BERWICK BANK WIND FARM

DEROGATION CASE

ENVIRONMENTAL IMPACT ASSESSMENT REPORT

Document Status

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ACRONYMS

Acronym	Definition
AEoI	Adverse Effect on Integrity
AOB	Apparently Occupied Burrows
AON	Apparently Occupied Nests
AOS	Apparently Occupied Sites
AOT	Apparently Occupied Territories
CCM	Colony Compensation Measures
CES	Crown Estate Scotland
CfD	Contract for Difference
CRRU	Campaign for Responsible Rodenticide Use
DHT	Dunbar Harbour Trust
EIA	Environmental Impact Assessment
EIAR	Environmental Impact Assessment Report
ELC	East Lothian Council
ELCAS	East Lothian Council Archaeological Service
FCM	Fisheries Compensatory Measures
FIHG	Forth Islands Heritage Group
HES	Historic Environment Scotland
HRA	Habitat Regulations Appraisal
IMP	Implementation and Monitoring Plan
INNS	Invasive Non-Native Species
LSE	Likely Significant Effect
MDS	Maximum Design Scenario
MHWS	Mean High Water Spring
MS-LOT	Marine Scotland – Licensing Operations Team
MU	Management Unit
NTSMP	Non-Target Species Management Plan
O&M	Operation and Maintenance
RIAA	Report to Inform Appropriate Assessment
RSPB	Royal Society for the Protection of Birds
SCOS	Special Committee
SNCB	Statutory Nature Conservation Body
SSER	SSE Renewables

Acronym	Definition
SSSI	Site of Special Scientific Interest
SPA	Special Protection Area
TAC	Total Allowable Catch
WMP	Waste Management Plan

1. INTRODUCTION

1.1. PROJECT BACKGROUND

1. Berwick Bank Wind Farm Limited (the Applicant) is proposing to develop the Berwick Bank Wind Farm (The Project), in the outer Firth of Forth and Firth of Tay within the former Round 3 Firth of Forth Zone. The Project will include offshore and onshore infrastructure including an offshore generating station (array), offshore export cables to landfall and onshore transmission cables leading to an onshore substation with electrical balancing infrastructure, and connection to the electricity transmission network. The offshore components of the Project seaward of MHWS are referred to as the Proposed Development.

2. The array comprises 307 wind turbines, with an estimated capacity of 4.1 gigawatt (GW). The array will be approximately 47.6 km offshore of the East Lothian coastline and 37.8 km from the Scottish Borders coastline at St, Abbs. It lies to the south of the offshore wind farms known as Seagreen and Seagreen 1A, south-east of Inch Cape and east of Neart Na Goaithe.

3. The most precautionary conclusions of the Report to Inform Appropriate Assessment (RIAA) of the Proposed Development has identified the potential for an adverse effect on the integrity of the following eight SPAs from the impacts of the Proposed Development (alone and/or in-combination):

   - Forth Islands SPA
   - St Abbs Head to Fast Castle SPA
   - Fowlsheugh SPA
   - Farne Islands SPA
   - East Caithness Cliffs SPA
   - Troup, Pennan & Lion's Heads SPA
   - Buchan Ness to Collieston Coast SPA
   - Flamborough and Filey Coast SPA

4. As such, the Applicant has proposed a derogation case including identifying compensatory measures which could be delivered to secure the overall coherence of the national site network, if necessary. The compensatory measures selection process, as set out within the Derogation Case, together with stakeholder consultation resulted in one fisheries management measure and two colony measures being selected from a long list. The chosen measures, as illustrated in Figure 1, comprise of the following:

   - Management of SA4 sandeel fishery (either under a “full closure of SA4” or an “ecosystem-based management” option);
   - Rat Eradication: Handa; and
   - Dunbar Castle Wardening Role.

5. These measures are substantial, and justification with evidence has been provided within the Derogation Case that provide sufficient information to allow the Scottish Ministers to conclude that the national site network will be maintained and enhanced. This evidence is supported, and should be read alongside the accompanying technical appendices (the Fisheries Compensatory Measures (FCM) Evidence Report and the Colony Compensatory Measures (CCM) Evidence Report).

6. Information on how each of the measures will be implemented and monitored is provided in the Implementation and Monitoring Plan (IMP). This includes a range of built-in adaptive management measures specific to each measure and a number of secondary measures, that could also be implemented as part of an adaptive management response. Rat eradication at Inchcolm Island is included as a secondary adaptive management compensatory measure that may be implemented for adaptive management purposes. A complete account of this measure is included within this document however it should be noted that further stakeholder consultation would be required before this specific measure could be secured and the intention is not to take this measure forward as compensation at this stage.

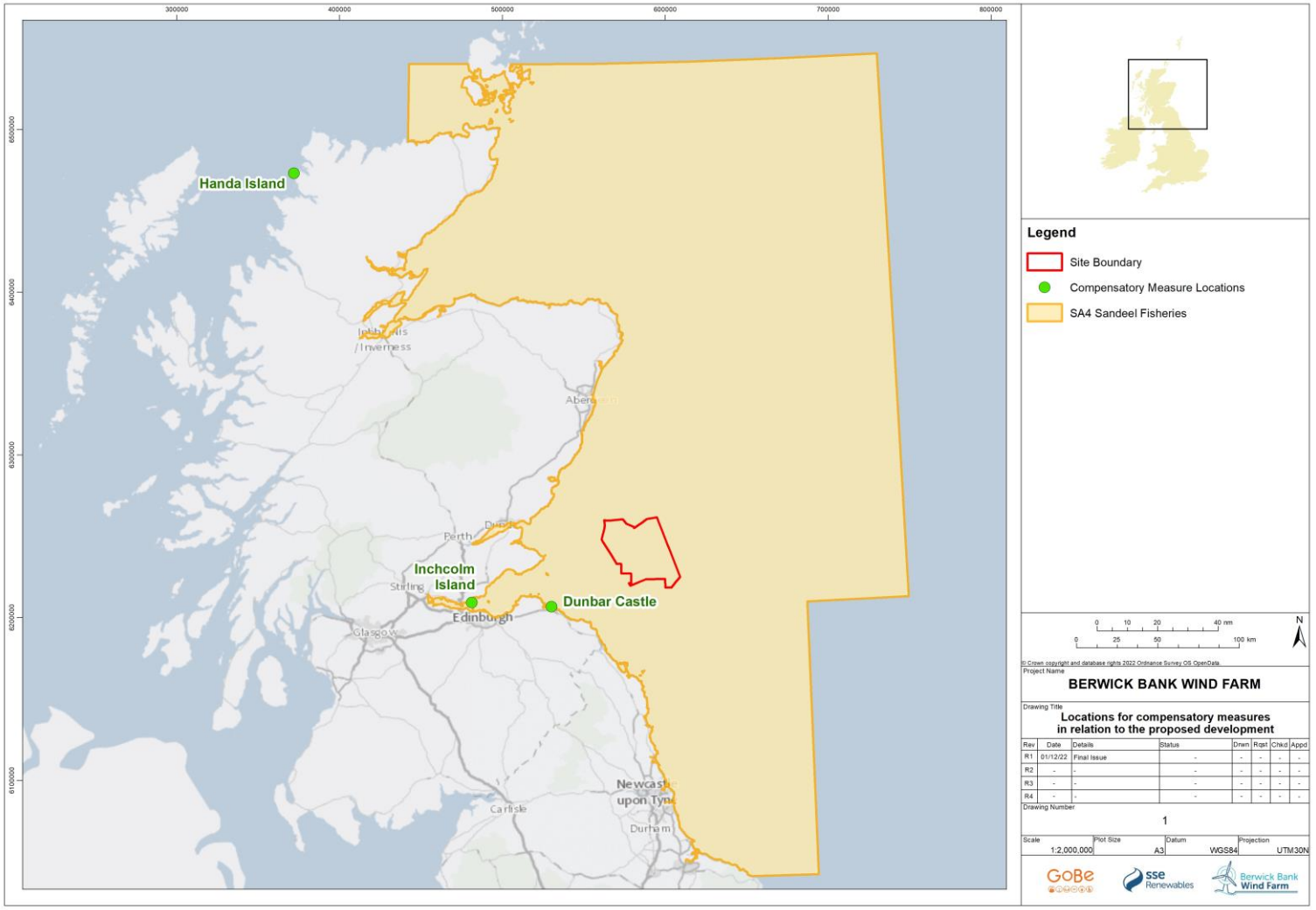

Figure 1: A map of the proposed locations for the proposed compensatory measures including the SA4 fishery, Handa island, Dunbar Castle, and Inchcolm island (included as a secondary measure for adaptive management purposes).

1.2. PURPOSE OF THIS DOCUMENT

7. This document presents an assessment of the likely significant environmental effects of the compensatory measures being developed as part of the Derogation Case for the Proposed Development. The compensatory measures are being brought forward, as a consequence of the Proposed Development's potential effects on the national site network. Any effects arising from the compensatory measures are, on a precautionary basis, considered to be indirect or secondary to the effects of the Proposed Development, and for consideration under the Environmental Impact Assessment (EIA) regulations[1]. The purpose of this document is to assess the likely significant effects of the proposed compensatory measures on the environment. For full context regarding the policy and legislative context for EIA please see Volume 1, Chapter 2: Policy and Legislation of the EIA Report.

1.3. STRUCTURE OF THIS DOCUMENT

8. This Environmental Impact Assessment Report (EIAR) is set out in a number of stages as follows:

- Consideration of alternative compensatory measures (Section 2);
- Brief description of the proposed compensatory measures for the Proposed Development (Section 3);
- Consultation (Section 4);
- A brief summary of the EIA Methodology used for the assessment (Section 5);
- An EIA section for each compensatory measure (Section 6 to 9), with each section containing the following sections:
  - Baseline – a summary of the baseline environment for each area considered; and
  - Assessment – identification of impacts and associated assessment.
- Conclusions (Section 10); and
- References (Section 11).

[1] The Electricity Works (Environmental Impact Assessment) (Scotland) Regulations 2017, The Marine Works (Environmental Impact Assessment) (Scotland) Regulations 2017 and The Marine Works (Environmental Impact Assessment) Regulations 2007.

2. CONSIDERATION OF ALTERNATIVE COMPENSATORY MEASURES

9. An important part of the development process for the Proposed Development has been the consideration of potential options, selection and the subsequent refinement of compensatory measures and their delivery. 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 such decisions have been made. The process undertaken by the Applicant for selection and consideration of alternative compensatory measures and alternative site/locations for their delivery is detailed within Part D of the Derogation Case. and the CCM Evidence Report and FCM Evidence Report.

10. The Applicant used a five-step process to select the proposed compensatory measures:

- Step 1 - Risk to conservation objectives
  - Quantify the nature and extent of potential adverse effects and the conservation objectives which may be undermined
  - Show how these effects might affect overall network coherence,
- Step 2 – Aims and Objectives
  - Specify the aims and objectives of compensatory measures
- Step 3 - Feasibility of *potential* compensatory measure options
  - Assessing the feasibility of potential compensatory measure options (technical, legal and financial)
  - Identify a final list of proposed compensatory measures and carry out a detailed feasibility assessment
  - The Applicant's detailed feasibility assessment has been carried out to ensure each of the measures selected meets the key criteria for compensation. The list of key criteria was developed in view of the suite of guidance documents available on compensation (see section 2.2 of the Derogation Case). The assessment demonstrates to Scottish Ministers that each of the chosen measures is feasible in respect of all criteria assessed.
- Step 4 - Assess the extent of the proposed compensatory measures and the sufficiency of each measure in ensuring the overall coherence of the National Site Network
- Step 5 - Implementation and monitoring plan

11. To avoid repetition the approach to selection and consideration of alternatives is not discussed further here however, as outlined within the Derogation Case and supporting documents, the Applicant has proposed a suite of compensatory measures which has been selected through a rigorous iterative process involving careful consideration and testing of options, stakeholder consultation and refinement. There is sufficient evidence to support the rationale for the final selection.

