Morven South Offshore Wind Array Project

Habitats Regulations Appraisal

Volume 3, Chapter 4: Compensation: EIA of Compensation Measures

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1 Introduction

1.1 Project background

1.1.1.1 Morven Offshore Wind Limited (MvOWL), a joint venture between JERA Nex bp Limited (JNBP), and EnBW Energie Baden-Württemberg AG (EnBW) (hereafter, 'the Applicant'), has been awarded a seabed option under the 2021/22 ScotWind Leasing Round for the Morven Option Lease Agreement Site (hereafter 'Morven Site'). The Morven Site is located wholly within Plan Option Area E1, identified in the Scottish Government's Sectoral Marine Plan for Offshore Wind Energy (SMP) (Scottish Government, 2020a).

1.1.1.2 The Applicant submitted the Environmental Impact Assessment (EIA) Scoping Report for the Morven Option Lease Agreement Site (hereafter, 'the Morven Site Scoping Report') to Marine Directorate – Licensing and Operations Team (MD-LOT) in July 2023, requesting a formal Scoping Opinion from Scottish Ministers. The Applicant subsequently received the Morven Option Lease Agreement Site Scoping Opinion (hereafter, 'Morven Site Scoping Opinion') from Scottish Ministers in November 2023. Since receiving the Morven Site Scoping Opinion, the Applicant has continued to develop and evolve the Morven Site and made the decision to split the site into two distinct projects, the Morven North Offshore Wind Array Project (hereafter, 'Morven North') and the Morven South Offshore Wind Array Project (hereafter, 'Morven South').

- Morven North is a proposed fixed-foundation offshore wind farm located approximately 61.2km from the Aberdeenshire coast and covers an area of 511.1km^2;
- Morven South is a proposed fixed-foundation offshore wind farm located approximately 86.1km from the Aberdeenshire coast and covers an area of 347.7km^2.

1.1.1.3 As per paragraph 1.1.1.2 the Morven Site will be progressed as two separate developments: Morven North and Morven South. This separation is primarily driven by the identification of two distinct grid Points of Connection (POC), Branxton in East Lothian and Hawthorn Pit in County Durham. To align with the respective grid connection arrangements and jurisdictional requirements, Hawthorn Pit in County Durham will be consented through a Development Consent Order (DCO), while Branxton in East Lothian will proceed via a marine licence application. A separate EIA Report will be produced for each of the Morven North and Morven South applications, but in the case of this report they are being considered together due to measures set out in the Compensation Plan. The Compensation Plan sets out the ornithological compensation measures proposed for both Morven North and Morven South where Adverse Effects on Integrity (AEOI) on SPAs could not be ruled out and sets out details of how the relevant measures were identified, selected and secured as well as details of how the measures will be implemented (as described in this report).

1.1.1.4 A detailed description of Morven North and Morven South is provided in their respective Offshore EIA Report Volume 1, Chapter 3: Project Description.

1.1.1.5 For each of Morven North and Morven South, the Applicant is seeking the following consent and licences:

- a Section 36 consent under the Electricity Act 1989 for an offshore generating station in the Scottish offshore region (12nm to 200nm) where generating capacity exceeds 50MW;
- a marine licence under the Marine and Coastal Access Act 2009 (MCAA) (Scottish waters beyond 12nm) for the generating station (wind turbines, foundation and inter-array cables);
- a marine licence under the MCAA (Scottish waters beyond 12nm) for the Offshore Substation Platforms (OSPs) infrastructure (OSPs, OSP foundations and interconnector cables within the site boundary).

1.1.1.6 Hereafter, the Electricity Works (Environmental Impact Assessment) (Scotland) Regulations 2017 and the Marine Works (Environmental Impact Assessment) Regulations 2007, which together set out the relevant legal framework for Environmental Impact Assessments of Morven North and Morven South, are collectively referred to as the EIA Regulations.

1.1.1.7 Key components of both Morven North and Morven South include:

- wind turbines, including foundations;

- inter-array cables;
- OSPs, including OSP foundations;
- scour protection;
- cable protection;
- interconnector cables.

1.1.1.8 Morven North will secure up to 96 fixed wind turbines. Up to five OSPs will be installed within the Morven North Boundary. The potential foundation types for the OSPs include piled jackets, suction bucket jackets, monopiles, or gravity-based structures. For wind turbines, the foundation options include piled jackets, suction bucket jackets, and monopiles. Subsea inter-array cables will connect the wind turbines to each other and to the OSPs, while interconnector cables will link the OSPs together.

1.1.1.9 Morven South will secure up to 95 fixed wind turbines. Up to five OSPs will be installed within the Morven South Boundary. The potential foundation types for the OSPs include piled jackets, suction bucket jackets, monopiles, or gravity-based structures. For wind turbines, the foundation options include piled jackets, suction bucket jackets, and monopiles. Subsea inter-array cables will connect the wind turbines to each other and to the OSPs, while interconnector cables will link the OSPs together.

1.1.1.10 The overall MW capacity for Morven North and Morven South is not yet defined and will be a function of turbine model selection post consent. Depending on the number and capacity of the wind turbines installed within the project design envelope (PDE) parameters defined for this assessment, the final installed generation capacity may vary, provided it remains within the assessed design parameters. Construction activities for Morven North and Morven South are expected to last up to 5 years. The decommissioning process will likely follow a similar, reverse sequence. The Applicant is seeking consent for an operational phase of 35-years for Morven North and Morven South.

1.1.1.11 As part of the Habitat Regulations Appraisal (HRA) a Report to Inform Appropriate Assessment (RIAA) accompanies the applications for Morven North and Morven South (Morven North Offshore Wind Array Project Chapter 2: Report to Inform Appropriate Assessment and Morven South Offshore Wind Array Project Chapter 2: Report to Inform Appropriate Assessment). The RIAA assesses whether Morven North or Morven South could have an adverse effect, either alone, or in-combination with other projects, on the integrity of any European site. European sites include Special Areas of Conservation (SACs), candidate SACs (cSACs), Sites of Community Importance (SCIs), Special Protection Areas (SPAs) and, as a matter of policy (Scottish Government, 2020b; Scottish Government, 2025), possible SACs (pSACs), potential SPAs (pSPAs) and Ramsar sites (listed under the Ramsar Convention on Wetlands of International Importance, where also designated as a European site).

1.1.1.12 The assessment presented within the Morven North and Morven South RIAAs concluded that AEOI could not be ruled out for the following SPAs when considered in combination with other projects:

- Forth Islands (guillemot (*Uria aalge*) and seabird assemblage (with regards to guillemot));
- St. Abb's Head to Fast Castle (kittiwake (*Rissa tridactyla*), razorbill (*Alca torda*) and seabird assemblage (with regards to kittiwake and razorbill));
- Troup, Pennan and Lion's Head (guillemot and seabird assemblage (with regards to guillemot));
- Outer Firth of Forth and St Andrew's Bay Complex (with regards to kittiwake and guillemot)).

1.1.1.13 While the Applicant concluded that AEOI could not be ruled out for the above four SPAs, the compensation package also considers a total of ten SPAs where there is potential, based on previous consent decisions, or based on the more precautionary assessment methodology preferred by NatureScot, for a conclusion of AEOI to be reached by Scottish Ministers. As such, the Applicant has compiled a Derogation Case, in part on a *without prejudice* basis, which includes compensation measures to offset all potential AEOI. The compensation measures as part of the proposed package are as follows:

- rat eradication at Isle of Muck to compensate for potential AEOI to guillemot, razorbill, puffin and kittiwake;

- a gannet compensation measure.

