented in the UWN report in Table 5.19.

Our assessment considers the more precautionary injury ranges, which exceed cumulative injury thresholds for low frequency cetaceans of 183dB NMFS (2024<sup>39</sup>). As a result, we believe this would fall under a Medium Magnitude of impact for minke whale. Considering our revised Sensitivity score of high, in combination with a revised Magnitude of Medium, this results in a **Moderate Adverse Significant Effect for cumulative PTS for minke whale for Morven South**. We consider this injury range can be reduced through applying standard mitigation and we encourage the consideration of the use of NAS as additional mitigation. Further updated advice can be provided post consent, if required, upon refinement of the project parameters.

According to the UWN modelling outputs, no other species would have the cumulative thresholds exceeded from any of the piling scenarios. Therefore, we agree there is Negligible Magnitude and a non-Significant Effect on all other species for Morven South.

For instantaneous PTS, we agree that ranges for all species should be fully mitigated through the use of standard mitigation (soft start, ramp up, MMO, PAM and ADDs) however we expect this to be revisited, if consented and once the project envelope has been refined to ensure instantaneous auditory injury ranges are fully covered for all species. Overall, for Morven South we agree with the conclusion of **No Significant Effects** for all other species from instantaneous PTS arising from piling.

#### *B.5.2 Disturbance from piling*

##### *B.5.2.1 NatureScot revised approach to disturbance assessment*

As with the SPL peak ranges for the assessment of injury, the disturbance ranges (SELss) are smaller than anticipated when compared to analogous developments. This is thought to be due to the approach adopted in UWN modelling. While the methodological differences between Morven and other developments will result in different disturbance footprints, the ranges reported for Morven are still significantly lower and without a clear understanding for how these have been derived. In addition, as outlined in B.4.2, the description of how disturbance ranges have been derived is inconsistent, with conflicting information presented in the EIA Report versus the UWN modelling report. As previously outlined, we require **clarification on the UWN modelling approach adopted to derive disturbance ranges**. In providing our advice, we have assumed the Applicant has applied the Graham et al., 2017 dose response.

Based on the uncertainty outlined above, and considering the small SELss ranges for the dose response curve, we have adopted a precautionary approach in assessing disturbance impacts by using Effective Deterrence Ranges (EDRs). We have compared our approach alongside the information presented by the Applicant to reach our own view. We do not have the resource to replicate the work undertaken by the specialist consultant teams and while we do not typically advise the use of EDRs for calculating the number of animals disturbed from piling, s, we have created rudimentary numbers of animals potentially disturbed from an EDR.

We have selected an EDR that aligns best with the cut off of the Graham et al 2017 dose response, where the probability of disturbance is not considered significant beyond this distance. This is also

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<sup>39</sup> National Marine Fisheries Service. 2024. Update to: Technical Guidance for Assessing the Effects of Anthropogenic Sound on Marine Mammal Hearing (Version 3.0): Underwater and InAir Criteria for Onset of Auditory Injury and Temporary Threshold Shifts. U.S. Dept. of Commer., NOAA. NOAA Technical Memorandum NMFS-OPR-71, 182 p.

the distance that typically aligns with the 140dB contour in SELss maps in recent applications, where we have agreed with the use of the 140dB cut off approach for all cetaceans except minke whale. We also recognise that using an EDR at a distance around the 140dB contour would be more precautionary than capping the dose response at 140dB. Our advice is therefore based on the reasonably proportionate assumption that the number of animals potentially disturbed lies between these calculated numbers and the numbers presented by the Applicant. We present our revised conclusions for each species based on this approach below.

#### *B.5.2.2 Harbour porpoise*

We are content that the correct density estimate has been applied and we agree with the Medium Sensitivity assigned. Recognising our revised assessment considers the number of harbour porpoise disturbed lies between the proportion of the population presented in the Morven South EIA, and the proportion from a precautionary EDR we have undertaken, we agree with a Magnitude of low, resulting in a Minor Adverse **Not Significant Effect** overall.

#### *B.5.2.3 Bottlenose dolphin – GNS*

For the GNS MU, the most appropriate / precautionary density estimate has not been applied for this assessment (0.005 animals/km<sup>2</sup> vs SCANS III estimate of 0.0298 animals/km<sup>2</sup>). This means that in addition to the uncertainties surrounding the shorter UWN modelling SELss ranges, the number of animals disturbed from the GNS MU is likely to be underestimated. We also disagree with the assignment of Low Sensitivity of bottlenose dolphin to disturbance from piling and our advice is based on a Sensitivity of Medium.

As a result, we provide our own assessment, considering 60km EDR to derive numbers of animals likely to be disturbance and a revised Sensitivity of Medium rather than Low. Considering our revised EDR numbers and those presented by the Applicant, we base our advice on the assignment of Medium Magnitude not Low as assigned by the Applicant, which combined with Medium Sensitivity would result in a **Moderate Adverse Significant Effect** overall.

#### *B.5.2.4 White-beaked dolphin*

As outlined in B.3.3, we consider there is insufficient precaution associated with the density estimate selected. A more precautionary and higher density estimate of 0.256<sup>2</sup> (design based) or 0.243/km<sup>2</sup> (SCANS III) should be used. Considering the revised density estimate, we consider disturbance a Medium Magnitude impact to white-beaked dolphin. We advise that white-beaked dolphin have a Medium Sensitivity to disturbance, rather than low. As a result, we consider there will be a **Moderate Adverse Significant Effect** for Morven South.

#### *B.5.2.5 Minke and humpback whale*

We disagree with the approach presented for minke and humpback whale as outlined in Section B.4.3.1. Therefore, **we are currently unable to conclude significance of effect** on the basis of uncertainty in why disturbance ranges are lower than anticipated, and given the Applicant has capped dose response at 140dB. Furthermore, an EDR approach is not appropriate for low frequency cetaceans, so we have been unable to present our own precautionary assessment.

As a result, we require the following **additional information**:

- following clarification on UWN approach adopted for disturbance, numbers of animals disturbed to be presented out to 120dB dose response from Graham et al 2019 using UK portion of the MU.
- iPCoD should be run using amended number of disturbed animals.

#### *B.5.2.6 Grey seal*

We note that up to 582 grey seal are at risk of disturbance from the 16 m monopile MDS. As per Section B.3.5.2, we have based our appraisal using the most up to date SCOS 2025 population estimates, (rather than SCOS 2022 as used by the Applicant). Using the latest population estimates, the proportion of grey seals at risk of disturbance of the combined SMUs would be 2.1%.

Given the uncertainties in UWN modelling as outlined in Section B.4.2, we assess the potential proportion of this combined population disturbance using EDRs, where we conclude a Medium Magnitude of impact. Combined with Medium Sensitivity, this results in a **Significant Effect** on grey seal for Morven South.

#### *B.5.2.7 Harbour seal*

We agree with the density used for assessment and while the combined SMU population is smaller than the most recent population counts, it makes no material difference to our advice. We agree with the assignment of Low Magnitude and with Medium Sensitivity, and we are content that this would not result in a Significant Effect overall for Morven South.

#### *B.5.3 UXO injury*

In paragraph 10.11.2.10 we note that the maximum UXO size is assumed to be 554kg NEQ and while we are content this does not need to be provided as additional information, we wish to highlight UXO sizes of up to 700kg have been found in the North Sea (Ocean Winds 2024). We welcome the commitment to using low order deflagration in addition to presenting the high order scenario as a last resort.

From Table 10.51, we are content that all ranges presented for SPL<sub>peak</sub> can be mitigated with standard JNCC mitigation and ADD use. We also appreciate if consented, this will be revisited depending on what UXOs are identified in order to create a bespoke mitigation plan.

We agree with the Sensitivity assigned to all marine mammals of High and overall Magnitude of Negligible assuming that low order deflagration will be successful. Overall, we agree with the Applicant's conclusion of Minor Adverse **Not Significant Effect** for all species for Morven South.

#### *B.5.4 UXO disturbance*

We are content with the use of TTS as a proxy for disturbance for the assessment of UXOs and we note both SPL and SEL are presented as a comparison. We agree with the assignment of Magnitude and Sensitivity of Low for all species in the EIA Report due to the very short term duration of any potential disturbance from UXO clearance, resulting in a Minor Adverse **Not Significant Effect** for Morven South.

#### *B.5.5 All other impact pathways*

For all other impact pathways, we agree with the conclusions in the EIA Report that there will not be any Significant Effects for any species from Morven South.

## B.6 Cumulative assessment

### B.6.1 Summary

**Overall, we conclude disturbance from piling to have significant cumulative effects for all species assessed, with the exception of harbour seal and the CES population of bottlenose dolphin for Morven South.** If consented, and following refinement of the design envelopment, we advise the Applicant to collaborate with other developments to avoid overlapping of piling campaigns as far as possible. We encourage development collaboration with the focus of reducing impacts as far as possible while developing mitigation such as noise abatement systems and phased development across all developments due to construct at the same time. We welcome and encourage liaising with MD-LOT and other stakeholders to identify evidence gaps and contribute to initiatives such as ScotMER as outlined in paragraph 10.13.1.1.

We provide specific comments on the cumulative **Scenario 4** (i.e., Morven South + other plans and projects screened in) for impact pathways below.

### B.6.2 Disturbance from piling

Table 10.88 presents the summary of CEA conclusions, and we note that the EIA Report states that given the uncertainty in the degree of temporal and spatial overlap of piling, summing the disturbance values across the developments would give an overestimate and was therefore not done. While we agree that this is a simplistic approach, it is our view that it should still be considered in the cumulative assessment - in order to understand the maximum proportion, and guide the potential impact Magnitude that populations of marine mammals may be at risk of experiencing.

We note that the Sensitivity of the receptors is assigned as Medium for harbour porpoise but Low for all other receptors. We base our advice on the assignment of Medium Sensitivity to all cetaceans in line with our advice on the proposed development alone.

Our standard advice is to scope in all projects piling at the same time within each assessed species MU. However, we are content that the approach of screening in projects within the Morven Regional Marine Mammal Study Area (whole of the North Sea) where construction phases overlap up to a year on either side of development is proportionate for the purpose of this CEA.

We agree with the use of EDRs where project specific numbers of animals potentially disturbed are not available for cumulative assessment. However, we note an EDR of 20 km has been applied, referring to JNCC 2025 guidance which is specifically for assessing the significance of noise disturbance for harbour porpoise in relation to SACs in England, Wales & Northern Ireland. NatureScot have not agreed that an EDR of 20km should be applied for piling on Scottish projects alone or cumulatively and **we advise the use of the 26km EDR in the absence of project specific disturbance numbers**, especially as the Applicant intends to install 16 m diameter piles. Overall, we are content that this does not make a material difference to the overall Magnitude assignment but deem it important to highlight for future cumulative assessments.

In paragraph 10.12.3.11, SCANS III density estimates have been used for bottlenose dolphin, which for the GNS MU would be 0.0298, and we are content with this approach. As noted earlier the lower density estimate of (0.005) for the EIA for Morven South was selected highlighting an inconsistency between densities used for project alone and cumulative assessments.

### *B.6.2.1 Harbour porpoise*

In Table 10.81, we note the maximum number of harbour porpoise disturbed from Morven South is presented as 846 individuals, based on a temporal scenario rather than a spatial worst case of 1,739. It is unclear why the temporal worst case has been adopted over a spatial worst case. We have based our advice with the assumption that the impact Magnitude lies somewhere between the most precautionary EDR and with what has been presented in the EIA Report.

Considering the revised proportion of the UK MU potentially impacted from piling using EDRs, we assign a Magnitude of Medium to high. With a Sensitivity of Medium applied to all species, this results in a **Moderate Adverse Significant Effect** Morven South.

### *B.6.2.2 Bottlenose dolphin – GNS*

We disagree that the GNS and CES should be assessed as a combined population when determining the Magnitude of an impact or when looking at long term population trends with iPCoD. As they are distinct ecotypes that have distinct density estimates and populations associated with them, we advise they are assessed separately.

We conclude a Magnitude of Medium-High which combined with a Sensitivity of Medium, results in an overall significance of a **Moderate Adverse Significant Effect** for Morven South.

### *B.6.2.3 White-beaked dolphin*

In paragraph 10.12.3.32, the EIA Report states that impacts could result in temporary changes to behavioural and/or distribution of individuals but not at a scale that could result in adverse effects to the long-term population trajectory. As iPCoD is currently not available for modelling long term impacts for white-beaked dolphin, this rationale has not been fully justified.

We conclude a Magnitude of Medium-High which combined with a Sensitivity of Medium, results in a **Moderate Adverse Significant Effect** for Morven South.

### *B.6.2.4 Minke whale*

The EIA Report does not present the full dose response numbers for minke whale and both NatureScot and MD-SEDD disagree with the use of distance-based or 140dB cut off approaches for low frequency cetaceans, **we are unable to fully advise on the quantitative analysis presented for Morven South alone or cumulatively.**

As with Morven South alone, and in addition to clarification around the UWN modelling and the resulting shorter than expected SELss ranges, we require the Applicant to provide the number of minke whale potentially disturbed from the worst-case piling scenario using the full 120dB dose response. We also require these numbers to be run through iPCoD using the UK portion of the IAMMWG minke whale population as additional information.

Despite, the absence of this information, we provisionally advise that the proposed development will contribute to a significant cumulative impact on minke whale, given all other projects scoped in would result in Medium Magnitude, as minimum. This combined with Medium Sensitivity results in a Significant Effect overall for Morven South. The EIA Report identifies has stated that humpback whale will be assessed as a proxy of minke whale for Morven South alone, this should be consistent with the cumulative assessment, hence the conclusion is the same.

#### *B.6.2.5 Grey seal*

Based on the large disturbance numbers from projects screened into the cumulative assessment and considering the potential number of seals disturbed as a result of Morven South from EDR calculations, we conclude a Magnitude of high. This combined with Medium Sensitivity results in a **Moderate Adverse Significant Effect** on grey seal cumulatively for Morven South.

#### *B.6.2.6 Harbour seal*

We agree with the assignment of Low Sensitivity and Low Magnitude for cumulative disturbance from piling. Overall, this is a minor adverse impact and is not significant in EIA terms for Morven South.

#### *B.6.3 Disturbance from vessels*

For screening in projects as with disturbance from piling, we advise that all projects within each species MU (or combined MUs) assessed are included. For disturbance from vessels, the Applicant has focused on projects within an 86km buffer around Morven South. This has resulted in less projects being included than for disturbance from piling and the 86km range appears an arbitrary distance as it isn't made clear why this distance has been chosen. However, we are content that it is suitably precautionary for the purpose of this CEA as it would make no material difference to the overall cumulative Magnitude and therefore significance if the same number of projects were included as for disturbance from piling.

Assuming a Low-Medium Sensitivity for all species, combined with Low Magnitude results in a Minor Adverse **Not Significant Effect** on all species for Morven South cumulatively.

### **B.7 Mitigation and monitoring**

Table 10.33 sets out the designed in mitigation measures which all appear standard at this stage of the development. If consented, we expect further development on mitigation within the Piling Strategy, once the design envelope has been refined, exploring additional mitigation such as NAS, adjustment of ADD use and strategic collaboration, if necessary.

We welcome the Applicant providing the MMMP and we advise that generally, all mitigation measures should be consulted further with NatureScot, if consented and once the UWN modelling aspects are better understood and Morven South envelope has been refined.

We are content with the level of detail provided and wish to highlight that the mitigation measures outlined in this report for geophysical, UXO and piling are all standard proposals and relevant to reducing or removing the impact of auditory injury. However as highlighted in our advice for the EIA and CEA, once confirmation of agreement is reached on the UWN modelling then mitigation should be revisited to ensure instantaneous injury ranges are fully covered, potentially through the use of noise abatement systems in addition to standard JNCC mitigation for piling activities.

Additionally, we advise adherence to the Scottish Marine Wildlife Watching Code should be included as best practice. Should the use of uncrewed vessels be considered at any stage of the Proposed Development, bespoke mitigation should be discussed through consultation with NatureScot, to ensure JNCC guidance can be adhered to, particularly in relation to geotechnical and geophysical surveys.

The EIA Report highlights that site specific monitoring is not proposed as the assessment concluded that Morven South did not give rise to significant effect for marine mammals either alone or cumulatively. We disagree with this and we expect the Applicant to contribute to strategic UWN monitoring especially as we consider there are Significant Effects Morven South alone and cumulatively, based on current information.