3. PROPOSED COMPENSATORY MEASURES

3.1. INTRODUCTION

12. A full description of each proposed compensatory measure can be found within the Implementation and Monitoring Plan (IMP).

13. In order to facilitate an environmental assessment of the measures, a Maximum Design Scenario (MDS) has been defined for each measure, which is presented in Table 1 and Table 2. The MDS represents the scenario(s) that would have the greatest impact and has been defined so that the "worst case" scenario can be assessed. As a result, the reader can be confident that any other (lesser) scenario(s) will have an impact that is no greater than that assessed.

14. The proposed compensatory measures are categorised into two groups, 'Fisheries Based' and 'Colony Based' measures as follows:

- Fisheries Based measures:
  - Management of SA4 sandeel fishery (considering two options: closure of SA4 sandeel fishery and ecosystem-based management).
- Colony Based measures:
  - Rat eradication: Handa;
  - Dunbar Castle wardening role; and
  - Rat eradication: Inchcolm (secondary measure)[2].

3.2. MAXIMUM DESIGN SCENARIO

15. A Rochdale Envelope approach has been adopted which allows meaningful EIA to take place by defining a 'realistic worst case' scenario that decision makers can consider in determining the acceptability, or otherwise, of the environmental impacts of a project. As long as a project's parameters fall within the limits of the envelope and the EIA process has considered the impacts of that envelope and provides robust and justifiable conclusions, then flexibility within those parameters is deemed to be permissible within the terms of any consent granted, i.e., if consent is granted on the assessed maximum parameters of a development, any parameters equal to or less than those assessed is permitted to be constructed. The principle of Rochdale permits the developer or applicant to provide broad or alternative project parameters, of which one or a selection of the scenarios or parameters will ultimately be implemented.

16. The 'realistic worst case' scenario assumes that one or other of the parameters will have a more significant adverse effect than the alternative. Where a range is provided, i.e., different fisheries management scenarios, the most detrimental is assessed in each case.

17. The design of the compensatory measure that could result in the most significant effect may be different for each receptor type. Understanding the cause and effect specific to each receptor leads to the definition of the appropriate Rochdale parameter for that receptor and, therefore, identifies the 'realistic worst case'. Taking the 'realistic worst case' scenario, it can be assumed if no significant impact is demonstrated at the 'realistic worst case', then no significant impact is likely for any scenario.

18. Table 1 and Table 2 present a summary of the MDS identified for the compensatory measures. Due to the nature of the compensatory measure for sandeel fishing, this

2 As noted above, this is included as a secondary measure that may be implemented for adaptive management purposes and the intention is not to take this measure forward as compensation at this stage. An assessment of this measure is included in the case this may be required to be implemented in the future, following stakeholder consultation, so any further assessments would not need to be undertaken.

measure has been presented with a different MDS per receptor (Table 1). The MDS's have been identified by examination of the Implementation and Monitoring Plan combined with knowledge of similar compensation projects, and applying expert judgement on the variables which may result in greater impacts.

Table 1: Maximum design scenario for the management of SA4 sandeel fishery compensatory measure

Receptor	Maximum Design Scenario
Benthic and intertidal ecology	The maximum design scenario for this receptor is based on the ecosystem-based management option for the management of SA4 sandeel fishery compensatory measure. The total allowable catch (TAC) is initially reduced to 0 and then managed based on an ecosystem-based assessment thereafter. For the purposes of defining the worst-case scenario for this receptor, it is assumed that the TAC set results in minimal changes to fishing effort i.e. the TAC is set just below historic levels. This would be the least beneficial outcome for this receptor group. Although it should be noted that any restriction – large all small - would always benefit this receptor group.
Commercial Fishing and socio-economics[3]	The maximum design scenario for this receptor is based on the closure of the SA4 fishery option for the management of SA4 sandeel fishery compensatory measure. TAC reduced to 0 at start of 2024 for all sandeel fishing indefinitely. Fishers receive no financial compensation for loss of fishing grounds and do not relocate elsewhere. It is assumed that they will not relocate elsewhere because other fisheries are subject to fisheries management and which are likely to restrict the overall level of fishing carried out in those areas which are assumed to already be at capacity and therefore the reduction in sandeel fishing at SA4 would not place additional fishing pressure elsewhere.
Fish and shellfish ecology	The maximum design scenario for this receptor is based on the ecosystem-based management option for the management of SA4 sandeel fishery compensatory measure. The TAC is initially reduced to 0 and then managed based on an ecosystem-based assessment thereafter. For the purposes of defining the worst-case scenario for this receptor, it is assumed that the TAC set results in minimal changes to fishing effort i.e. the TAC is set just below historic levels. This would be the least beneficial outcome for this receptor group. Although it should be noted that any restriction – large all small - would always benefit this receptor group.
Offshore and Intertidal ornithology	The maximum design scenario for this receptor is based on the ecosystem-based management option for the management of SA4 sandeel fishery compensatory measure. The TAC is initially reduced to 0 and then managed based on an ecosystem-based assessment thereafter. For the purposes of defining the worst-case scenario for this receptor, it can be assumed that the TAC will always be adjusted to facilitate for a positive response from seabirds populations.
Marine mammals	The maximum design scenario for this receptor is based on the ecosystem-based management option for the management of SA4 sandeel fishery compensatory measure. The TAC is initially reduced to 0 and then managed based on an ecosystem-based assessment thereafter. For the purposes of defining the worst-case scenario for this receptor, it can be assumed that the

[3] For the assessment of this measure, the commercial fishing and socio-economic receptors have been combined into one receptor, as the only pathway to socio-economic receptors is through the impact to commercial fishing receptors.

Receptor	Maximum Design Scenario
	TAC will always be adjusted to facilitate for a positive response from seabirds populations, which in turn will have a benefit for marine mammals in terms of increased prey

Table 2: Maximum design scenario for the colony based compensatory measures

Measure	Rat Eradication: Handa	Dunbar Castle Wardening Role	Rat Eradication: Inchcolm (Secondary measure)
Mechanism	• Eradication phase to be undertaken in winter period and last five months (November to March inclusive) • Eradication phase to use approximately 1300 bait stations • Eradication phase and immediate monitoring to require visits at minimum every two days to replace rodenticide • Long term monitoring phase to start following eradication phase and continue for two years (monitoring at least every four weeks over the two-year period) • Biosecurity measures will be in place for the operational lifetime of the Proposed Development	• Nesting habitat improvements to be undertaken in winter period (outside the breeding season) • Debris removal activities to be undertaken in winter period (outside the breeding season) • Cameras/equipment for monitoring purposes to be installed in the winter period	• Eradication phase to be undertaken in winter period and last five months (November to March inclusive) • Eradication phase to use approximately 170 bait stations • Eradication phase and immediate monitoring to require visits at minimum every two days to replace rodenticide • Long-term monitoring phase to start following eradication phase and continue for two years (monitoring at least every four weeks over the two year period) • Biosecurity measures will be in place for the operational lifetime of the Proposed Development

Measure	Rat Eradication: Handa	Dunbar Castle Wardening Role	Rat Eradication: Inchcolm (Secondary neasure)
Timescale	• Rodent removal (eradication phase) over a single winter period. • Monitoring phase and any additional removals over a two-year period. • Biosecurity measures will be in place for the operational lifetime of the Proposed Development	• Initial period of wardening activities	• Rodent removal (eradication phase) over a single winter period. • Monitoring phase and any additional removals over a two-year period. • Biosecurity measures will be in place for the operational lifetime of the Proposed Development

3.3. COMPENSATORY MEASURES COMMITMENTS

19. The approach taken to EIAR for the compensatory measures is detailed in section 5. Where there is potential for an adverse effect, the primary measure applied to avoid a significant adverse effect is mitigation. For the Proposed Development, these mitigation measures are identified below in Table 3.

20. The commitments described in Table 3 are incorporated within the IMP. As part of the process of discharging suspensive requirements of consent conditions, it is anticipated that the Applicant will produce a Colony Measures Implementation Plan and Sandeel Measures Implementation Plan for submission to Scottish Ministers. Each plan will be informed by stakeholder feedback and the commitments made in the IMP. Section 6 of the IMP details the Applicant's recommendation to Scottish Ministers on how this process should be secured within the consent.

Table 3: Commitments relating to the proposed compensatory measures

Commitment Reference	Commitment Details
1	Consideration of the timing and location of predator eradication programme will be made to ensure that it is undertaken at the optimal time/location and that it will avoid/reduce interaction with non-target species. Design of eradication programme and eradication methods will follow current good practise design to minimise impact on sensitive habitats, non-target species and disruption to land use.
2	Consideration of the timing and location of predator eradication long-term monitoring programme will be made to ensure that it is undertaken at the optimal time/location and that it will avoid/reduce interaction with non-target species. Design of eradication programme and eradication methods will follow current good practise design to minimise impact on sensitive habitats, non-target species and disruption to land use.
2	Consideration of the timing and location of debris removal activities will ensure that work is undertaken at the optimal time/location and that it will avoid/reduce interaction with sensitive species. Design of the programme and methodology will follow current good practise design to minimise impact on sensitive habitats, species and disruption to land use.
3	Consideration of the timing and location of kittiwake nesting habitat improvement activities will ensure that work is undertaken at the optimal time/location and that it will avoid/reduce interaction with sensitive species. Design of the programme and methodology will follow current good practise design to minimise impact on sensitive habitats, species and non-target species and disruption to land use.
4	Consideration of the timing and location of camera/monitoring equipment installation and removal activities will ensure that work is undertaken at the optimal time/location and that it will avoid/reduce interaction with sensitive species. Design of the programme and methodology will follow current good practise design to minimise impact on sensitive habitats, species and disruption to land use.

4. CONSULTATION

21. The Applicant has undertaken consultation with relevant stakeholders and Statutory Nature Conservation Bodies (SNCBs) as part of the preparation of the Derogation Case (namely, NatureScot, Marine Scotland – Licensing Operations Team (MS-LOT), Historic Environment Scotland (HES), Department for Environment Food and Rural Affairs (Defra), the Scottish Seabird Centre, the Centre for Ecology and Hydrology, the National Trust, the National Trust for Scotland, the Scottish Wildlife Trust, Crown Estate Scotland (CES), Royal Society for Protection of Birds (RSPB), Dunbar Harbour Trust (DHT), East Lothian Council (ELC), East Lothian Council Ranger Service (ELCAS), Scottish Fishermen's Federation (SFF), local ornithological consultants, and local bird ringers) regarding compensation for the Proposed Development. Further detail on this consultation is presented in the Consultation Log which is found in Appendix 1 of the Derogation Case. Engagement will be ongoing with various stakeholders for the proposed compensatory measures at various stages through the process, as detailed in the IMP.

