Muir Mhòr Offshore Wind Farm

Derogation Case

Appendix A: Ornithological Compensation Plan

Revision No.	Date	Reason for Issue	Author	Reviewer	Approver
01	22/11/2024	Final	GoBe Consultants Ltd.	GoBe Consultants Ltd.	MMOWF Ltd

Document Information

Document ID	**MMH-GBE-A004-ENV-0006-602**
Revision	01
Date	22/11/2024

Contents

1. Introduction 1
1.1. Project Background 1
1.2. Document Purpose 1
2. HRA Guidance and Predicted Impacts 3
2.1. Guidance 3
2.2. Conservation Objectives 3
2.3. Predicted Impacts 4
3. Species of Focus 5
3.1. Introduction 5
3.2. Atlantic puffin (*Fratercula arctica*) 5
3.3. Black-legged kittiwake (*Rissa tridactyla*) 6
3.4. Common guillemot (*Uria aalge*) 7
3.5. Northern gannet (*Morus bassanus*) 8
4. Selection of Compensation Measures 10
4.1. Overview 10
4.2. Site Selection 11
Long List of Sites 11
Short List of Sites 12
5. Ornithological Surveys 13
5.2. Methodology 13
5.3. Key Findings 13
5.4. Consultation 14
6. Compensation Measures 16
6.1. Introduction 16
6.2. Results: Compensation Measures 16
6.3. Artificial Nesting Structures 17
6.4. Predator Control 17
6.5. Disturbance Reduction 18
6.6. Strategic Compensation 19
7. Securing Compensation under Section 36 Consent 19
8. References 21

Figures

Figure 3-1 Puffin population trends at Farne Islands SPA and Forth Islands SPA, which have connectivity to the Proposed Development. Source: Burnell et al., 2023. 6

Figure 3-2 Kittiwake population trends at SPAs with connectivity to the Proposed Development. Source: Burnell et al., 2023. 7

Figure 3-3 Guillemot population trends at SPAs with connectivity to the Proposed Development. Source: Burnell et al., 2023. 8

Figure 3-4 Gannet population trend at Forth Islands SPA, which has connectivity to the Proposed Development. Source: Burnell et al., 2023. 9

Tables

Table 2-1 Project-only predicted annual mortality of breeding adult seabirds (worst-case scenario) and associated SPAs where AEoSI has been determined by NatureScot. 4

Table 4-1 Shortlisted sites of non-SPA colonies, including other conservation designations. 12

Table 5-1 Exchanges with stakeholders on possible compensation measures. 14

Table 6-1 Summary of proposed compensation measures and associated species. 16

Glossary

Term	Definition
Additionality	The compensation measure must be additional to the normal activities carried out for the protection and management of SPAs. Measures that are already undertaken by SNCBs should not be considered as compensation.
Array Area	The area in which the generation infrastructure (including Wind Turbine Generators and associated foundations and inter-array cables), Offshore Electrical Platform(s), and an interconnector cable will be located.
Developer	Muir Mhòr Offshore Wind Farm Limited.
European Sites	European sites consist of SACs and SPAs, which together provide for the protection and long-term survival of Europe's most valuable and threatened species and habitats. Collectively, these sites comprise the Natura 2000 network of protected sites across Europe.
Floating Foundations	The floating structures on which the Wind Turbine Generators are installed.
Hammock	Artificial ledges drilled into a cliff side and designed for kittiwake to nest on.
Inter-array cables	Cables which link the wind turbines generators to each other and the Offshore Electrical Platform(s).
Interconnector cable	Cable which links the Offshore Electrical Platform(s) to one another, allowing for power to be transferred between the platforms.
Landfall	The area between Mean High Water Springs (MHWS) and Mean Low Water Springs (MLWS) where the offshore export cables are brought onshore.
National Site Network	A National Site Network covering both land and sea, including the UK's inshore and offshore marine areas. This network encompasses existing SACs and SPAs, as well as new SACs and SPAs designated under the Habitats Regulations.
Offshore Electrical Platform(s) (OEP(S))	Offshore platform consisting of High Voltage Alternating Current (HVAC) equipment, details depending on the final electrical set up of the Project.
Offshore export cables	The subsea electricity cable circuits running from the Offshore Electrical Platform(s) to the landfall which will transmit the electricity generated by the offshore wind farm to the onshore export cables for transmission onwards to the onshore substation and the national electrical transmission system along with auxiliary cables such as fibre optic cables.
Philopatry	Philopatry refers to an organism's tendency to remain in or frequently return to a specific location. There are many reasons for this behaviour, but one of the most common is natal philopatry, where animals return to their birthplace to reproduce.
Productivity	Productivity and nesting refer to data and statistics concerning bird breeding performance, including metrics such as number of chicks produced per nesting attempt.
Project	Muir Mhòr Offshore Wind Farm – comprises the wind farm and all associated offshore and onshore components.
Proposed Development	The offshore Muir Mhòr Offshore Wind Farm project elements to which this Offshore EIA Report relates.
Wind Turbine Generator (WTG)	The wind turbines that generate electricity consisting of tubular towers and blades attached to a nacelle housing mechanical and electrical generating equipment.

Acronyms

Term	Definition
AA	Appropriate Assessment
AEoSI	Adverse Effect on Site Integrity
ANS	Artificial Nesting Structure
AON	Apparently Occupied Nest
AOS	Apparently Occupied Site
BTO	British Trust for Ornithology
CE	Conservation Education
CO	Conservation Objective
CIMP	Compensation Implementation and Monitoring Plan
EE	Environmental Education
EEZ	Exclusive Economic Zone
EIA	Environmental Impact Assessment
EIAR	Environmental Impact Assessment Report
HPAI	Highly Pathogenic Avian Influenza
HRA	Habitats Regulations Appraisal
HVAC	High Voltage Alternating Current
IND	Individual (birds)
INNS	Invasive Non-Native Species
IROPI	Imperative Reasons of Overriding Public Interest
IUCN	International Union for Conservation of Nature
LPO	Ligue pour la protection des oiseaux
LSE	Likely Significant Effects
MCP	Mink Control Project
MD-LOT	Marine Directorate Licensing Operations Team
MW	Megawatt
MHWS	Mean High Water Springs
MLWS	Mean Low Water Springs
MMF	Mean Maximum Foraging
MPA	Marine Protected Area
NSN	National Site Network
OEP(s)	Offshore Electrical Platform(s)
OFFSAB	Outer Firth of Forth and St Andrews Bay Complex
OWF	Offshore Wind Farm
RIAA	Report to Inform Appropriate Assessment
RSPB	Royal Society for the Protection of Birds
SAC	Special Area of Conservation
SD	Standard Deviation
SISI	Scottish Invasive Species Initiative
SMP	Seabird Monitoring Programme
SNCB	Statutory Nature Conservation Body
SPA	Special Protection Area

Term	Definition
SSC	Scottish Seabird Centre
SSSI	Site of Special Scientific Interest
SUP	Stand-Up Paddleboard
UNK	Unknown
WTG	Wind Turbine Generator

1. INTRODUCTION

1.1. PROJECT BACKGROUND

1.1.1. Muir Mhòr Offshore Wind Farm Limited (hereafter referred to as 'the Developer') is proposing to develop the Muir Mhòr Offshore Wind Farm (hereafter 'the Project'). The Project is made up of both offshore and onshore components. The subject of this report is the offshore infrastructure of the Project seaward of Mean High-Water Springs (MHWS) which is hereafter referred to as 'the Proposed Development'.

1.1.2. The Muir Mhòr Array Area covers an area of approximately 200 km^2 and is located approximately 63 km east of Peterhead on the east coast of Scotland. The offshore infrastructure of the Proposed Development includes Wind Turbine Generators (WTGs) and associated floating foundations, the Offshore Electrical Platform(s) (OEP(s)) and associated foundations, the inter-array cables, an interconnector cable, offshore export cables and landfall.