1.1.1.14 Progress is being made on developing a gannet (*Morus bassamus*) measure; however, due to commercial sensitivity, further detail cannot yet be provided and will be made available during the determination phase. Therefore, this document does not consider this measure further.

1.1.1.15 Full details, including the evidence underpinning the rat eradication measure and the plan for delivery is provided in HRA, Volume 3, Chapter 2: Compensation and Evidence Plan and Volume 3, Chapter 3: Outline Compensation Implementation, Monitoring and Adaptive Management Plan.

1.2 Purpose of this document

1.2.1.1 This document presents an assessment under the EIA Regulations of the proposed compensation measure at the Isle of Muck being developed as part of the Morven North and Morven South compensation package.

1.2.1.2 The proposed rat eradication compensation measure does not fall within the scope of EIA Schedule 1 or Schedule 2 projects, the compensation measure is being brought forward in response to the potential AEOI of Morven North and Morven South on European sites. Any effects arising from the compensation measure are, as a precaution, considered to be indirect or secondary to the effects of Morven North and Morven South, and are therefore assessed in accordance with the EIA Regulations, which requires consideration of indirect and secondary Likely Significant Effects (LSE[1]).

1.2.1.3 The purpose of this document is to evaluate the LSE[1] of the proposed compensation measure on the environment. Further details on the relevant policy and legislation context are detailed in Volume 1, Chapter 2: Policy and Legislation of the EIA Report for both Morven North and Morven South.

1.2.1.4 The assessment of the LSE[2] from the proposed compensation measure on European sites in the context of the HRA is provided separately in Volume 3, Chapter 5: Compensation: HRA of Compensation Measures.

1.3 Structure of this document

1.3.1.1 This document is set out in a number of sections, as follows:

- Section 2: Consultation;
- Section 3: Proposed compensation measure;
- Section 4: Consideration of alternative compensation measures;
- Section 5: EIA methodology;
- Section 6: EIA – rat eradication on the Isle of Muck;
- Section 7: Conclusions.

2 Consultation

2.1.1.1 As part of the development of the compensation package, the Applicant has undertaken pre-submission consultation with relevant stakeholders. Further detail on this engagement is presented in Volume 3, Annex 2.1: Compensation Stakeholder Consultation for the HRA. Engagement with stakeholders on the proposed compensation measure will continue at various stages of the process, as detailed in the Applicant's Outline Compensation Implementation, Monitoring and Adaptive Management Plan (Volume 3, Chapter 3: Outline Compensation Implementation, Monitoring and Adaptive Management Plan).

3 Proposed compensation measure

3.1.1.1 A summary of the proposed compensation measure is provided in Table 3.1. Full details are provided in Volume 3, Chapter 2: Compensation and Evidence Plan. To reduce potential impacts on sensitive ecological receptors, the compensation measure will be implemented in accordance with recognised good practice standards. These standards reflect the Applicant's commitments and are discussed in Volume 3, Chapter 2: Compensation and Evidence Plan and Chapter 3: Outline Compensation Implementation, Monitoring and Adaptive Management Plan.

Table 3.1: Summary of compensation measure

Compensation measure	Summary	Species of relevance	Designed-in Mitigation
Rat Eradication at the Isle of Muck	The eradication will focus on brown rats *Rattus norvegicus*. The subsequent biosecurity measures on the Isle of Muck will support the recovery of vulnerable seabird species for the operational lifetime of Morven North and Morven South (minimum 35 years) to prevent reinvasion and safeguard long-term ecological benefits. Post-eradication, monitoring will be undertaken annually to confirm success and detect any incursions. Should evidence of reinfestation arise, targeted follow-up eradication will be carried out promptly.	Kittiwake, guillemot, razorbill, and puffin (*Fratercula arctica)*	For planning and implementing rodent eradication projects in the United Kingdom (UK), the Biosecurity for Life programme has provided a good practice rat eradication toolkit with guidelines, templates, and worked examples as a systematic framework to guide eradications and subsequent biosecurity measures (Biosecurity for Life, 2021). The standardised guidelines for rodent eradication methodology have been developed over several years of research and are detailed in the UK Rodent Eradication Best Practice Toolkit (Thomas *et al*., 2017). It is discouraged to use any other methods without careful and extensive consultation. Volume 3, Chapter 3: Outline Compensation Implementation, Monitoring and Adaptive Management Plan also provides site-specific recommendations to optimise eradication success and reduce ecological risks. These include trials and refinements to bait delivery/station design, adjusting grid density in high-risk areas, and risk assessments and mitigation measures to reduce interactions and risks to non-target species.

4 Consideration of alternative compensation measures

4.1.1.1 A key step in the development of the compensation package has been the identification, selection and refinement of compensation measures and their delivery plan. Well-informed decisions on the selection and consideration of alternatives are critical, and the Applicant recognises the need to ensure consultees and stakeholders understand how decisions have been made.

4.1.1.2 The process undertaken by the Applicant for selection and consideration of compensation measures involved creating a long-list of potential compensation measures, which were refined into a short-list based on their suitability. A 'do nothing' approach (whereby no compensation measures would be implemented) was not considered feasible as compensation is required as Morven North and Morven South could have an AEOI for the qualifying seabird species of several SPAs when considered in-combination with other plans and projects. Therefore, the Applicant chose the most feasible and beneficial compensation measure for Morven North and Morven South, which was then carried into this assessment. Further detail on the process by which the proposed compensation measures were selected (including consideration of alternative compensation measures) is detailed within Volume 3, Chapter 2: Compensation and Evidence Plan.

5 EIA methodology

5.1 Introduction

5.1.1.1 Volume 1, Chapter 6: Environmental Impact Assessment Methodology of the EIA Report sets out the EIA methodology followed for Morven North and Morven South. It describes the approach used to identify, evaluate, and mitigate potential effects and evaluate whether they are likely to be significant in EIA terms (i.e. LSE[1]). The requirement for EIA and the proposed temporal, spatial and technical scope of the assessments are described in detail and are equally relevant to this document.

5.2 Overview of process

5.2.1.1 EIA is a systematic, iterative, and prescribed process framed by statutory requirements as well as the relevant planning and policy context (see Volume 1, Chapter 2: Policy and Legislation of the EIA Reports). Furthermore, consideration of best, good and advised EIA practice and adoption of a proportionate EIA approach (see Volume 1, Chapter 6: Environmental Impact Assessment Methodology of the EIA Reports) has guided the specific approach followed by the Applicant in relation to this document.

5.2.1.2 The key elements of the development for the compensation package and the identification of LSE[1] are described in the following sections.

5.3 Impacts, effects and significance

5.3.1.1 The compensation measure has the potential to result in a range of impacts and effects in relation to the physical, biological and anthropogenic environment.

5.3.1.2 For the purposes of the EIA of the compensation measure, the term 'impact' is defined as a change as a result of an action. Impacts can be defined as direct, indirect, temporary, irreversible, secondary, cumulative and inter-related. They can also be either beneficial or adverse, although the relationship between them is not always straightforward and relies on available evidence and professional judgement. Definitions of impact terms are presented in Volume 1, Chapter 6: Environmental Impact Assessment Methodology of the EIA Reports.

5.3.1.3 The term 'effect' is defined as the consequence of an impact. Effect significance is determined by consideration of the magnitude of impact alongside the sensitivity of each receptor or receptor group in accordance with the defined significance criteria as per Volume 1, Chapter 6: Environmental Impact Assessment Methodology of the EIA Reports.