5. EIAR METHODOLOGY

5.1. INTRODUCTION

22. Volume 1, Chapter 6: Environmental Impact Assessment Methodology of the EIA Report sets out the EIA methodology followed for the offshore stages of the Proposed Development. It describes the approach used to identify, evaluate and mitigate potential likely significant effects in and evaluate whether they are significant in EIA terms. The requirement for EIA and the proposed temporal, spatial and technical scope of the assessments are described with the detail being equally relevant to the derogation case EIA and as such, most of this detail is not repeated within this document. To enhance the readability of this derogation case EIAR, some elements of EIA methodology are repeated below to allow this document to be read and understood without extensive cross-referencing to other documents required.

5.2. OVERVIEW OF PROCESS

5.2.1. OVERVIEW

23. 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). 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) has guided the specific approach followed by the Applicant in relation to this derogation case EIA.

24. The key elements of the derogation case EIAR process and the identification of significant effects are described in the following sections. While these provide a general framework for identifying impacts and assessing the significance of their effect(s), in practice the approaches and criteria applied across different EIA topics vary.

25. An overview of the approach to assessment of the derogation case EIAR is provided in Figure 2.

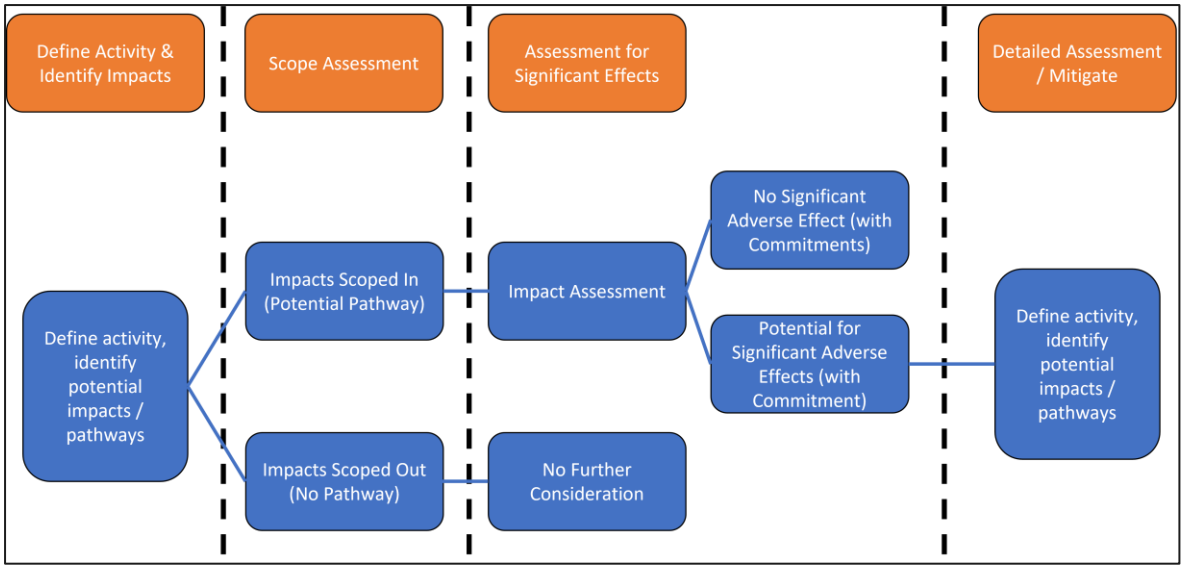

Figure 2: Compensatory measures EIA Process

5.3. IMPACTS, EFFECTS MITIGATION, AND SIGNIFICANCE

26. 'Impacts' are defined as the physical (or chemical) changes that will be caused by the Proposed Development activities. 'Effects' are defined as the consequences of these impacts to biological populations, ecosystems, and humans (including their physical and cultural assets). The impacts of the various compensation measures presented in this document have been identified based on knowledge of impact pathways from examining similar projects plus a consideration of the existing baseline environment and subsequent potential for impact.

27. For many technical topics, the likely significance of an effect is established by combining the magnitude of an impact with the sensitivity of the receptor to that impact (noting that sensitivity is not considered as an inherent characteristic but how something specifically responds to an external factor). The magnitude of an impact is the consideration of the extent, duration, frequency, and reversibility of an impact. In defining the sensitivity for each receptor/receptor group, the vulnerability, recoverability, and value/importance of that receptor will be taken into consideration. The conclusion of significance of effect is determined through a significance matrix as presented in Table 4.

28. A level of effect of moderate or more will be considered a 'significant' effect for the purposes of the EIAR. A level of effect of minor or less will be considered 'not significant'. Effects of moderate significance or above are therefore considered important in the decision-making process, whilst effects of minor significance are afforded less weight in the decision-making process.

Table 4: Matrix used for the assessment of the significance of the effect

		Magnitude of Impact			
		Negligible	**Low**	**Medium**	**High**
Sensitivity of receptor	**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

29. For more information on the methodology for assessing the likely significance of effects, including the significance matrix utilised in this assessment, see Volume 1, Chapter 6: Environmental Impact Assessment Methodology.

5.4. SCOPING OF IMPACTS

30. In order to facilitate a proportionate level of environmental assessment, an informal scoping stage was undertaken to identify what potential impacts exist for each of the compensatory measures. The results of the scoping stage are presented in Table 5. Scoping was undertaken based on knowledge of the proposed locations of each measure and the baseline environment, and potential impacts of the measures from other similar projects undertaken (such as rat eradication projects already undertaken elsewhere in the UK).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 EIAR. Justification for scoping out is presented in Table 5.

Table 5: Results of scoping of environmental impacts of the compensatory measures

Compensatory measure	EIA receptor group scoped in	Potential impacts scoped in	EIA receptor group scoped out	Rationale for scoping out
Management of SA4 sandeel fishery	Benthic and intertidal ecology	Beneficial effect on benthic ecology populations through reduction in habitat degradation	Air Quality; Aviation and radar; Geology and ground conditions; Historic environment; Human Health; Hydrology and flood risk; Infrastructure and other users; Land use and agriculture; Marine archaeology; Marine geology, oceanography, and physical processes; Noise and vibration; Onshore ecology; Seascape, landscape, and visual resources; Shipping and navigation; Socio-economics; and Traffic and transport.	Given the area being investigated for this measure is an offshore fisheries area and there is no spatial overlap it is considered that there is no impact on onshore ecology receptors and therefore it has been scoped out as no pathways for impact have been identified. It is not assumed that the fishery will be displaced elsewhere because other fisheries are subject to fisheries management measures and it is assumed that these are already at capacity and therefore would not be subject to increased fishing as a result of the closure of SA4. The proposed methodology will not result in any lasting infrastructure or physical intrusions meaning that there will be no impact on either the seascape, landscape, and visual resources receptor group so this receptor group has been scoped out. Additionally, the proposed methodology is not anticipated to impact on air quality, aviation and radar, geology and ground conditions, historic environment, human
	Commercial Fishing and Socio-economics[4]	Adverse effect on sandeel fishery through restriction of activities		
	Fish and shellfish ecology	Beneficial effect on fish and shellfish populations through reduction in fishing pressure		
	Marine mammals	Beneficial effect on marine mammals through an increase in prey resource		
	Offshore and intertidal ornithology	Beneficial effect on seabirds through an increase in prey resource		

[4] For the assessment of this measure, the commercial fishing and socio-economic receptors have been combined as the only pathway for impact socio-economic receptors is through the impact to commercial fisheries.

Compensatory measure	EIA receptor group scoped in	Potential impacts scoped in	EIA receptor group scoped out	Rationale for scoping out
				health, hydrology and flood risk, infrastructure and other users, land use and agriculture, marine archaeology, marine geology, oceanography, and physical processes, noise and vibration, onshore ecology, seascape, landscape, and visual resources, shipping and navigation, socio-economics, and traffic and transport. Furthermore, no risks of major accidents and/or disasters to occur as a result of this measure. Receptor groups. Therefore, they have been scoped out from assessment as no impact pathways exist.
Rat Eradication: Handa	Infrastructure and other users.	Impacts to tourism due to biosecurity measures	Air Quality; Aviation and radar; Benthic and intertidal ecology; Commercial fishing; Fish and shellfish; Geology and ground conditions; Human Health; Hydrology and flood risk; Land use and agriculture; Marine archaeology; Marine geology, oceanography, and physical processes; Marine Mammals; Noise and vibration;	The effects associated with the proposed method for this measure will be restricted to the island itself and will not directly impact on any of the offshore receptors with the exception of the target receptor (offshore and intertidal ornithology). Therefore, the marine archaeology, marine geology oceanography and physical processes, benthic and intertidal ecology, fish and shellfish ecology, and marine mammal receptor groups have been scoped out as no pathways for impact have been identified. Additionally, the proposed methodology is not anticipated to impact on air quality, aviation and radar, benthic and intertidal
	Offshore and intertidal ornithology	Potential for disturbance from human activity due to eradication and immediate monitoring phase of the programme		
		Potential for disturbance from human activity due to long-term monitoring phase of the programme		
		Beneficial effect on seabird populations from reduced predation on eggs/ juveniles		

Compensatory measure	EIA receptor group scoped in	Potential impacts scoped in	EIA receptor group scoped out	Rationale for scoping out
	Onshore ecology;	Impacts to onshore plants and animals other than the targeted rat species	Seascape, landscape, and visual resources; and Traffic and transport.	ecology, commercial fishing, fish and shellfish, geology and ground conditions, historic environment, human health, hydrology and flood risk, land use and agriculture, marine geology, oceanography, and physical processes, marine mammals, noise and vibration, seascape, landscape, and visual resources, and traffic and transport and therefore they have been scoped out as no pathways for impact have been identified. Furthermore, no risks of major accidents and/or disasters to occur as a result of this measure
		Potential for disturbance from human activity due to eradication, immediate monitoring, and long-term monitoring phase of the programme		
		Beneficial effect on onshore ecology from reduced predation from rats		
	Shipping and navigation	Potential disturbance to usual operating procedures to factor in biosecurity measures		
	Socio-economics	Beneficial effect on local industry resulting from increased birds on site		
		Impacts to tourism operators due to biosecurity measures		
Dunbar Castle Wardening Role	Historic environment	Adverse effect on historic listed castle building from improvement of kittiwake nesting habitat	Air Quality; Aviation and radar; Benthic and intertidal ecology; Commercial fishing; Fish and shellfish; Geology and ground conditions; Human Health; Hydrology and flood risk;	The effects associated with the proposed method for this measure will be restricted to Dunbar Castle itself and will not directly impact on any of the offshore receptors with the exception of the target receptor (offshore and intertidal ornithology). Therefore, the marine geology oceanography and physical processes,
	Noise and vibration	Adverse effect on local residents from increasing noise levels due to kittiwake population growth		