1.1.3. The Proposed Development is located within Scottish Territorial Waters (extending to 12 nautical miles (nm) from shore) and the United Kingdom (UK) Exclusive Economic Zone (EEZ; between 12 and 200 nm). Consents and licences required for the construction and operation of offshore wind farms in these waters are granted by Scottish Ministers. As a generating station with a generating capacity of above 50 megawatt (MW) located in the Scottish offshore region, the Developer is applying for a Section 36 Consent alongside the necessary marine licences for the generating and transmission assets comprised in the Proposed Development. The Marine Directorate Licensing Operations Team (MD-LOT), process Section 36 Consent and marine licence applications on behalf of the Scottish Ministers.

1.2. DOCUMENT PURPOSE

1.2.1. This Ornithological Compensation Plan (hereafter referred to as 'the Plan') provides information on the proposed ornithological compensation measures for the Proposed Development. It outlines the actions undertaken in the development of the Plan and how these measures can be implemented and monitored if deemed necessary by the Scottish Ministers further to a derogation for the Proposed Development under the Habitat Regulations.

1.2.2. An Appropriate Assessment (AA) is required for projects or plans which may affect European sites. If, during the Habitats Regulations Appraisal (HRA) process an Adverse Effect on Site Integrity (AEoSI) of a particular site cannot be excluded, a derogations process is undertaken during which any potential alternative solutions are assessed. Should no appropriate alternative solutions exist, and provided there are Imperative Reasons of Overriding Public Interest (IROPI) in the project proceeding, the final stage of the derogations process is to develop compensation measures to ensure that overall coherence of the National Site Network (NSN) is protected.

1.2.3. Pending the Scottish Ministers AA conclusions, the derogation case is presented for the NSN sites and species where the Developer's Report to Inform Appropriate Assessment (RIAA) (Muir Mhòr Offshore Wind Farm Limited, 2024) concludes that either an AEoSI cannot be ruled out; or, no AEoSI is concluded but it is considered there is a risk that Scottish Ministers may disagree with these conclusions. In the latter case, the derogation case is therefore presented "without prejudice" to the Developer's conclusions.

1.2.4. The derogation case has been provided for four qualifying seabird species: Atlantic puffin (*Fratercula arctica*, hereafter referred to as puffin), black-legged kittiwake (*Rissa tridactyla*, hereafter referred to as kittiwake), common guillemot *(Uria aalge*, hereafter referred to as guillemot), and northern gannet (*Morus bassanus*, hereafter referred to as gannet) at five SPAs which are set out in Section 2.3.

1.2.5. This document (and its associated appendices) supports the compensation aspect of the derogation case, identifying the compensatory measures which could be delivered to secure the overall coherence of the National Site Network. Details of whether this case has been provided as a full derogation or without prejudice derogation case, depending on site and/or species, is presented in Table 2-1.

1.2.6. The proposed list of compensation measures has the potential to be delivered either individually or as a suite of measures that provide benefits for a range of different seabird species including all those identified within these documents. The measures also have the flexibility to be scaled up (or down) to meet the specific compensation requirements determined by Scottish Ministers.

1.2.7. It is the Developer's view that the information presented within this Plan (and its associated annexes) clearly provides enough information to give Scottish Ministers confidence in the proposed measures, allowing them to grant the required consents based on this Plan, should they decide that securing compensation is necessary. The Developer has provided detail of the proposed compensation measures within the corresponding appendices for each measure. These appendices present further detail on the delivery methodology for the compensation measures, including their flexibility and scale.

1.2.8. Each compensation measure in this document is detailed in its respective Evidence and Roadmap document, as per the following:

- Appendix B: Artificial Nesting Structures for Kittiwake Evidence and Roadmap;
- Appendix C: Predator Control Evidence and Roadmap; and
- Appendix D: Disturbance Reduction Evidence and Roadmap.

1.2.9. An outline Compensation Implementation and Monitoring Plan (CIMP) is provided as part of each Evidence and Roadmap document. These will be progressed post-consent and submitted to the Scottish Ministers to be approved in consultation with relevant key stakeholders.

2. HRA GUIDANCE AND PREDICTED IMPACTS

2.1. GUIDANCE

2.1.1. There is at present no publicly available formal guidance from the Scottish Government in relation to the identification of potential ornithology compensation measures at individual project level. The following documents have therefore been used to guide the identification of said compensation measures:

- Best Practice Guidance for Developing Compensatory Measures in relation to Marine Protected Areas (Defra, 2021);
- Consultation on policies to inform updated guidance for Marine Protected Area (MPA) assessments (Defra, 2024);
- Guidance document on Article 6(4) of the 'Habitats Directive' 92/43/EEC (European Commission, 2007);
- European Commission (EC) 2018 "Managing Natura 2000 Sites" (European Commission, 2018);
- The Planning Inspectorate's Nationally Significant Infrastructure Projects: Advice on Habitats Regulations Assessments (Planning Inspectorate, 2024).
- Framework to Evaluate Ornithological Compensatory Measures for Offshore Wind (DTA 2021);
- Report to Crown Estate Scotland and the Scottish Offshore Wind Energy Council: HRA Derogation Scope B – Review of Seabird Strategic Compensation Options (MacArthur Green 2021); and
- Assessment of Compensatory Measures for Impacts of Offshore Windfarms on Seabirds (McGregor *et al.* 2022).

2.2. CONSERVATION OBJECTIVES

2.2.1. The Conservation Objectives (COs) for SPAs with connectivity to the Proposed Development were consulted. COs are designed to safeguard site integrity for the qualifying features (i.e., individual species and/or species assemblages) for which the SPA was designated and to ensure that the site contributes to achieving the aims of the Birds Directive (transposed into UK law following Brexit). COs may be affected by AEoSI and as such, it is important to consider them when developing compensation measures, as said measures should address specific impacts on the site.

2.2.2. The COs for the Scottish SPAs identified are as follows:

- To avoid deterioration of the habitats of the qualifying species (listed below) or significant disturbance to the qualifying species, thus ensuring that the integrity of the site is maintained; and
- To ensure for the qualifying species that the following are maintained in the long term:
  - Population of the species as a viable component of the site;
  - Distribution of the species within site;
  - Distribution and extent of habitats supporting the species;
  - Structure, function and supporting processes of habitats supporting the species; and
  - No significant disturbance of the species.

2.2.3. These COs primarily offer site-based protection and not all are applicable to mobile interests, such as seabirds, when they are outwith the site boundaries. It is therefore the conservation objective relating to maintaining the *population of the species as a viable component of the site* which is key to the consideration of potential impacts from offshore wind farms to seabirds at sea.

2.2.4. This CO addresses the population-level consequence of potential seabird mortalities arising from collision risk and/or distributional response impact pathways to determine whether there could be any effect on population viability arising from Project-alone or cumulative impacts, and thus an AEoSI.

2.2.5. Collision risk and distributional responses are the key impact pathways to consider under Appropriate Assessment for SPA breeding seabird interests, as these are the only ones where mortality is quantifiable and where a population-level consequence may be possible.

2.3. PREDICTED IMPACTS

2.3.1. This section provides an overview of the conclusions of the RIAA (Muir Mhòr Offshore Wind Farm Limited, 2024) for the Proposed Development that must be considered during the development of compensation measures. It sets out the species, SPAs, and relevant predicted impacts from the Proposed Development, where the Developer considers there is a risk that the Scottish Ministers cannot rule out an AEoSI for project mortalities in-combination with other planned and consented projects. The SPAs and species included in Table 2-1 are features for which NatureScot have previously concluded AEoSI (Scottish Government, 2024). The impacts presented are the predicted annual project-alone mortalities across both breeding and non-breeding seasons, applying the worst-case distributional mortality scenario.

Table 2-1 Project-only predicted annual mortality of breeding adult seabirds (worst-case scenario) and associated SPAs where AEoSI has been determined by NatureScot.