We advise that monitoring to validate the EIA Report predictions and better understand the likelihood of these impacts of disturbance from piling may be required. Site-specific noise monitoring during construction should be undertaken to validate the assessments in the EIA and we recommend that the NPL Good Practice Guide (2014)<sup>40</sup> is followed.

As above, if consented, we welcome the commitment from the Applicant to contribute to post-consent strategic monitoring of the Southern Trench Nature Conservation Marine Protected Area (NCMPA) to validate the assessment conclusions.

## **B.8 MPA Assessment**

### *B.8.1 Southern Trench NCMPA*

The Southern Trench NCMPA is approximately 57 km from Morven South at the closest point.

During scoping NatureScot agreed that minke whale as part of the Southern Trench NCMPA could be screened out of assessment (dated 25th May 2023).

Project specific underwater noise modelling indicates that impact piling will not produce noise levels that cause disturbance within the boundary of the site. However, the criteria used within the assessment is based on the extent of underwater sound contours associated with sound pressure levels above 140dB re 1µPa RMS, with a maximum range of 41.8 km for piling of a 16 m diameter monopile.

As outlined above, we have queries on the UWN impact ranges and based on our recent experience of assessing similar projects (i.e. Ossian and Bowdun), we conclude that there is potential for the proposed activities to be capable of affecting the minke whale qualifying species of the Southern trench NCMPA. As such we request that the Applicant considers contributing to post-consent strategic monitoring of the Southern Trench NCMPA to validate the assessment conclusions, if consented. However, we do not consider there is a significant risk of hindering the achievement of the conservation objectives, and therefore no further assessment is required.

A cumulative assessment has not been carried out regarding disturbance to individuals from piling events. Based on our experience with similar developments and the reasons outlined above, we are content that the disturbance from pile driving will not hinder the achievement of the site Conservation Objectives when considered cumulatively.

## **B.9 RIAA**

### *B.9.1 Berwickshire and North Northumberland Coast SAC and The Isle of May SAC*

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<sup>40</sup> Robinson, S.P., Lepper, P. A. and Hazelwood, R.A. (2014) Good Practice Guide for Underwater Noise Measurement, National Measurement Office, Marine Scotland, The Crown Estate, NPL Good Practice Guide No. 133, ISSN: 1368-6550.

The Berwickshire and North Northumberland Coast SAC, at its closest point, is located 97.5 km from Morven South. As this site lies within English waters, comments should be sought from Natural England as the relevant nature conservation body.

The Isle of May SAC, at its closest point, is located 108.6 km from Morven South.

In Scotland, the Conservation Objectives for the grey seal qualifying species relate to the protection of the breeding colony. During the breeding season, grey seals do not generally travel further than 20 km and we therefore use this distance as a connectivity buffer. Outside the breeding season the number of grey seals present at a protected site can dramatically decrease. There is evidence to show that grey seals do not forage close to the SAC outside the breeding season and instead can travel to different management units when foraging.

Grey seal telemetry data is presented in Annex 10.4 Seal Telemetry and Haul-out Data Study. We note that there is evidence of grey seal travelling through the Array area, however in our previous advice (dated 3rd July 2023) to the LSE Stage 1 Screening Report our position is that grey seal SACs are scoped out of assessment as there is no evidence of hotspots or regular foraging areas within the Morven South boundary.

#### *B.9.2 Firth of Tay and Eden Estuary SAC*

The Firth of Tay and Eden Estuary SAC, at its closest point, is located 109.3 km from Morven South.

Harbour seal telemetry data is also presented in Annex 10.4 Seal Telemetry and Haul-out Data Study. For harbour seals, we advise screening sites in for assessment if the project site/impact radius is within 50 km of the SAC. Harbour seals show greater site fidelity throughout the year, and unlike grey seals, there is no seasonal difference. We would consider ranges further than this if there is tagging information to suggest SAC animals were regularly using the project site area. We acknowledge the use of telemetry data and while this could provide evidence of harbour seal travelling through the proposed array site, we are content for harbour seal SACs to be scoped out if there is no evidence of hotspots or regular foraging areas within the project boundary.

Considering the smaller than expected UWN noise modelled impact ranges and taking a precautionary approach of a 60 km EDR, individuals from this SAC have the potential to be impacted from piling driving activities.

However, we agree with the conclusions reached whereby there is no potential for adverse effect on site integrity from Morven South.

#### *B.9.3 Moray Firth SAC*

The Moray Firth SAC, at its closest point, is located 181.2 km from Morven North and 215.8 km from Morven South. The CES MU, at its estimated closest point, is located 60 km from Morven South.

The spatial and temporal MDS show no potential for underwater sound generated by either scenario to affected bottlenose dolphins either within the Moray Firth SAC or the CES MU boundary. Therefore, the Moray Firth SAC was not taken forward to the in-combination assessment.

We agree with the conclusions reached whereby there is **no potential for Adverse Effect on Site Integrity from Morven South**.

## NATURESCOT ADVICE ON MORVEN SOUTH OFFSHORE WIND FARM

### Appendix C Fish and Shellfish Ecology

Fish and Shellfish Ecology is considered in Chapter 9 (Volume 3) of the Morven North EIA Report, and the following appendices:

- Fish and Shellfish Ecology Shared Technical Report, Volume 4, Annex 9.1
- Underwater Sound Shared Technical Report, Volume 3, Annex 10.2
- Report to Inform Appropriate Assessment

The assessment for fish and shellfish ecology concludes **No Significant Effects**, both Morven South alone and cumulatively. While we broadly support most of these conclusions, we provide comments on aspects where there remains uncertainty and suggest potential measures to reduce impacts.

#### C.1 Study area

Two study areas are defined for Morven South which we accept.

The Morven South Fish and Shellfish Ecology study area includes the Morven South boundary plus a 5-14 km buffer, reflecting the area covered by the site-specific benthic survey.

The Regional Fish and Shellfish Ecology study area is defined by a 100 km buffer zone around the Morven South and North Boundary. This buffer zone encompasses wider direct and indirect impacts, including those from underwater noise.

#### C.2 Baseline characterisation

##### C.2.1 Methods

A combination of a desktop study and site-specific surveys have been used to characterise the baseline. Site-specific surveys include grab sampling, drop down video and eDNA sampling (Environmental Baseline Survey and Habitat Assessment) and monthly Digital Aerial Surveys (DAS) as part of the Ornithology and Marine Megafauna DAS. No site-specific surveys were undertaken specifically to characterise fish and shellfish ecology receptors, however benthic survey data has been used to characterise sandeel and herring habitat suitability. The desk-top resources are summarised in Table 9.9, and we are content with the data sources used and agree that they provide a helpful baseline. All relevant species have been included.

##### C.2.2 Spawning and nursery grounds

###### C.2.2.1 Herring

Site specific particle size analysis (PSA) and DNA metabarcoding data from benthic surveys have been used to supplement desk-based information. PSA sampling indicated that all 100 samples from the Morven South study area were classified as 'unsuitable' for herring spawning. Alongside this, EMODnet seabed substrate data indicates that the Morven South study area overlaps areas of 'marginal' herring spawning habitat. eDNA detected the presence of herring in 3 out of 29 samples. Overall, the site-specific survey information for the Morven South study area indicates that habitat suitability is low for herring. It would have been beneficial for the Gardline (2023) *Morven Offshore Wind Farm Integrated Survey, Environmental Baseline Survey Report*, to have

been shared with NatureScot to allow us to determine both the time of year eDNA samples were taken, as well as which of the eDNA samples detected herring.

Desk-based information indicates that both the Morven South boundary and regional study area overlap with low intensity nursery grounds (Ellis *et al.*, 2012). The regional study area overlaps with undetermined intensity spawning ground (Coull *et al.*, 1998). The Morven South boundary is in close proximity to a high intensity nursery ground (Ellis *et al.*, 2012), which also overlaps with the Morven North boundary, and is within the Morven regional study area (Figure 4.2 of the Fish and Shellfish Shared Technical Report). Additionally, International Herring Larvae Surveys (IHLS) datasets (Figures 4.7 – 4.9) indicate fluctuating numbers of herring larvae within the Morven South boundary and regional study area.

Based on the above, and in the absence of reviewing the Gardline (2023) baseline report, we are cognisant that both eDNA data and desk-based data support the presence of herring within the Morven South boundary and regional study area and as a result we have considered this in our impact assessment advice.

#### *C.2.2.2 Sandeel*

PSA indicated that samples were of predominantly ‘marginal’ sandeel habitat suitability, with one showing preferred spawning suitability. EMODnet data was used to supplement site-specific PSA data and indicated ‘preferred’ sandeel habitat across the Morven South study area. Additionally, eDNA samples detected the presence of sandeel within 30 seawater and sediment samples, however there is no information on the number of eDNA samples taken overall. As above, the provision of the Gardline (2023) baseline report would have aided our understanding of site-specific surveys and the relevant results for Fish and Shellfish Ecology.

Figure 4.3 of the Fish and Shellfish Shared Technical Report shows that the Morven South boundary and regional study area overlap entirely with a low intensity sandeel nursery ground (Ellis *et al.*, 2012), and a further overlap of 3 undetermined intensity nursery grounds within the RSA (Coull *et al.*, 1998).

Based on the site-specific data and desk-based information, we consider sandeel are likely to be present within the Morven South array area boundary and regional study area.

### **C.3 Assessment approach**

The impacts scoped into the Fish and Shellfish Ecology assessment are in line with our scoping advice and are appropriate. The approach to assessing fish and shellfish effects follows the methodology set out in Volume 1, Chapter 6: EIA Methodology, as well as consideration of the legislative frameworks set out in Section 9.3. The Applicant has followed CIEEM guidelines (2024) to identify Important Ecological Features (IEFs), with Table 9.14 setting out the criteria used to define the value of IEFs and assign a nature conservation value which we are pleased to see. IEF value is used when considering the overall value and Sensitivity of a receptor in determining significant effects as per standard EIA methodology.

### **C.4 Impact assessment**

#### *C.4.1 Temporary habitat loss*

Both sandeel and herring have life stages that are substrate dependent. For sandeel, this substrate specificity is year-round, whilst for herring it is restricted to the spawning period. Sandeels

demonstrate high substrate specificity and heavily rely on specific substrates for predator avoidance, spawning and winter hibernation, whilst herring require specific benthic substrates for spawning.

The Maximum Design Scenario (MDS) anticipates a maximum total temporary habitat loss of 62,596,300m<sup>2</sup> during construction, representing 4.38% of the Morven South Study Area, and 0.12% of the Regional Study Area. This estimate considers sandwave clearance, cable installation, jack-up events, anchor placements, cable removal and UXO clearance.

PSA and eDNA samples from site-specific surveys demonstrate that sandeel utilise the Morven South Boundary and Regional Study Area, further supported by sandeel spawning habitat suitability data (Figure 4.3, 4.13 and 4.14 of the Technical Assessment).

With regards to herring, there remains uncertainty regarding the utilisation of the Morven South study area by herring. Additionally, herring are only dependent on specific substrates during the spawning period, which in the North Sea is August and October. As previously outlined, it would have been helpful to understand when eDNA samples were taken to determine whether the low detection of herring was linked to seasonality, and also which samples detected herring to understand spatially where herring were present. Additionally, there is no information around when turbines are anticipated to be installed.

Considering the substrate dependent life history of herring, we disagree with the assigning of Low Sensitivity to temporary habitat loss, especially should this occur during sensitive periods, and suggest this should be Medium.

Despite our revised Sensitivity score, we remain satisfied with the conclusion of **Not Significant** in EIA terms for all IEFs with respect to temporary habitat loss.

#### *C.4.2 Underwater sound impacting fish and shellfish receptors*

The underwater noise (UWN) assessment for Morven South focuses on the construction and decommissioning phases only and concludes a Minor Adverse significance of effect for all IEFs, which is **Not Significant** in EIA terms. Overall, we agree with the conclusion for all IEFs but provide further comments noting uncertainty.

##### *C.4.2.1 Group 1 fish*

Group 1 (Popper et al., 2014) fish are species which remain close to the seabed, and include elasmobranchs, flatfish and lampreys, as well as sandeel. Species in Group 1 are sensitive to particle motion rather than sound pressures and show sensitivities to a narrower band of frequencies. We are content with the conclusion of **Not Significant** for all species within this category and accept that most IEFs can flee localised underwater noise.

However, due to the substrate specificity of sandeel, we highlight impacts are likely to be greater, especially if sandeel are buried during piling activities. Table 9.25 details the mortality range (2.92 km) and recoverable injury (4.11 km) for Group 1 species (sandeel) for concurrent 16 m monopile installation (MDS). For behavioural effects (measured as TTS) this has been allocated a range of 37.1 km for all fish groups. Figures 9.7 and 9.8 show that the 160 SPL contour band (dB re 1 re 1µPa<sup>2</sup>) for the single piling scenarios overlaps entirely with the low intensity sandeel spawning ground (Ellis et al., 2012) and partially overlaps with the high intensity spawning ground to the west. For the concurrent piling scenario, there is a larger overlap with the high intensity spawning

ground. Section 9.11.3.41 states that the maximum range of the 160dB dB re 1 re 1 $\mu$ Pa<sup>2</sup> is approximately 22 km and argues that there is sufficient availability of sandeel spawning habitat outwith this impact range, and as such the Sensitivity of sandeel is considered to be Low. Whilst we agree that adult sandeel could flee, it is unclear if piling operations will interact with the sensitive burrowed period of sandeel between September and February.

While there remains uncertainty regarding potential impacts to buried sandeel, we are able to accept a conclusion of **Not Significant**. However, we consider as part of the Piling Strategy consideration should be given to potential impacts to buried sandeel and possible mitigation measures where practicable. This could relate to timing of works, adjustment / refinement of piling parameters and installation scenarios (e.g., sequential vs concurrent), and the use of alternative foundations / installation techniques as Morven South progresses through detailed design if consented.

#### C.4.2.2 Particle motion

Particle motion has been identified as a key evidence gap by ScotMER and as such we request that:

- **Morven South, if consented, explores opportunities to contribute to emerging research in this field.**

#### C.4.2.3 Group 3 fish

Group 3 species are fish that possess swim bladders and are sensitive to both particle motion and sound pressure (Popper et al., 2014). IEFs in this hearing group represent the most sensitive species to UWN. Our advice focusses on potential concurrent piling within the Morven South boundary, and the lack of understanding in terms of potential impacts to spawning herring. Table 9.25 shows the mortality range (9.29 km), recoverable injury range (14 km) for herring, and TTS range for all fish groups (37.1 km) using cumulative Sound Exposure Levels (SEL dB re 1 $\mu$ Pa<sup>2</sup>).

Figure 9.10 shows the overlap of sound contours for single and concurrent piling of monopiles and pin piles with herring spawning grounds. In all piling scenarios, the low intensity herring spawning grounds overlap with the entire profile of underwater noise / contour bands (160 – 210 SPL dB re 1 $\mu$ Pa<sup>2</sup>) and partially with the high intensity nursery ground (Ellis *et al.*, 2012). For the concurrent piling scenarios, the overlap with the high intensity nursery ground (Ellis *et al.*, 2012) is larger, with the monopile scenario predicting the largest range. Section 9.11.3.43 states that the MDS scenario for piling (concurrent 16 m monopiles) will result in a sound contour of 21 km at 160 SPL dB re 1 $\mu$ Pa<sup>2</sup>, and that this will not overlap with the herring spawning 'hotspot' identified by IHLS data, and as such there is no potential for behavioural disturbance within key areas of high intensity herring spawning. Whilst it is true that the modelled sound contours do not overlap with the IHLS 'hotspot', we do not agree that this equates to no potential for behavioural disturbance to herring, when Figure 9.10 demonstrates an interaction with modelled spawning and nursery grounds.

If piling activities overlap with the sensitive herring spawning season (August – October) then the impacts to herring, and their eggs and larvae will likely be greater.

As per sandeel, we consider there remains uncertainty regarding potential impacts to herring for mortality and injury assessment. While we are able to accept a conclusion of **Not Significant**, we consider as part of the Piling Strategy, consideration should be given to potential impacts to spawning herring and possible mitigation measures where practicable. This could relate to timing

of works, adjustment / refinement of piling parameters and installation scenarios (e.g. sequential), and the use of alternative foundations / installation techniques as Morven South progresses through detailed design if consented.