5.3.1.4 The magnitude of an impact is the spatial extent, duration, frequency and reversibility of an impact from the implementation and operation of the compensation measure (as detailed within Volume 1, Chapter 6: Environmental Impact Assessment Methodology of the EIA Reports). A magnitude is assigned to each of the impacts assessed within this EIA Report.

5.3.1.5 The magnitude of an impact is defined according to the following scale:

- high;
- medium;
- low;
- negligible.

5.3.1.6 The definitions for each of these categories is set out in Volume 1, Chapter 6: Environmental Impact Assessment Methodology of the EIA Reports. For the compensation measure, the relevant category definitions have been applied using appropriate external policy, guidance, standards and other material, or specialist knowledge.

5.3.1.7 Receptors can be the physical or biological resource or human user group that have the potential to be affected by impacts as a result of the compensation measure throughout its lifetime. These receptors are identified through pre-existing data and baseline characterisation studies conducted in the development of the compensation measure.

5.3.1.8 In defining the sensitivity for each receptor/receptor group, the vulnerability, recoverability and value/importance of that receptor/receptor group has been considered. These are defined in Volume 1, Chapter 6: Environmental Impact Assessment Methodology of the EIA Reports. In instances where these aspects are not considered in the assessment, the reasoning for this is explained within the compensation measure assessment.

5.3.1.9 Sensitivity is defined according to the following scale:

- very high;
- high;
- medium;
- low;
- negligible.

5.3.1.10 Definitions for each of these categories are set out in Volume 1, Chapter 6: Environmental Impact Assessment Methodology of the EIA Reports. For the compensation measure, these definitions have been applied using appropriate external policy, guidance, standards and other material, or specialist knowledge.

5.3.1.11 The overall significance of an effect is determined through the correlation of the potential magnitude of impact and the sensitivity of the receptor. To ensure consistency in defining the significance of an effect, a matrix approach has been adopted and is presented in Table 5.1. In cases where a range of significance is possible for an effect, there remains the possibility that this may span the significance threshold (i.e. where the range is given as minor to moderate). In such cases the final significance is based upon the technical specialist's professional judgement as to which outcome delineates the most likely effect, with an explanation as to why this is the case.

5.3.1.12 For the purposes of this assessment:

- a level of significance of moderate or above will be considered a 'significant' effect in terms of the EIA Regulations;
- a level of significance of minor or below will be considered 'not significant' in terms of the EIA Regulations.

Table 5.1: Matrix used for the assessment of the significance of the effect

		Magnitude of impact			
Sensitivity of receptor		Negligible	Low	Medium	High
	Negligible	Negligible	Negligible to minor	Negligible to minor	Minor
	Low	Negligible to minor	Negligible to minor	Minor	Minor to moderate
	Medium	Negligible to minor	Minor	Moderate	Moderate to major
	High	Minor	Minor to moderate	Moderate to major	Major
	Very high	Minor	Moderate to major	Major	Major

5.4 Scoping of impacts

5.4.1.1 To facilitate a proportionate level of environmental assessment for the compensation measure, a simplified scoping process was undertaken to identify the potential impacts. The results of the scoping stage are presented in Table 5.2. Scoping was undertaken based on the knowledge of the

proposed location of the measure and the baseline environment, and potential impacts of the measure from other similar projects already undertaken elsewhere. Where no pathway for impact exists or all impacts on a particular receptor have been scoped out, that receptor is scoped out and not examined further in this document. Justification for scoping out is presented in Table 5.3.

5.4.1.2 Please note that human health was scoped out of the Morven North and Morven South EIA Reports and therefore has not been included in this assessment. While human health is scoped out of this assessment, it is noted qualitatively that rat eradication on the Isle of Muck can generally be considered as beneficial for local communities and therefore will result in a positive impact on human health. In terms of concerns to human health from the proposed compensation measure, a potential pathway could be considered due to the use of rodenticide. However, there is not predicted to be an impact of rat eradication on human health from the use of rodenticide as the Applicant will ensure that industry best practices are followed as per the UK Rodent Eradication Best Practice Toolkit (Biosecurity for Life, 2021), including undertaking a site specific trials and risk assessments to ensure risks to the local populace are avoided.

5.5 Measures to avoid, prevent, reduce or, if possible, offset likely significant adverse effects

5.5.1.1 Where LSE[1] are identified, the EIA Regulations require "a description of the measures envisaged to avoid, prevent, reduce or, if possible, offset any identified significant adverse effects on the environment and, where appropriate, of any proposed monitoring arrangements" to be included in the EIA Report.

5.5.1.2 Mitigation within the EIA process can be categorised into the following:

- Primary mitigation;
- Secondary mitigation;
- Tertiary mitigation.

5.5.1.3 The iterative approach to the assessment process implemented for Morven North and Morven South involves a feedback loop, as illustrated in

5.5.1.4 Figure 5.1. An impact, along with the resulting significance of effect, is initially assessed. If this is deemed to be a likely significant adverse effect in EIA terms, adjustments are made (where reasonably practicable) to relevant project design parameters, or specific mitigation measures are implemented to avoid, prevent or reduce the magnitude of the potential impact or the offset the adverse effect. The assessment is then repeated to determine the updated significance of effect, and the process continues, until the EIA practitioner is satisfied, within the bounds of the scope of development objectives, that one of the following options is applicable:

- the effect has been reduced to a level that is not significant in EIA terms;
- having regard to other constraints, no further changes may be made to project design parameters or no practicable mitigation measures are available to reduce the magnitude of impact (and hence the significance of effect). In such cases, an overall effect that is still significant in EIA terms may be presented in the EIA Report.