Species	Population	Project-only predicted annual mortality of breeding adults (higher distributional response scenario)	Derogation: Full or without-prejudice?
Kittiwake	Buchan Ness to Collieston Coast SPA	13.91	Full
	East Caithness Cliffs SPA	7.22	Full
	Fowlsheugh SPA	4.95	Full
	Troup, Pennan and Lion's Heads SPA	9.35	Full
	Forth Islands SPA	1.81	Full
Guillemot	Buchan Ness to Collieston Coast SPA	62.24	Without-prejudice
Puffin	Forth Islands SPA	10.2	Without-prejudice
Gannet	Forth Islands SPA	10.6	Without-prejudice

3. SPECIES OF FOCUS

3.1. INTRODUCTION

3.1.1. The following Sections outline the species of interest for potential compensation measures. Each Section provides a brief overview of species ecology, conservation status, and threats and pressures at SPAs with connectivity to the Proposed Development. This Section is an introduction to the qualifying species brought forward by the RIAA (Muir Mhòr Offshore Wind Farm Limited, 2024) and is not specific to the sites selected for compensation.

3.2. ATLANTIC PUFFIN (*FRATERCULA ARCTICA*)

3.2.1. The Atlantic puffin (hereafter referred to as 'puffin') is a small (approximately 430 g) pelagic seabird with a European nesting range extending from the high Arctic (Svalbard, Norway) to Brittany (France) (Burnham *et al.*, 2021; Major *et al.*, 2024). Puffins are currently listed as vulnerable by the International Union for Conservation of Nature (IUCN), and their European population is predicted to decline by 50-79% by 2065 (Burnham *et al.*, 2021). Puffins are burrow-nesters, arriving in the UK in March for the breeding season to lay a single egg and heading back out to sea at the end of July (British Trust for Ornithology (BTO), 2024a). They are on the Red List of UK Birds of Conservation Concern and are classed as endangered Species of European Conservation Concern (BTO, 2024a). At sites with connectivity to the Array Area, the threats and pressures identified for puffins include climate change, fisheries management (prey availability – sandeels), and invasive alien species (NatureScot, 2024). They are a qualifying feature at the following connectivity sites: Farne Islands SPA, Forth Islands SPA, and Outer Firth of Forth and St Andrews Bay Complex (OFFSAB) SPA. Compensation measures for puffin that have historically been proposed include closure of sandeel and sprat fisheries in all UK waters, rat eradication, and the prevention of oil spills (Furness *et al.*, 2013). Population counts as recorded during the Seabirds 2000 (1998-2002) counts and Seabirds Counts (2015-2021, Burnell *et al*., 2023) for the SPAs above where data were available can be found in Figure 3-1. Across Britain and Ireland, puffin populations have declined by 24% between the two counts (Burnell *et al.*, 2023).

3.2.2. However, the most recent count concluded in 2021 and as such does not feature populations affected by highly pathogenic avian influenza (HPAI). The puffin population of St Kilda has been affected by HPAI (Tremlett *et al*., 2024), however, puffin was not included in an assessment of colony counts between the HPAI outbreak in 2022 and 2023 due to the RSPB classing this species as having a relatively low mortality risk from HPAI (Tremlett *et al*., 2024).

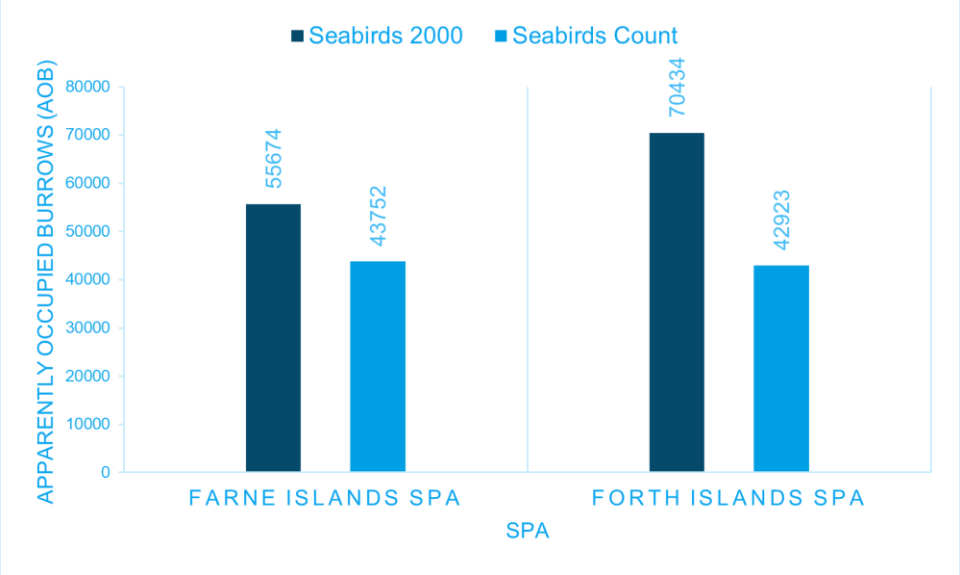

Figure 3-1 Puffin population trends at Farne Islands SPA and Forth Islands SPA, which have connectivity to the Proposed Development. Source: Burnell et al., 2023.

3.3. BLACK-LEGGED KITTIWAKE (*RISSA TRIDACTYLA*)

3.3.1. The black-legged kittiwake (hereafter referred to as 'kittiwake') is a small (38-40 cm long) surface-feeding gull (Coulson, 2011). These pelagic birds arrive at breeding colonies in March to nest along sheer cliffs and depart in September, although some individuals may be recorded year-round (Coulson, 2011; Coulson, 2019; BTO, 2024b). Clutch size ranges from one to three eggs (Coulson, 2011). Kittiwakes are listed as vulnerable by the IUCN and as Species of European Conservation Concern, and they are Red-listed UK Birds of Conservation Concern (BTO, 2024b). At sites with connectivity to the Array Area, threats and pressures include climate change and fisheries management (prey availability) (NatureScot, 2024). They are a qualifying feature the following SPAs with connectivity to the Proposed Development: Buchan Ness to Collieston Coast SPA, East Caithness Cliffs SPA, Forth Islands SPA, Fowlsheugh SPA, Outer Firth of Forth and OFFSAB SPA, St. Abb's Head to Fast Castle SPA, and Troup, Pennan and Lion's Heads SPA. Compensation measures for kittiwake that have historically been proposed include closure of sandeel and sprat fisheries in UK waters, provision of artificial structures for new kittiwake colonies, mink eradication, feral cat eradication, rat eradication, fencing out foxes from colonies, and exclusion of predatory birds, such as the great black-backed gull (Furness *et al.*, 2013). Populations counts as recorded during the Seabirds 2000 (1998-2002) counts and Seabirds Counts (2015-2021, Burnell *et al.*, 2023) for the SPAs above where data were available can be found in Figure 3-2. Across Britain and Ireland, kittiwake populations have declined by 42% between the two counts (Burnell *et al.*, 2023).

3.3.2. However, the most recent count concluded in 2021 and as such does not feature populations affected by highly pathogenic avian influenza (HPAI). Kittiwake populations have seen a significant decline across Britain and Ireland (Burnell *et al.*, 2023). However, where HPAI is concerned, a study comparing population count before and after HPAI outbreak found that the number of AONs increased by 8% in the UK between 2022 and 2023 (Tremlett et al., 2024). Nevertheless, declines of 10% were still seen in 36 out of 90 sites that were surveyed (Tremlett et al., 2024). It should also be noted that the survey counts were undertaken in 2023 and as such any population changes caused by HPAI outbreak since 2023 have not been captured in the most recent data. Current kittiwake population trends therefore need to be considered in light of the epidemic.