#### *C.4.3 Increased suspended sediment concentrations (SSC) and associated deposition*

For all phases, overall, the significance of effect for all IEFs is considered to be Minor Adverse, which is **Not Significant** in EIA terms. We agree with this conclusion for the Operations and Maintenance (O&M) and decommissioning phases but provide additional advice below for herring and sandeel during the construction phase.

##### *C.4.3.1 Sandeel*

Sandeel are dependent on substrate year-round, and as such the suspension of 11,259,679 m<sup>3</sup> of sediment from foundation preparation and 9,849,600m<sup>3</sup> from cabling preparation as a result of sandwave clearance is likely to impact sandeel at all life stages (eggs, larvae, juvenile and adult). However, we are content that impacts will result in a minor loss or, or alteration to the sandeel feature and therefore be of Low Magnitude. Therefore, considering the Medium Sensitivity of the feature we agree that impacts will be **Not Significant** in EIA terms.

##### *C.4.3.2 Herring*

Herring are seasonally dependent on substrate, with the spawning season (August – October) representing the most important period for herring and their eggs/larvae. Table 9.19 details that sandwave clearance activities will be undertaken across a fifteen-month window throughout the five-year construction period. If sandwave clearance occurs prior to or overlaps with this herring spawning season, then there is an increased risk to herring eggs and larvae.

Section 9.11.4.11 states that there is no 'pathway of potential impact due to no overlap with the Zone of Influence (Zoi) (the Morven South boundary) for increased SSC, for herring. We disagree with this statement and highlight desk-based sources such as IHLS and Coull et al., 1998 and Ellis et al., 2012, spawning and nursery grounds (Figure 4.2) show that the Morven South boundary and regional study area overlaps with low intensity spawning grounds

However, whilst we disagree that there is no pathway for impact, overall, we are content that the likely impacts to herring will be **Not Significant** in EIA terms.

#### *C.4.4 Long term habitat loss*

For all phases, the significance of effect for all IEFs is considered to be Minor Adverse, which is **Not Significant** in EIA terms. We agree with this conclusion for all phases of the development. However, we provide advice below for decommissioning.

We note that the Applicant intends to leave up to 1,649,807 m<sup>2</sup> of the overall 1,820,664 m<sup>2</sup> of assessed infrastructure in-situ after decommissioning. This represents a significant proportion (approximately 91%) of the overall MDS assessed long term habitat loss. As per Scottish Government policy<sup>41</sup>, it is expected that developments will fully remove all infrastructure upon decommissioning. Whilst we understand that the removal of infrastructure could introduce

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<sup>41</sup> <https://www.gov.scot/publications/offshore-renewable-energy-decommissioning-guidance-scottish-waters/pages/12/>

additional environmental pressures on Fish and Shellfish receptors, we note that the EIA should at this stage, base the assessment on full removal of all infrastructure.

#### *C.4.5 Electromagnetic fields*

For O&M, a Minor Adverse **Not Significant** effect has been concluded for all IEFs for this impact. No project specific modelling has been carried out for Morven South, and therefore a high level, qualitative assessment has been provided in Section 9.11.7 utilising research publications. Our collective understanding of EMF effects remains poor, particularly in relation to in-field measurements of EMF and potential impacts of sensitive receptors, such as elasmobranchs including basking sharks. ScotMER currently have a research contract on this subject matter, due to report later this year. We advise that the outputs of this work should be considered in the final project design.

### **C.5 Cumulative assessment**

Overall, a conclusion of **Not Significant** has been reached for all impact pathways. We are mostly in agreement with this conclusion but provide further detail below on areas which require further consideration.

Table 9.32 of the Fish and Shellfish Ecology Chapter sets out the scenarios considered in the Morven South Whole Project and cumulative effects assessment (CEA).

#### *C.5.1 Temporary habitat loss and disturbance*

Table 9.34 of the Fish and Shellfish Chapter details the plans and projects considered as part of the 3 MDS scenarios for each potential cumulative effect. For temporary habitat loss and disturbance, we are content with the list of Tier 1, 2 and 3 projects included within the CEA.

##### *C.5.1.1 Scenarios 1 and 2 (Whole Project)*

Table 9.35 of the Fish and Shellfish Chapter assesses the Sensitivity of the receptor and Magnitude of impact for each relevant Scenario at each phase of Morven South. For Scenarios 1 and 2, the Applicant has not been able to provide any estimated amounts for the temporary habitat loss and disturbance attributed by the Morven Hawthorn Pit Grid Connection (MHPGC) or Morven Branxton Grid Connection (MBAGC).

While it is understood that these connections are at an earlier stage of development and thus do not have the requisite design information to develop a MDS, we would have expected to see a greater level of consideration of cumulative impacts, with provision of a qualitative assessment.

As a result, the subsequent Marine Licence applications for these cable connections will need to fully address cumulative impacts, based on an understanding of MDS for each respective cable route.

##### *C.5.1.2 Scenario 4 (CEA)*

Tables 9.36 – 9.38 detail the cumulative footprint for this effect at the construction (252,200,748 m<sup>2</sup>) O&M (74,631,100 m<sup>2</sup>) and decommissioning phase (165,094,900 m<sup>2</sup>) of Morven South. We are content with significance conclusions for both the O&M and decommissioning phase, and in line with our advice for Scenarios 1 and 2, and the Morven South project alone assessment, we agree with the conclusions reached cumulatively.

### *C.5.2 Underwater sound impact fish and shellfish receptors*

We are content with the projects included within Tier 1, 2 and 3 of Scenario 4 in Table 9.34 for this impact, and note the extended, precautionary buffer of 100 km. Only construction has been assessed for this impact, which we agree is appropriate.

#### *C.5.2.1 Scenarios 1 and 2 (Whole Project)*

Whilst no information is available for the anticipated UWN impacts for the MHPGC and MBAGC projects respectively, it is likely that UXO clearance is the only significant noise producing impact for both cable routes. Without knowing the anticipated number of UXOs to be detonated along each cable route, it is difficult to reach a Sensitivity and Magnitude scoring for these Scenarios. However, we provisionally agree with the Applicant's conclusions of **Not Significant** for the Whole Project Assessments.

#### *C.5.2.2 Scenario 4 (CEA)*

Table 9.41 summarises the CEA for UWN in the construction phase of Morven South. Overall, the developer concludes effects from underwater noise will be **Not Significant** under Scenario 4. In the alone assessment, the Applicant discusses the ability of herring to flee localised UWN noise and re-locate to areas without this pressure. The CEA shows that in the vicinity of Morven South; several other wind farms could be at a similar construction phase and contributing to the cumulative UWN. Considering the cumulative underwater noise impacts, we advise impacts to fish and shellfish receptors, namely spawning herring and sandeel:

- **Should be considered further via the development of the Piling Strategy and possible mitigation measures outlined where applicable. Measures could relate to timing of works, adjustment / refinement of piling parameters and installation scenarios (e.g. sequential), and the use of alternative foundations / installation techniques as Morven South progresses through detailed design.**

### *C.5.3 Increased SSC's and associated deposition*

#### *C.5.3.1 Scenarios 1 and 2*

Both the MHPGC and MBAGC project will increase SSC through cable installation activities during the construction phase. Table 9.43 provides a very high-level overview of these activities, and no indicative quantified amounts of anticipated sediment increases are provided.

While we recognise that these connections are at an earlier stage of development and thus do not have the requisite design information to develop a MDS, we would have expected to see a greater level of consideration of cumulative impacts, with provision of a qualitative assessment. As a result, the subsequent Marine Licence applications for these cable connections will need to fully address cumulative impacts, based on an understanding of MDS for each respective cable route.

Based on cumulative impacts being fully assessed through subsequent Marine Licence applications, we are content with the conclusion of **Not Significant**.

### C.5.4 Long-term habitat loss

The Applicant has not provided an estimated footprint for the long-term habitat loss associated with the MBAGC and MHPGC. As per our comments above we consider the subsequent Marine Licence applications for these cable connections will need to fully address cumulative impacts, upon understanding of the MDS for each respective cable route. Further information is needed regarding amounts of export cable infrastructure intended to be left in-situ, and this should be clearly outlined in the forthcoming Marine Licence applications. We again highlight the Scottish Government policy for full removal of wind farm infrastructure at decommissioning phases.

## C.6 Mitigation and monitoring

No additional mitigation measures are proposed for effects on fish and shellfish IEFs. A number of designed-in measures have been proposed to reduce potential impacts on environmental receptors, and those relevant are considered in Table 9.20. All measures, excluding MM-16 (UXO clearance) are plans. The commitment to produce a plan (and adhere to this post-consent) does not technically constitute mitigation, and whilst these plans are positive, we do not consider the identification of a plan to be mitigation, but that the onset of plans should specify mitigation measures.

On the basis that **No Significant** adverse effects have been identified, we are content that additional mitigation measures are largely not required. However, given the current uncertainty surrounding piling scenarios and timings, and considering the likely impacts to potential suitable herring and sandeel spawning and nursery habitat, we advise further consideration is given to this through development of a Piling Strategy if consented.

## C.7 RIAA

At the EIA Scoping stage, we provided our position on diadromous fish whereby impacts should be assessed through the EIA process and not through HRA. This position reflects:

- Current limited knowledge of spatial and temporal distribution and behaviour of these species in the marine environment;
- Current lack of evidence to inform impact pathways; and
- Lack of reference population figures which prevents impact apportioning to SACs.

We acknowledge that diadromous fish have been considered through the EIA process as recommended and are content with the assessment conclusions reached. We have not reviewed the assessment provided in the RIAA.

## NATURESCOT ADVICE ON MORVEN SOUTH OFFSHORE WIND FARM

### Appendix D Benthic ecology

Benthic ecology is considered in Chapter 8 (Volume 2) and the following relevant supporting Appendices:

- Volume 3, Annex 8.1: Benthic Subtidal Ecology Shared Technical Report
- Volume 2, Chapter 21: Inter-related and Ecosystem Effects
- Volume 3, Annex 6.1: Cumulative Effects Screening
- Volume 4, Annex 1, Appendix 1.2: Invasive Non-native Species Management Plan (INNSMP) and Biosecurity Plan

Overall, the documents provide an appropriate level of detail. The assessment for Benthic Ecology concludes **No Significant Effects**, both Morven South alone and cumulatively, which we support.

In this Appendix, we provide comments and advice which addresses elements of the assessment process but does not affect the outcome of the assessment or the overall conclusion of our advice.

Advice with respect to the Firth of Forth Banks Complex Nature Conservation Marine Protected Area is provided below in Annex 1 of this Appendix.

#### D.1 Study area

The study area is defined at a local, regional and survey scale in section 8.2 of Chapter 8. The local benthic ecology study area encompasses the Morven South array area boundary and a buffer of one spring tidal ellipse, ranging from 5 km to 14 km.

The regional benthic ecology study area encompasses wider northern North Sea habitats and neighbouring designated sites, and consented, developing and planned offshore wind farms in an area extending 50 km to 191 km from Morven South.

The survey benthic ecology study area is the area within which the benthic site-specific survey was undertaken in 2022, covering both Morven North and Morven South and the predicted Zone of Influence (Zoi) around both sites.

We are content with the scale of study areas used for the local, regional and survey scale.

#### D.2 Baseline characterisation

Baseline characterisation is discussed in section 8.6 of Chapter 8, and in the Benthic Subtidal Ecology Shared Technical Report (Volume 3, Annex 8.1). The data collection methods for baseline characterisation follow standard methodologies for benthic and environmental sampling and aligns with the relevant guidance. It provides a suitable approach to characterising the baseline environment to inform the EIA.

Existing and site-specific data has been reviewed and clearly presented, with species and habitats of conservation value identified and considered, including a number of Priority Marine Features (PMFs) and UK Biodiversity Action Plan (UK BAP) priority habitats.

However, minimal information has been provided by the Applicant about the presence of ocean quahog recorded within the local study area. In the Benthic Subtidal Ecology Shared Technical Report (Volume 3, Annex 8.1), it is stated that 17 juveniles were identified but it is not specified at

which sampling stations and / or frequency per station. It's unclear if they were identified within or outwith the array area. More detail, such as the abundance, distribution and density of ocean quahog would have been useful. It is also likely and should be acknowledged that these ocean quahog numbers likely under-represent the ocean quahog numbers within the local study area.

### D.3 Assessment approach

We are content with the approach to assessment for benthic ecology, including impacts scoped in/out as per Tables 8.6 and 8.7. However, we note that there are errors in Table 8.7, namely that the ticks and crosses incorrectly show that 'impacts to benthic invertebrates due to EMF' has been scoped out for the operations and maintenance phase, contradictory to the justification provided, which says it has been scoped in for this phase. Also, the ticks and crosses incorrectly show that 'impacts to benthic invertebrates due to thermal emissions from subsea electrical cables' has been scoped in for the construction and decommissioning phases, contradictory to the justification provided which says it has been scoped out for these phases.

Feature Activity Sensitivity Tool (FeAST) and Marine Evidence based Sensitivity Assessment (MarESA) have been used in the assessment as well as consideration of wider literature. However, some scores reported from FeAST are incorrect (e.g. FeAST scores are presented for SS.SSa.CFiSa.EpusOborApri, but this biotope is not assessed in FeAST). This does not affect the overall assessment.

### D.4 Impact assessment

Overall, we support the EIA Report conclusions of **Not Significant** for construction, operation and maintenance and decommissioning phases for benthic receptors, with further commentary on specific impacts below.

#### D.4.1 Ocean quahog – habitat loss and disturbance

Ocean quahog (17 juveniles) were recorded within the study area. Grab sampling typically collects only the top 10-20 cm of sediment and penetration is often reduced in hard sediments. Ocean quahog, particularly adults, may be found deeper in the sediment (variable depths from upper few cm to 10 cm+). To that end, it is likely that the grab sampling will underestimate the number of individual animals present. We therefore recommend using the total extent of subtidal sands and gravels as a proxy for potential habitat for ocean quahog, whilst recognising this may over-estimate potential impacts. We note that an assessment of impacts to offshore subtidal sands and gravel has been considered, as this is deemed suitable habitat for ocean quahog.

The overall Sensitivity for ocean quahog and offshore subtidal sands and gravel has been deemed as 'high', in line with FeAST. This reflects the conservation value of the species, as well as the low tolerance to most of the pressures and the likelihood of slow recovery, due to this species being slow-growing and having long generational times. We are content with this approach.

The survey area subtidal sediments were composed of sand (91.7%), mud (7.24%), and gravel (1.06%), as per Section 5.1.1 of Annex 8.1: Benthic Subtidal Ecology Shared Technical Report.

The maximum temporary habitat loss and / or disturbance from site preparation, construction and maintenance activities is estimated as 62,596,300 m<sup>2</sup> during the construction phase and 7,967,400 m<sup>2</sup> during the operation and maintenance phase, representing 18% and 2.3% of the site boundary, respectively. For long-term habitat loss and disturbance from the installation of the infrastructure

during the construction phase and throughout the operation and maintenance phase, a total of 1,820,664m<sup>2</sup> is estimated, representing 0.5% of the site extent.

Given the widespread nature of the sands and gravels habitat throughout Scottish / UK waters, the Magnitude of this impact is likely to be Low, in line with the EIA Report conclusions. **Although a specific PMF assessment was not undertaken, based on previous experience, our assessment concludes that there is likely to be an impact on ocean quahog but without Significant Impact on National Status.**

The EIA Report Sensitivity of High and Magnitude of Low results in a significance of Minor to Moderate using the Applicant's significance matrix (Table 8.16). As above, given the widespread nature of the sands and gravels habitat, we are content that the effect is concluded as Minor, which is **Not Significant** in EIA terms.

#### *D.4.2 Electromagnetic Fields (EMF)*

Section 8.11.9.8 states that, where feasible, a minimum burial depth of 0.5 m will be applied to all cables during installation. Where burial is not possible, cable protection will be used. We highlight that a burial depth of 1-2 m is preferable.

Collectively, our understanding of EMF effects remains poor, particularly in relation to in-field measurements of EMF and potential impacts to sensitive receptors. In line with other recently consented offshore floating / fixed wind farm proposals, **we therefore advise that monitoring of EMF should be conducted to validate predicted EMF effects (see below).**

### **D.5 Cumulative assessment**

The cumulative impact pathways have been identified in Table 8.25, with an appropriate level of detail presented in Section 8.13. We are content with the conclusion of **Not Significant** for cumulative impacts at all phases of Morven South.