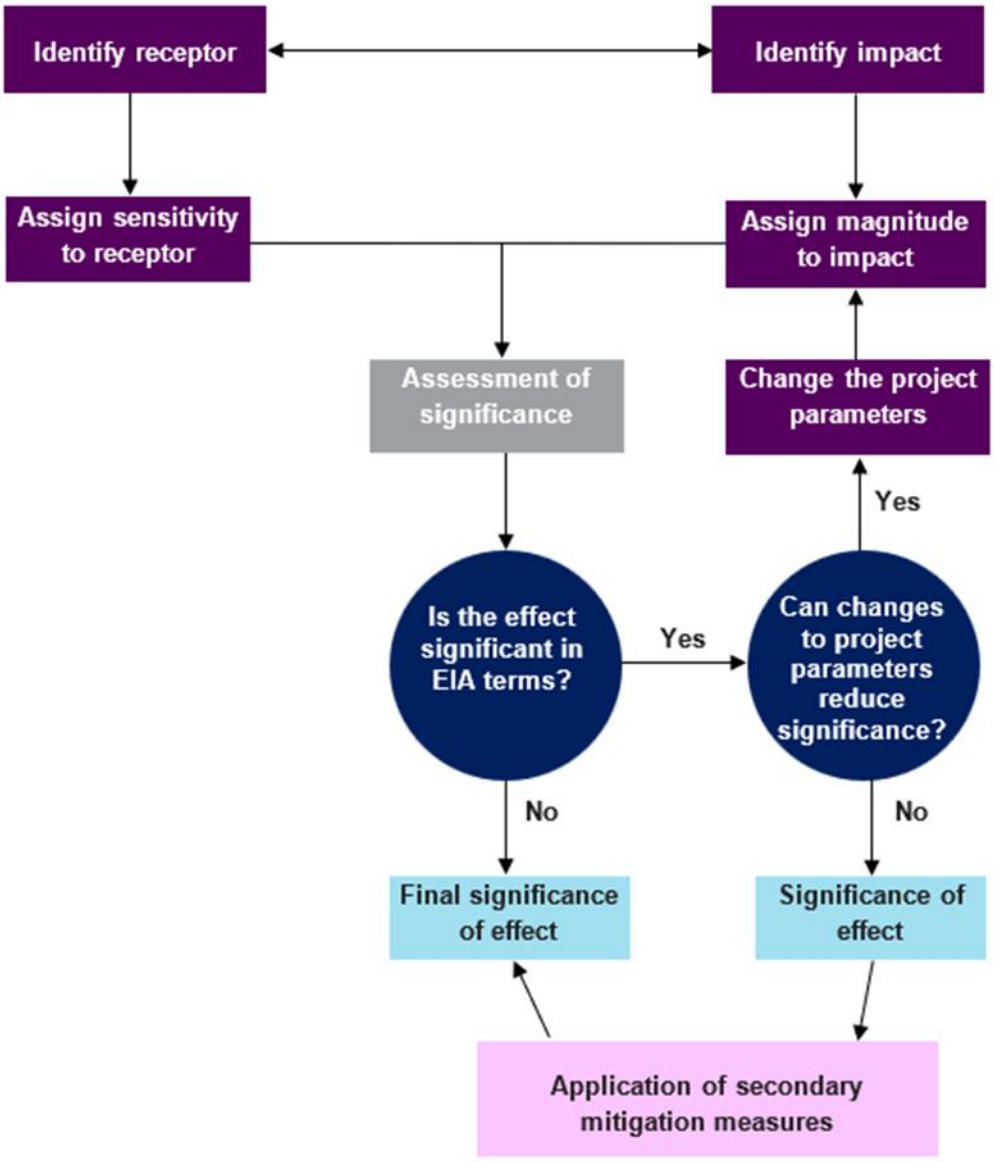

Figure 5.1: Iterative approach to mitigation within the Environmental Impact Assessment

5.5.2 Primary mitigation

5.5.2.1 The Institute of Sustainability and Environmental Professionals (ISEP) (formerly Institute of Environmental Management and Assessment (IEMA)) describes primary (inherent) mitigation as: "Modifications to the location or design of the development made during the pre-application phase that are an inherent part of the project, and do not require additional action to be taken" (IEMA, 2024).

5.5.2.2 As described in Volume 1, Chapter 6: Environmental Impact Assessment Methodology of the EIA Reports, an iterative approach to the assessment process has been employed to inform the design parameters for the compensation measure (through a process of identification of potential impacts and LSE[1] and the subsequent amendments to compensation measure design to avoid LSE).

5.5.3 Secondary mitigation

5.5.3.1 ISEP describes secondary (foreseeable) mitigation as: "Actions that will require further activity in order to achieve the anticipated outcome. These may be imposed as part of the planning consent, or through inclusion in the Environmental Statement" (IEMA, 2024).

5.5.3.2 Secondary mitigation refers to additional measures which are implemented following the completion of the assessment process. The aim of secondary mitigation is to prevent, reduce and offset LSE[1] that may arise, which could not be avoided through designed-in measures. Any secondary mitigation would be secured though a condition of the section 36 consent and/or marine licence and can be implemented through management plans.

5.5.4 Tertiary mitigation

5.5.4.1 ISEP describes tertiary (inexorable) mitigation as: "Actions that would occur with or without input from the EIA feeding into the design process. These include actions that will be undertaken to meet other existing legislative requirements, or actions that are considered to be standard practices used to manage commonly occurring environmental effects" (IEMA, 2024).

5.5.4.2 For the compensation measure, both primary (inherent) mitigation and tertiary (inexorable) mitigation are referred to as "designed-in measures".

5.5.4.3 The designed-in mitigation for the compensation measure is to follow good practice standardised guidelines (see Table 3.1) in order to ensure the timings and locations of the activities associated with the implementation of the compensation measure reduces any impacts to non-target species.

5.6 Cumulative, inter-related effects, and transboundary effects

5.6.1.1 For consideration of cumulative effects, where it is considered that an LSE[1] exists cumulatively with other projects, this has been assessed within the assessment section for the compensation measure.

5.6.1.2 The EIA Regulations require consideration of the inter-relationships between effects across EIA topics, termed inter-related effects. For clarity, project-lifetime inter-related effects consider interactions between different impacts or project phases over time, whereas receptor-led effects such as those assessed in Section 6.3.2 consider effects of individual measure activities on specific ecological receptors in isolation.

5.6.1.3 This report has given due consideration using expert judgement to the potential for different residual effects to have a combined significant effect on key sensitive receptors. The proposed compensation measure may result in potential project-lifetime inter-related effects over the lifetime of its implementation; as per Table 3.1 the biosecurity measure of rat eradication would be maintained for the lifetime of Morven North and Morven South as a minimum (for 35 years on the Isle of Muck). There is the also the potential for receptor-led effects. The assessment of inter-related effects is detailed within the compensation measure assessment in Section 6.3.4.

5.6.1.4 The potential for transboundary effects to arise is a result of an impact from the compensation measure which has the potential to significantly affect the environment in the jurisdiction of a European Economic Area state(s). Transboundary effects have also been considered during the assessment process where appropriate.

Table 5.2: Results of the potential receptor groups and impacts scoped in for the compensation measure

Compensation measure	EIA receptor group scoped in	Potential impacts scoped in	Rationale for scoping in
Rat eradication on the Isle of Muck	Offshore and intertidal ornithology	Potential for disturbance from human activity due to rat eradication methods	Please refer to Section 6.3.
		Potential for unintended primary and secondary poisoning of non-target bird species due to rat eradication methods	
	Biodiversity, terrestrial ecology and terrestrial ornithology	Potential for disturbance to non-target species due to rat eradication methods	
		Potential for unintended primary and secondary poisoning of non-target species due to rat eradication methods	

Table 5.3: Results of the potential receptor groups scoped out for the compensation measure (* - onshore topics)

Compensation measure	EIA receptor group scoped out	Rationale for scoping out
Rat eradication on the Isle of Muck	Air quality*; aviation and radar; benthic ecology; climate change (onshore and offshore); commercial fisheries; cultural heritage (onshore and offshore); fish and shellfish; geology and ground conditions*; infrastructure and other users; landscape and visual impact assessment*; land use, agriculture and public access*; major accidents and disasters; marine archaeology; marine mammals, noise and vibration*; offshore bats; physical processes; seascape, landscape and visual impacts; shipping and navigation; socio-economics*, tourism and recreation (onshore and offshore); traffic and transport; and water quality and flood risk*.	The proposed measure is being applied to the onshore environment. As an ecological measure it is anticipated that there will be no impact to non-ecological receptors. Therefore, the effects to offshore receptor groups will be limited to ornithological receptors only. It is not anticipated that there will be an impact on air quality*; aviation and radar; climate change (onshore and offshore); cultural heritage (onshore and offshore); geology and ground conditions*; infrastructure and other users; landscape and visual impact assessment*; marine archaeology; noise and vibration*; seascape, landscape and visual impacts; shipping and navigation; socio-economics*, tourism and recreation (onshore and offshore); traffic and transport; and water quality and flood risk*. Therefore, impact on these receptor groups have been scoped out as no pathways for impact have been identified. The effects to all offshore receptors have been scoped out (with the exception of ornithological receptors), as no impact pathways between the proposed measure and these receptors has been identified. There is a potential impact pathway for land use, agriculture and public access (including recreation) due to the small number of livestock on the Isle of Muck. However, due to the limited scale of the works, the short term nature of the eradication (i.e. most of the works occurring over a period of months) and the designed-in mitigation measures outlined in Table 3.1, the risk of LSE[1] is very low and as such this receptor group has been scoped out. The proposed measure will not result in any lasting infrastructure or physical intrusions meaning that there will be no impact on the landscape and visual impact assessment* receptor group so this receptor group has been scoped out. Furthermore, no pathway to cause a major accident and/or disaster to occur as a result of this measure has been identified. Therefore, these receptor groups have been scoped out from assessment as no impact pathways exist.