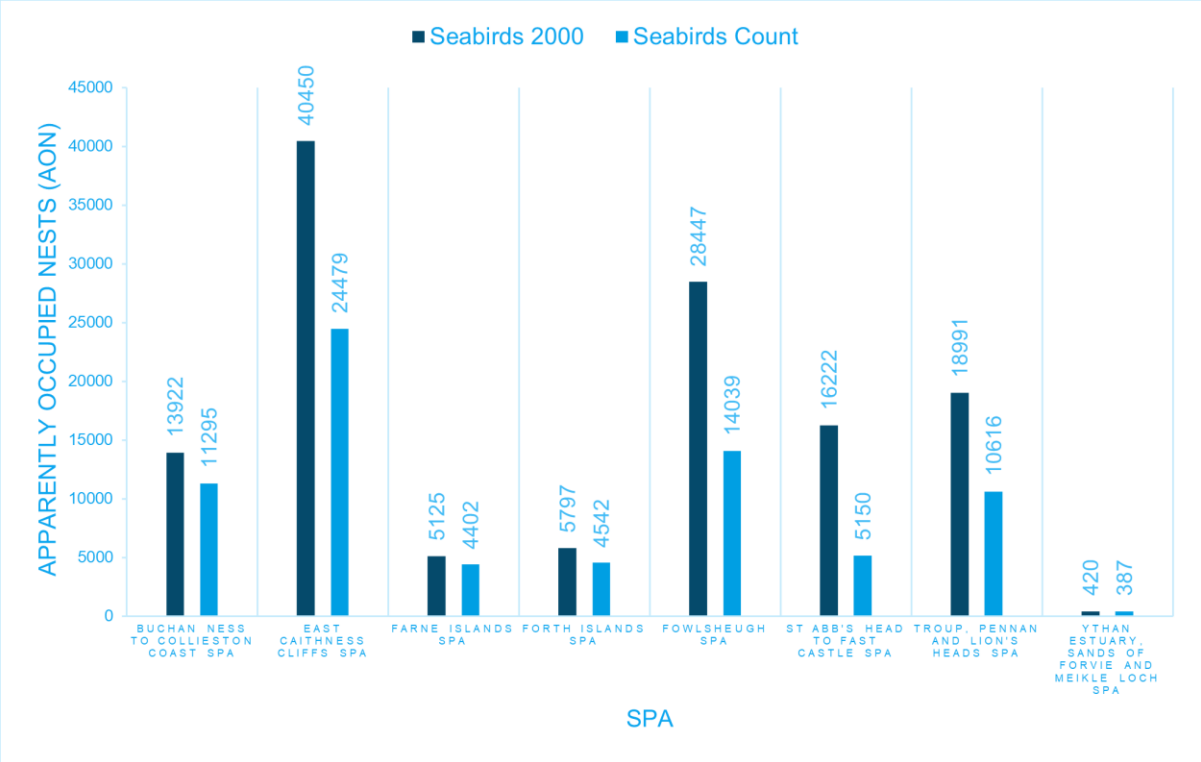

Figure 3-2 Kittiwake population trends at SPAs with connectivity to the Proposed Development. Source: Burnell et al., 2023.

3.4. COMMON GUILLEMOT (*URIA AALGE*)

3.4.1. The common guillemot is a colonial seabird that breeds at higher densities than any other bird (Birkhead, 1977). Guillemots breed on low-lying flat-topped islands and stacks, as well as on broad and narrow cliff ledges although maximum densities are achieved on broad, flat areas (Birkhead, 1977). The breeding season occurs between April and July, resulting in a single egg clutch that may be replaced if eggs are lost early in the breeding season (Bennett *et al.*, 2022). Guillemots are Amber-listed UK Birds of Conservation Concern and are classed as of least concern by the IUCN and Species of European Conservation Concern (BTO, 2024c). At sites with connectivity to the Proposed Development, threats and pressures include climate change, fisheries management (prey availability), and on-site management (NatureScot, 2024). Guillemots are a qualifying feature the following SPAs with connectivity to the Proposed Development: Buchan Ness to Collieston Coast SPA, East Caithness Cliffs SPA, Farne Islands SPA, Forth Islands SPA, Fowlsheugh SPA, Outer Firth of Forth and OFFSAB SPA, St. Abb's Head to Fast Castle SPA, and Troup, Pennan and Lion's Heads SPA. Compensation measures for common guillemot that have historically been proposed include closure of sandeel and sprat fisheries in all UK waters and in guillemot wintering areas, rat eradication, and the prevention of oil spills (Furness *et al.*, 2013). Population counts as recorded during the Seabirds 2000 (1998-2002) and Seabirds Counts (2015-2021, Burnell *et al.*, 2023) for the SPAs above where data were available can be found in Figure 3-3.

3.4.2. Across Britain and Ireland, guillemot populations have declined by 8% between the two counts (Burnell *et al.*, 2023). However, the most recent count concluded in 2021 and as such does not feature populations affected by HPAI. Guillemot populations have been particularly affected by HPAI, with a recorded decline of 6% in the UK between 2022 and 2023 (Tremlett

et al., 2024). Although there was variation in the changes of colonies with increasing populations of 3% and 33% found at Buchan Ness to Collieston SPA and North Caithness Cliffs, respectively, following the HPAI outbreak (Tremlett *et al.*, 2024). As such current guillemot population trends need to be considered in light of the epidemic.

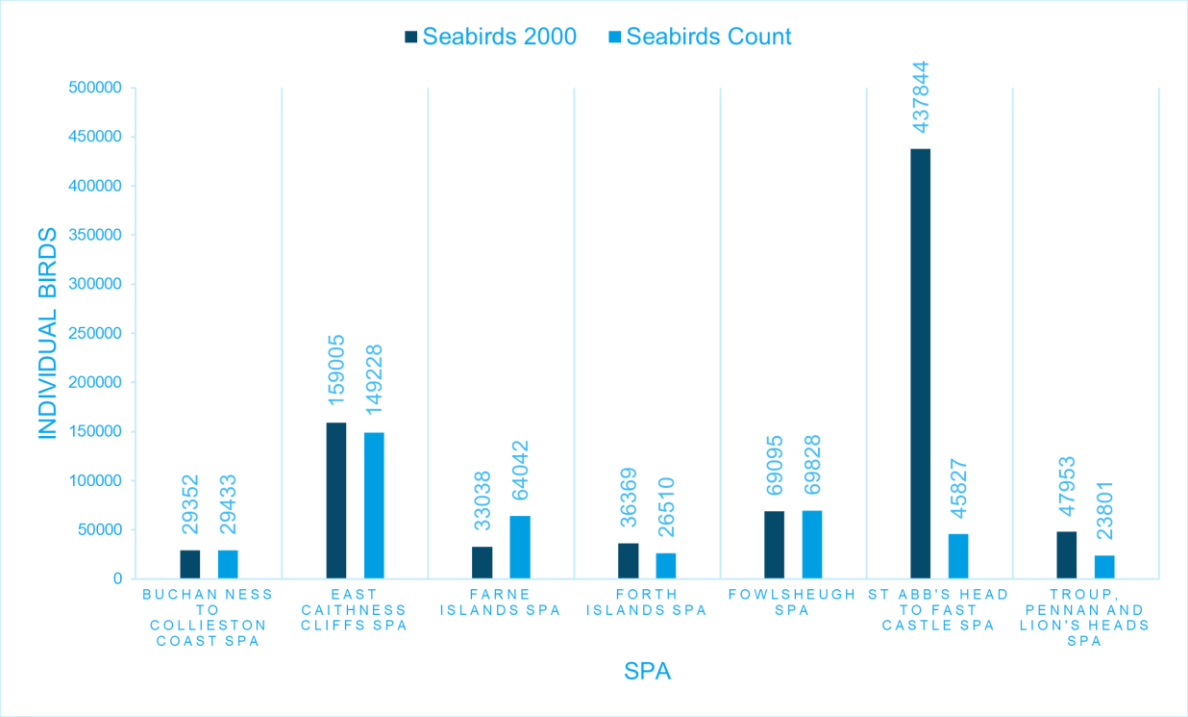

Figure 3-3 Guillemot population trends at SPAs with connectivity to the Proposed Development. Source: Burnell et al., 2023.