### **D.6 Mitigation**

As all impacts are assessed as **Not Significant**, no additional mitigation measures are proposed beyond the embedded mitigation outlined in Table 8.18, which is largely the production of and adherence to post-consent plans and programmes.

Where feasible, we recommend that infrastructure such as cable protection and scour protection use materials that consider nature inclusive design aspects. They should also not contain any plastic etc. contaminants that would be released over time.

We note that Table 8.18 states that the Cable Plan will include the requirement of minimum burial depths of 0.5 m. As mentioned above, we highlight that a burial depth of 1-2 m is preferable.

#### *A.1.1 Invasive non-native species mitigation plan*

We note that an Invasive Non-native Species Management Plan (INNSMP) and Biosecurity Plan is included as Appendix 1.2 to Annex 1 (Volume 4): Environmental Management Plan. Future iterations of the INNSMP will require more information regarding biosecurity surveillance, monitoring and reporting (Section 5.4), including the contingency plan (Section 5.4.2), which the Applicant has stated they will prepare prior to construction.

The following guidance should be followed when preparing the more detailed INNSMP:

- Marine biosecurity planning – Identification of best practice: A review: NatureScot Commissioned Report No. 748
- Marine Biosecurity Planning Guidance
- IMO Resolution MEPC.378(80) (adopted on 7 July 2023) 2023 Guidelines for the Control and Management of Ships' Biofouling to Minimize the Transfer of Invasive Aquatic Species
- MGN675 (M+F) Amendment 1 The merchant shipping (control and management of ships' ballast water and sediments) regulations 2022
- MCA MGN 398 Amendment 1: The merchant shipping (anti-fouling systems) regulations 2024

We highlight that a new report by SAMS commissioned by ScotMER regarding '*Invasive non-native species mitigation measures for offshore renewables*' is soon to be published and we recommend that the Applicant consults this and modifies their Marine Invasive and Non-Native Species Biosecurity Plan once available.

## D.7 Monitoring

No monitoring is proposed in relation to benthic interests. We understand that the ScotMER (Offshore Wind Directorate) project 'A Targeted Approach to Characterising EMF from Subsea Cables and Understanding Potential Impacts on Fish and Benthic Species' is due to report shortly. Recommendations from this, together with those in FLOWERS – Floating Offshore Wind Environmental Response to Stressors – WP2 electromagnetic fields (EMFs), should be considered further to inform mitigation and or monitoring requirements. Advice from OWD / MD-SEDD may be helpful given their involvement and expertise.

As noted above, and in-line with other recently consented offshore wind farm proposals, we advise that monitoring of EMF should be conducted to validate EIA predictions. Should Scottish Ministers grant consent, we advise that:

- **Monitoring of EMF either Morven South alone or in collaboration via strategic measures to contribute to the evidence gap in relation to EMF (e.g., via ScotMER research campaign).**

Where possible, we recommend that any data collected is shared with strategic monitoring, or research programmes such as ScotMER.

## D.8 Designated sites

Please refer to Annex 1 of Appendix D below for JNCC's advice on the MPA Assessment.

'Chapter 6: Marine Protected Area Assessment: Morven North' has been provided and we note that Morven South was screened out of the assessment due to a lack of connectivity with the Firth of Forth Banks Complex MPA. We agree with this approach.

## D.9 RIAA

No sites with Annex I habitats were advanced to the RIAA stage, which is in line with our advice on the HRA Screening Report.

## Annex 1, Appendix D – JNCC Advice

### JNCC Advice on Morven South Offshore Wind Array Project – Offshore Marine Protected Areas – (Part of JNCC Ref OIA-11618)

JNCC's role in relation to offshore renewables has been delegated to NatureScot. NatureScot is now authorised to exercise JNCC's functions as a statutory consultee in respect of certain applications for offshore renewable energy installations in inshore and offshore waters (0-200nm) adjacent to Scotland.

JNCC however, maintains responsibility for offshore Marine Protected Areas (MPAs). As such, JNCC have provided the following advice in relation to the Morven South Offshore Wind Array Project Environmental Impact Assessment (EIA) to provide a view on nature conservation matters related to the Firth of Forth Banks Complex Nature Conservation Marine Protected Area (NCMPA), which is located in the vicinity of the development area.

#### Overall comments

The proposed project is located 86.1km from the Aberdeenshire coast and the nearest designated site is Firth of Forth Banks Complex NCMPA, which lies 17.3km to the northwest of the Morven South project boundary.

#### Firth of Forth Banks Complex NCMPA

The proposed operations are located close to Firth of Forth Banks Complex NCMPA. The Conservation Objectives for this site are that the protected features:

- so far as already in favourable condition, remain in such condition; and
- so far as not already in favourable condition, be brought into such condition, and remain in such condition.

The protected features of the NCMPA, in accordance with Section 127 of the Marine and Coastal Access Act (2009), and their condition are:

- Ocean quahog aggregations: The feature is in **unfavourable** condition.
- Offshore subtidal sands and gravels: The feature is in **unfavourable** condition.
- Shelf banks and mounds: The feature is in favourable condition
- Quaternary of Scotland - moraines: The feature is in favourable condition

On reviewing the assessment of the environmental impacts, JNCC considers that the proposed operations are unlikely to affect, other than insignificantly, the protected features of Firth of Forth Banks Complex NCMPA, when assessed both alone and in combination with other plans and projects, and therefore we **do not object** on marine nature conservation grounds.

## NATURESCOT ADVICE ON MORVEN SOUTH OFFSHORE WIND FARM

### Appendix E Physical processes

Physical processes are considered in Chapter 7, Volume 2 and the following supporting appendices:

- Volume 3, Annex 7.1: Physical Processes Shared Technical Report

In addition, we have also reviewed the following Morven North supporting appendix

- Additional Application Information - Chapter 6: Marine Protected Area Assessment: Morven North

#### E.1 Summary

The assessment in Chapter 7 concludes **No Significant Effects**, both alone and cumulatively - we broadly agree, however **with one exception**. This relates to be omission of consideration of the Firth of Forth Banks Complex Nature Conservation Marine Protected Area (NCMPA), as a receptor, in view of our assessment of the potential change to the wave regime cumulatively and we note gaps in the available cumulative assessment for this.

In considering this aspect, we have sought and included advice from JNCC on the implications to the subtidal sands and gravels feature of the Montrose Bank component of the adjacent Firth of Forth Banks Complex NCMPA.

Advice on seasonal stratification impacts should be sought from MD SEDD as we have no expertise on this aspect.

#### E.2 Study area

Section 7.2 of Chapter 7 defines the study area for physical processes as the Morven South boundary plus one spring tidal excursion from the Morven South boundary, ranging from 5 km to 14 km. This omits consideration of the Montrose Bank component of the adjacent Firth of Forth Banks Complex NCMPA.

The MPA is 17.3km from Morven South at closest, and in our view should have been considered as a receptor. Our experience indicates that 'wave shadows' from similar offshore wind farms are regularly modelled as extending several tens of km. Moreover, the Cumulative Effects Assessment (CEA) appears to miss part of the MPA's Montrose Bank compartment which does fall within the 28 km Zone of Influence for CEA screening Cumulative Study Area (Section 7.12.1.10) yet is absent from Figure 7.2 (Chapter 7).

#### E.3 Baseline characterisation

The baseline is characterised by appropriate data sources and site-specific surveys, as described in Table 7.7 and Table 7.8.

##### E2.1 Sediment transport

Within the MPA, it's the south-eastern part of the Montrose Bank component of the Firth of Forth Banks Complex composite MPA that is most likely to experience any hydro-sedimentary effects from Morven South proposed wind farm. The Montrose Bank component of the MPA

encompasses a high diversity of sand and gravel habitats and an area where juvenile ocean quahog are recorded.

Although the MPA Site Summary<sup>42</sup> describes the subtidal sands and gravels feature as ‘strongly influenced by water currents’, understanding of seabed sediment movement in these areas is limited as noted in the JNCC Supplementary Advice on Conservation Objectives<sup>43</sup> - see page 16.

Nevertheless, the assessment provided by the Applicant does explore this for the Morven South array area, which is only a little deeper (Annex 7.1 - Technical Report Figure 4.4) and has similar habitats (MPA Data Confidence Assessment maps<sup>44</sup>). The modelling found that sediment transport here is only significant during storms (7.7.1.19 - 21) and it is the deep effects of storm waves that could potentially stir up the finer fractions of the mixed sandy seabed, though as expected at these depths (ca. 70 m), bi-directional tidal flow then dominates the transport of that sediment.

## E.4 Impact assessment

### E.4.1 Impacts to wave regime

Regarding the assessment of impacts to wave regime, part of the Montrose Bank compartment would be within the modelled Morven South ‘wave-shadow’ during storms from the East (e.g. Figure 5.27 in Annex 7.1 - Technical Report). Our assessment concludes that any reduction in wave height would be no greater than 1%, which is **Not Significant** in EIA terms.

## E.5 Cumulative assessment

### E.5.1 Impacts to wave regime

With reference to Table 7.20, the justification for a Low Magnitude score is insufficient. During easterly storms, the potential wave-shadow from Morven South alone extends >17 km and would reach the MPA. The west side of the Ossian array area is a similar distance from the centre of Morven South; moreover, the Ossian floating foundations could cause more wave attenuation than the narrower fixed bottom foundations of Morven South - noting that an assessment of impacts to wave regime was not presented in the Ossian EIA Report. Regardless, we consider the cumulative wave-shadow would not be *localised*, and its reduction of wave heights within the MPA might be significant. Although the Morven South wave shadow would be weak within the MPA relative to that of Morven North, this could be offset by a greater contribution from the Ossian wave shadow, because the Ossian array area is much wider ‘upwind’ of Morven South than of Morven North.

Therefore, the Magnitude of cumulative impacts to wave regime should be assessed as Medium not Low. Considering the Medium Sensitivity of the subtidal sands and gravels feature, this would result in a **Significant Effect** (contrary to Table 7.11). Please note this conclusion relates to the potential for wave regime change to a physical-processes receptor and not the NCMPA feature. However, as no assessment of the cumulative effects of any wave-shadow arising from Ossian and

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<sup>42</sup> <https://jncc.gov.uk/resources/4d478592-6a82-4a75-97ad-de7057da9e8a#FFBC-1-SiteSummaryDocument-July14.pdf>

<sup>43</sup> <https://jncc.gov.uk/resources/92fb7e5e-5e68-4e66-bde3-afd9c27d6b14#FFBC-3-SACO-v1.0.pdf>

<sup>44</sup> <https://jncc.gov.uk/resources/4d478592-6a82-4a75-97ad-de7057da9e8a#FFBC-2-DataConfidenceAssessment-v5.0.pdf>

Morven South in combination has been provided, we cannot comment further and recommend further discussion with MD LOT & MD SEDD.

We note that for Morven North and South combined (Whole Programme), in storms from East or South-east, this cumulative wave shadow does cover a larger area of Montrose Bank compared to Morven South alone (Annex 7.1 - Technical Report Figure 5.25 compared to 5.26, and 5.29 compared to 5.30). However, it appears that the maximum predicted reductions in wave heights would be <2%, which we agree is **Not Significant** in EIA terms.

## **E.6 MPA Assessment – Firth of Forth Banks Complex NCMPA (Montrose Bank) – JNCC advice**

### *E.6.1 Subtidal sands and gravel feature*

Given the **Significant Effect** conclusion reached above including gaps within the assessment provided and evidence base, we have discussed the implications of any change to the wave regime in view of the subtidal sands and gravel feature of the Firth of Forth Bank Complex NCMPA with JNCC and provide their advice in the paragraph below.

#### JNCC Advice

*As noted, there remains a knowledge gap of whether storm events play a significant role in sediment transport within the deeper portions of the NCMPA and whether a reduction in wave height during a storm event will be significant to the site or not. Although the NCMPA has a depth range of 30 to 110m, the estimated impact would be occurring in the deeper sections of the NCMPA (the north and east of the site). We note that both the Advice on Operations<sup>45</sup> and MarESA consider the 'offshore subtidal sands and gravels' and 'ocean quahog' to not be sensitive to changes in wave exposure. Advice on Operations does list these two features as sensitive for changes in water flow (tidal currents) but this is not reflected in MarESA which lists these features as 'Not Sensitive' to that pressure. Taking this all into account, we therefore do not believe that a reduction in wave height during storm events would be of concern for the features of the deeper part of the NCMPA.*

## **E.7 Mitigation**

No additional mitigation measures are proposed beyond the embedded mitigation outlined in Table 7.13, which is largely the production of and adherence to post-consent plans and programmes. We highlight that plans and programmes themselves do not strictly constitute mitigation – it is the measures contained within the plan that will mitigate impacts. However, in-line with other similar developments, we are content for this to be addressed through the development of the post-consent plans.

## **E.8 Monitoring**

Similarly, no specific monitoring is proposed. We request that further consideration is given to closing this knowledge gap to better understand the influence of offshore wind infrastructure on the wave regime, alone and cumulatively.

We note that the ScotMER research project "Development of marine physical process modelling guidelines for offshore wind farm environmental impact assessments" is about to, or has recently,

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<sup>45</sup> <https://jncc.gov.uk/resources/92fb7e5e-5e68-4e66-bde3-afd9c27d6b14#FFBC-5-AdviceOnOperations-v1.0.xlsx>

completed. Whilst this Application is too late to consider the outputs of this research project, it would however be useful to consider the research outputs when designing monitoring, if consented. As could the following research programmes and outputs inform monitoring proposals:

- ECOWind “Physics-to-Ecosystem Level Assessment of Impacts of Offshore Windfarms” (PELAgIO)<sup>46</sup>
- Enabling Sustainable Wind Energy Expansion in Seasonally Stratified Seas (eSWEETS3)<sup>47</sup>
- Ecological Effects of Floating Offshore Wind (ECOFlow)<sup>48</sup>

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<sup>46</sup> <https://ecowind.uk/projects/pelagio/>

<sup>47</sup> <https://pcwww.liv.ac.uk/%7Ejons/research.htm>

<sup>48</sup> <https://www.ecoflow.org.uk/>

## NATURESCOT ADVICE ON MORVEN SOUTH OFFSHORE WIND FARM

### Appendix F Blue carbon

Blue carbon interests are considered in Annex 18.2: Climate Change Shared Greenhouse Gases Technical Report (Volume 3). In this Appendix we provide advice on the blue carbon assessment and conclusions, we do not provide comment on other elements of the Climate Change Shared Greenhouse Gases Technical Report.

The assessment for blue carbon concludes **No Significant Effects**, which we support.

We recognise that blue carbon assessments are a relatively new element of EIA Reports for proposed marine energy projects. Whilst advice included within this Appendix is specific to the proposed Morven South Offshore Wind Farm EIA Report, there are some instances in which we provide comment on aspects of the assessment process which do not affect the outcome of the assessment or the overall conclusions reached in our advice; we hope these comments will be of benefit to future blue carbon assessments.

Furthermore, the biodiversity value and ecosystem functions provided by blue carbon habitats are well understood and afforded protection through a variety of policies. Lastly, there is an increasing need to also recognise the climate change mitigation potential in line with the Blue Carbon Action Plan<sup>49</sup>.

#### F.1 Study area

The study area is defined as the proposed development boundary, i.e. the Array Area only. However, we note that the Cumulative Assessment considers impacts from the Morven Hawthorn Pit Grid Connection Project and associated export cables, as well as the Morven Branxton Area Grid Connection Project and associated export cables. Further advice is provided in F.5 to our advice below.

Typically, we advise that the study area defined for blue carbon should be the same as that used for physical processes and benthic ecology, i.e. based on one spring tidal ellipse. However, after reviewing Chapter 8: Benthic Subtidal Ecology Morven South (Volume 2), we consider that there are unlikely to be any blue carbon habitats with potential impact pathways from the proposed development within the spring tidal ellipse buffer. We therefore accept the study area in this case.