6 Environmental Impact Assessment – rat eradication on the Isle of Muck

6.1 Introduction

6.1.1.1 This section considers the potential impacts and LSE[1] arising from the rat eradication compensation measure.

6.1.1.2 A characterisation of the baseline for the relevant receptor groups is presented in Table 6.1 followed by the results of an assessment of LSE[1] arising from the proposed compensation measure.

6.2 Baseline

6.2.1.1 Table 6.1 provides a description of the baseline environment for each receptor which was identified during the scoping stage as potentially being affected by the proposed compensation measure (Table 5.2).

6.2.1.2 The Isle of Muck is the island that has been proposed for the rat eradication compensation measure. For specific details on the scale and site selection for this compensation measure, please refer to Section 4 in Volume 3, Chapter 2: Compensation and Evidence Plan.

Table 6.1: Baseline Environment for the Receptor Groups Scoped into this Assessment

Receptor Group	Summary of Baseline Environment
Offshore and intertidal ornithology	The study area for this receptor group is confined to the Isle of Muck and its associated islets (Horse Island, Eagamol, and Lamb Island), as all works and any potential effects are restricted to the immediate vicinity of the island due to the strictly terrestrial nature of the rat-eradication activities. A precautionary 20 km buffer was applied to identify any European sites with potential ecological or functional connectivity to offshore and intertidal ornithology. Within this buffer, the only sites considered relevant were the Rum SPA and the Rum SSSI (Site of Special Scientific Interest), owing to the presence of ornithological qualifying features with a potential for interaction. All other sites were screened out as no plausible impact pathways were identified. The Rum SPA lies relatively close to the Isle of Muck, with its nearest boundary approximately 5.6 km away. The site is designated for its breeding offshore and intertidal ornithological features, including guillemot, kittiwake, Manx shearwater (*Puffinus puffinus*), red-throated diver (*Gavia stellata*), and wider assemblage of breeding seabirds, some of which may also occur on Muck. Potential interactions between the rat-eradication works and these qualifying features are considered in detail in Volume 3, Chapter 5: Compensation: HRA of Compensation Measures. The Rum SSSI, is located approximately 10 km from Muck and has only one feature with potential ecological connectivity to the island group: the breeding population of Manx shearwater. The Isle of Muck and its associated islets support a diverse assemblage of seabirds and coastal species. Historically, the island has been an important breeding site for guillemot, razorbill, and puffin, alongside other species such Arctic tern (*Sterna paradisaea)*, sandwich tern (*Sterna sandvicensis)*, shag (*Gulosus aristotelis)*, black guillemot (*Cepphus grille)*, common gull (*Larus canus)*, kittiwake, herring gull (*Larus argentatus)*, lesser black-backed gull (*Larus fuscus)* and great black-backed gull (*Larus marinus)* (Volume 3, Chapter 2: Compensation and Evidence Plan). Of the key seabird species present on the Isle of Muck (kittiwake, guillemot, razorbill, puffin), kittiwake colonies are present on the southern cliffs; numbers have declined over recent decades, from 140 apparently occupied nests (AON) in the mid-1980s to

Receptor Group	Summary of Baseline Environment
	around 20 AON recorded in 2025 (as per Chapter 3.1: Compensation and Evidence Plan) and as few as 4 in 2021 (Dobson & Dobson, 1986; Inger *et al*., 2021). Guillemot and razorbill have also experienced long-term declines, with guillemot falling from over 1,000 individuals in 1986 to 179 in 2025, and razorbill from 246 individuals to 32 over the same period. Puffin numbers are now very low, with only 22 individuals recorded in 2025 dropping from 254 in 1986 (Dobson & Dobson, 1986). These trends are thought to reflect multiple pressures, including predation by invasive rats, wider food availability and climate change constraints.
Biodiversity, terrestrial ecology and terrestrial ornithology	The study area for biodiversity, terrestrial ecology and terrestrial ornithology is restricted to the Isle of Muck and its associated islets, as all terrestrial habitats, species and potential impact pathways are confined to the immediate vicinity of the island. The eradication works are entirely land-based, with no mechanisms for effects to extend beyond the island group, and assessment therefore focuses solely on ecological receptors present or recorded previously on Muck and its islets. No JNCC National Vegetation Classification data for the Muck island group exists, though several habitat types were observed during the site visits including inland rough grassland and machair, some small tree plantations, moorland and heathland. Most of the island is crofting farmland that has low lying, fertile pastures, particularly for sheep. Horse Island is predominantly inland rough grassland though, like Eagamol, features maritime grassland communities (Volume 3, Chapter 2: Compensation and Evidence Plan). On the Island of Muck there is the designation for the Camas Mor, Muck SSSI, however this is only for tertiary igneous earth sciences and as such does not have any impact pathway from this measure. Furthermore, the island group is not designated as an SPA or SAC, nor are there any designated sites in the close vicinity (<5km) designated for biodiversity, terrestrial ecology and terrestrial ornithology. However, terrestrial biodiversity which has been recorded on the Isle of Muck includes: • wood mouse (*Apodemus sylvaticus*); • field vole (*Microtus agrestis*); • pygmy shrew (*Sorex minutes*); • brown rat (*Rattus norvegicus*) – invasive species targeted for eradication; • livestock (including sheep and cows). Raptors and corvids which have been recorded on the Isle of Muck, include: • white-tailed eagle (*Haliaeetus albicilla*); • common buzzard (*Buteo buteo*); • peregrine falcon (*Falco peregrinus*); • common kestrel (*Falco tinnunculus*); • hen harrier (*Circus cyaneus*); • short-eared owl (*Asio flammeus*); • long-eared owl (*Asio otus*); • hooded crow (*Corvus cornix*); • golden eagle (*Aquila chrysaetos*); • common raven (*Corvus corax*). Terrestrial bird species also occur, such as • lapwing (*Vanellus vanellus*); • snipe (*Gallinago gallinago*); • oystercatcher (*Haematopus ostralegus*); • northern wheatear (*Oenanthe oenanthe*);

Receptor Group	Summary of Baseline Environment
	• great skua (*Stercorarius skua*); • black-headed gull (*Chroicocephalus ridibundus*); • grey heron (*Ardea cinerea*).

6.3 Assessment

6.3.1 Identification of impacts and scope of assessment

6.3.1.1 Based on the information presented in Volume 3, Chapter 2: Compensation and Evidence Plan and Chapter 3: Outline Compensation Implementation, Monitoring and Adaptive Management Plan, the activities associated with the rat eradication compensation measure are defined and potential impact pathways identified.

6.3.1.2 The rat eradication programme will be carried out using poisoned bait stations over a six month intensive programme on the Isle of Muck. The rat eradication programme will cover the entirety of the Isle of Muck and its sub-islands in a methodological and comprehensive manner, deploying bait stations in a grid design that will be used across the islands, with a higher density grid in areas of known good quality rat habitat, including but not limited to locations of gamebird feeders, livestock feed storage, and the harbour area. The number and spacing of bait stations will be defined in the detailed eradication plan (in Volume 3, Chapter 3: Outline Compensation Implementation, Monitoring and Adaptive Management Plan), informed by trap-line detection results and island-specific access constraints. Current survey data indicate that a grid-based deployment would be feasible, but final station numbers cannot be determined until operational planning has been confirmed.