Compensatory measure	EIA receptor group scoped in	Potential impacts scoped in	EIA receptor group scoped out	Rationale for scoping out
	Offshore and intertidal ornithology	Temporary disturbance during improvement of kittiwake nesting habitat	Infrastructure and other users; Land use and agriculture; Marine archaeology; Marine geology, oceanography, and physical processes; Marine Mammals; Seascape, landscape, and visual resources; Shipping and navigation; and Traffic and transport.	marine archaeology, benthic and intertidal ecology, fish and shellfish ecology, and marine mammal receptor groups have been scoped out as no pathways for impact have been identified. Additionally, the proposed methodology is not anticipated to impact on air quality, aviation and radar, commercial fishing, human health, hydrology and flood risk, infrastructure and other users, land use and agriculture, seascape, landscape, and visual resources, shipping and navigation, and traffic and transport and therefore they have been scoped out as no pathways for impact have been identified. Furthermore, no risks of major accidents and/or disasters to occur as a result of this measure.
		Beneficial effect on seabird populations from improved nesting habitat		
		Temporary disturbance through access for debris removal activities		
		Beneficial effect on seabird populations from removal of debris activities		
		Temporary disturbance during camera/monitoring equipment installation and removal		
	Onshore ecology	Temporary disturbance during improvement of kittiwake nesting habitat		
		Temporary disturbance through access for debris removal activities		
	Socio-economics	Beneficial effect on local economy through the creation of an employed position		
	Historic environment	Impact to cultural heritage from loss of black rats	Air Quality; Aviation and radar;	The effects associated with the proposed method for this measure will be restricted

Compensatory measure	EIA receptor group scoped in	Potential impacts scoped in	EIA receptor group scoped out	Rationale for scoping out
Rat Eradication: Inchcolm	Infrastructure and other users.	Impacts to tourism due to biosecurity measures	Benthic and intertidal ecology; Commercial fishing; Fish and shellfish ecology; Geology and ground conditions; Human Health; Hydrology and flood risk; Land use and agriculture; Marine archaeology; Marine geology, oceanography, and physical processes; Marine Mammals; Noise and vibration; Seascape, landscape, and visual resources; and Traffic and transport.	to the island itself and will not directly impact on any of the offshore receptors with the exception of the target receptor (offshore and intertidal ornithology). Therefore, the marine archaeology, marine geology oceanography and physical processes, benthic and intertidal ecology, fish and shellfish ecology, and marine mammal receptor groups have been scoped out as no pathways for impact have been identified. With respect to the historic environment at the site, it is noted that Inchcolm Abbey is a scheduled monument. However, with careful design and the use of non-invasive installation techniques, the Applicant does not anticipate a requirement for consent under s. 2 Ancient Monuments and Archaeological Areas Act 1979. If consent is required, an application would be made to Historic environment Scotland (HES). As non-invasive installation techniques would be used to avoid any structural change to the scheduled monument, the Applicant does not foresee any impediments to gaining such permission. Therefore it is considered that due to the small scale and non-invasive nature of the works it is considered that this potential impact is scoped out. Additionally, the proposed methodology is not anticipated to impact on air quality,
	Offshore and intertidal ornithology;	Potential for disturbance from human activity due to eradication and immediate monitoring phase of the programme		
		Potential for disturbance from human activity due to long-term monitoring phase of the programme		
		Beneficial effect on seabird populations from reduced predation on eggs/ juveniles		
	Onshore ecology;	Impacts to onshore plants and animals other than the targeted rat species		
		Potential for disturbance from human activity due to eradication, immediate monitoring, and long-term monitoring phase of the programme		
		Beneficial effect on onshore ecology from reduced predation from rats		
	Shipping and navigation	Potential disturbance to usual operating procedures		

Compensatory measure	EIA receptor group scoped in	Potential impacts scoped in	EIA receptor group scoped out	Rationale for scoping out
		to factor in biosecurity measures		aviation and radar, benthic and intertidal ecology, commercial fishing, fish and shellfish, geology and ground conditions, human health, hydrology and flood risk, land use and agriculture, noise and vibration, seascape, landscape, and visual resources, and traffic and transport and therefore they have been scoped out due to the small scale and non-invasive nature of the works. Furthermore, no risks of major accidents and/or disasters to occur as a result of this measure
	Socio-economics	Beneficial effect on local industry resulting from increased birds on site		
		Impacts to tourism operators due to biosecurity measures		

5.5. CUMULATIVE, INTER-RELATIONSHIPS AND TRANSBOUNDARY EFFECTS

31. For consideration of cumulative effects, where it is considered that a potential likely significant effect exists cumulatively with other plans and projects this has been assessed within the section for each individual compensation measure.

32. Inter-relationships refer to a situation where several impacts may combine on a particular receptor. This EIAR has given due consideration using expert judgement to the potential for different residual impacts to have a combined impact on key sensitive receptors, however, within the context of this assessment it has been considered that there is no potential for inter-relationships

33. Transboundary effects (likely significant effects on another country or countries) have been considered during the assessment process where appropriate. The only adverse transboundary impact identified was associated with the management of SA4 sandeel fishery compensatory measure and no transboundary impacts have been identified associated with the other compensatory measures.

6. EIA – MANAGEMENT OF SA4 SANDEEL FISHERY

6.1. INTRODUCTION

34. This section considers the potential impacts arising from the management of SA4 sandeel fishery compensatory measure. A characterisation of the physical, biological and human environmental baseline is presented below (Section 6.2) followed by the results of an assessment of potential likely significant effects arising from the proposed compensatory measure (Section 6.3).

35. The objective of this compensatory measure is to increase productivity and survival of seabirds (namely Kittiwake, Guillemot, Atlantic Puffin and Razorbill) associated with SPA colonies in proximity to the Proposed Development. The Applicant considers there are two options which could be taken to increase sandeel stocks as well as delivering the required level of compensation for the Proposed Development:

- Option 1: Closure of the SA4 sandeel fishery and monitoring of seabirds (at SPAs within SA4 and SPAs impacted by the Proposed Development outside of SA4) and sandeel (through dredge surveys of key sandbanks in SA4); or
- Option 2: Ecosystem based approach for management of SA4 and monitoring of seabirds (at SPAs within SA4 and SPAs impacted by the Proposed Development outside of SA4) and sandeel (through dredge surveys of key sandbanks in SA4).

36. The SA4 sandeel fishery area is located offshore along the east coast of Scotland as shown in Figure 1. Section 2 of the IMP provides a detailed description of the proposed compensatory measure.

6.2. BASELINE

37. Table 6 provides a description of the baseline environment for each receptor which was identified during the scoping stage as potentially being affected by the proposed compensatory measure (Table 5).

Table 6: The baseline environment for the receptor groups relevant to the management of SA4 sandeel fishery

Receptor Group	Baseline Environment
Benthic and Intertidal Ecology	The SA4 area covers approximately 95,337 km^2, with approximately 1,400 km of coastline, with 1,200 km of Scottish coastline and 200 km of English coastline. Within this area, the UKSeaMap 2018 Version 2 (EUNIS Habitats classification data) determines that the following benthic habitats are present: • PA4.12: Sponge communities on deep circalittoral rock; • A4.27: Faunal communities on deep moderate energy circalittoral rock; • A4.33: Faunal communities on deep low energy circalittoral rock; • A5.13: Infralittoral coarse sediment; • A5.14: Circalittoral coarse sediment; • A5.15: Deep circalittoral coarse sediment; • A5.23 or A5.24: Infralittoral fine sand or infralittoral muddy sand; • A5.25 or A5.26: Circalittoral fine sand or circalittoral muddy sand;

Receptor Group	Baseline Environment
	• A5.27: Deep circalittoral sand; • A5.33 or A5.34: Infralittoral sandy mud or infralittoral fine mud; • A5.33: Infralittoral sandy mud; • A5.34: Infralittoral fine mud; • A5.35 or A5.36: Circalittoral sandy mud or circalittoral fine mud; • A5.35: Circalittoral sandy mud; • A5.36: Circalittoral fine mud; • A5.37: Deep circalittoral mud; • A5.43: Infralittoral mixed sediments; • A5.44: Circalittoral mixed sediments; and • A5.45: Deep circalittoral mixed sediments.
Commercial Fishing and Socio-economics[5]	Fishing activity: Approximately 6,600 fishing vessels operate in the Greater North Sea, with the largest numbers coming from the UK, Norway, Denmark, the Netherlands and France. Total landings have been decreasing since the early 1970s (ICES 2021). The highest catch in recent years was in 2018 where the value of sandeel landings by UK vessels was £150,016 (ABPmer, 2021). However, Scottish Government does not allocate TAC for sandeel fishing in SA4. The average annual value of landings from European vessels between 2015-2019 was £3,278,516.10 (ABPmer, 2021; STECF, 2020). The majority of the sandeel fishery in EU and UK waters is by Danish vessels (SA4 represents 6% of Danish sandeel landings). This is demonstrated by the quota shares of the EU total quota that are allocated to individual countries. Denmark receives 96 % of the EU total quota. The UK previously received 2 % of the EU quota, prior to leaving the EU. Under the terms of the EU-UK Trade and Cooperation Agreement, the percentage of EU and UK sandeel quota that will be received by the UK will increase to 3.2 %; this will not result in a significant shift of quota distribution and the majority will still be allocated to Denmark (ABPmer, 2021). However, it is the Scottish government's policy not to allocate any TAC for UK vessels and sandeel fishing by UK vessels within SA4 will no longer occur. Fishing methods: The primary fishing methods used in the North Sea are otter and beam trawls for demersal fisheries, and pelagic trawls and seines for pelagic fisheries, along with potting for crustacea including brown crab, lobster and whelk, and dredging for scallop. Within the SA4 area, sandeels are a highly sought-after fishing resource. See the IMP for full details on the sandeel fishing within SA4.
Fish and Shellfish Ecology	The SA4 fishery sits within the Greater North Sea Ecoregion, which is categorised by the following (ICES 2021): • Herring *Clupea harengus*; • Sandeel; • Sprat *Sprattus*; • Norway Pout *Trisopterus esmarkii*; • Whiting Merlangius merlangus;

[5] For the assessment of this measure, the commercial fishing and socio-economic receptors have been combined as the only pathway for impact socio-economic receptors is through the impact to commercial fisheries.

Receptor Group	Baseline Environment
	• Haddock Melanogrammus aeglefinus; • Grey gurnard Eutrigla gurnardus; • Western horse mackerel *Trachurus*; • Cod *Gadus morhua*; and • Saithe *Pollachius virens*. Fisheries spawning data (Coull et al., 1998) identifies that the following species use the area as a spawning ground: • Herring; • Cod; • Whiting; • Plaice; • Lemon sole; • Norway pout; • Sandeel; • Sprat; • *Nephrops* lobsters; Fisheries nursery data (Coull et al., 1998) identifies that all the above spawning species also use SA4 as a nursery ground, with the addition of: • Haddock; • Saithe; and • Blue whiting.
Marine Mammals	The SA4 fishery is contained within the following marine mammal Management Units (MUs): • Coastal East Scotland MU (bottlenose dolphin); • Greater Celtic and North Sea MU (common dolphin, white-beaked dolphin, Atlantic white-sided dolphin, Risso's dolphin, and minke whale); • Greater North Sea MU (bottlenose dolphin); • North Sea MU (harbour porpoise); • North East England MU (grey and harbour seal); • East Scotland MU (grey and harbour seal); • Moray Firth MU (grey and harbour seal); and • North Coast and Orkney MU (grey and harbour seal). In addition to the above species identified through the MU approach, long-finned pilot whales *Globicephala melas*, and unidentified beaked whales were also identified within the SA4 fishery through the SCANS III cetacean survey (Hammond, et al., 2021). Therefore it is considered that the baseline environment for marine mammals includes the following species; harbour porpoise, bottlenose dolphin, common dolphin, white-beaked dolphin, Atlantic white-sided dolphin, Risso's dolphin, minke whale, long finned pilot whale, beaked whales, grey seal, and harbour seal.
Offshore and Intertidal Ornithology	There are 42 SPAs and Ramsar sites designated for ornithological receptors within the SA4 area, including several notable sites such as the Firth of Forth SPA and Ramsar, Firth of Tay and Eden Estuary SPA and Ramsar, and the Outer Firth of Forth and St Andrews Bay Complex

Receptor Group	Baseline Environment
	SPA. The species most commonly covered by these sites are guillemot, pink-footed goose, common tern, and kittiwake. Colonies: In addition to those designated sites, there are 238 identified colonies of note for the target species (kittiwake, guillemot, razorbill and Atlantic puffin), ranging from 1 to 64,042 individuals per colony site.