#### F.2 Baseline characterisation

Many key data sources we would recommend for the blue carbon assessment are missing, including:

- Burrows, M. T., Smeaton, C., Tillin, H., Grundy, S., Sugden, H., Moore, P., Fitzsimmons, C., Austin, W., O'Dell, A. 2024. The United Kingdom's Blue Carbon Inventory: Assessment of Marine Carbon Storage and Sequestration Potential in Scotland (Including Within Marine Protected Areas). A Report to The Wildlife Trusts, WWF and the RSPB. Scottish Association for Marine Science, Oban.
- Daewel, U., Akhtar, N., Christiansen, N., & Schrum, C. (2022). Offshore wind farms are projected to impact primary production and bottom water deoxygenation in the North Sea.

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<sup>49</sup> <https://www.gov.scot/publications/scottish-blue-carbon-action-plan/>

Communications Earth and Environment, 3(1), 1–8. <https://doi.org/10.1038/s43247-022-00625-0>

- Diesing, M., Thorsnes, T., & Rún Bjarnadóttir, L. (2021). Organic carbon densities and accumulation rates in surface sediments of the North Sea and Skagerrak. *Biogeosciences*, 18(6), 2139–2160. <https://doi.org/10.5194/bg-18-2139-2021>
- Hunt C, Demšar U, Dove D, Smeaton C, Cooper R and Austin WEN (2020) Quantifying Marine Sedimentary Carbon: A New Spatial Analysis Approach Using Seafloor Acoustics, Imagery, and Ground-Truthing Data in Scotland. *Front. Mar. Sci.* 7:588. <https://doi.org/10.3389/fmars.2020.00588>
- Smeaton, C., Hunt, C.A., Turrell, W.R. and Austin, W.E.N. 2021. Marine Sedimentary Carbon Stocks of the United Kingdom's Exclusive Economic Zone. *Frontiers in Earth Science*, 9 <https://doi.org/10.3389/feart.2021.593324>
- Turrell, W. R., Austin, W. E. N., Philbrick, S. P., Tilbrook, C., & Kennedy, H. (2023). Clarifying the role of inorganic carbon in blue carbon policy and practice. *Marine Policy*, 157(October), 105873. <https://doi.org/10.1016/j.marpol.2023.105873>
- Watson, S. C. L., Somerfield, P. J., Lemasson, A. J., Knights, A. M., Edwards-Jones, A., Nunes, J., ... Beaumont, N. J. (2024). The global impact of offshore wind farms on ecosystem services. *Ocean and Coastal Management*, 249 (September 2023). <https://doi.org/10.1016/j.ocecoaman.2024.107023>

In this case, this does not affect the outcome of the assessment or the overall conclusions reached in our advice, but we highlight this for future Applicants to be aware of.

### F.3 Assessment approach

#### F.3.1 Impact pathways

Only one potential impact pathway is considered for blue carbon, '*the impact of GHG emissions arising from seabed change*'. Our understanding is that this includes the direct, long-term habitat loss associated with the proposed infrastructure footprints, as per Table 5.2 of Annex 18.2. However, there is no consideration of temporary disturbance associated with shorter term activities, i.e. vessel anchoring, jack-up vessels, boulder clearance, etc. We have provided our own assessment of temporary disturbance based on the values provided in Table 8.17 of Chapter 8: Benthic Subtidal Ecology (Volume 2), which should also be applicable for blue carbon.

Little consideration is given to blue carbon habitats, however, from reviewing Chapter 8: Benthic Subtidal Ecology (Volume 2), we note that no key blue carbon habitats (e.g. seagrass) have been identified through the baseline characterisation. Thus, we accept the lack of detail presented.

Moreover, we typically advise that changes in physical processes resulting from the presence of the subsea infrastructure associated with the proposed development are included in an assessment e.g. scour effects, changes in wave/tidal current regimes and resulting effects on sediment transport. We therefore recommend that future blue carbon assessments should include this as an impact pathway where relevant, as sediment and associated carbon accumulation may result from the proposed development (Daewel, *et al.*, 2022; Watson *et al.*, 2024). This could be further impacted at decommissioning stage, although the impact is likely to be Negligible given relatively low sediment accumulation rates in the North Sea, noting that this does vary spatially (Diesing, Thorsnes, & Bjarnadóttir, 2021).

### F.3.2 Sedimentary Blue Carbon

Our understanding is that the site-specific benthic surveys have informed the blue carbon assessment through the application of site-specific sediment habitat classification types to estimated carbon stocks from existing data sources (Smeaton et al., 2020)<sup>50</sup>. We accept this approach.

## F.4 Impact assessment

### F.4.1 Sedimentary carbon

For long-term habitat loss associated with the direct footprints from the proposed infrastructure of Morven South, the total disturbance is estimated as 1,547 ha. The estimated average carbon stock across the proposed development is 4.46 tC ha<sup>-1</sup>, using values presented in Smeaton et al. (2020) scaled by site-specific sediment habitat classification types, as per Table 6.3. This results in an overall total of 6,903 tonnes of carbon potentially disturbed through long-term habitat loss, which is 25,311 tCO<sub>2</sub> equivalent.

For temporary disturbance associated with the construction phase of the proposed development, the total disturbance is estimated as 6,270 ha, based on the values provided in Table 8.17 of Chapter 8: Benthic Subtidal Ecology (Volume 2). Applying the estimated average carbon stock of 4.46 tC ha<sup>-1</sup> results in an overall total of 27,963 tonnes of carbon potentially disturbed through temporary activities, which is 102,623 tCO<sub>2</sub> equivalent.

We consider this to be Negligible due to the footprint of Morven South relative to the total seabed area, and net benefit of displaced greenhouse gas emissions across the operational lifetime.

Regarding Sensitivity, we consider that the sedimentary carbon is deemed to be of high vulnerability, low recoverability and high value. This is because sediment accumulation on the seabed can be very low and recovery therefore is slow. As such, the Sensitivity would be classed as High.

Overall, we conclude a significance of Minor, which is **Not Significant** in EIA terms.

## F.5 Cumulative assessment

The Cumulative Assessment considers impacts from the Morven Hawthorn Pit Grid Connection Project and the associated export cables, as well as the Morven Branxton Area Grid Connection Project and associated export cables, noting that limited detail is known about the proposed grid connections currently. For the Morven Hawthorn Pit Grid Connection Project, it is estimated that 341 km and up to six offshore export cables may be required, although this represents the entire estimated cable length, which mostly travels through English waters. For the Morven Branxton Area Grid Connection Project, it is estimated that 113 km and up to six offshore export cables may be required.

Our understanding is that an assessment of long-term habitat loss associated with the direct footprints from the proposed infrastructure has been presented. Paragraph 10.2.1.6 states an

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<sup>50</sup> Smeaton, C., Austin, W., & Turrell, B. (2020). *Re-evaluating Scotland's sedimentary carbon stocks*. (2 ed.) (Scottish Marine and Freshwater Science; Vol. 11, No. 2). Marine Scotland. <https://doi.org/10.7489/12267-1>

average blue carbon stock of 4.19 tCO<sub>2</sub> equivalent was used, based on a proportionate average from Morven North and Morven South. However, the units are incorrect and should be tC ha<sup>-1</sup>.

For the Morven Hawthorn Pit Grid Connection Project, 2,000 ha are estimated to be disturbed through long-term habitat loss, resulting in an estimated 31,407 tCO<sub>2</sub> equivalent according to Table 10.1. However, we calculate this as 30,754 tCO<sub>2</sub> equivalent. For the Morven Branxton Area Connection Project, 700 ha are estimated to be disturbed through long-term habitat loss, resulting in an estimated 10,416 tCO<sub>2</sub> equivalent according to Table 10.1. However, we calculate this as 10,764 tCO<sub>2</sub> equivalent. These minor discrepancies could be due to rounding errors and do not change the outcome of our advice.

As above for Morven South project alone, we also conclude a significance of Minor cumulatively, which is **Not Significant** in EIA terms.

No consideration has been given to coastal habitats (e.g. sand dunes, saltmarsh, seagrass) that may be present closer to shore / at the landfall site. We understand that the Morven Hawthorn Pit Grid Connection Project will have a landfall in England, in which case, this is outwith our remit. However, it is unclear where the Morven Branxton Area Grid Connection Project would come ashore and whether there are any sensitive blue carbon habitats within proximity. If Scottish Ministers are minded to consent, once further information is known about the finalised grid connection, cable corridor and landfall location, an assessment of any potential impacts to coastal blue carbon habitats will be required within the Morven Branxton Area Grid Connection Project application and considered cumulatively with the wind farm array areas.

## F.6 Mitigation and monitoring

No mitigation or monitoring is proposed for blue carbon, which is in line with the Negligible Magnitude and **No Significance** of effect.

## NATURESCOT ADVICE ON MORVEN SOUTH OFFSHORE WIND FARM

### Appendix G Derogation

The Applicant has submitted a derogation case alongside the s36 and Marine Licence Applications for the proposed Morven South Offshore Wind Farm. This is provided on a without prejudice basis, and includes the following documents which have been compiled jointly for Morven South and Morven North:

- Volume 3, Chapter 1 - Derogation Case (of which only the Compensation summary section 7 is relevant to our remit)
- Volume 3, Chapter 2 - Compensation and Evidence Plan
- Volume 3, Annex 2.1 - Compensation Stakeholder Consultation
- Volume 3, Annex 2.2 - Long List of Species and Compensation Options
- Volume 3, Annex 2.3 - Assessment of Offshore Islands Potentially Suitable for Predator Eradications Report
- Volume 3, Annex 2.4 - Predator Eradication Modelling Report
- Volume 3, Annex 2.5 - Island Screening Report: Muck
- Volume 3, Annex 2.6 - Pre-eradication Field Study Report: Muck
- Volume 3, Chapter 3 - Outline Compensation Implementation, Monitoring and Adaptive Management Plan (CIMAMP)
- Volume 3, Chapter 4 - Compensation: EIA of Compensation Measures
- Volume 3, Chapter 5 - Compensation: HRA of Compensation Measures

We welcome the approach undertaken by the Applicant and encourage the submission of well-presented, thorough documentation as an example for other developers. The approach taken has included excellent stakeholder engagement but also been informed by early commissioning of appropriate site-specific survey work.

#### G.1 Summary

Two compensation measures are proposed, comprising:

- Rat eradication on the Muck Island Group (Muck, Lamb Island, Horse Island and Eagamol) to address predicted annual impacts to guillemot, razorbill, puffin and kittiwake.
- Gannet measures - details have not yet been provided for gannet measures and instead are expected later in the determination phase, our advice focuses on the rat eradication measure only.

Overall, there is merit in the proposed rat eradication compensation measure and benefits to target seabird species are likely based on the existing presence of target species, evidence of rat activity during the breeding season, availability of sufficient unoccupied habitat for colony expansion and location of nearby donor colonies. Limited direct evidence of rat predation on seabirds is available, however, supporting evidence from nearby cliff nesting colonies on Rum is provided.

Predictive modelling indicates the potential for significant delays in the achievement of compensation targets, particularly for guillemot and unknown for kittiwake, although we note targets are reasonably likely to be met for puffin and potentially for razorbill although only for the

Morven South alone scenario. Further consideration of this by the Applicant is needed in discussion with NatureScot and Marine Directorate.

## **G.2 Compensation and Evidence Plan (and associated Annexes)**

### *G.2.1 Summary of Impacts (section 1.4)*

Impacts predicted by the Applicant upon SPAs and their qualifying seabird species arising from the proposed Morven South and Morven North wind farm are presented in Tables 1.2 and 1.3 based on conclusions presented in the RIAAs. Section 1.4.2 presents mortality estimates for a wider range of SPAs and qualifying features on a “without prejudice” basis – Tables 1.4 and 1.5 with annual mortalities presented both for the Applicant’s approach (low) and NatureScot’s approach (high). The combined totals across Morven North and Morven South are then provided in Table 1.6 which are then taken forward in the Compensation Plan. Please note there are a number of discrepancies between the Applicants conclusions and our advice (Appendix A) which will need to be resolved.

### *G.2.2 Short list (section 3)*

- It is noted that the compensation measures retained as project led options from the long list (section 2) into the short list (section 3) for Morven South and Morven North are for predator (rat) control and as yet undetailed gannet measure(s).

The only measure retained as potential components of a wider suite, potentially in collaboration with other developers is:

- Reduction of disturbance at colonies.

No other measures are being taken forward for project level compensation.

### *G.2.3 Rat eradication (section 4)*

Rat eradication is being taken forward as the main compensation measure for auks and kittiwake. The Muck Island Group has been identified as the most suitable location for the eradication, following an appropriate selection process which was discussed with NatureScot and is detailed in Volume 3 Annex 2.3: Islands Potentially Suitable for Predator Eradication.

The island of Muck features cliffs up to 40m in height, with vertical faces whereas the neighbouring offshore Islands of Lamb, Horse and Eagamol feature rocky plateaux, grassy slopes and boulder fields.

Although the Muck Island Group is not designated as an SPA or SSSI for breeding seabirds, it lies within a suitable distance to other designated seabird colonies where the four target species are present (e.g. Canna and Sanday SPA, Treshnish Isles SSSI as well as Ceann a’ Mhara to Loch a’ Phuillon SSSI on Tiree, noting that while the seabird colony here is not a SSSI notified feature, it is nonetheless mentioned on the SSSI citation). This together with the likely inter-connectivity and meta population dynamic between seabird colonies means that any growth in seabird populations within the Muck Island Group is considered suitable to generate recruits for these nearby colonies, thereby contributing to the overall UK MPA Site Network.

#### *G.2.3.1 Population modelling of potential benefits of rat eradication on Muck*

Population modelling (section 4.3 and Annex 2.4 (Volume 3) was undertaken to assess the benefits to key seabird species on the Muck Island Group from rat eradication and to equate this with the compensation required resulting from predicted impacts from Morven South and Morven North both alone and combined.

The approach considers seabird population growth trends on islands where rat eradication has been conducted and compares this with nearby (control) islands where rats were not present. By subtracting the growth rate from control islands, from that of islands with eradication, the net growth rate, accounting for local trends, can be obtained. This is then used to predict population growth rates for the Muck Island Group, during and after rat eradication has taken place.

Species and Islands for which this comparison was undertaken comprise:

- Guillemot: Lundy (eradication) compared to Skomer and Skokholm (rats not present)
- Razorbill: Lundy (eradication) compared to Skomer and Skokholm (rats not present) and Canna (eradication) compared to Ceann a Mhara (rats not present)
- Puffin: Lundy (eradication) compared to Skomer and Skokholm (rats not present).

While we agree that this approach has merit for estimating the benefits from the eradication and provides a useful indication of the likely population growth rates, there are inherent assumptions and limitations to be considered which the Applicant acknowledges.

In our view these include:

- There will be important differences between the Islands used in the modelling and the Muck Island Group. For example, geographic location comparisons with the key island Lundy located in the Bristol Channel; and breeding habitat types including landform and geology.
- Rat predation will not be the only limiting factor on productivity and population growth. Growth can only occur if other limiting factors allow it - these include prey availability, availability of suitable unoccupied nesting habitat, recruitment into colonies, mortality events such as auk wrecks and Avian Influenza (HPAI). Subtracting the growth rate from the control islands (those which lacked rats) from that seen on the eradication island may help to account for other factors affecting population growth, where there is commonality between these factors / islands.

#### *Population projections for guillemot, razorbill and puffin*

Tables 4.4 - 4.7 present the results of the modelling exercise for guillemot, razorbill and puffin. Further detail is provided by the Applicant in Annex 2.4 (Volume 3).

In terms of the modelling provided, we consider:

- Annual growth rates will fluctuate and are unlikely to be consistently the same over long periods. For example, the Applicant states that on Canna the population size was declining rapidly prior to rat eradication. Following removal of rats, the decline was halted and there have been periods of stability and periods of growth.
- The modelling is likely to result in an exponential growth rate with no upper limit. This means that the increase in population estimated for 20 years or more after eradication is likely to be unrealistic. This is especially noticeable for puffin where an 8.4 % annual population rate increase is used, resulting in a population of 560, 587 and an additional

142,820 birds / annum after 35 years. This is clearly extremely unrealistic. In reality, growth will be limited by factors such as available nesting habitat on the Island and / or prey resources. For example, for puffin, the habitat assessment indicates that available habitat for colony expansion would only accommodate a maximum of 4315 pairs of breeding puffins.