3.5. NORTHERN GANNET (*MORUS BASSANUS*)

3.5.1. The northern gannet is the largest breeding seabird in the North Atlantic Ocean, with a wingspan of 180 cm (Amélineau *et al.*, 2014). There are 48 known colonies of gannets, from Brittany (France) in the south to the Arctic circle (Norway) (d'Entremont *et al.*, 2022). The gannet breeding season takes place from late spring (April and May) through early autumn (September and October) and are subject to changes in environmental conditions and prey availability throughout this time (d'Entremont *et al.*, 2022). Climate change (increased sea surface temperatures) and over-fishing have had a negative impact on the gannet's key prey, the Atlantic mackerel (*Scomber scombrus*) and as a result, the productivity of gannets has declined in their southernmost limit (d'Entremont *et al.*, 2022). However, in more northern colonies, mackerel populations have increased and, as such, so have gannet populations (d'Entremont *et al.*, 2022). Gannet pairs produce one egg per breeding season (BTO, 2024d). Gannets are Amber-listed UK Birds of Conservation Concern and are classed as of least concern by the IUCN and Species of European Conservation Concern (BTO, 2024d). They are a qualifying feature at Forth Islands SPA and OFFSAB SPA, which have connectivity to the Proposed Development. Potential compensation measures for northern gannet that have been proposed in the past include ending the harvest of chicks, encouraging the establishment of new colonies, and reducing bycatch in fisheries (Furness *et al.*, 2013). Population count as recorded during the Seabirds 2000 (1998-2002) and Seabirds Counts (2015-2021, Burnell *et al.*, 2023) the Forth Islands SPA can be found in Figure 3-4. Across Britain and Ireland, gannet populations have increased by 38% between the two counts (Burnell *et al.*, 2023). However, the most recent count concluded in 2021 and as such does

not feature populations affected by highly pathogenic avian influenza (HPAI). Gannet populations have been particularly affected by HPAI, with a recorded decline of 25% in the UK between 2022 and 2023 (Tremlett *et al.*, 2024). As such current gannet population trends need to be considered in light of the epidemic.

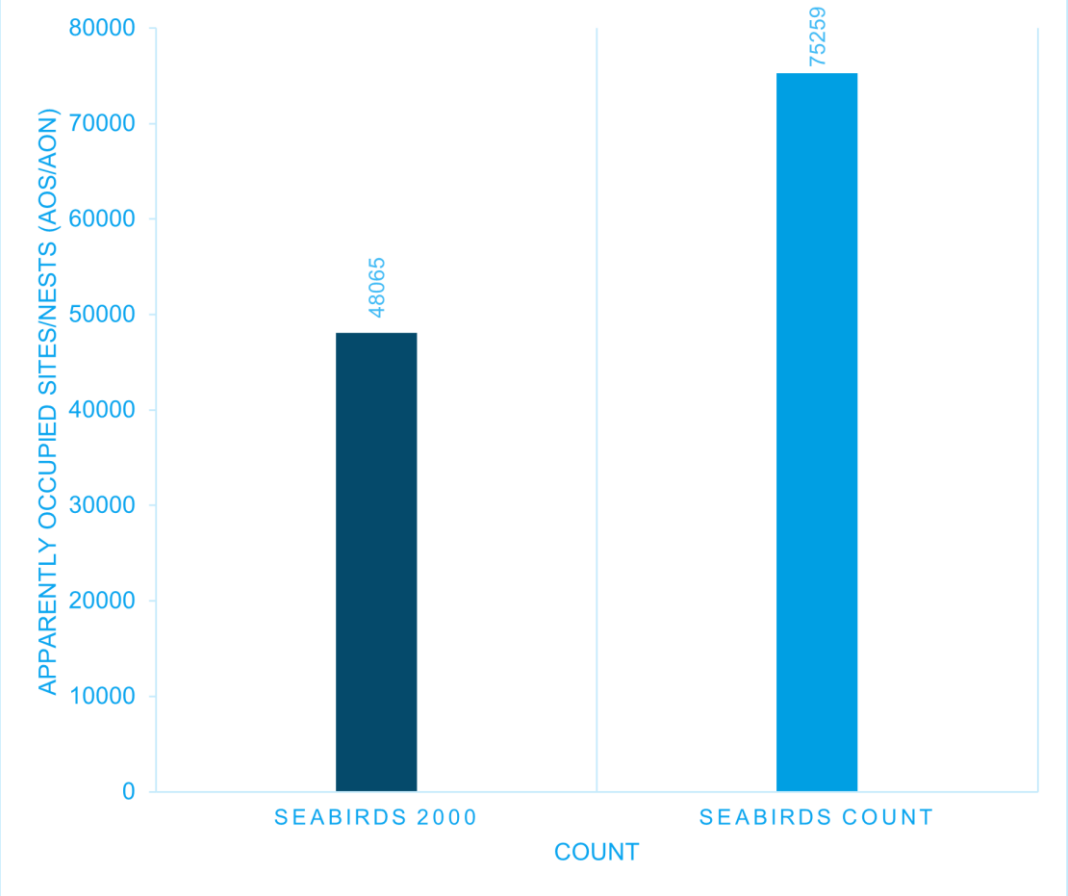

Figure 3-4 Gannet population trend at Forth Islands SPA, which has connectivity to the Proposed Development. Source: Burnell et al., 2023.

4. SELECTION OF COMPENSATION MEASURES

4.1. OVERVIEW

4.1.1. The approach to the selection of compensation measures for the Proposed Development is different than that traditionally used by Developers. Instead of shortlisting compensation measures and then identifying sites at which to apply them, the approach used here first identified threats or pressures at colonies (SPAs with no formal management plans in place and non-SPA colonies) and then to develop compensation measures to benefit those shortlisted colonies.

4.1.2. Several guidance documents were consulted during the development of compensation measures for the Proposed Development. Under the Defra (2024) guidance, the primary factors when identifying suitable compensatory measures are ecological effectiveness and connectivity to the National Site Network. The site selection undertaken follows these criteria more rigorously because sites can be shortlisted based on their connectivity to an affected SPA and specific pressures at those sites can be addressed to provide confidence that the measures identified will be effective.

4.1.3. The following is an overview of the steps taken to develop a set of appropriate compensation measures:

1. **Assessment of Conservation Objectives:** For all relevant features of screened-in SPAs, it was assessed whether an AEoSI of the COs could be ruled out. Although no conclusions of AEoSI were made within the RIAA (Muir Mhòr Offshore Wind Farm Limited, 2024), the results helped to identify the sites and features to be included with this derogation case.
2. **Consideration of SPA and Non-SPA Colonies**: Both SPA and non-SPA colonies were reviewed. SPAs with active management plans in place were ruled out of consideration, because compensation measures at these sites may not meet the required additionality criteria. Non-SPA colonies with connectivity to the SPAs where AEoSI could not be ruled out were identified, and a long list of these sites was created (see Section 11).
3. **Site Investigations and Stakeholder Engagement**: Desk-based research, site investigations at a subset of short-listed colonies, and engagement with local and national stakeholders were conducted in spring and summer 2024 to assess whether addressing specific pressures or threats could support these colonies.
4. **Development of Compensation Measures**: Potential compensation measures were considered, focusing on the impacts identified during the investigations. For each measure, the feasibility (technical, financial, and legal) and the likelihood of successful implementation over the required timeframes were evaluated (see Appendix B-D).
5. **Finalisation of Compensation Plan**: The sites for the Proposed Development's compensation plan were shortlisted, and the compensation measures selected for these sites were finalised through conversation with local experts and organisations. The measures aim to enhance productivity and survival at seabird colonies for target species, including kittiwake, gannet, guillemot, and puffin.