6.3.1.3 As set out in Volume 3, Chapter 3: Outline Compensation Implementation, Monitoring and Adaptive Management Plan, further studies, surveys and trials will be undertaken prior to the full eradication programme, for example to provide further confirmation of rat presence and activity across the Isle of Muck, to refine design of bait delivery systems, undertake further rodenticide resistance testing of the population etc. This preparatory phase is intended to reduce any potential aversion to bait stations or bait, thereby increasing bait uptake during the initial stages of the eradication and improving the likelihood of targeting the majority of the rat population. This will also inform a risk assessment and further inform appropriate mitigation measures to avoid impacts on non-target species.

6.3.1.4 Following these initial surveys and trials, an initial intensive baiting phase of up to six weeks is expected to be implemented, after which a reduced-intensity baiting approach could be adopted over the remainder of the six month eradication programme. During the eradication campaign, bait stations will be checked regularly – ideally every one to three days – with bait replenished frequently during these checks as required. The rodenticide phase of the baiting eradication will typically commence in late autumn and continue through winter to early spring. Monitoring will be undertaken across the island during and after this period to detect and target any surviving rats and to help establish an effective long-term biosecurity monitoring network.

6.3.1.5 Potential impact pathways have been identified with respect to the relevant receptor groups:

- offshore and intertidal ornithology:
  - potential for disturbance from human activity due to rat eradication methods;
  - potential for unintended primary and secondary poisoning of non-target bird species due to rat eradication methods.
- biodiversity, terrestrial ecology and terrestrial ornithology:
  - potential for disturbance to non-target species due to rat eradication methods;
  - potential for unintended primary and secondary poisoning of non-target species due to rat eradication methods.

6.3.2 Impact assessment alone

6.3.2.1 The assessment of the LSE[1] of the compensation measure alone is presented below:

Offshore and intertidal ornithology

Potential for disturbance from human activity due to rat eradication methods

6.3.2.2 There is potential for disturbance to offshore and intertidal ornithological receptors (Table 6.1) on the Isle of Muck and its sub-islands (Lamb Island, Horse Island and Eagamol) due to human presence and activity associated with undertaking rat eradication. In particular, disturbance could occur intermittently when the ground-based bait stations are deployed and then regularly checked to replenish bait. This may cause stress to seabirds on the Isle of Muck including key species such as guillemot, razorbill, puffin, and kittiwake, which breed on cliffs, boulder fields, and grassy slopes across the island group, although these key species will generally be absent from the island outside the breeding periods when eradication would occur as they spend their non-breeding months foraging offshore or in more distant marine areas.

6.3.2.3 The impact is predicted to be of local spatial extent around the ground-based bait stations. It is expected that any human disturbance to seabirds and intertidal birds during initial deployment of stations and regular checks would be temporary (the rodenticide phase of eradication will take at least six months with bait stations remaining in-situ for one month after the last evidence of rat bait-take).

6.3.2.4 As detailed in Table 3.1, designed-in mitigation, through the use of good practice standards will be applied throughout. This includes the use of a feasibility study undertaken by rodent-eradication specialists, which informs the design of the bait-station grid to ensure sensitive habitats such as the key seabird breeding areas mentioned above are avoided. Recommendations arising from this feasibility work will be applied wherever practicable to reduce disturbance to ecological receptors and enhance the effectiveness of the eradication approach. To facilitate deployment of bait stations at the required density, narrow tracks no wider than 1m may be cut through dense vegetation, allowing access along specific routes only. This physical footprint will be very limited, and the required vegetation clearance will be minimal, reversible and unlikely to impact the habitats of these receptors.

6.3.2.5 As the rodenticide phase of the baiting eradication will commence in late autumn and continue through winter to early spring, disturbance during the most sensitive period for offshore ornithological receptors, which is the breeding season in spring and early summer will be avoided. Outwith the breeding season, several seabird species have been shown to exhibit a medium tolerance to intermittent human presence and low-level disturbance associated with activities such as walking and equipment placement (Cutts *et al*., 2013). In addition, the deployment and checking of bait stations is a manual process that does not involve the use of heavy machinery or powered equipment; as such, noise generation will be negligible and short-lived.

6.3.2.6 In summary, the magnitude of disturbance associated with the initial deployment of bait stations and subsequent routine checks is expected to be temporary, highly localised, reversible, and limited in spatial extent, with the timing of works substantially reducing risk. The magnitude of the impact is therefore considered to be low.

6.3.2.7 Key species that may be vulnerable to disturbance include guillemot, razorbill, puffin, and kittiwake. Isle of Muck preliminary surveys confirmed that seabird breeding habitat is located primarily on steep cliffs, boulder fields, and offshore islets (Horse Island and Eagamol), rather than across vegetated inland areas that baiting teams might cross (Volume 3, Annex 2.6: Pre-eradication Field Study Report: Muck). The suitable seabird habitat is therefore confined to these cliff and slope systems, with large areas of breeding habitat identified as unoccupied but highly localised along coastal edges rather than inland routes. Although there will be a regular presence of humans over the 6 month intensive baiting period, bait placement and checking would not intersect with the majority of these sensitive zones and as mentioned above, the breeding season will be avoided during the rat eradication period (Table 3.1). Taking account of the vulnerability, recoverability, seasonal timing, and limited habitat overlap, the sensitivity of offshore and intertidal ornithology receptors is, conservatively, considered low.

6.3.2.8 Based on professional judgement and due to the implementation of good practice standards, the magnitude of impact is low and, combined with low sensitivity, results in an effect of **minor** adverse significance, which is not significant in EIA terms.

6.3.2.9 No additional mitigation is considered necessary because the anticipated effect, in the absence of further mitigation measures, is not significant. The residual effect is therefore not significant.

Potential for unintended primary and secondary poisoning of non-target bird species due to rat eradication methods

6.3.2.10 There is a potential risk of unintended primary and secondary poisoning of non-target bird species (Table 6.1) due to the use of rodenticides.

6.3.2.11 As detailed in the UK Rodent Eradication Best Practice Toolkit (Biosecurity for Life, 2021) and Volume 3, Chapter 3: Outline Compensation Implementation, Monitoring and Adaptive Management Plan, risks of unintentional primary and secondary poisoning will be assessed and mitigated before baiting commences. The likelihood of secondary poisoning varies between species and is strongly influenced by their feeding behaviour. Predators and scavengers that regularly consume rodents or carrion are at the highest risk of secondary exposure, whereas species that rarely eat rodents have a much lower likelihood of encountering contaminated prey (Brakes and Smith, 2005). Most of the bird species relevant to this compensation measure and receptor group are not obligate scavengers and would only be exposed to secondary poisoning if they opportunistically consumed deceased rats. Furthermore, examples of mitigation for this risk include:

- use of lockable bait stations with restricted entry points;
- additional wires or baffles to reduce entrance size and prevent access by birds;
- placement of bait stations away from sensitive seabird nesting areas wherever possible;
- timing of eradication outside the key breeding seasons (late autumn to early spring) to minimise exposure risk;
- bait stations will be checked regularly (ideally every one to three days) with bait replenished frequently during these checks as required as well as the removal of moribund animals;
- removal of dead individuals across the island which would reduce the risk of secondary poisoning;
- as detailed in paragraph 5.5.4.3, good practice measures are considered as designed-in mitigation.