Therefore, it is clear from the examples of rat eradication projects, especially on Lundy, that auks have benefitted from rat eradication and populations have increased as a result. However, the modelling provided can only be used as an indication of likely population expansion - baseline and post-eradication monitoring will be crucial to establish actual trends.

#### Population projections for Kittiwake

Population modelling was not undertaken for kittiwake. The Applicant states that there is limited evidence for the extent to which kittiwake populations recover from rat eradications, but that there will be some benefit to a declining population by removing a potential additional pressure. The report further notes that rats could be restricting available habitat for kittiwake on Muck as the population was historically higher (140 pairs in the 1980s compared with 22 individuals in 2025).

While there is no attempt to quantify the benefit to kittiwake, the Applicant considers that there will be sufficient benefit to meet the modest compensation required (9 - 22 birds / annum). It seems likely that other factors, such as prey availability, are more important in limiting the kittiwake population on Muck, but we agree that there could be some benefit for this species from the measure. However, as it is not quantified, we cannot comment on whether there will be sufficient benefit to meet the compensation requirement. Baseline and post eradication monitoring will be necessary to identify any population increase and adaptive management proposals may be required if insufficient benefit occurs.

#### *G.2.3.2 Projection timeframes*

Table 4.8 estimates the period taken for projected populations to reach compensation targets based on estimated impacts and assuming net growth. This is defined by the Applicant as the point at which the target number of additional birds would be added to the population each year. Both the Applicant's approach (Low) and NatureScot's approach (High) are presented. In reviewing this, we note from the NatureScot approach only (High) the following timeframes (see Table A below) which we have extracted from Table 4.8:

*Table A: Number of years expected before target number of additional birds is added to the population each year - Values have been extracted from Table 4.8 for the High (NatureScot approach) only. For each species the indicative number of birds (individuals) require per annum is provided in brackets as per Table 1.6.*

|                          | Guillemot (480.5) | Razorbill (23.1) | Puffin (13.3) |
|--------------------------|-------------------|------------------|---------------|
| Morven South alone       | 23 years          | 12 years         | 2 years       |
| Morven North alone       | >35 years         | 22 years         | 3 years       |
| South and North combined | >35 years         | 26 years         | 4 years       |

From the indicative modelling provided, we conclude that the proposed compensation measure could provide the required benefit within a reasonable timeframe for puffin in all scenarios, and potentially for razorbill for Morven South alone depending on construction / compensation commencement. However, for the remaining species and scenarios (guillemot and kittiwake), there is a concern that the modelling predictions point to a significant lag prior to reaching the required benefit target. Noting this is unknown for kittiwake.

Further consideration is therefore required to understand how this might be addressed, acknowledging that limitations within the modelling referred to above may only really be resolved through colony monitoring to derive a more accurate annual growth rate. **Further consideration of this by the Applicant is needed in discussion with NatureScot and Marine Directorate.** We also advise the Applicant to consider this further in the light of the recently published Statutory Guidance<sup>51</sup> on 'offshore wind – compensating for adverse effects on protected Europeans sites' for further advice including timing of benefit, overcompensation and adaptive management.

### *G.2.3.3 Isle of Muck surveys*

Section 4.4 details the surveys undertaken to inform the proposed rat eradication with further detail noted in Annex 2.5: Island Screening Report. We note that the seabird, seabird habitat availability and rat surveys were all carried out using appropriate methodologies. We commend the Applicant for their time and effort to ensure the surveys informed the compensation plan and NatureScot's recommendations provided during pre-application engagement. Our appraisal of these is provided below.

#### *Are the key seabirds present?*

Seabird counts were undertaken in June 2025. Surveys were undertaken by boat and high-resolution panoramic images of cliff sections were taken in rapid succession, to create panoramic images of cliff sections capturing all individuals present at that time.

Survey results (section 4.4.4) indicate that all target species were present, albeit in fairly low numbers:

- Guillemot - 179 individuals (Muck, Eagamol and Horse Island)
- Razorbill - 32 individuals (Muck, Eagamol and Horse Island)
- Puffin - 22 individuals (Horse Island)\*
- Kittiwake - 11 Apparently Occupied Nests (Muck)

\*The 22 puffins recorded on Horse Island were seen standing in burrow entrances - nesting was not confirmed.

Therefore, all key species are present, although we note all have declined since Seabirds Count (Burnell 2023).

#### *Is there suitable seabird breeding habitat available?*

Potential seabird habitat was visually assessed as being either unoccupied or partially occupied (with space for additional birds) and matched to known guillemot and / or razorbill, puffin and

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<sup>51</sup> <https://www.gov.scot/publications/compensating-adverse-effects-offshore-wind-protected-european-sites-scotland-statutory-guidance-2026/>

kittiwake breeding preferences (including height above high tide and splash zone, presence of existing colony, orientation of feature, protection from adverse weather, width and incline of ledge, depth of crevices etc). A photographic record of potential habitat was collected.

Habitat was rated as Red, Amber or Green, (RAG), to reflect qualitative estimates of poor, moderate and good quality habitat respectively. Good quality habitat was considered to provide suitable features such as cliff-ledges, and boulder and crevice habitat, and as such, most likely to be recolonised readily by the target species. Helpful examples were provided in Annex 2.5.

Survey results (Section 4.4.5) estimate a total of 513.5m<sup>2</sup> of good quality, suitable and unoccupied habitat across the Muck Island Group for guillemot and razorbill. Assuming a nesting density of 20 breeding pairs per m<sup>2</sup> for guillemot / razorbill (Paragraph 4.4.5.5), indicating the potential for unoccupied habitat available for 10, 270 pairs – sufficient for the compensation requirements.

The current extent of the puffin population is restricted to the north-west slopes of Horse Island, though anecdotal information from local residents indicates puffin historically also nested on Eagamol. A total of 22 puffin were observed standing in burrow entrances on the north-west facing grassy slopes of Horse Island and as such were assumed to be nesting. The habitat assessment rated the north facing grassy slopes and north-west vegetated slopes of Horse Island, and the north-east-facing grassy slopes of Eagamol, as good for breeding puffin. Horse Island was estimated to provide 3,785 m<sup>2</sup> of suitable and unoccupied habitat, and Eagamol estimated as 2,127m<sup>2</sup>. Assuming a lower burrow density of 0.05 m<sup>2</sup> (Paragraph 4.4.5.6) this, indicates there is approximately unoccupied habitat potentially available for a 4, 315 pairs of puffin via expansion of the colony on Horse Island and potentially a new colony on Eagamol – sufficient for the compensation requirement

No attempt was made to estimate potentially suitable kittiwake nesting habitat. Given the very low numbers recorded in recent surveys and that the compensation requirement is expected to be small (9 to 22 birds / annum), the Applicant considers it reasonable to expect that even a modest increase in kittiwake pairs would achieve the required levels of compensation.

Historically, kittiwake numbers have been higher, with 140 AON reported in the mid-1980s (Dobson and Dobson 1986) and 67 in 2001 (Mitchell et al. 2004). From this the Applicant infers that there is suitable habitat for the current small population to expand, which we consider to be a reasonable assumption.

Lastly, within Annex 2.5, Figures 3 and 4 present a geospatial visualisation of seabird population size and trend data taken from the JNCC seabird census for the key species - guillemot, razorbill, kittiwake and puffin. These data indicate the proximity of potential additional recruitment colonies for the Muck Island Group and show trends over the long-term census periods. This indicates there are donor colonies within easy reach of the Muck Island Group.

Therefore, we conclude there is sufficient available habitat for colony expansion for the target species.

#### *G.2.3.4 Muck pre-eradication rat survey*

A rat population survey was conducted between 31 July and 21 August 2025. Rat traps, ink blocks, wax blocks and camera traps were deployed across Muck. Thermal drones were also used, including over Horse Island and Eagamol which were not covered by trapping.

Analysis of trapped rats included review of stomach contents and the collection of rat whiskers for stable isotope analysis to help determine if rats were predating on seabirds.

Key survey findings include:

- 40 rats were caught in traps on the main Muck Island (in survey traps and ad hoc traps used by land managers on the island)
- Rat captures were highest in the vicinity of pheasant feeders and the harbour
- Rat captures were lowest near the main seabird cliffs, which was expected as many of the seabirds had departed by the time the surveys took place at the beginning of August.
- Rats were observed in the thermal drone imagery at the main seabird areas at Camus Mor and south main Island
- Rats were recorded by thermal UAV on both Horse Island and Eagamol, with activity evident in areas that would likely be occupied by seabirds including cliff nesting and burrow nesting species
- Preliminary rat stomach content analysis conducted during onsite necroscopies identified that rats caught by the ad hoc traps all had pheasant grain in their stomach contents. The stomachs of rats caught elsewhere primarily contained vegetation and invertebrates, with some evidence of bird feathers present in one individual; however, these are suspected to be from a gamebird species
- Stable isotope analysis of the whiskers indicated that the rats had a varied diet but that rats caught on the traplines had a more littoral based diet and rats caught by land managers near the grain feed had a predominantly terrestrial signature
- The presence of littoral isotopes suggests that rats in locations away from buildings and feed stations forage in the coastal environment, while some samples with more marine signatures suggests some rats forage on more marine food sources which could include seabirds. Overall, this indicates that it is likely some rats would forage in coastal habitats that are, or could be, occupied by seabirds.

#### *Notable nearby evidence*

Established thinking generally considers that cliff nesting seabirds are unlikely to be at significant risk of rat predation but new evidence from the nearby Island of Rum suggests this may not necessarily be true:

- Evidence of guillemot eDNA was confirmed in analysis of rat stomach contents on the neighbouring Island of Rum with two individuals showing a 99% probable match (Annex 2.6, Section 5.2). One individual was caught in a cliff-top location within 100m of ledges occupied by guillemots. Surveys on Rum took place in July when more seabirds were still present and we acknowledge the results can't determine if this was a result of a scavenging event or active predation (Chapter 2, Figure 4.3).
- Thermal drone surveys on Rum revealed thermal images of rats moving around on steep high cliffs which might otherwise have been considered inaccessible to rats (Chapter 2, Figure 4.2).

These somewhat surprising findings indicate the importance of pre-eradication surveys to establish likely risk of rat predation as a pressure on cliff nesting seabirds. Further monitoring here, and elsewhere, is needed support these initial findings and add to the emerging evidence on rat accessibility and predation risk.

Overall, from our review of section 4.4.5 and Annex 2.6 (Pre-eradication Field Study Report), we can conclude:

- Rats are present on the main Muck Island, with numbers inflated due to the presence of pheasant grain feeders.
- Thermal drone survey indicates that rats are present on Horse Island and Eagamol and at the seabird colonies on the main Island.
- Initial stomach contents analysis did not show any evidence of predation on seabirds, but as the survey was carried out at the beginning of August it is likely many seabirds would have already left the Islands. It was unfortunate the survey was not carried out earlier in the season.
- Stable isotope analysis indicated some rats forage in the coastal environment but provided no direct evidence of predation on seabirds.

Therefore, while the surveys did not provide significant direct evidence of rat predation on the target species on the Muck Island Group, evidence from nearby Rum is noted and goes some way to support the potential that rats could prey on cliff nesting seabirds.

#### *G.2.4 Gannet compensation (section 5)*

The predicted impact on gannet from Morven South and Morven North is between 12.3 individuals (low) to 24.7 individuals (high). These impacts cannot be directly compensated through the proposed rat eradication on Muck since gannet do not currently breed at this site and there are no historical records of gannet breeding here.

The Applicant has been developing options for a gannet specific compensation measure but due to commercial sensitivity further detail on this measure will be submitted during the determination phase.

Therefore, we cannot comment on compensation for gannet at this time.

#### *G.2.5 Monitoring of compensation (section 7)*

Seabird monitoring is a key part the proposed rat eradication measure.

The status of the seabird populations will be monitored on an annual basis, both pre-eradication for one to two years to establish baseline populations and post eradication for a period to be agreed with NatureScot and MD-LOT. This is acceptable.

In addition, the Applicant intends to establish productivity monitoring plots, which we consider an important element of the monitoring. These should be set up pre-eradication to establish baseline productivity which can then be compared with post-eradication productivity.

Monitoring will enable the benefits calculated through the predictive population modelling to be verified with site-specific data from Muck on population changes.

#### *G.2.6 Adaptive management and strategic measure (section 8)*

Reducing disturbance to breeding seabirds at colonies was identified as a measure which could potentially be delivered by Morven South and Morven North in collaboration with other developers if insufficient compensation is delivered through the rat eradication measure. No detail is provided on this.

The Applicant also indicates that adaptive management may involve strategic measures through a Marine Recovery Fund, such as predator eradication on Rum or Tier 2 or 3 measures. The Applicant is unable to provide any detail at this stage.

### **G.3 Outline Compensation, Implementation, Monitoring and Adaptive Management Plan**

This document (Chapter 3, Volume 3) sets out the outline (skeleton) for the detailed Compensation Implementation, Monitoring and Adaptive Management Plan (CIMAMP) that will be fully developed by Morven South and Morven North, if consented. It notes where further work, discussion and agreement will be necessary. Our advice, as set out below is also outline and covers general principles.

The structure and content of the outline CIMAMP is appropriate and we are pleased to see that biosecurity and incursion response (Section 1.5.4) are included with a Biosecurity Plan to be developed. We consider this to be an essential part of the measure, vital to success.

Section 1.5.6 defines the success criteria for the rat eradication measure. For Criterion 2 – *Increased seabird nesting numbers and distribution*, success will be based on demonstrable increases in the distribution and number of breeding seabirds which is appropriate.

Further pre-eradication monitoring is expected to be completed before the eradication start date to establish a current baseline count of seabirds and confirm distribution of nesting habitat around the Muck Island Group. Following eradication, seabird population monitoring will be implemented with surveys commencing from the first breeding season following eradication. Which we welcomed, but as discussed in the Compensation and Evidence Plan (above) it would also be beneficial to undertake productivity monitoring at selected plots.

### **G.4 EIA and HRA of Compensation Measures**

We note and welcome consideration has been given to the potential for disturbance from human activity due to rat eradication methods, as well as, the potential for unintended primary and secondary poisoning of non-target species due to rat eradication methods as provided in EIA and HRA of Compensation Measures reports (Chapters 4 and 5 (Volume 3) respectively). Going forward, we wish to review these assessments once further site-specific information is available, at which stage we can provide advice. From our preliminary review we note:

- Limited consideration of the environmental baseline particularly for non-seabird intertidal and terrestrial receptors including, but not limited to, waders, raptors including white-tailed eagle, shag and upland species. Consideration is needed around the requirement of baseline surveys to adequately inform assessment of non-seabird receptors.
- Some species breeding on the Muck Island Group will not be absent at all times. Common guillemot and razorbill are known to attend breeding sites outside of the breeding season (Sinclair et al., 2017; Bennett et al., 2024), while black guillemot show limited post-breeding dispersal movements Johnston et al. (2018) and therefore each of these species may be susceptible to disturbance during the baiting programme.
- The use of a 20 km Likely Significant Effect screening buffer is not advisable although we note this is unlikely to change assessment conclusion for seabird features. Further consideration is required in relation to Rum SPA and its golden eagle feature.

SEPA

**From:** Planning.North <Planning.North@sepa.org.uk>  
**Sent:** 04 June 2026 11:37  
**To:** MD Marine Renewables  
**Cc:** [Redacted]  
**Subject:** PCS-20009033 SEPA response to 00012342 / 00012343 / 00012344 / 00012345

To Whom It May Concern,

00012342 / 00012343 / 00012344 / 00012345

Morven Offshore Wind Limited – Morven North Offshore Wind Array and Morven South Offshore Wind Array – EIA Section 36 Consent and Marine Licence Applications  
 00012342, 00012343 – Morven Offshore Wind Limited – Morven North Offshore Wind Array – approximately 61 km off the Aberdeenshire coast, 00012344, 00012345 – Morven Offshore Wind Limited – Morven South Offshore Wind Array – approximately 86 km off the Aberdeenshire coast

Thank you for the above consultation. Based on the information provided, these applications appear to fall below the thresholds at which SEPA would normally provide site specific advice. We recommend that you refer you to [SEPA standing advice for the Department for Business, Energy and Industrial Strategy and Marine Scotland on marine consultations](#). You should also refer to our wider standing advice and other guidance, which is available on our website via [www.sepa.org.uk/environment/land/planning/](http://www.sepa.org.uk/environment/land/planning/).