4.2. SITE SELECTION

4.2.1. This section details phase two (shortlisting of potential colonies) and phase three (site investigations) of the preceding overview. The aim of the site-selection phase was to identify a shortlist of viable colonies with identified pressures and threats that may lend themselves to compensation measures.

LONG LIST OF SITES

4.2.2. A long list of sites to investigate was collated through a desk-based investigation. Firstly, SPAs on the east coast of the UK, with the target species as qualifying features, were reviewed. The SPAs were investigated using the appropriate Statutory Nature Conservation Body (SNCB) websites (e.g., NatureScot's SiteLink) and the Seabird Monitoring Programme (SMP) database (British Trust for Ornithology, 2024e). These online sources provided information about the conservation objectives, management, designation features, feature conditions, population counts and trends, and productivity measurements.

4.2.3. Primarily SPAs within the mean maximum foraging (MMF) range plus 1 standard deviation (SD) (MMF±1SD) of target species to the Proposed Development were investigated to provide insight on the current colony condition. By focusing on colonies with breeding season connectivity to the Proposed Development it increases the probability that birds will be recruited back into the impacted site. In addition, compensation measures proposed by other offshore wind farm projects at these SPAs were explored to develop best practice and reduce doubling of efforts. Understanding what management measures are currently in place in these SPAs can help identify gaps/needs for more effective conservation. Marine planning documents for proposed bird conservation projects were consulted to provide additional information into the efforts currently being undertaken to protect seabird populations in response to pressures.

4.2.4. Initially, the following SPAs were identified ((Muir Mhòr Offshore Wind Farm Limited, 2024) to have connectivity to the Proposed Development:

- Buchan Ness to Collieston Coast SPA;
- East Caithness Cliffs SPA;
- Farne Islands SPA;
- Forth Islands SPA;
- Fowlsheugh SPA;
- St. Abb's Head to Fast Castle SPA;
- Troup, Pennan and Lion's Heads SPA; and
- Ythan Estuary, Sands of Forvie and Meikle Loch SPA/Ramsar/Sites of Special Scientific Interest (SSSI).

4.2.5. Except for the Farne Islands SPA, located in Northumberland, all SPAs are located on Scotland's east coast. In addition, non-SPA colonies with connectivity to the Proposed Development were added to the longlist of sites because many of the SPAs identified have been investigated for compensation options by other projects (e.g., Green Volt, Ossian, Berwick Bank, etc.), or have existing management plans in place based on their designation.

POPULATION TRENDS

4.2.6. The population size and health of each longlisted colony was determined using SMP data (BTO, 20234f). Colony health was classified based on changes between the most recent

count and the peak historical count. Colonies with historically stable populations but that are in recent decline or recently found to be extinct were considered appropriate targets for compensatory measures that act to increase survival (e.g. predator eradication) as they may present an opportunity to return to historically higher counts. In addition, colonies with stable or increasing populations have also been considered for the potential of population spill over into surrounding colonies. The data suggests that these colonies appear healthy and as such lend themselves to measures that aim to improve productivity (e.g. artificial nesting structures).

4.2.7. Colonies were initially selected if recent counts revealed over 100 individual seabirds for at least one of the target species. Subsequently, additional colonies with less than 100 individuals were then identified using counts recorded in the SMP database and included in the long list, as these colonies may be so limited by pressures that they have not been able to maintain their high historical figures. Puffin were considered, although their populations have severely declined and are extinct at some sites. None of the non-SPA colonies identified featured gannet. A full analysis to colony population trends across all sites was collated from the SMP database (BTO, 2024e) and Burnell *et al.* (2023).

SHORT LIST OF SITES

4.2.8. The short-listed sites in Table 4-1 were selected from the long list based on one or more of the following criteria:

- The colony has seen a marked decline in population of kittiwake, guillemot, and/or puffin;
- The colony is likely to be affected by one or more of the pressures described in the species descriptions in Section 3; and
- Where the colony has a stable or increasing population, it may be considered for shortlisting if it has the potential to spill over into surrounding colonies (both SPA and non-SPA).

Table 4-1 Shortlisted sites of non-SPA colonies, including other conservation designations.

Site	Designation	Are kittiwake and/or auks a designated feature?
North Sutor to Cromarty/Castlecraig	Rosemarkie to Shandwick SSSI	No
South Sutor	Rosemarkie to Shandwick SSSI	No
Black Slough to Burn of Daff	N/A	N/A
Findon Ness to Black Slough	Findon Moor SSSI	No
Seal's Cove to Findon Ness	N/A	N/A
Hare Ness to Seal's Cove	N/A	N/A
Cove to Hare Ness	Cove SSSI	No
Cove Bay	N/A	N/A
Burnbanks	N/A	N/A
Inchkeith	N/A	N/A
Inchcolm	N/A	N/A

The short-listed table of sites provided in Table 4-1 are taken forward for consideration of locations of compensation measures, being non-designated sites for kittiwake and auks.

5. ORNITHOLOGICAL SURVEYS

5.1.1. Upon selection of the short-listed colonies (non-SPAs), site investigations at all sites were carried out during the breeding season (July 2024) at colonies between Stonehaven and Aberdeen and at North and South Sutors. Having people on the ground can provide crucial information on threats to the seabird colonies that would not have been evident from desk-based assessments, may have been overlooked during previous surveys, or could have changed in the time between surveys. The Firth of Forth islands were not investigated due to logistical constraints but were surveyed by the Forth Seabird Group during the 2024 breeding season (Forth Seabird Group, pers. comm.). For full details of the surveys undertaken see the Compensation Site Investigation Report (Derogation Case: Appendix F – Compensation Measures: Site Investigation Report).

5.2. METHODOLOGY

5.2.1. For each site, surveyors spent one day performing census counts of the species of interest known to have historically been present at each colony (kittiwake, guillemot, and puffin). Surveyors additionally recorded any possible pressures that they noticed during their time at each colony. These pressures allowed for the development of potential compensation measures aimed at reducing mortality and disturbance, as well as increase productivity. These measures can be found in Section 6.

5.2.2. Landowners were identified and contacted to provide them with information about the surveys being conducted as well as contact information for our team should they have any questions or concerns. All colonies are publicly accessible.

5.2.3. Locations for recreational activity were found, including a coastal path with high foot traffic, boat tours, kayaking, rock climbing, and a clay shooting ground. Hotspots for water and running/walking sports were identified using Strava, a social subscriber platform that tracks exercise-based activity.

5.3. KEY FINDINGS

5.3.1. Comparing the most recent SMP count data (BTO, 2024e) with the initial site investigation visits (see Appendix E: -Compensation Measures: Site Investigation Report) could suggest local population declines (although not conclusive) in target species across most sites from Aberdeen to Stonehaven, as well as at North Sutor. No nesting species were observed at South Sutor. It is important to recognise that these initial investigations only offer a brief snapshot of the seabird population and do not provide a reliable estimate of breeding birds for the 2024 season. This limitation should be kept in mind when comparing them to the latest SMP counts. Even so, if population declines are occurring, no clear primary cause was identified.

5.3.2. Seven locations were identified where habitat modifications could be implemented to create additional breeding habitat, mainly for kittiwakes. Although further studies are needed at each site, this approach could serve as a valuable compensatory strategy, potentially leading to an expansion of colonies and increased productivity by creating additional suitable breeding space in optimal locations.

5.3.3. The initial site investigations also highlighted several local features and activities that might disturb breeding seabirds: commercial quarrying, recreational climbing and abseiling, water sports, and an active shooting range. Human disturbance reduction measures have the potential to mitigate any impacts on breeding seabirds due to these activities.

5.3.4. A detailed description of the survey findings can be found in the accompanying document, the Compensation Site Investigation Report.