6.3. ASSESSMENT

6.3.1. IDENTIFICATION OF IMPACTS AND SCOPE OF ASSESSMENT

38. Based on the information presented in this document, the IMP and the FCM Evidence Report, all activities associated with the implementation and management of SA4 sandeel fishery compensatory measure were defined and potential impact pathways identified. The potential impact pathways identified were:

- Benthic and intertidal ecology:
  - Beneficial effect on benthic ecology receptors through a reduction in habitat degradation
- Commercial fishing and Socio-economics:
  - Adverse effect on sandeel fishery through restriction of activities
- Fish and shellfish ecology:
  - Beneficial effect on fish and shellfish ecology receptors through a reduction in habitat degradation
- Marine mammals:
  - Beneficial effect on marine mammals through an increase in prey resource
- Offshore and intertidal ornithology:
  - Beneficial effect on seabirds through an increase in prey resource

6.3.2. IMPACT ASSESSMENT ALONE

39. The assessment for the effects of the compensation alone (that is not combined with any other plans or projects) is presented below:

Benthic and intertidal ecology

<u>Beneficial effect on benthic ecology receptors through a reduction in habitat degradation</u>

40. The proposed measure will result in a decrease in fishing effort and therefore a reduction in habitat degradation. This would be beneficial to fish and shellfish ecology receptors. The assessment presented here is based on the MDS presented within Table 1.

41. The sandeel fishery in the north sea primarily uses extensive otter trawls with mesh sizes ranging from 10-20mm. While the specific area that is trawled by the fishery is unknown at the time of writing, it is understood that the nets are towed along ridges of sandbars or edges of sandbanks forming typical habitats of sandeels throughout spring and (early) summer. Bottom trawling, including otter trawls, are known to cause significant damage to benthic communities and habitats (Engelhard, et al., 2008; Sciberras et al., 2018), meaning that the existing practice of sandeel fishing causes adverse effects to benthic ecology through direct damage to communities and degradation of the habitat. In 2021

approximately 52,000 tonnes of sandeel were caught within SA4 (ICES, 2022), which is a significant increase from the previous 18 years where it was greatly reduced. The management of the sandeel fishery would reduce the level of trawling in SA4 and therefore have a beneficial effect on benthic ecology through reduction in habitat degradation. Although, the scale of reduction in fishing that will occur is (at the time of writing) somewhat uncertain, whatever level of reduction that will occur have a beneficial effect. Assuming a worst case scenario of minimal changes to fishing effort, the magnitude of this effect is considered to be **low (beneficial).** Due to the potential for significant damage and degradation to be alleviated, the sensitivity in this case considered to be between **medium** and **high (beneficial).**

42. Following the significance matrix utilised in this assessment (Table 4), a magnitude of low and a sensitivity of medium to high results in a **minor or minor to moderate beneficial** significance of effect, which is **significant (beneficial)** in EIA terms.

Commercial fishing and Socio-economics

Adverse effect on sandeel fishery through restriction of activities

43. Under the worst-case scenario for commercial fisheries, the proposed measure will result in a closure of the SA4 sandeel fishery indefinitely. This could have an adverse effect on the commercial fishing industry that currently uses this area. This section examines the potential adverse effect on the UK commercial fishing industry, with transboundary effects on commercial fishers outside of the UK assessed within Section 9.3.4. The assessment presented here is based on the MDS presented within Table 1. Under this MDS, the fishing industry would not receive financial compensation for the closure and would not be displaced elsewhere.

44. The value of UK sandeel landings within SA4 in 2018 was £150,016 (ABPmer. 2021). However, it is the Scottish government's policy not to allocate any TAC for UK vessels and sandeel fishing by UK vessels within SA4 will no longer occur. Therefore, under the worst-case scenario with a long-standing closure, there would be no loss of annual income to UK vessels as they would not otherwise be allowed to fish for sandeel within SA4. Furthermore, it has been noted by Natural England that the increase in sandeel populations may result in a benefit to the commercial fishing industry due an increase in more valuable species that prey on sandeel (recent prepublication study for Defra (unpublished). Therefore, with respect to the UK fishery it is anticipated that the magnitude is **negligible (adverse)** as no TAC is currently allocated to UK vessels and there is no indication that this policy will change. The sensitivity is anticipated to be **negligible (adverse)** due to the limited potential for loss of income.

45. Following the significance matrix utilised in this assessment (Table 4), a magnitude of low and sensitivity of low results in a **negligible adverse** significance of effect, which is not significant in EIA terms.

Fish and shellfish ecology

Beneficial effect on fish and shellfish ecology receptors through a reduction in habitat degradation

46. The proposed measure will result in a decrease in fishing effort and therefore a reduction in habitat loss and degradation. This would be beneficial to fish and shellfish ecology receptors. The assessment presented here is based on the MDS presented within Table 1.

47. The sandeel fishery in the north sea primarily uses extensive otter trawls with mesh sizes ranging from 10-20mm. While the specific area that is trawled by the fishery is unknown at the time of writing, it is understood that the nets are towed along ridges of sandbars or

edges of sandbanks forming typical habitats of sandeels throughout spring and (early) summer. Bottom trawling, including otter trawls, are known to cause significant damage to benthic communities and habitats (Engelhard, et al., 2008; Sciberras et al., 2018), meaning that the baseline practice of sandeel fishing causes adverse effects to fish and shellfish ecology receptors through damage to the habitat and direct capture in the nets. In 2021 approximately 52,000 tonnes of sandeel were caught within SA4 (ICES, 2022), which is a significant increase from the previous 18 years where it was greatly reduced. The management of the sandeel fishery would reduce the level of trawling in SA4 and therefore have a beneficial effect on fish and shellfish ecology through reduction in habitat degradation and reduction in capture. Although the scale of reduction in fishing that will occur is (at the time of writing) somewhat uncertain, whatever level of reduction that will occur will have a beneficial effect. Assuming a worst case scenario of minimal changes to fishing effort, the magnitude of this effect is considered to be **low (beneficial).** Due to the potential for significant damage and degradation to be alleviated, the sensitivity in this case considered to be between **medium** and **high (beneficial).**

48. Following the significance matrix utilised in this assessment (Table 4), a magnitude of low and a sensitivity of medium to high results in a **minor or minor to moderate beneficial** significance of effect, which is **significant (beneficial)** in EIA terms.

Marine mammals

Beneficial effect on marine mammals through an increase in prey resource

49. The proposed measure will result in an increase in sandeel populations, which act as a prey resource for several marine mammal species. This would be beneficial to marine mammal receptors. The assessment presented here is based on the MDS presented within Table 1.

50. Harbour porpoise, bottlenose dolphin, minke whale, harbour seal, and grey seal are all known to have sandeel as regular parts of their diet, to varying degrees of importance (Pierce et al., 2007; Santos et al., 2001; Pierce et al., 2004, Wilson and Hammond, 2016; SCOS, 2017). It is anticipated that the increase in sandeel as a prey resource would be a significant beneficial effect for marine mammals and therefore the sensitivity is considered to be **high (beneficial)**. Under and ecosystem-based approach to management TAC will always be adjusted to facilitate for a positive response from seabirds populations so the magnitude of an increase in prey (which marine mammals will also benefit from) is considered to be **medium** and **high (beneficial).**

51. Following the significance matrix utilised in this assessment (Table 4), a magnitude of high and sensitivity of high results in a **major (beneficial)** significance of effect, which is significant in EIA terms.

Offshore and intertidal ornithology

Beneficial effect on seabirds through an increase in prey resource

52. The proposed measure will result in an increase in sandeel populations, which act as a prey resource for several bird species. This would be beneficial to offshore and intertidal ornithology receptors. The assessment presented here is based on the MDS presented within Table 1.

53. Sandeel make up part of the diet of a wide range of seabird species, with arctic tern (*Sterna paradisaea*), common tern (*Sterna hirundo*), kittiwake (*Rissa tridactyla*), arctic skua (*Stercorarius parasiticus*), common guillemot (*Uria aalge*), great skua (*Stercorarius skua*), puffin (*Fratercula arctica*), razorbill (*Alca torda*), and red-throated diver (*Gavia stellata*) being of notable importance. While there is a potential loss of prey resource with respect to

discards from fishing vessels, it is anticipated that the increase in natural sandeel as a prey resource would be a significant benefit (FCM Evidence Report) and have a greater beneficial effect than the adverse effect associated with the loss of discards. Therefore it is considered that the beneficial effect for offshore and intertidal ornithology results in a sensitivity of **high (beneficial)**. Under and ecosystem-based approach to management TAC will always be adjusted to facilitate for a positive response from seabirds populations so the magnitude of this effect is considered to be **medium** and **high (beneficial).**

54. Following the significance matrix utilised in this assessment (Table 4), a magnitude of high and sensitivity of high results in a **major (beneficial)** significance of effect, which is significant in EIA terms.

6.3.3. CUMULATIVE EFFECT ASSESSMENT

55. Based on the nature and scale of effects associated with the management of SA4 sandeel fishery compensatory measure, it is considered that the scope of the cumulative effects assessment should consider other plans or projects which have the potential to significantly affect the sandeel fishery or sandeel populations within SA4.

56. The Applicant has considered the effects of all plans or projects, within or in proximity to SA4, that fall within the following categories:

- Oil and gas;
- Cables and pipelines;
- Offshore wind farms;
- Tidal energy;
- Wave energy; and
- Seismic / geophysical surveys
- Government Policy

57. The Applicant has found no other plans/ initiatives to expand the existing 'sandeel box' (which is already a closed area) or impose any other restrictions/ closures in the remaining sandeel fishery SA4. It is therefore considered that there are no other projects which have the potential to interact in a cumulative fashion with the proposed compensatory measure.

6.3.4. TRANSBOUNDARY IMPACTS

58. The closure of SA4 will have a transboundary impact by affecting fishers from other countries that currently fish in this area. The vast majority of fishing vessels that catch sandeels in SA4 are of Danish origin and therefore it is predicted that the effect on fishing vessels described in Section 9 would primarily affect Danish vessels rather than UK vessels. However, only 6% of the total sandeels fished by Danish vessels have historically been from within SA4 and therefore it is considered that there would only be a minor impact on the Danish Fleet under the full closure option for the management of SA4 fishery compensatory measure. It should also be noted that the whole Danish fishery was 952,000 tonnes in 2020 and only 2% of the total fish caught and landed in Denmark was sandeels from SA4 in 2020 (Statistics Denmark, 2022). Therefore it is considered that for this impact the magnitude is **medium (adverse)** and the sensitivity is **low (adverse).**

59. Following the significance matrix utilised in this assessment (Table 4), a magnitude of medium and sensitivity of low results in a **minor adverse** significance of effect, which is **not significant** in EIA terms.