If there is a significant site-specific issue that you would like our advice on that is not addressed by our guidance or other information available on our website, please reconsult us clearly highlighting the issue in question and we will do our best to assist.

from

[Redacted]

Senior Planning Officer



**For the future of our environment**

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# ABERDEENSHIRE COUNCIL

Our Ref: ENQ/2026/0957

Your Ref: 00012342, 00012343, 00012344, 00012345

[Redacted]

Marine Directorate - Licensing Operations Team (MD - LOT)  
Scottish Government  
5 Atlantic Quay  
150 Broomielaw  
Glasgow  
G2 8LU

9 July 2026

Dear Sir/Madam

**Marine Licence Consultation for Consultation under Section 36 of the Electricity Act 1989 and Marine and Coastal Access Act 2009 for the Erection of Offshore Wind Farm and Associated Infrastructure at Morven North Offshore Wind Array (approximately 61 Km Off The Aberdeenshire Coast) And Morven South Offshore Wind Array (approximately 86 Km Off The Aberdeenshire Coast)**

Thank you for consulting Aberdeenshire Council on the above Marine Licence and Section 36 applications for the proposed Morven North and Morven South Offshore Wind Array Projects.

The Council notes that the proposed developments comprise offshore wind generating stations and associated infrastructure located approximately 61km and 86km offshore from the Aberdeenshire coast respectively. The applications relate solely to the offshore generating infrastructure and do not include onshore grid connection works within Aberdeenshire.

The Council has consulted relevant internal services. The responses received are summarised below:

**Natural Environment:**

The Council's Natural Environment Team has reviewed the proposals and advises that, given the significant offshore location of the developments and the absence of any onshore connection works forming part of the applications, it has no comments on the proposals.

**Archaeology:**

The Council's Archaeology Service has reviewed the submitted archaeological information and confirms that it is satisfied with the archaeological Written Scheme of Investigation

submitted in support of the applications. The Archaeology Service raises no objection to the proposals, subject to the inclusion of a condition requiring the submission, approval and implementation of a Programme of Archaeological Works and provision for any necessary post-excavation analysis and reporting:

*Programme of archaeological works*

*i) No development shall commence unless an archaeological Written Scheme of Investigation (WSI) for a Programme of Archaeological Works has been submitted to, and approved in writing by, the planning authority. The WSI shall include details of how the recording and recovery of archaeological resources found within the application site will be undertaken, and how any required updates to the WSI will be provided throughout the implementation of the programme of archaeological works. The WSI will also detail how any requirement for reporting, post-excavation analysis, archive deposition, publication of results, and the delivery of public benefit (including how this will be recorded and reported) will be undertaken.*

*ii) A Programme of Archaeological Works must be carried out in accordance with the approved WSI, and any addendums to it, as agreed under point (i) unless otherwise agreed in writing with the Planning Authority.*

*iii) Should the archaeological works carried out under point (ii) reveal the need for post excavation analysis, the development hereby approved shall not be occupied or be brought into use unless a Post-Excavation Research Design (PERD) for the analysis, publication and dissemination of results, including additional public engagement and archive deposition, has been secured by the developer and submitted to, and approved in writing by, the planning authority.*

*Reason: To safeguard and record the archaeological potential of the area, and to accord with NPF4 Policy 7 and Historic Environment Policy for Scotland.*

**Conclusion:**

Having regard to the location and nature of the proposed developments, and based on the consultation responses received, **Aberdeenshire Council raises no objection** to the granting of Section 36 consent and the associated Marine Licences for the Morven North and Morven South Offshore Wind Array Projects.

Should you be minded to grant consent, the Council requests that the archaeological condition above is applied.

Yours faithfully  
[Redacted]

[Redacted]  
Head of Planning and Economy

# ANGUS COUNCIL

**From:** [Redacted]  
**Sent:** 16 June 2026 16:38  
**To:** MD Marine Renewables  
**Cc:** [Redacted]  
**Subject:** RE: 00012342, 00012343, 00012344, 00012345 - Morven Offshore Wind Limited – Morven North Offshore Wind Array and Morven South Offshore Wind Array – EIA Section 36 Consent and Marine Licence Applications - Consultation – Response Required by 16 July 2026  
  
**Categories:** Saved in eRDM  
**Objective:** -1

OUR REF: 26/00334/S36

Dear Sir/Madam,

**ELECTRICITY ACT 1989**  
**MARINE (SCOTLAND) ACT 2010**  
**MARINE AND COASTAL ACCESS ACT 2009**

**00012342, 00012343 – Morven Offshore Wind Limited – Morven North Offshore Wind Array – approximately 61 km off the Aberdeenshire coast**

**00012344, 00012345 – Morven Offshore Wind Limited – Morven South Offshore Wind Array – approximately 86 km off the Aberdeenshire coast**

I refer to your email below and can confirm Angus Council Planning Service has reviewed the consultations relating to the above projects and has no comments to make in relation to the proposal in so far as potential impacts it may have on Angus.

Yours sincerely,

[Redacted] | Team Leader – Development Standards | Planning & Sustainable Growth | Angus Council | Angus House | Orchardbank Business Park, Forfar, DD8 1AN | [Redacted]

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# DUNDEE CITY COUNCIL

**Benjamin Taylor**

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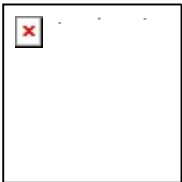
**From:** [Redacted]  
**Sent:** 25 June 2026 12:17  
**To:** MD Marine Renewables  
**Subject:** RE: 00012342, 00012343, 00012344, 00012345 - Morven Offshore Wind Limited – Morven North Offshore Wind Array and Morven South Offshore Wind Array – EIA Section 36 Consent and Marine Licence Applications - Consultation – Response Required by 16 July 2026

**Categories:** Saved in eRDM  
**Objective:** -1

Good afternoon

I have considered the information submitted in respect of these proposals and can confirm Dundee City Council has no comments to make due to the distance and remote nature of the proposed development from the local authority area.

Kind Regards  
[Redacted]



[Redacted]  
Principal Planning Officer (Planning & Economic Development) at Dundee City Council

---

[Redacted]

**W** [www.dundee.gov.uk](http://www.dundee.gov.uk)

**A** Dundee House, 50 North Lindsay Street, DUNDEE, DD1 1QE

# EAST LoTHIAN COUNCIL

**From:** [Redacted]  
**Sent:** 27 August 2026 10:53  
**To:** MD Marine Renewables  
**Cc:** [Redacted]  
**Subject:** RE: 00012342, 00012343, 00012344, 00012345 - Morven Offshore Wind Limited – Morven North Offshore Wind Array and Morven South Offshore Wind Array – EIA Section 36 Consent and Marine Licence Applications - Consultation – Response Required by 16 July 2026

Good morning Benjamin

Thank you for your response and for confirming this. As there are no details available for the Branxton connection, we would make the following comments:

It is acknowledged that the submitted documents reference the proposed 'Morven Branxton Area Grid Connection Project', which is understood to be located within the East Lothian council area. However as there are no technical details for this particular project attached to this case, the Council is unable to make any comments at this time. If further details are submitted, the Council respectfully requests that they are re-consulted in order to review this and make any comments if applicable.

Kind regards

[Redacted]  
Planning Officer  
Planning Policy & Projects  
Development  
East Lothian Council

[Redacted]

CITY OF EDINBURGH COUNCIL

## Benjamin Taylor

---

**From:** [Redacted]  
**Sent:** 15 July 2026 15:29  
**To:** MD Marine Renewables  
**Subject:** 00012342, 00012343, 00012344, 00012345 - Morven Offshore Wind Limited – Morven North Offshore Wind Array and Morven South Offshore Wind Array – EIA Section 36 Consent and Marine Licence Applications - Consultation

Good afternoon,

### **ELECTRICITY ACT 1989**

*The Electricity Works (Environmental Impact Assessment) (Scotland) Regulations 2017*

*The Electricity (Applications for Consent) Regulations 1990*

### **MARINE AND COASTAL ACCESS ACT 2009**

*The Marine Works (Environmental Impact Assessment) Regulations 2007*

**00012342, 00012343 – Morven Offshore Wind Limited – Morven North Offshore Wind Array – approximately 61 km off the Aberdeenshire coast**

**00012344, 00012345 – Morven Offshore Wind Limited – Morven South Offshore Wind Array – approximately 86 km off the Aberdeenshire coast**

Thank you for the consultation request for the above applications. Having reviewed the information, I can confirm that the City of Edinburgh Council has no comments to make on these proposals.

Kind regards,

[Redacted]

[Redacted] Senior Biodiversity Officer | Specialist Team | Planning and Building Standards | Sustainable Development | PLACE Directorate | The City of Edinburgh Council | Waverley Court, G.2, 4 East Market Street, Edinburgh, EH8 8BG | [Redacted] You can access our services at [www.edinburgh.gov.uk/planning-building](http://www.edinburgh.gov.uk/planning-building) and follow the [Planning Edinburgh](#) blog for updates on our service.

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FIFE COUNCIL

**From:** [Redacted]  
**Sent:** 15 July 2026 09:26  
**To:** MD Marine Renewables  
**Cc:** Development Central  
**Subject:** 26/01559/CON - Consultation Response Regarding Applications 00012342, 00012343 Morven North Offshore Wind Array and 00012344, 00012345 Morven South Offshore Wind Array

Dear Marine Directorate,

Thank you for the consultation regarding for the above application.

Fife Council, as Planning Authority, has no comment to make.

Kind Regards,



[Redacted] | **Graduate Planner |**  
**Major Business & Customer Service |**  
**Planning, Climate and Sustainability Service**

For more information, please see our website [fife.gov.uk/planning](https://fife.gov.uk/planning)



*Fife Council has been accredited a Bronze Carbon Literate Organisation (CLO) by [The Carbon Literacy Project](#) and is committed to delivering climate literacy within the organisation to address the climate emergency. Planning, Climate & Sustainability Services have achieved [Gold Carbon Literate Organisation](#), further rising to the challenge of the climate emergency.*

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Fife Council

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HES



HISTORIC  
ENVIRONMENT  
SCOTLAND

ÀRAINNEACHD  
EACHDRAIDHEIL  
ALBA

By email to:

[MD.MarineRenewables@gov.scot](mailto:MD.MarineRenewables@gov.scot)

Longmore House  
Salisbury Place  
Edinburgh  
EH9 1SH

[redacted]

Licensing Operations Team  
Marine Directorate

Enquiry Line: 0131 668 8716  
[HMConsultations@hes.scot](mailto:HMConsultations@hes.scot)

Our case ID: 300063810  
Your ref: 00012344  
00012345  
24 August 2026

Dear [redacted]

Electricity Act 1989

The Electricity Works (Environmental Impact Assessment) (Scotland) Regulations 2017,

The Electricity (Applications for Consent) Regulations 1990, Marine and Coastal Access Act 2009

The Marine Works (Environmental Impact Assessment) Regulations 2007

Morven South Offshore Wind Array– approximately 86km off the Aberdeenshire coast - Construction and Operation of Generating Station and Associated Infrastructure

## **EIA Report**

Thank you for consulting us on this Environmental Impact Assessment (EIA) Report, Section 36 and Marine License applications, which we received on 31 July 2026. We have reviewed the information received and considered the proposed development in terms of our historic environment interests. This covers cultural World Heritage Sites, scheduled monuments and their settings, category A-listed buildings and their settings, inventory gardens and designed landscapes, inventory battlefields and Historic Marine Protected Areas.

The relevant local authority archaeological and cultural heritage advisors will also be able to offer advice on impacts on the historic environment. This may include topics covered by [our advice-giving role](#), and also other topics such as unscheduled archaeology, category B and C listed buildings, and conservation areas.

### **Our advice**

We have considered the information received and we do not have any comments to make on the proposals. We have not identified any likely significant effects on our historic environment interests.

Our scoping response of 24 August 2023 confirmed that we were content for impacts on the setting of terrestrial historic environment assets from the offshore elements to be scoped

Historic Environment Scotland – Longmore House, Salisbury Place, Edinburgh, EH9 1SH

Scottish Charity No. **SC045925**

VAT No. **GB 221 8680 15**

out of the EIA for this proposal. We are therefore content that the EIA Report does not contain a cultural heritage assessment of impacts on heritage assets within our remit.

Please note that from 1 January 2025, we no longer provide advice on undesignated underwater cultural heritage. This includes the preparation of documents for post-consent activities including Written Schemes of Investigation or Protocols for Archaeological Discoveries. We therefore have no comments to make on the marine archaeology assessment. For EIA projects, the relevant competent authority must ensure that they have access to sufficient expertise to examine the EIA Report in accordance with the relevant regulations.

Our decision not to provide comments should not be taken as our support for the proposals. This application should be determined in accordance with national and local policy on development affecting the historic environment, together with related policy guidance.

#### **Further information**

Decisions that affect the historic environment should take the [Historic Environment Policy for Scotland](#) (HEPS) into account as a material consideration. HEPS is supported by our [Managing Change guidance series](#).

We hope this is helpful. If you would like to submit more information about this or any other proposed development to us for comment, please send it to our consultations mailbox, [hmconsultations@hes.scot](mailto:hmconsultations@hes.scot). If you have questions about this response, please contact [redacted]

Yours sincerely

**Historic Environment Scotland**

MCA



Maritime &  
Coastguard  
Agency

Vaughan Jackson  
**Maritime and Coastguard Agency**  
UK Technical Services Navigation  
105 Commercial Road  
Southampton  
SO15 1EG

[www.gov.uk/mca](http://www.gov.uk/mca)  
10<sup>th</sup> July 2026

Licensing Operations Team,  
Marine Directorate,  
Scottish Government,  
5 Atlantic Quay,  
150 Broomielaw,  
Glasgow,  
G2 8LU.

By email to [MD.MarineRenewables@gov.scot](mailto:MD.MarineRenewables@gov.scot)

Dear Marine Directorate,

**APPLICATION FOR CONSENT UNDER SECTION 36 OF THE ELECTRICITY ACT 1989 AND  
MARINE LICENCES UNDER PART 4 OF THE MARINE (SCOTLAND) ACT 2010 AND PART 4  
OF THE MARINE AND COASTAL ACCESS ACT 2009 TO CONSTRUCT AND OPERATE:**

**Morven Offshore Wind Limited – Morven North Offshore Wind Array**

**Morven Offshore Wind Limited – Morven South Offshore Wind Array**

Thank you for the opportunity to comment on the applications for consent under Section 36 of the Electricity Act 1989 and marine licences under the Marine (Scotland) Act 2010 for the Morven North and Morven South Offshore Wind Farms.

The Maritime and Coastguard Agency (MCA) is an Executive Agency of the Department for Transport and is responsible throughout the UK for implementing and developing the UK Government's maritime safety and environmental protection policy. This includes co-ordinating maritime Search and Rescue (SAR) through His Majesty's Coastguard 24 hours a day and checking that ships meet UK and international safety rules. The MCA works to prevent the loss of lives at the coast and at sea, to ensure that vessels are safe, and to prevent coastal pollution. The Marine Safety and PNT Services Branch is responsible for UK radiocommunication and navigation policy. This primarily covers SOLAS Convention (Safety of Life at Sea Convention 1974, as amended) Chapters IV and V; the COLREG Convention (International Regulations for Preventing Collisions at Sea 1972, as amended); and the ITU Convention (International Telecommunications Convention 1932, as amended).

The Navigation Risk Assessment (NRA) and the shipping and navigation elements of the Environmental Impact Assessment Reports for both Morven North and Morven South have been reviewed and we would like to comment as follows:

## **Navigation Risk Assessment**

Anatec Limited has undertaken a detailed Navigation Risk Assessment (NRA) in accordance with MCA guidance (MGN 654) and NRA risk assessment methodology. This NRA informs the shipping and Navigation chapters of the EIA consisting of:

Volume 2– Morven North, Chapter 13: Shipping and Navigation,  
 Volume 2– Morven South, Chapter 13: Shipping and Navigation and;  
 Volume 3 – Annex 13.1: Shipping and Navigation Shared Navigation Risk Assessment.

We are satisfied that appropriate traffic data has been collected in accordance with MGN 654, which includes two 14-day marine vessel traffic surveys in Summer 2024 (June - July) and winter 2024 (November – December). In addition, further surveys from winter and summer 2023 have been included for characterisation of the traffic movements along with a full 12-month Automatic Identification System (AIS) data set from 2022.