5.4. CONSULTATION

5.4.1. Local stakeholders, including relevant organisations such as birding groups and governmental institutions such as councils, were contacted to discuss the short-listed sites and possible compensation measures. Stakeholders across the eastern coast of Scotland, such as the Scottish Seabird Centre and the Scottish Wildlife Trust, were contacted to discuss potential measures that could be applied at other sites within the MMF±SD for target species. Conversations and exchanges with relevant organisations allowed for the short-listing of compensation measures that could increase productivity at colonies via conservation measures. These measures are discussed in more detail in Section 6.

5.4.2. In addition to the short-listed colonies listed above, two islands of interest were identified (but not surveyed) in the Firth of Forth: Inchkeith and Inchcolm. These islands are known to be inhabited by brown and black rats, respectively, as well as house mice (Stanbury *et al.*, 2017). Inchkeith in particular supports the largest seabird colonies for target species populations in the non-SPA Firth of Forth Islands (see Derogation Case: Appendix C: Predator Eradication Evidence and Roadmap). Inchkeith and Inchcolm are surveyed once a year in late May/early June by the Forth Seabird Group (Forth Seabird Group, pers. comm.).

5.4.3. Stakeholders (site managers, wardens, local birding organisations) were identified and contacted to discuss pressures. Stakeholder consultations were set up to discuss the shortlisted sites and to identify which compensation measures could be feasibly taken forward following the surveys (Table 5-1). Local knowledge provided valuable insights into the ecosystem functioning of the site and highlight any conservation needs that appropriate compensation measures can address. Additional site surveys may be required to further investigate pressures. For example, setting bait-traps to survey for mammalian invasive non-native species (INNS) or monitoring disturbance to colonies.

5.4.4. The selected without-prejudice compensation measures were consulted on with local and national stakeholders, such as NatureScot and the Royal Society for the Protection of Birds (RSPB). Meetings were held with NatureScot and the RSPB to discuss the selected sites, surveys, and proposed compensation measures. In addition, several written exchanges occurred with local groups or organisations and councils to discuss potential measures. A detailed list of exchanges can be found in Table 5-1. This list only includes exchanges with stakeholders who engaged with the Developer, as several other stakeholders were contacted and did not provide a response.

Table 5-1 Exchanges with stakeholders on possible compensation measures.

Stakeholder	Communication	Date(s)	Topic(s) of discussion
NatureScot	Meeting	08/08/2024; 10/10/2024	Ornithological surveys and their results were presented to NatureScot, and a subsequent meeting discussed potential compensation measures.
RSPB	Meeting	18/06/2024	Ornithological surveys and their methodology were presented to the RSPB.
Highland Bird Ringing Group	E-mail	26/04/2024 to 01/05/2024	Conversation around potential threats to seabird colonies at North and South Sutor.
Forth Seabird Group	E-mails, Meeting	22/08/2024 to 09/10/2024	Conversation around mammalian predator eradication at the Firth of Forth Islands. Meeting on 09/10/2024.

Stakeholder	Communication	Date(s)	Topic(s) of discussion
Aberdeenshire Council	E-mail	15/08/2024 to 24/09/2024	Landownership and current council seabird conservation/mammalian predator eradication programmes were discussed.
Scottish Seabird Centre	Meetings	04/09/2024; 31/10/2024; 21/11/2024	Possible compensation measures to support the Scottish Seabird Centre and their projects were discussed. Letter of understanding for a partnership between the Developer and the Scottish Seabird Centre has been signed (see Derogation Case: Appendix D – Disturbance Reduction: Evidence and Roadmap).
National Trust for Scotland	E-mail	19/08/2024 to 19/11/2024	Current seabird conservation initiatives carried out by the National Trust for Scotland were discussed.
Scottish Wildlife Trust	E-mail	26/09/2024 to 30/09/2024	Current seabird conservation initiatives carried out by the Scottish Wildlife Trust for Scotland were discussed.
Ligue pour la protection des oiseaux (LPO, French partner of BirdLife International)	E-mail	30/08/2024 to 24/09/2024	A possible collaboration to support the LPO in reducing bycatch in French waters was the focus of this discussion.

6. COMPENSATION MEASURES

6.1. INTRODUCTION

6.1.1. This section provides a summary of the measures that could be carried out at the shortlisted sites to fulfil compensation requirements, as well as the species each measure aims to target. Further details on each measure are discussed in full within the Evidence and Roadmap documents (Appendices B through D) drawn up for each measure. These documents include a literature review, rationale, compensation calculations, and a roadmap for delivery and monitoring for each of the three proposed compensation measures summarised below.

6.2. RESULTS: COMPENSATION MEASURES

6.2.1. Following investigation and consultation, a legally securable and implementable short-list of proposed compensation measures was developed (Table 6-1). The proposed compensation measures were developed in response to threats identified during both the desk-based and field studies. In other words, measures were shortlisted based on how appropriate they were in relieving pressures identified at shortlisted sites. Each measure has assessed through a compensation check list in their respective roadmaps to further justify its appropriateness of the measure as well as provided the relevant guidance and how this has been achieved throughout the documents. The measures set out below have each been assessed for effectiveness, location, technical feasibility, timeframe, additionality, quantifiability, and scale and have all been found to meet the desired criteria to carry the measures forward.

6.2.2. The Developer has committed to securing funding for these measures, alone or in partnership with conservation organisations such as the Scottish Seabird Centre (SSC), and as such the measures are considered financially feasible.

6.2.3. Measures that were not carried forward included SPA designation for the non-SPA colonies, supporting SPA management by addressing gaps in management and monitoring, offshore artificial nesting structures (ANS), fisheries management, and bycatch reduction in Scotland. SPA designation is a lengthy legal process that requires certain criteria to be met for designation that the population numbers at the non-SPA colonies do not fulfil (Joint Nature Conservation Committee, 2022). Determining gaps in management and monitoring at current SPAs is currently considered unfeasible as NatureScot have not yet identified which SPAs would benefit from additional support. Where offshore ANS are concerned, this measure is not supported by NatureScot, and the effectiveness of current offshore ANS projects has yet to be determined. The sandeel ban in place in the North Sea also makes fisheries management challenging, and it must be considered that research shows that sandeel fisheries closures will primarily benefit kittiwake, with other seabird species not benefiting from such a measure (Daunt *et al.*, 2008).

Table 6-1 Summary of proposed compensation measures and associated species.

Species	Compensation measures
Kittiwake	Artificial nesting structures (hammocks) Predator control Disturbance reduction
Guillemot Puffin	Predator control Disturbance reduction
All target species	Disturbance reduction

6.2.4. The Developer is confident that the measures identified will more than deliver the required benefit to the target species (see relevant appendices). There will be at least one measure acting on each species, and the measures are generally scalable, therefore increasing the likelihood of successful compensation being provided.

6.3. ARTIFICIAL NESTING STRUCTURES

6.3.1. This section summarises the compensation measure of artificial structures for kittiwake. Full details are found in Derogation Case: Appendix B: Artificial Nesting Structures for Kittiwake Evidence and Roadmap.

6.3.2. The proposed compensation measure is to build ANS in the form of artificial structures (or 'hammocks') into the cliffs at existing colonies at up to seven potential sites located within the following non-SPA colonies: Burnbanks, Cove Bay, Cove Bay to Hare Ness, Hare Ness to Seal's Cove, Seal's Cove to Findon Ness, and Findon Ness. As those sites are part of the same regional population as SPA sites in the area, additional adults produced as a result of ANS can disperse to breed into the wider regional population, including at SPA sites. Therefore, delivering compensation at those proposed non-SPA sites will provide benefits by boosting population growth at the implementation locations, and by supporting coherence of the network directly through "new" adults from the compensation site recruiting to breed into SPA colonies.

6.3.3. A conservative estimate of the benefit of this measure is an additional 407.1 fledglings per annum, while the maximum yield could potentially add 2,430.8 kittiwake fledgelings to the non-SPA populations in eastern Scotland, which more than compensates for the number of birds required based on the compensation quantum calculations (see Derogation Case: Appendix B – Artificial Nesting Structures for Kittiwake: Evidence and Roadmap).