6.3.2.12 The spatial extent of the risk of primary exposure will be localised to the immediate vicinity of ground-based bait stations. However, secondary exposure is not necessarily constrained in the same way, as individuals that have ingested the poison (i.e. primary toxicity) may move prior to morbidity. Accordingly, the assessment recognises a potential for wider far-field effects in the absence of appropriate controls (e.g. regular removal and disposal of dead animals). To address this risk, the measure incorporates the designed-in mitigation above to ensure that, even if individuals travel distance post-exposure, the overall risk and potential remains managed and low due to removal of dead individuals across the entire island. In contrast, without such measures a prolonged programme could present a higher level of risk. A similar principle applies with smaller bird species, although the likelihood of access to bait stations is low, designed-in mitigation has been implemented to further reduce this residual risk to as low as reasonably practicable.

6.3.2.13 Rodenticide will only be placed within locked bait stations, and it is therefore expected that only a small proportion of the total area will be accessible to primary exposure during the eradication. While secondary exposure is not spatially constrained in the same way, the combination of seasonal timing (outside the breeding season) and restricted physical access substantially limits opportunities for food web transfer during the operational period.

6.3.2.14 Bait will be confined to locked bait stations, and stations will remain in place for approximately one month after the last evidence of bait-take to verify cessation of uptake and to manage any residual risk. Incidental effects, should they occur, would result in mortality of small numbers of individuals, which is unlikely to result in population-level effects. The risk itself will be short-lived and would cease with the end of baiting operations. Following successful eradication and removal of bait stations, ornithological receptors are expected to begin the return to their natural ecological population levels (where they are impacted at all), with recovery supported by the elimination of

chronic predation pressure from rats and the consequent improvement in breeding success and survivorship over subsequent seasons. Accordingly, while the operational risk to non-target bird species populations exists during the baiting window, the risk of unintended primary and secondary poisoning will be temporary and reversible; while isolated, short-term losses within the local seabird assemblage cannot be entirely excluded, no permanent population-level effects are anticipated in the long term. The magnitude of impact is therefore considered low for the proposed activities.

6.3.2.15 Temporally, key species will be most sensitive during the main breeding season (e.g. spring and early summer; Cutts *et al.,* 2013). As detailed above, baiting will typically commence in the late autumn and continue through the winter to early spring, outside the most sensitive time of year, thereby avoiding the most sensitive period for offshore and intertidal bird species. Evidence from comparable rat eradication programmes within the region demonstrates that poison-based eradication can be an effective conservation measure, delivering long-term benefits for seabird populations. On Canna, positive responses were observed for some species following rat removal, although wider recovery was initially masked by concurrent external pressures such as storm events and regional food shortages (Luxmoore *et al*., 2019). Further evidence on success of rat eradication programmes on seabirds is presented in Volume 3, Chapter 2: Compensation and Evidence Plan. This has been presented by conservationists as proof that seabird restoration works, with expectations of continued recovery if biosecurity and monitoring are maintained. Although there is potential for mortalities to individuals during the baiting window, population-level effects are unlikely to occur due to avoidance of sensitive periods and baiting targeted away from sensitive habitats. Due to the loss of some individuals but high potential for recovery of populations, the sensitivity to key species is considered to be low.

6.3.2.16 Based on professional judgement and due to the implementation of good practice standards, the low magnitude of impact and low sensitivity of the receptor to primary and secondary poisoning are considered to result in an effect of **minor** adverse significance, which is not significant in EIA terms.

6.3.2.17 No additional mitigation is considered necessary because the anticipated effect, in the absence of further mitigation measures, is not significant in EIA terms. The residual effect is therefore not significant.

Biodiversity, terrestrial ecology and terrestrial ornithology

Potential for disturbance to non-target species due to rat eradication methods

6.3.2.18 The placement of bait stations will be temporary and non-intrusive (there will be no physical disturbance such as digging or trenching of the ground), therefore there will be no permanent habitat loss and negligible disturbance to plant species from the placement of the bait stations. To enable the deployment of bait stations at the required density, narrow access routes no wider than 1m may be cut through dense vegetation, this represents the only alteration to vegetation associated with the proposed activities. The physical footprint of these access routes will be very limited, and any vegetation clearance will be minimal, localised, and fully reversible. The bait stations will be deployed for approximately six months and once removed, vegetation will recover naturally. As such, there is no likelihood of significant adverse effects on habitats and plant species from disturbance as a result of the rat eradication methods.

6.3.2.19 There is potential for disturbance to non-target animal species (i.e., terrestrial ornithology species and other terrestrial fauna; Table 6.1) from rat eradication methods, as those undertaking the proposed measure may cause visual and noise disturbance and stress non-target species on site when the ground-based bait stations are deployed and checked to replenish bait.

6.3.2.20 The potential for disturbance to non-target species has been assessed on the same basis as per above for offshore and intertidal ornithology. Furthermore, rat eradication activities will involve small teams on foot undertaking bait placement, monitoring and retrieval, with designed-in mitigation and the use of good practice standards applied throughout (as per paragraph 6.3.2.3 *et seq.*). Timing of baiting will be outside the breeding season of most terrestrial ornithology species (late autumn through early spring) which reduces sensitivity risks (NatureScot, 2017). Therefore, the magnitude of the impact is considered low.

6.3.2.21 Terrestrial ornithological receptors within this receptor group's study area primarily comprise common and widespread breeding and foraging bird species associated with farmland, grassland and settlement habitats. These species are generally well habituated to routine agricultural activity and low-level human presence and are not dependent on discrete or spatially restricted habitat features within areas likely to be accessed during eradication activities. No significant breeding or foraging assemblages of sensitive terrestrial species have been identified within the inland operational footprint and there is no evidence of legally protected terrestrial species regularly utilising inland habitats likely to be affected by operational access. Movement associated with site activities would avoid the sensitive habitat features, and works would be undertaken outside the core breeding period for terrestrial ornithology and terrestrial mammals where practicable, further reducing the likelihood of disturbance. Taking account of the low intensity and temporary nature of eradication activities, the widespread availability of alternative habitat, the behavioural resilience and recoverability of non-target terrestrial mammal and bird species, the absence of notable habitat constraints, and the low potential for noise or visual disturbance, the sensitivity of biodiversity, terrestrial ecology and terrestrial ornithology receptors is considered low.

6.3.2.22 Based on professional judgement and the implementation of good practice standards, the combination of low magnitude impact and low sensitivity receptors results in an effect of **minor** adverse significance, which is not significant in EIA terms.

6.3.2.23 No additional mitigation is considered necessary because the anticipated effect, in the absence of further mitigation measures, is not significant in EIA terms. The residual effect is therefore not significant.

Potential for unintended primary and secondary poisoning of non-target species due to rat eradication methods

6.3.2.24 There is a potential risk of unintended primary and secondary poisoning of non-target species (i.e. terrestrial ecology and terrestrial ornithology species (Table 6.1)) due to the use of rodenticides during the eradication campaign.

6.3.2.25 As described above (paragraph 6.3.2.12 *et seq.*) the spatial extent of any primary exposure will be localised to the immediate vicinity of ground-based bait stations, whilst secondary exposure may occur further afield as poisoned animals could travel some distance from the traps and be predated on by species higher in the food chain. For example, primary poisoning of small species such as field vole and wood mouse could lead to secondary poisoning of their predators, including raptors (e.g. kestrel, owl species). Mitigation measures to reduce this risk have been detailed above (paragraph 6.3.2.11) and will include measures to reduce exposure of non-target animals (small terrestrial mammals and bird species) to the poisoned bait, such as locked traps and restricted physical access. Furthermore, regular monitoring across the Isle of Muck during the eradication phase (including removal of dead individuals) will further reduce the potential for secondary poisoning. Thus, the designed-in mitigation will be premeditated to ensure that, even if individuals travel some distance post-exposure, the overall risk and potential remains managed and low.