We note that the data have been considered over three study areas as described in section 13.2 volume 2 of the Morven North and Morven South Shipping and Navigation chapters and section 3.4 of the NRA. These areas are Morven North, Morven South and the combined North and South areas referred to as the Regional Shipping and Navigation Study Area. Vessel traffic movements for all three scenarios are assessed in chapter 10 of the NRA.

The MCA is content that the hazard log presented in Appendix B, Table B.1 of the NRA is a reasonable and proportional assessment of the risks. A completed MGN 654 Checklist has also been provided in Appendix A, Table A.1 as part of the NRA, and the MCA is satisfied that all recommendations have been addressed.

It is noted that some of the older studies carried out by the MCA regarding Navigation, Communication, and Position Fixing Equipment are referred to in Section 13 of the NRA. These are supported by other more recent studies which is welcomed. There may be additional benefit in referring to more recent helicopter trials and documents written by the MCA in 2019, titled: “MCA report following aviation trials and exercises in relation to offshore windfarms” and “MCA report following aviation trials at Hornsea Project 1 windfarm”. However, we are content with the conclusions of the impact on navigation, communication and position fixing equipment presented by the applicant.

## **Emergency Response and Search and Rescue**

A SAR checklist based on the requirements in MGN 654 Annex 5 will need to be completed in agreement with MCA before construction starts. This will include the requirement for an approved Emergency Response Co-operation Plan (ERCoP) and will be incorporated as a condition of the Marine Licence.

During SAR discussions, particular consideration will need to be given to the implications of the site size and location. As there are various possible scenarios regarding the build out of Morven North and Morven South Offshore Wind Farms (OWFs) as detailed in the shared NRA, it would be beneficial for the applicant to confirm the final build out scenario as early in these SAR discussions as possible.

Attention should be paid to the level of radar surveillance, AIS and shore-based VHF radio coverage and give due consideration for appropriate mitigation such as radar, AIS receivers and in-field, Marine Band VHF radio communications aerial(s) (VHF voice with Digital Selective Calling (DSC)) that can cover the entire wind farm sites and their surrounding areas.

## **Cumulative Impacts**

A Cumulative Impact Assessment (CIA) has been made based on existing and proposed developments in the study area as explained in Volume 3, Appendix 6.1 Cumulative Effects Screening. These developments are summarised in Section 14, table 14.1 and figure 14.1 of the NRA. As there are multiple scenarios, assessments have been carried out considering Morven North and Morven South in isolation and the complete build out of north and south together covering the Regional Shipping and Navigation Study Area concurrent build out scenario.

The main commercial routes and those with potential for deviations have also been identified. Current routes and expected deviations under fore mentioned scenarios are considered in Section 15 of the NRA with cumulative risks for the various scenarios being assessed in sections 21-23 of the NRA. These are summarised in Volume 2, Chapter 13 of the EIA for both Morven North and Morven South.

It is also noted that a tiered approach to cumulative assessment has been adopted. We are content with this approach to the CIA at this stage.

## **Layout Design**

The turbine layout design will require MCA and Northern Lighthouse Board (NLB) approval prior to construction to minimise the risks to surface vessels, including rescue boats, and search and rescue aircraft operating within the site. The MCA will seek to ensure all structures are aligned in straight rows and columns with a minimum of two lines of orientation. Further advice will be provided to the project once the layout discussions have started. Once again we note that there are potentially three scenarios regarding construction, therefore we encourage the applicant to enter these layout discussions with MCA and NLB as early in the post consent process as possible.

## **Marking, Lighting and Construction Programme**

The MCA will seek to ensure the turbine numbering system follows a 'spreadsheet' principle and is consistent with other windfarms in the UK. All lighting and marking arrangements will need to be agreed with the MCA and the NLB. The MCA requires all aviation lighting to be visible 360° and compatible with night vision imaging systems, as detailed in CAP 764 and MGN 654 Annex 5. We would also expect to see some form of linear progression of the construction programme avoiding disparate construction sites across the development area, and the consent needs to include the requirement for an agreed construction plan to be in place ahead of any works commencing.

## **Wet Storage**

As fixed bottom structures are to be used in the projects as stated in both Morven North and Morven South's Volume 1 chapter 3, Project Descriptions, large scale wet storage of floating infrastructure is not expected. Regarding the storing of components on the seabed within the array area, as the charted depths are greater than 40 metres, it is not expected that any storage would increase the risk to surface navigation. However, the MCA will need to be informed of materials to be stored within the array (and along the export cable corridor) and made aware of any that will exceed a 5% reduction in surrounding depth referenced to Chart Datum.

## **Hydrographic Surveys**

MGN 654 requires that hydrographic surveys should fulfil the requirements of the International Hydrographic Organisation (IHO) Order 1a standard, with the final data supplied as a digital full density data set, and survey report to the MCA Hydrography Manager. Further information can be found in MGN 654 Annex 4 supporting document titled 'Hydrographic Guidelines for Offshore Developers', available on our website: <https://www.gov.uk/guidance/offshore-renewable-energy-installations-impact-on-shipping>. This includes surveys during the pre-construction, post-construction and post-decommissioning stages. We would like to highlight the need to provide the data in either GSF or

CARIS format and that Total Vertical and Horizontal Uncertainty (TVU & THU) calculations must be provided.

### **Cable Routes**

The exact export cable route to landfall is yet to be fully developed and does not form part of this application as detailed in Paragraph 6.2.5.2. of the non-technical summary but does include transmission infrastructure options for multiple Offshore Substation Platforms and associated foundations, interconnector cables and scour protections.

it is noted in table 2.1, Volume 3, Annex 6.3: EIA Commitments Register, that a Cable Burial Risk Assessment (CBRA) is to be carried out and a cable plan (CaP) produced as mitigation measure MM-2. Any consented cable protection works must ensure existing and future safe navigation is not compromised. The MCA would accept a maximum of 5% reduction in surrounding depth referenced to Chart Datum.

We note that there is reference to High Voltage Direct Current (HVDC) infrastructure in the project description and would like to remind the applicant that there may be potential impact on ships compasses from the electro-magnetic field generated. A pre-construction compass deviation study may be required on the expected electro-magnetic field. Should this go ahead, we would be willing to accept a three-degree deviation for 95% of the cable route. For the remaining 5% of the cable route no more than five-degree deviation will be attained.

If this requirement cannot be met, further mitigation measures may be required including a post installation deviation survey of the cable route. This data must then be provided to the MCA and UKHO, as a precautionary notation may be required on the appropriate Admiralty Charts regarding possible magnetic anomalies along the cable route.

Where High Voltage Alternating Current (HVAC) transmission infrastructure is to be used, a pre-construction compass deviation study will not be required.

### **Safety Zones**

The requirement and use of safety zones as detailed in the application, specifically as mitigation measure MM-33 in table 2.1, Volume 3, Annex 6.3: EIA Commitments Register is noted. MCA supports the use of safety zones and will comment on the safety zone application once submitted, as a statutory consultee.

### **Liaison with local MCA Marine Office**

The applicant should be reminded that their contractors and subcontractors must have the required certification for all vessel operations, and early engagement with the local MCA Marine Office should be undertaken where necessary to ensure there are no issues with regards to survey and inspections, towage, and safety requirements. Various additional certificates including a load line exemption for the turbine platforms will be required prior to any towage to site and the applicant must ensure any ballast water requirements are addressed.

### **Embedded Mitigation**

We have the following comments on the proposed risk controls in section 24, Table 24.1 of the NRA and Volume 3, Annex 6.3: EIA Commitments Register

1. Cable Burial Risk Assessment;
  - In case of damage to, or destruction or decay of, the authorised project seaward of MHWS or any part thereof, excluding the exposure of cables, notification must be issued

to MCA, NLB, the Kingfisher Information Service of Seafish and the UKHO within 24 hours of becoming aware.

- In case of exposure of cables on or above the seabed, the undertaker must within three days following identification of a potential cable exposure, notify mariners and inform Kingfisher Information Service of the location and extent of exposure. Copies of all notices must be provided to the MCA, NLB, and the UKHO within 5 days.
- The plan must include proposals for monitoring offshore cables including cable protection during the operational lifetime of the authorised scheme which includes a risk-based approach to the management of unburied or shallow buried cables.
- Attention should be paid to cabling routes and where appropriate burial depth for which a Burial Protection Index study should be completed and subject to the traffic volumes, an anchor penetration study may be necessary.

## 2. Navigational Safety Plan and Vessel Management Plan (NSPVMP);

- Local notification to mariners must be issued at least 14 days prior to the commencement of the authorised project or any part thereof advising of the start date of each work and the expected vessel routes from the construction ports to the relevant location. They must be updated and reissued at weekly intervals during construction activities and at least 5 days before any planned operations (or otherwise agreed) and maintenance works and supplemented with VHF radio broadcasts agreed with the MCA.
- The Kingfisher Information Service of Seafish, must be informed of details of the vessel routes, timings and locations relating to the construction of the authorised project or any part thereof by email to [kingfisher@seafish.co.uk](mailto:kingfisher@seafish.co.uk) :-
  - i. at least 14 days prior to the commencement of offshore activities, for inclusion in the Kingfisher Fortnightly Bulletin and offshore hazard awareness data, and;
  - ii. as soon as reasonably practicable and no later than 24 hours of completion of all offshore activities.
- Post construction monitoring is required and must include vessel traffic monitoring by automatic identification system for a duration of three consecutive years following the completion of construction of the authorised project. An appropriate report must be submitted to the MCA and NLB at the end of each year of the three-year period.

## Conclusion

The comments detailed above are not considered to be blocks to development, but they are provided to highlight any areas which may require further discussion. Subject to the applicant meeting any requirements addressed in this letter and meeting the licence conditions, it provides a cautious acceptance of the application for consent.

Yours faithfully,

[Redacted]

Vaughan Jackson  
Offshore Renewables Project Lead  
Marine Safety and PNT Services

NLB



# Northern Lighthouse Board

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Your Ref: Morven North OWA – S36 Consent & ML Application  
Our Ref: AL/OPS/ML/WIND\_026\_26

[Redacted]

Licensing Operations Team – Marine Directorate  
Scottish Government  
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23 June 2026

## ***ELECTRICITY ACT 1989***

*The Electricity Works (Environmental Impact Assessment) (Scotland) Regulations 2017*  
*The Electricity (Applications for Consent) Regulations 1990*

## ***MARINE AND COASTAL ACCESS ACT 2009***

*The Marine Works (Environmental Impact Assessment) Regulations 2007*

## **Application for Consent Under Section 36 of the Electricity Act 1989 and Part 4 of the Marine & Coastal Access Act 2009 to Construct and Operate the Morven North Offshore Wind Array, Approximately 61km East of the Aberdeenshire Coast**

Thank you for your e-mail correspondence dated 3<sup>rd</sup> June 2026 relating to the application submitted by **Morven Offshore Wind Ltd** for consent to develop and operate the Morven North Offshore Wind Array (OWA), located approximately 61km east the Aberdeenshire coast.

Northern Lighthouse Board note that the Morven North OWA will consist of up to 96 fixed-bottom Wind Turbine Generators (WTG) with an approximate export capacity of up to 1.5GW. A maximum of five Offshore Substation Platforms (OSP) will be located within the array, with onshore grid connections expected at Branxton, East Lothian and Hawthorn Pit, County Durham.

NLB have reviewed the documentation associated with the application, with particular reference to the navigational safety elements, including cumulative impacts, of the application contained within Chapter 13 (Shipping & Navigation) and Chapter 16 (Other Sea Users and Communications). NLB recognise the inclusion of Annex 13.1: Morven North OWA and Morven South OWA Shared Navigational Risk Assessment (NRA), and Annex 13.2: East Region Developers Group Cumulative Baseline for Shipping and Navigation.

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NLB note the hazards identified through the Navigational Risk Assessment (NRA) process, and the associated embedded mitigations detailed within Table 17.1 of the NRA. NLB also acknowledge the inclusion of Section 17.2 Marine Aids to Navigation within the document, with particular reference to Section 17.2.3.1, highlighting the importance of the Lighting and Marking Plan (LMP) working successfully for not only Morven North, but also in conjunction with Morven South, and any other adjacent developments if required.

NLB also note the inclusion of Annex 13.2 (East Region Developers Group Cumulative Baseline for Shipping and Navigation).

The inclusion of Outline Post-Consent Documentation such as the Outline Lighting & Marking Plan (LMP) and Outline Navigational Safety Plan and Vessel Management Plan (NSP&VMP) is welcomed.

Within the Outline Lighting & Marking Plan, NLB acknowledge the inclusion of Section 6 (Maintenance of AtoN), and the commitment to undertake remote monitoring of AtoN on buoyage during the construction phase, and of WTG AtoN during the O&M phase. NLB also welcome the commitment that general maintenance will be undertaken to ensure functionality of the AtoN is maintained and optimised.

Within Section 6 (Maintenance of Aids to Navigation) of the Outline Lighting & Marking Plan, NLB request inclusion of the following text:

“NLB will conduct regular audits of Morven Offshore Wind Farm Ltd for their provision of Aids to Navigation, as established by the Merchant Shipping Act 1995, and the Northern Lighthouse Board’s position as the General Lighthouse Authority for Scotland and the Isle of Man. NLB request that a record of annual AtoN maintenance and testing is kept for auditing purposes.”

NLB request that Sections 7.2.1.2 to 7.2.1.5 (Loss of Aids to Navigation) of the Outline LMP is reworded to include the following:

“In the event of a significant AtoN outage, notification will be provided to the Northern Lighthouse Board (navigation@nlb.org.uk / 08000 326655) and the NLB AtoN Reporting Portal at <http://nlb.org.uk/latonsonline>, the UK Hydrographic Office (using form H102 via [admiralty.co.uk/H-note](http://admiralty.co.uk/H-note)) and the local HM Coastguard ([zoneXXX@hmcg.gov.uk](mailto:zoneXXX@hmcg.gov.uk)).

Notifications to local marine stakeholders shall also be made by Notice to Mariners and the Kingfisher Safety Bulletin scheme. In the event of a failure which may lead to a significant risk to navigational safety, additional temporary risk mitigation measures will be considered following consultation with the NLB and MCA, including the use of a guard vessel, until such time as the AtoN has been repaired or replaced.”

Morven North OWA – S36 Consent & ML Application  
Ms J Goodheir  
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NLB also acknowledge the commitment to engage with NLB with regard to a significant failure of AtoN, and potential mitigations including the deployment of a guard vessel. NLB request that Section 7.2.1.3 – Point 3 is amended to read “loss of station of any navigational buoy, including significant delay (greater than 72 hours) to it being restored”.

NLB also request that Section 7.1 (Loss of Aid to Navigation) of the Outline Lighting & Marking Plan contains reference to Section 3 of the Morven North OWF Navigational Safety Plan & Vessel Management Plan, and the relevant procedures for the promulgation of Local Notices to Mariners and Radio Navigational Warnings in the event of an Aid to Navigation failure.

It is acknowledged that the Morven North and Morven South projects are closely linked, whilst being subject to individual consenting processes. Additionally, the close proximity of other offshore wind projects, including Ossian, Bowdun and Bellrock OWFs, establishes a requirement for flexibility with regard navigational safety issues, including the Lighting and Marking scheme for each project. NLB will engage closely with both Morven Offshore Wind Ltd and adjacent project developers to ensure that the lighting and marking solutions for each project are suitable for both the individual projects, and the wider cumulative region.

The establishment, alteration and discontinuation of any Aid to Navigation is subject to the Statutory Sanction of the Commissioners of Northern Lighthouses. Further guidance and application forms can be obtained on request from the NLB Navigation Department ([navigation@nlb.org.uk](mailto:navigation@nlb.org.uk)).

NLB operate vessels in the Central North Sea as part of their statutory duties under the Merchant Shipping Act 1995. However, this is largely for the inspection of AtoN installed on offshore installations. Aids to Navigation associated with the Bellrock OWF would be incorporated in to these inspection voyages, and NLB do not anticipate that the project will negatively impact these operations.

Northern Lighthouse Board have no objection to the proposed Morven North OWF, and will continue to engage with the applicant with regard to the development of post-consent navigational safety documentation.

Yours sincerely  
[Redacted]

[Redacted]  
Navigation Manager

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