6.3.4. Artificial nesting structures can be created by a blacksmith using two steel rods attached to a stainless steel 'hammock.' The hammock is pinned to the cliff using epoxy resin (Wrobel, 2021). Two 12 mm holes are bored into the cliff side and within minutes, a new ledge becomes available to kittiwake (Wrobel, 2021). The RSPB trialled these artificial ledges at Coquet Island, and they were quickly colonised by breeding pairs (Wrobel, 2021). The proposed hammocks for the non-SPA colonies identified can be designed to optimise kittiwake productivity by addressing nest structure integrity issues, such as the need for irrigation to prevent flooding or the addition of a roof or overhang to protect kittiwake from avian predators.

6.4. PREDATOR CONTROL

6.4.1. This Section summarises the compensation measure of mammalian predator control. Full details are found in the corresponding Predator Control Evidence and Roadmap document (Derogation Case: Appendix C – Predator Control: Evidence and Roadmap).

6.4.2. Initial site selection identified two non-SPA islands in the Firth of Forth that have been identified as hosting populations of mammalian predators: Inchcolm, and Inchkeith. These islands are regularly visited by tourist boats during the summer which, coupled with their proximity to the shore, can pose a biosecurity risk, as rodents are strong swimmers (Stanbury *et al.*, 2017). Black rats have been reported on Inchcolm (Ratcliffe *et al.*, 2009; Forth Seabird Group, *pers. comm.*). Inchkeith has been identified as a priority island for INNS eradication in the UK by Stanbury *et al.* (2017), as it hosts brown rats and house mice. Inchkeith hosts the largest population of nesting seabirds in the non-SPA Forth Islands (Deare, 2023). Puffin are also breeding on Inchkeith but were not counted by the Forth Seabird Group. Predator management on Inchkeith has the potential to provide additional protection for nesting seabirds.

6.4.3. The Developer acknowledges that Berwick Bank OWF has previously proposed the implementation of mammalian predator control at Inchcolm, and also considered Inchkeith in their application (although the latter was not taken forward as a final location). However, given the fact that the outcome of the Berwick Bank application is at this stage uncertain, this measure could potentially be progressed at Inchcolm by Muir Mhòr, only in the event that Berwick Bank should not require the implementation of compensation at Inchcolm. If, based on the consenting decision, Berwick Bank do progress this measure, the Developer is open to engaging with Berwick Bank to explore a potential collaboration on the subject of predator control at Inchcolm. Alternatively, site selection will be expanded to identify further sites for the delivery of predator control by the Developer.

6.4.4. Predator control in the form of non-lethal and lethal control and eradication programmes are easier to implement on islands. The proposed measure of predator eradication will require a further assessment, with the use of bait traps and camera to identify the targeted species as well as the appropriate eradication method to implementation.

6.4.5. Alternatively, the Developer is exploring options to deliver this measure collaboratively by funding an existing predator management programme. Scotland currently has one active predator control programme that has the potential to have a positive effect on seabird populations. This is the Mink Control Project (MCP), led by the Scottish Invasive Species Initiative (SISI). Since spring 2018, SISI has worked with volunteers and partners to control American mink (*Neovison vison*) across the northern third of Scotland (SISI, 2024). The predator control measure could thus be feasibly delivered through partnership with the MCP (or similar existing predator management programme) to expand its activities to areas currently not being covered by the programme, for example due to limited resources. Predator control through collaboration with the MCP has been put forward by Ossian Offshore Wind Farm and that option would thus be pursued in collaboration with them.

6.5. DISTURBANCE REDUCTION

6.5.1. This section summarises the compensation measure of disturbance reduction. This measure involves addressing human disturbance at non-SPA colonies. Full details are found in the Derogation Case: Appendix D – Disturbance Reduction: Evidence and Roadmap.

6.5.2. Where the colony at Seal's Cove to Findon Ness is concerned, there is speculation that the clay shooting range may be having a negative impact on kittiwake. According to Labansen *et al.* (2021), gunshot noises may affect adult fitness, as repeated escape behaviour can have a negative effect on the fitness of breeding kittiwake and auks. At North Sutor, tour boats may increase disturbance of cliff-nesting seabirds such as kittiwake and guillemot. EcoVentures offers regular trips to visit the seabird colony around North Sutor, including during the breeding season between April and July (EcoVentures, 2024). Watercrafts, which include these tourist boats, jet skis, and kayaks, can negatively impact seabird breeding success (Buckley, 2004). In addition, the site investigations on the east coast of Scotland found evidence of rock-climbing and footfall near the colonies.

6.5.3. The Developer has discussed a collaboration with the Scottish Seabird Centre on the implementation of outreach activities, with a letter of understanding between the two parties having been signed (see Derogation Case: Appendix D – Disturbance Reduction: Evidence and Roadmap). These measures are in line with the upcoming Scottish Seabird Strategy and has been supported by RSPB Scotland as a compensatory measure. While difficult to quantify, there is a significant amount of evidence to support the use of Environmental Education (EE) or Conservation Education (CE) as a biological conservation tool (Kühn *et al.*, 2008; Howe *et al.*, 2012; Curti *et al.*, 2010; Ardoin *et al.*, 2020; Bergamo *et al.*, 2023). Simple education measures such as signposting have proven effective at reducing human

disturbance. In addition, disturbance reduction measures may take the form of wardens or rangers.

6.5.4. As evidenced by the site investigation surveys the non-SPA colonies are facing human disturbance from clay pigeon shooting, rock climbing, and water-sport activity. The proposed compensation measure is an education and outreach programme, which involves public engagement on disturbance activities impacts in seabirds as well as the use of educational signage and the employment of wardens or rangers at a located site to be determined. This can ensure that the chosen colony can have maximised effectiveness (increased productivity rate) from the compensatory measure. Furthermore, the details and strategy of the proposed "Campaign Approach" will be finalised in partnership with the Scottish Seabird Centre to ensure effective implementation.

6.6. STRATEGIC COMPENSATION

6.6.1. Strategic compensation involves developers working together, potentially with government, to deliver a joint, wide-reaching compensation measure or series of measures which compensate for the predicted impacts of all projects part of the strategic compensation initiative. This includes the delivery of compensation through the planned Marine Recovery Fund, a strategic fund for the UK which developers pay into to discharge their compensation obligations.

6.6.2. The Developer plans to continue to be involved in the development of strategic compensation and is considering the potential for strategic compensation to be used: i) in combination with, ii) instead of, or iii) as adaptive management for, the project level compensation proposed in the derogation case for the Project. In addition, the developer is actively engaging with other developers to explore the potential to collaborate and jointly deliver compensation. Details of this can be found in the relevant appendices (B-D).

7. SECURING COMPENSATION UNDER SECTION 36 CONSENT

7.1.1. This section provides the Developer's draft consent condition, which Scottish Ministers can utilise as part of the Section 36 consent for the Proposed Development (generating assets only).

The "Ornithology Compensation Plan" means the plan with that title dated 22/11/2024 submitted with the Application.

The Company must, no later than 6 months prior to the Commencement of Development, submit a Compensation Implementation and Monitoring Plan (CIMP), in writing, to the Scottish Ministers for their written approval. Such approval may only be granted following consultation by the Scottish Ministers with any advisors or organisations as may be required at the discretion of the Scottish Ministers.

The CIMP must be based on the Outline Compensation Implementation and Monitoring Plan (here provided as part of the Evidence and Roadmap appendices). The CIMP must be implemented as approved (including any updates or amendments).

No wind turbines forming part of the Development may become operational unless and until all those measures required by the approved CIMP to be implemented prior to the

operation of the wind turbines have been implemented and the Scottish Ministers have confirmed this in writing.

Any updates or amendments to the CIMP by the Company must be submitted, in writing, by the Company to the Scottish Ministers for their written approval.

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