7. EIA – RAT ERADICATION: HANDA

7.1. INTRODUCTION

60. This section considers the potential impacts arising from the rat eradication at Handa. A characterisation of the physical, biological and human environmental baseline is presented (Table 7) followed by the results of an assessment of potential likely significant effects arising from the proposed compensatory measure (Section 7.3).

61. This compensatory measure proposes to eradicate the brown rat from Handa, an island off the northwest coast of Scotland, as shown in Figure 1. Following eradication the Applicant will implement biosecurity measures, implement appropriate seabird habitat management, undertake monitoring and address any re-incursions. The objective of this measure is to increase black-legged kittiwake, common guillemot, Atlantic puffin, and razorbill populations on the island through the removal of predation pressure from brown rats.

7.2. SECTION 3 OF THE IMP PROVIDES A DETAILED DESCRIPTION OF THE PROPOSED COMPENSATORY MEASURE. BASELINE

62. Table 7 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).

Table 7: The baseline environment for the receptor groups relevant to the rat eradication at Handa compensatory measure

Receptor Group	Summary of Baseline Environment
Infrastructure and Other Users	No one is recorded to live on Handa island, and there is no major infrastructure, however it does receive approximately 5,000 visitors per annum for its natural features (Haswell-Smith, 2004). On the island there is a small shelter near the landing location, containing information, binoculars to rent, a composting toilet, and a small selection of souvenirs.
Offshore and Intertidal Ornithology	Designated national sites: Handa island is itself an SPA, designated for guillemot, razorbill, kittiwake, great skua, and Northern fulmar. Handa has high Torridonian sandstone sea-cliffs that provide tiered ledges used by a range of nesting seabird species. It is designated as an SPA and at the time of designation in 1990 supported populations of European importance for guillemot (98,686 individuals – 9.3% of the British population and 2.9% of the North Atlantic biogeographic population) and razorbill (16,394 individuals – 11% of the British population and 1.9% of the *Alca torda islandica* population). It also supports nationally important colonies of kittiwake (10,732 pairs, 2.2% of the British population), as well as several hundred puffins (735 AOB). The most recent counts show there are an estimated 68,524 guillemots (individuals), 3,749 kittiwakes (AON), 5,047 razorbills (individuals) and 208 puffins (individuals). As well as the key species, Handa also supports nationally important numbers of great skua *Stercorarius skua*, which numbered 66 pairs (0.8% of the GB population) at the time of designation in 1990. Since then numbers increased to 283 pairs in 2018, with numbers in 2022 reduced to just 73 AOT due to the impacts of avian influenza. Northern fulmar *Fulmarus glacialis* numbered 3,500 pairs (0.7% of the GB population) at the

Receptor Group	Summary of Baseline Environment
	time of designation in 1990 but has reduced to 1,879 pairs. It also supports breeding arctic skua (20 AOT, SWT 2021). Other breeding species on the island include European shag *Phalacrocorax aristotelis*, common eider *Somateria mollissima*, red-throated diver *Gavia stellata*, common gull *Larus canus*, herring gull *Larus argentatus*, great black-backed gull *Larus marinus*, arctic tern *Sterna paradisaea*, oystercatcher *Haematopus ostralegus*, ringed plover *Charadrius hiaticula* and snipe *Gallinego gallinago* (SWT 2021). Seabird species that have formerly bred on Handa but were thought lost include common tern *Sterna hirundo* (last bred successfully in 2002) and arctic tern *Sterna paradisaea* (last bred successfully in 2015). However, tern chicks and fledglings (most likely Arctic) have been seen in July 2022 for the first time in 7 years, although formal monitoring has not been possible due to guidance issued by NatureScot relating to avian influenza transmission.
Onshore Ecology	The EUNIS land cover data categorises Handa island having the following habitat types: • Wet heaths; • Coastal shingle, • Littoral rock and other hard substrata; • Alpine, subalpine and extensive grasslands; • Grasslands and lands dominated by forbs mosses or lichens; • Inland surface waters; and • Buildings of cities, towns and villages/ low density buildings. There is a population of brown rat (*Rattus norvegicus*) on Handa island, which are known to impact the seabirds on site. Brown rat were originally removed from Handa in March 1997, however subsequent monitoring resulted in rats being spotted again in 2005 and 2006. Eradications in 2007 and 2008 meant that none were seen in 2009, 2010, or 2011, however by 2012 there were signs again, with sightings seen annually since. The total amount of rats differed but the presence has remained on the island.
Shipping and navigation	The island is regularly visited by tourist trips, often for bird watching purposes. There is a ferry service that operates to the island, departing several times a day. The ferry service runs all year but recommends the summer for trips, leaving from the West coast of Scotland, near Tarbet and Loch Dubh. There is also a tour operator, North Coast Sea Tours, that runs tours to the island to see the wildlife from the sea, without landing on the island. In the area around Handa island, the average shipping density ranges from 0.21 to 4.51 hours of shipping traffic per square km per month.
Socio-economics	The island is regularly visited by tourist trips, often for bird watching purposes. There is a ferry service that operates to the island, departing several times a day. There is no charge to go on Handa island itself, however the ferry does cost £20 for adults and £10 for children between 5 and 14 (children under 5 go free). There is also a tour operator, North Coast Sea Tours, that runs tours to the island to see the wildlife from the sea, without landing on the island. They charge £80 for adults, and £50 for students and young persons.

7.3. ASSESSMENT

7.3.1. IDENTIFICATION OF IMPACTS AND SCOPE OF ASSESSMENT

63. Based on the information presented in this document and the IMP and CCM Evidence Report, all activities associated with the rat eradication at Handa compensatory measure were defined and potential impact pathways identified. The potential impact pathways identified are presented here with respect to the relevant receptor groups:

- Infrastructure and other users:
  - Impacts to tourism due to biosecurity measures
- Offshore and intertidal ornithology:
  - Potential for disturbance from human activity due to eradication and immediate monitoring phase of the programme;
  - Potential for disturbance from human activity due to long-term monitoring phase of the programme;
  - Beneficial effect on seabird populations from reduced predation on eggs/juveniles.
- Onshore ecology:
  - Impacts to onshore plants and animals other than the targeted rat species;
  - Habitat disturbance as a result of increased human activity due to implementation of eradication programme e.g. regular setting of baits or traps and monitoring work; and
  - Beneficial effect on onshore ecology from reduced predation from rats
- Shipping and navigation:
  - Potential disturbance to usual operating procedures to factor in biosecurity measures
- Socio-economics:
  - Beneficial effect on local industry resulting from increased birds on site
  - Impacts to tourism operators due to biosecurity measures

7.3.2. IMPACT ASSESSMENT ALONE

64. The assessment for the effects of the compensation alone (that is not combined with any other plans or projects) is presented below:

Infrastructure and other users

<u>Impacts to tourism due to biosecurity measures</u>

65. The proposed measure will involve the implementation of a biosecurity plan to ensure that no new rodents are brought onto the island. At the time of writing, details on the biosecurity plan have not yet been established, however it will be compatible with the Biosecurity for LIFE guidance (Biosecurity for Life, 2022). The plan is likely to include measures such as requiring boat operators to regularly check vessels for stowaways, storing waste securely in rodent proof bins, storing personal food in mouse-proof containers, using rat guards on mooring lines and anchor chains, deploying chew cards or wax chew blocks on the vessel, and not landing at the destination if a stowaway is spotted on board. The assessment presented here is based on the MDS presented within Table 1.

66. Given the nature of the anticipated measures, following the IMP and the Biosecurity for Life programme (Biosecurity for Life, 2022), it is anticipated that the disturbance to tourism from these additional measures is likely to be minor as the only vessel going the island is the ferry, therefore the measures will only involve additional management from the ferry operator, or small adjustments from individuals regarding personal food storage. However,

the inclusion of the advice to not land at your destination if there is a stowaway on board could result in people's visits not continuing, having a strong negative impact on the tourism receptor. However, this is considered to be relatively rare as the remainder of the measures as part of the biosecurity plan will aim to prevent stowaways from being on the vessel in the first place. Therefore, this potential effect has a high potential vulnerability but a low likelihood, enabling the magnitude of the proposed compensation measure to be **low (adverse)**. The proposed steps within the biosecurity plan (following the Biosecurity for Life programme (Biosecurity for Life, 2022)) are not novel suggestions for biosecurity, and they are implemented for other projects, with the ferry operator likely to already familiar with them. Therefore, given the low impact of the majority of the measures within the biosecurity plan, the considered rarity of the highest impacts where the trips are completely cancelled, and the adoption of the measures elsewhere in the industry, the sensitivity of receptor is considered to be **low (adverse).**

67. Following the significance matrix utilised in this assessment (Table 2), a magnitude of low and a sensitivity of low results in a **negligible to minor adverse** significance of effect, which is not significant in EIA terms.

Offshore and intertidal ornithology

Potential for disturbance from human activity due to eradication and immediate monitoring phase of the programme

68. The proposed measure will involve the placement of approximately 1300 bait stations during the eradication phase, and visits every two days to the stations for maintenance and monitoring purpose for the first four months. There is a potential for disturbance to offshore and intertidal ornithological receptors from these trips, as those undertaking the proposed work may cause disturbance and stress to birds on site. The assessment presented here is based on the MDS presented within Table 2.

69. The spatial extent of disturbance would be small, with any disturbance from human presence being temporary and short-term. The temporal extent is also anticipated to be small, with any disturbance caused being temporary (typically in terms of hours). When factoring in the small spatial and temporal extent and the comparatively low numbers of birds on the island (Table 10), it is considered that the proposed activities have a magnitude of **low (adverse)**. As the eradication and immediate monitoring phases will be undertaken within the winter period (November to March), it therefore avoids the breeding season for offshore and intertidal ornithological receptors. Additionally, kittiwake are often found in and around human population centres so it is considered that they have a moderate level of resilience to human disturbance, especially on Handa island where there are approximately 9,000 visitors to the site per year. Therefore, it is considered that the receptors have a sensitivity of **negligible (adverse)**.

70. Following the significance matrix utilised in this assessment (Table 4), a magnitude of low and sensitivity of low results in a **negligible to minor adverse** significance of effect, which is not significant in EIA terms.

Potential for disturbance from human activity due to long-term monitoring phase of the programme

71. The proposed measure will involve the monitoring of the approximate 1300 bait stations every four weeks for two years. There is a potential for disturbance to offshore and intertidal ornithological receptors from these trips, as those undertaking the proposed work may cause disturbance and stress to birds on site. The assessment presented here is based on the MDS presented within Table 2.

72. The spatial extent of disturbance would be small, with any disturbance from human presence being temporary and short-term. The temporal extent is also anticipated to be

small, with any disturbance caused being temporary (typically in terms of hours). When factoring in the small spatial and temporal extent and the comparatively low numbers of birds on the island (Table 7), it is considered that the proposed activities have a magnitude of **low (adverse)**. As the long-term monitoring phase will be undertaken year-round, and it therefore includes the breeding season for offshore and intertidal ornithological receptors, therefore having a greater potential sensitivity than during other times of the year. Additionally, kittiwake are often found in and around human population centres so it is considered that they have a moderate level of resilience to human disturbance, especially on Handa island where there are approximately 9,000 visitors to the site per year Therefore, it is considered that the receptors have a sensitivity of **low (adverse)**.