6.3.2.26 The timing of the works has the potential to reduce the risk to non-target terrestrial mammals and bird species as the baiting programme will take place outside the breeding and nursing period for most species (i.e. avoiding spring and summer). There will, however, be loss of some individuals during this intensive poisoning phase although this is unlikely to lead to population-level effects due to the short period of eradication (6 months), the small numbers affected in the context of wider population and the high recovery potential following eradication. In addition, the eradication of rats should have a positive effect on populations of key species through removal of this species as a key predator, which commonly preys on the eggs and young of vulnerable bird species, small mammals, amphibians etc. Therefore, the sensitivity of terrestrial ecology and terrestrial ornithology to primary and secondary poisoning is considered to be medium.

6.3.2.27 Based on professional judgement and the implementation of good practice standards, the combination of low magnitude impact and medium sensitivity receptors results in an effect of **minor** adverse significance, which is not significant in EIA terms.

6.3.2.28 No additional mitigation is considered necessary because the anticipated effect, in the absence of further mitigation measures, is not significant in EIA terms. The residual effect is therefore not significant.

6.3.3 Cumulative Effect Assessment

6.3.3.1 The Applicant has identified no other plans or projects with the same impacts that would overlap spatially and/or temporally with the proposed rat eradication compensation measure that would result in a cumulative effect for the impacts considered above. The eradication programme is a discrete, short-term intervention designed to deliver long-term ecological benefits and does not coincide with other invasive mammal control projects or habitat management measures in the area.

6.3.4 Inter-related effects

6.3.4.1 As detailed in paragraph 5.6.1.3, there is limited potential for project-lifetime inter-related effects, defined as effects that arise where impacts from different activities or project phases combine or influence one another over time in a way that alters their overall effect. This is because effects related to the compensation measures will largely be limited to a short period of time (i.e. approximately 6 months) with limited activities occurring once the eradication is completed.

6.3.4.2 There is a potential for spatial and short-term temporal interactions on offshore and intertidal ornithological receptors between the impacts arising from potential disturbance from human activity and unintended primary and secondary poisoning due to rat eradication methods. There is limited potential for interactions between the impact of disturbance and the impact of poisoning because the two impacts act through different effect pathways and result in distinct, non-compounding outcomes. These individual impacts were assigned a maximum significance of minor adverse significance as standalone impacts, which is not significant in EIA terms.

6.3.4.3 Additive, synergistic and antagonistic effects were considered in relation to temporary disturbance associated with human presence during rat eradication activities and the low risk of unintended primary or secondary poisoning. Disturbance may lead to short-term behavioural responses (e.g. displacement or increased vigilance), while toxicological risk is determined solely by bait uptake pathways; however, neither impact alters the nature or magnitude of the other. As both disturbance and potential poisoning are independent, short-lived and spatially limited, there is no plausible mechanism for them to combine in a way that increases, offsets or otherwise changes their individual effects. Given the very small scale of each impact, there is no potential for any form of interaction to result in a greater overall effect.

6.3.4.4 Similarly, for the receptor group biodiversity, terrestrial ecology and terrestrial ornithology, the potential impacts of disturbance from human activity due to rat eradication methods and unintended primary and secondary poisoning of non-target terrestrial species are also short-term and temporary. As per paragraph 6.3.4.2 and 6.3.4.3, there is also limited potential for interactions between the impact of disturbance and the impact of poisoning because the two impacts act through different effect pathways and result in distinct, non-compounding outcomes. These activities will be carefully managed through designed-in mitigation and scheduled outside sensitive periods. These individual impacts for this receptor group were also assigned a maximum significance of minor adverse significance as standalone impacts, which is not significant in EIA terms. Furthermore, the nature, pathways and outcomes of these impacts when considered as project-lifetime inter-related effects do not differ with those assessed for offshore and intertidal ornithological receptor group as per paragraphs 6.3.4.2 and 6.3.4.3. Accordingly, the conclusions for the offshore and intertidal receptor group regarding the absence of additive, synergistic or antagonistic effects also apply to this receptor group.

6.3.4.5 Although these potential receptor-led effects may arise, it is important to recognise that the individual activities will not necessarily occur simultaneously, although some effects will. However, due to the limited scale and duration of the proposed rat eradication and the high reversibility of any effects on receptors, these are not anticipated to be any more significant than the individual impacts to each receptor in isolation.

6.3.4.6 Given the timing, scale, and mitigation measures in place, any inter-related effects are anticipated to remain minor and will not result in any major impacts or significant combined effects.

6.3.5 Transboundary impacts

6.3.5.1 Due to the limited scale of the rat eradication compensation measures (i.e. limited to the Isle of Muck only) there is no potential for transboundary effects.

7 Conclusions

7.1.1.1 This document has considered the environmental impacts and potential for likely significant effects associated with the implementation of the following proposed compensation measure:

- rat eradication on the Isle of Muck.

7.1.1.2 The assessment provided in this document is based on the current understanding of the location, scope and nature of the proposed compensation measure as provided within Volume 3, Chapter 2: Compensation and Evidence Plan. For the proposed compensation measure, the parameters have been defined from Volume 3, Chapter 3: Outline Compensation Implementation, Monitoring and Adaptive Management Plan. A range of impacts were identified and assessed with respect to the compensation measure. Those impacts where an assessment of LSE[1] was undertaken are shown in Table 5.2. The report sets out the baseline for key sensitive receptors that could be affected by each impact (Table 6.1) and provided justification for those receptors that could be scoped out (Table 5.3). The magnitude of impact and sensitivity of each receptor has been considered, and the level of significance has been derived following the matrix approach (Table 5.1).

7.1.1.3 No adverse impacts were considered likely to result in significant effects (in EIA terms) on any sensitive receptors with respect to the measure of rat eradication on the Isle of Muck (Table 7.1).

7.1.1.4 Inter-related effects over the project-lifetime and receptor-led inter-related effects were also considered with no adverse impacts and no likely significant effects in EIA terms with respect to rat eradication on the Isle of Muck (Table 7.1).

Table 7.1: Summary of impacts and potential for significant effects in EIA terms for the measure of rat eradication on the Isle of Muck

Receptor Group	Impact Pathways Assessed	Significance
Offshore and intertidal ornithology	Potential for disturbance from human activity due to rat eradication methods	Minor adverse (not significant)
	Potential for unintended primary and secondary poisoning of non-target bird species due to rat eradication methods	Minor adverse (not significant)
Biodiversity, terrestrial ecology and terrestrial ornithology	Potential for disturbance to non-target species due to rat eradication methods	Minor adverse (not significant)
	Potential for unintended primary and secondary poisoning of non-target species due to rat eradication methods	Minor adverse (not significant)
Inter-related effect (Offshore and intertidal ornithology)	Interaction between potential for disturbance from human activity due to rat eradication methods and potential for unintended primary and secondary poisoning of non-target bird species due to rat eradication methods	Minor adverse (not significant)
Inter-related effect (Biodiversity, terrestrial ecology and terrestrial ornithology)	Interaction between potential for disturbance to non-target species due to rat eradication methods and potential for unintended primary and secondary poisoning of non-target species due to rat eradication methods	Minor adverse (not significant)

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