73. Following the significance matrix utilised in this assessment (Table 4), a magnitude of low and sensitivity of low results in a **negligible to minor adverse** significance of effect, which is not significant in EIA terms.

Beneficial effect on seabird populations from reduced predation on eggs/juveniles

74. The proposed measure will result in reduced rat populations, and therefore a reduction in the predation on offshore and intertidal ornithological receptors at Handa Island. This would be a beneficial effect to the ornithological receptors. The assessment presented here is based on the MDS presented within Table 2.

75. The proposed measure is anticipated to result in a significant increase in the population of kittiwakes, puffin, razorbill and guillemot on the island, (Table 8 – taken from the CCM Evidence Report) and therefore it is considered that the magnitude of activities is **high (beneficial)**. Given the high sensitivity of the receptors to predation of eggs/juveniles from rats on the island, it is also considered that their sensitivity is **high (beneficial).**

Table 8: Preliminary conservation targets and associated increases for each key species on Handa Island. All numbers are expressed as single birds.

Measurement	Kittiwake	Puffin	Razorbill	Guillemot
Current count	7498	208	5047	68524
Max. recorded count	25000	1470	16394	98686
Additional fledged chicks generated per year	251	-	353	1367
Conservation Target[6]	11838	1748	10647	84354
Additional adult birds generated per year	124	44	160	460

76. Following the significance matrix utilised in this assessment (Table 4), a magnitude of high and sensitivity of high results in a **major beneficial** significance of effect, which is significant in EIA terms.

[6] Conservation targets for Handa have been set by multiplying the number of additional adult birds per year that would be generated by rat removal (as calculated above) by the 35 year operational lifetime of the Proposed Development, and then adding to this the number of birds that are currently present.

Onshore ecology

Impacts to onshore plants and animals other than the targeted rat species

77. The proposed measure will involve the placement of bait stations during the eradication phase, which will remain in place for up to 5 months (November to March inclusive). There is a potential for non-target species (i.e. any species other than rats) to interact with the bait stations and be adversely affected. The assessment presented here is based on the MDS presented within Table 2.

78. A Non-Target Specia Management Plan (NTSMP) will be developed, which will consider the timing and location of predator eradication programme to ensure that it is undertaken at the optimal time/location and that it will have a minimal effect on non-target species. The inclusion of the NTSMP will follow current good practise design to minimise impact on sensitive habitats, non-target species and disruption to land use. Therefore, due to the implementation of the NTSMP the magnitude of effect is considered to be **negligible (adverse)**. Furthermore it is anticipated that if any non-target species were to ingest bait or secondarily ingest a poisoned rat, only small numbers of animals would be affected and therefore resulting sensitivity is **negligible to low (adverse)** sensitivity.

79. Following the significance matrix utilised in this assessment (Table 4), a magnitude of negligible and sensitivity of negligible to minor results in a **negligible adverse** significance of effect, which is not significant in EIA terms.

Habitat disturbance due to increased human activity due to implementation of eradication programme e.g. regular setting of baits or traps and monitoring work

80. The proposed measure will involve the placement of bait stations during the eradication phase, and various visits to the stations for maintenance and monitoring purposes. There is a potential for disturbance to any onshore ecology receptors from these trips, as those undertaking the proposed work may cause disturbance and stress to animals on site. The assessment presented here is based on the MDS presented within Table 2.

81. The spatial extent of disturbance would be small, with any disturbance from human presence being temporary and short-term. The temporal extent is also anticipated to be small, with any disturbance caused being temporary (typically in terms of hours). Based on the small spatial and temporal extent, it is considered that the proposed activities have a magnitude of **low (adverse)**. As the island regularly has visitors, any onshore animals on the island are likely to be used to human foot traffic and therefore it is anticipated that the receptors have a sensitivity of **low (adverse)**.

82. Following the significance matrix utilised in this assessment (Table 4), a magnitude of low and sensitivity of low results in a **negligible to minor adverse** significance of effect, which is not significant in EIA terms.

Beneficial effect on onshore ecology from reduced predation from rats

83. The proposed measure will involve the removal of rats from the island of Handa, with the aim of 100% eradication. There is a potential for a beneficial effect to onshore ecology receptors from a reduction in predation caused by rats. The assessment presented here is based on the MDS presented within Table 2.

84. A wide range of species have benefitted from previous eradications at Handa island, including sea rocket *Cakile maritima*, various *Atriplex* species, pygmy shrew *Sorex minutus,* slow worm *Anguis fragilis,* common lizard *Zootoca vivipara,* lesser white-toothed shrew *Crocidura suaveolens,* bank vole *Myodes glareolus,* and even moths (Thomas et al. 2017). All these species among others increased significantly following previous rat eradication from Handa, and it is possible that a repeated eradication on Handa could result in the same beneficial effects on these species (CCM Evidence Report). However, it is noted that

the beneficial effects to plants from previous eradications was short lived as the increase in other onshore ecology receptors results in increased grazing and a subsequent reduction in growth rates (CCM Evidence Report). Therefore the magnitude is considered to be **low (beneficial).** Given the previous history of eradications being beneficial, it is anticipated that the sensitivity of receptors to this effect is considered to be **medium beneficial.**

85. Following the significance matrix utilised in this assessment (Table 4), a magnitude of low and sensitivity of medium results in a **minor beneficial** significance of effect, which is not significant in EIA terms.

Shipping and navigation

Potential disturbance to usual operating procedures to factor in biosecurity measures

86. The proposed measure will involve the implementation of a biosecurity plan to ensure that no new rodents are brought onto the island. At the time of writing, details of the biosecurity plan have not been established, however following the advice given by the Biosecurity for Life programme (Biosecurity for Life, 2022), measures to be taken may include regularly checking belongings and vessels for stowaways, storing waste securely in rodent proof bins, storing personal food in mouse-proof containers, using rat guards on mooring lines and anchor chains, deploying chew cards or wax chew blocks on the vessel, and not landing at your destination if you see a stowaway on board. The assessment presented here is based on the MDS presented within Table 1.

87. Given the nature of the anticipated measures, following the IMP and the Biosecurity for Life programme (Biosecurity for Life, 2022), it is anticipated that the disturbance to shipping and navigation receptors from these additional measures is likely to be minor, as the measures will only affect those vessels planning to land on the island, which would be limited to the ferry service (see impacts to tourism due to biosecurity measures assessment above). The measures would mainly involve additional management from the ferry operator or small adjustments from individuals regarding personal food storage, each of which are not considered to have any noticeable effect on the receptor as a whole. However, the inclusion of the advice to not land at your destination if there is a stowaway on board could result in strong negative impacts on the individual receptors. However, this is considered to be relatively rare as the remainder of the measures as part of the biosecurity plan will aim to prevent stowaways from being on the vessel in the first place. Therefore, this potential effect has a high potential vulnerability but a low likelihood, enabling the magnitude of the proposed compensation measure to be **low (adverse)**. The proposed steps within the biosecurity plan (following the Biosecurity for Life programme (Biosecurity for Life, 2022) are not novel suggestions for biosecurity, and they are implemented for other projects, with ferry operators likely already familiar with them. Therefore, given the low impact of the majority of the measures within the biosecurity plan, the considered rarity of the highest impacts where the trips are completely cancelled, and the adoption of the measures elsewhere in the industry with no significant effects, the sensitivity of receptor is considered to be **low (adverse).**

88. Following the significance matrix utilised in this assessment (Table 2), a magnitude of low and a sensitivity of low results in a **negligible to minor adverse** significance of effect, which is not significant in EIA terms.

Socio-economics

Beneficial effect on local industry resulting from increased birds on site

89. The proposed measure will result in increased bird populations, and therefore there is a potential for increased visits to the island through bird-watching trips. This would be a beneficial effect to local industry and socio-economic receptors, as the main reason visitors

go to Handa is for the wildlife. The assessment presented here is based on the MDS presented within Table 2.

90. The proposed measure is anticipated to result in a significant increase in the population of seabirds on the island. This is anticipated to increase the number of trips a small amount, as many trips will be undertaken regardless of numbers but a few additional trips may be needed for additional numbers of visitors. Therefore, it is considered that the magnitude of activities on socio-economic receptors is **low (beneficial)**. The various companies and receptors involved in this industry are highly sensitive to the amount of tourist activity so it is considered that their sensitivity is **medium (beneficial).**

91. Following the significance matrix utilised in this assessment (Table 4), a magnitude of medium and sensitivity of high results in a **minor beneficial** significance of effect, which is not significant in EIA terms.

Impacts to tourism operators due to biosecurity measures

92. The proposed measure will involve the implementation of a biosecurity plan to ensure that no new rodents are brought onto the island. At the time of writing, details of the biosecurity plan have not yet been established, however it will be compatible with the Biosecurity for LIFE guidance (Biosecurity for Life, 2022), and CRRU. The plan would, in the worst case, include measures such as requiring boat operators to regularly check vessels for stowaways, storing waste securely in rodent proof bins, storing personal food in mouse-proof containers, using rat guards on mooring lines and anchor chains, deploying chew cards or wax chew blocks on the vessel, and not landing at the destination if a stowaway is spotted on board. The assessment presented here is based on the MDS presented within Table 1.

93. Given the nature of the anticipated measures, following the IMP and the Biosecurity for Life programme (Biosecurity for Life, 2022) and CRRU, it is anticipated that these measures may cause a minor inconvenience to boat operators and therefore potentially knock-on small scale adverse economic effects. The measures mainly involve minor additional management from the operator regarding personal food storage and waste. However, under a worst-case scenario if a stowaway was spotted on board this could result in the trip not continuing, which may result in a refund for any tourists on the vessel, and a financial loss for the tourism operator. However, the likelihood of this happening is considered to be relatively rare as the remainder of the measures as part of the biosecurity plan will aim to prevent stowaways from being on the vessel in the first place. Therefore, this potential effect has a high potential vulnerability but a low likelihood, resulting in a magnitude of the effect of **low (adverse).** The proposed steps within the biosecurity plan (following the Biosecurity for Life programme (Biosecurity for Life, 2022) are standard suggestions for biosecurity, and they are implemented for other projects within Scotland (such as the Isle of May), with tourism vessel operators likely already familiar with them. Therefore, given the low impact of the majority of the measures within the biosecurity plan, the low likelihood of trips being curtailed, and the adoption of the measures elsewhere in the industry, the sensitivity of receptor is considered to be **low (adverse).**

94. Following the significance matrix utilised in this assessment (Table 2), a magnitude of low and a sensitivity of low results in a **negligible to minor adverse** significance of effect, which is **not significant** in EIA terms.

7.3.3. CUMULATIVE EFFECT ASSESSMENT

95. As the potential adverse effects are small in nature (spatial and temporal) with no significant adverse effects alone, no adverse effects are anticipated further afield than Handa island itself, and therefore the scoping undertaken for projects to be considered cumulatively is limited to those with direct spatial overlap with the proposed compensatory measures.

96. Following on from the above methodology, no projects have been identified for the consideration of cumulative effects. Therefore it can be concluded that there is no potential

for any significant cumulative effects between the proposed measure and any other projects.

7.3.4. TRANSBOUNDARY IMPACTS

97. No transboundary impacts are predicted due to the localised and small scale nature of this compensatory measure.

8. EIA –DUNBAR CASTLE WARDENING ROLE

8.1. INTRODUCTION

98. This section considers the potential impacts arising from the Dunbar castle wardening role compensatory measure. A characterisation of the physical, biological and human environmental baseline is presented (Table 9) followed by the results of an assessment of potential likely significant effects arising from the proposed compensatory measure (Section 8.3).

99. The third compensatory measure proposed by The Applicant is wardening of kittiwake colonies on the mainland site of Dunbar Castle. The wardening position is provided as an umbrella role to implement a series of sub-measures to reduce human disturbance (through education and liasion, access restrictions and fencing of areas) and improve nesting habitat for Kittiwakes (through reducing fishing litter / debris from nests and adding artificial ledges) in Dunbar Castle.

100. Section 3 of the IMP provides a detailed description of the proposed compensatory measure.

8.2. BASELINE

101. Table 9 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).

Table 9: The baseline environment for the receptor groups relevant to the Dunbar Castle wardening role compensatory measure

Receptor Group	Baseline Environment
Offshore and Intertidal Ornithology	The kittiwake colony at Dunbar Castle has a well-documented history, starting in 1934 when three nests were recorded. This has increased and fluctuated over time, reaching 1,155 nests in 2007 (Coleman et al., 2011). As of 2020, there were 808 pairs of kittiwake, 16 pairs of Northern fulmar, 16 pairs of European shag, and 15 pairs of herring gull (CCM Evidence Report). The kittiwake nests specifically are distributed around Dunbar castle and the coastline, with the greatest numbers in 2020 recorded at the inner castle, castle, and leisure pool (CCM Evidence Report). Additionally, surveys conducted on the Dunbar Coast within the Firth of Forth SPA have identified fulmar, shag, kittiwake, great black-backed gull, herring gull, and lesser black-backed gull within the area between 1986 and 2016 (SMP, 2021). In the wider area around Dunbar Castle, at least 19 species of seabird breed on the coasts of the North Sea, in particular large numbers of northern gannet, herring gull, lesser black-backed gull, kittiwake, common guillemot, razorbill, and puffin (Wanless et al., 1998). The key species of relevance to this measure are kittiwake, guillemot, razorbill, and gannet, all of which are features at several designated sites nearby to the search area. Kittiwake have a mean-max foraging range of 156.1 km, guillemot have a range of 73.1 km, razorbill have a range of 88.7 km, and Gannet have the largest range of 315.2 km (Woodward et al., 2019). Designated national sites: Dunbar Castle has directed overlap with the Outer Firth of Forth and St Andrews Complex SPA, which incorporates key foraging areas from Forth Islands SPA, Fowlsheugh SPA, Firth of Forth SPA, Firth of Forth Ramsar site, and St Abb's Head to Fast Castle SPA.

Receptor Group	Baseline Environment
	These sites cover a wide range of species including the ones listed above and additional seabirds and waterbirds. Additionally there is overlap with the Firth of Forth SSSI.
Onshore Ecology	The EUNIS land cover data categorises Dunbar Castle having the 'Buildings of cities, towns and villages/ low density buildings' classification. The surrounding area of Dunbar, includes the 'Buildings of cities, towns and villages/ low density buildings' classification but also the following: • Woodland, forest and other wooded land; • Littoral rock and other hard substrata; and • Cultivated areas of gardens and parks.
Historic environment	The main feature at this site is Dunbar Castle, which was one of the strongest fortresses in Scotland, situated in a prominent position overlooking the harbour of the town of Dunbar, in East Lothian. Several fortifications were built successively on the site, near the English-Scottish border. The castle is made up of the Fortress, South Battery, Citadel, several gun ports, apartments, and towers. In its current state the castle is considered a ruin. The castle is designated as a scheduled monument, under the Ancient Monuments and Archaeological Areas Act 1979. Scheduled monuments are designated by Historic Environment Scotland, and the records provide an indication of the national importance of the scheduled monument which has been identified by the description and map. Scheduled monument consent is required to carry out certain work, including repairs, to scheduled monuments (Historic Environment Scotland, 2021).
Noise and vibration	Baseline noise and vibration levels at Dunbar Castle are considered to be low. The site is not near any major sources of noise, including Edinburgh Airport or the A1 road. The primary sources of noise and vibration at the site will come from wind and waves against the shoreline, birds already at the site, and some minor noise generated by passing boats and visitors. The potential receptors for any noise effects at the site include the birds already present at the site, visitors to the site and any of the nearby residents (the nearest residential property is approximately 98.5 metres away).
Socio-economics	Dunbar Castle has little socio-economic impact on the local area. It is a ruin which may attract few tourists and no-one works at the site. The surrounding town of Dunbar is primarily reliant on tourism, fishing, and several examples of small-scale industry including Belhaven Brewery, Oxewell mains landfill, and Torness power station.

8.3. ASSESSMENT

8.3.1. IDENTIFICATION OF IMPACTS AND SCOPE OF ASSESSMENT

102. Based on the information presented in this document and the IMP, and CCM Evidence Report, all activities associated with the wardening at Dunbar Castle were defined and potential impact pathways identified. The potential impact pathways identified are presented here with respect to the relevant receptor groups:

- Historic Environment:
  - Adverse effect on historic fabric of listed castle building from improvement of kittiwake nesting habitat
- Noise and Vibration
  - Adverse effect on local residents from increasing noise levels due to kittiwake population growth
- Offshore and Intertidal Ornithology:
  - Temporary disturbance during improvement of kittiwake nesting habitat
  - Beneficial effect on seabird populations from improved nesting habitat
  - Temporary disturbance through access for debris removal activities
  - Beneficial effect on seabird populations from removal of debris activities
  - Temporary disturbance during camera/monitoring equipment installation and removal
- Onshore Ecology:
  - Temporary disturbance during improvement of kittiwake nesting habitat
  - Temporary disturbance through access for debris removal activities
  - Temporary disturbance during camera/monitoring equipment installation and removal
- Socio-economics:
  - Beneficial effect on local economy through the creation of an employed position

8.3.2. IMPACT ASSESSMENT ALONE

103. The assessment for the effects of the compensation alone (that is not combined with any other plans or projects) is presented below:

Historic Environment

Adverse effect on historic listed castle building from improvement of kittiwake nesting habitat

104. The proposed measure involves adding artificial ledges and overhangs in certain areas during the winter period. There is a potential for an adverse effect on the castle building from the addition of these ledges which may result in adverse visual effects, or change the historic fabric of the site. Dunbar Castle is a Scheduled Monument. Therefore, scheduled monument consent may be required for the undertaking works which would be obtained from HES. The purpose of scheduled monument consent is to ensure that any changes to monuments are appropriate and sympathetic to their character. Therefore, permission of the works would only be granted by HES if they deem that the works are appropriate within the context of Dunbar Castle and its significance. The assessment presented here is based on the MDS presented within Table 2.

105. The spatial extent of the impacts would be small, as the ledges themselves will only take up a small proportion of the castle, not the whole structure. The temporal extent is anticipated to be long-term, with the ledges not currently being proposed to be removed once installed. Based on this, any visual impacts associated with the improvement of kittiwake nesting habitat works have a magnitude of **medium (adverse**). With respect to structural change, the historic value of the site means that further liaison will be undertaken with the local Conservation Officer and HES to agree an acceptable plan for the work to minimise adverse effects, including use of non-invasive techniques for installation. Therefore, it is considered that the magnitude associated with structural change is **negligible (adverse).**

106. Given the proposed natural colour of the artificial ledges and the swift covering of nesting materials and excrement from the presence of kittiwakes, it is anticipated that the sensitivity of the receptor to visual impacts associated with this measure is **negligible (adverse).** As

Dunbar Castle is a scheduled monument, the sensitivity of this receptor to structural change is considered to be **high (adverse).**

107. Following the significance matrix utilised in this assessment, a magnitude of medium and sensitivity of negligible results in a **negligible to minor adverse** significance of effect for visual impacts, which is **not significant** in EIA terms. A magnitude of negligible and a sensitivity of high results in a **minor adverse** significance of effect for structural change which is **not significant** in EIA terms. It should be noted that the works will only go ahead if scheduled monument consent is obtained (if required) and this provides a protective mechanism for the historic value of the site and they would only go ahead if the effects on the historic environment are deemed acceptable by HES.

Noise and Vibration

Adverse effect on local residents from increasing noise levels due to kittiwake population growth

108. The proposed measure will result in increased bird populations, and therefore there is a potential for an adverse effect on local residents due to an increase to the level of noise generated at the site from the increase in the number of birds, especially with an increase in juveniles resulting in increased noise in the breeding season (summer). The assessment presented here is based on the MDS presented within Table 2.

109. The proposed measure is anticipated to result in a significant increase in the population of kittiwakes at Dunbar, to approximately 400 pairs (800 birds) which could result in additional noise being generated when reaching this population size. However, the population growth will be gradual over a 5-year period. Therefore, given the gradual nature of the change and the timescales associated with it, it is considered that the magnitude of noise generated is **low (adverse)**. As the site is already an established kittiwake colony, noise is already created by the presence of kittiwakes, and it is considered that local residents will be used to noise generated by the colony. Given the existing level of noise that local residents will be adjusted to and the anticipated gradual increase in volume, the sensitivity of this receptor is **low (adverse)**.

110. Following the significance matrix utilised in this assessment (Table 4), a magnitude of low and sensitivity of low results in a **negligible to minor adverse** significance of effect, which is not significant in EIA terms.

Offshore and intertidal ornithology

Temporary disturbance during improvement of kittiwake nesting habitat

111. The proposed measure involves adding artificial ledges and overhangs in certain areas during the winter period. There is a potential for disturbance to offshore and intertidal ornithological receptors from the required trips for planning / designing the work, and the physical construction of the ledges / platforms, as those undertaking the proposed work may cause disturbance and stress to birds on site. The assessment presented here is based on the MDS presented within Table 2.

112. The spatial extent of disturbance would be moderate, with any disturbance from human presence being temporary and short-term. The temporal extent is also anticipated to be small, with any disturbance caused being temporary (typically in terms of days). Based on the small spatial and temporal extent, it is considered that the proposed activities have a magnitude of **medium (adverse).** As the kittiwake nesting habitat improvement will be undertaken within the winter period (November to March), it therefore avoids the breeding season for offshore and intertidal ornithological receptors. Based on the lack of interaction with receptors during the breeding season, it is considered that the receptors have a sensitivity of **negligible (adverse).**

113. Following the significance matrix utilised in this assessment (Table 4), a magnitude of low and sensitivity of negligible results in a **negligible to minor adverse** significance of effect, which is not significant in EIA terms.

Beneficial effect on seabird populations from improved nesting habitat

114. The proposed measure involves adding artificial ledges and overhangs in certain areas during the winter period. There is a potential for an increase to kittiwake breeding success and therefore population growth due to the implementation of the improved habitat. The assessment presented here is based on the MDS presented within Table 2.

115. The proposed measure is anticipated to result in a significant increase in the population of kittiwakes at Dunbar, to approximately 400 pairs (800 birds) as per the conservation targets, and therefore it is considered that the magnitude of activities is **high (beneficial)**. Given the declining population of kittiwakes at the site, it is considered that the measures being taken will be great importance and effectiveness, meaning that it is considered that their sensitivity is **high (beneficial)**.

116. Following the significance matrix utilised in this assessment (Table 4), a magnitude of high and sensitivity of high results in a **major beneficial** significance of effect, which is significant in EIA terms.

Temporary disturbance through access for debris removal activities

117. The proposed measure involves the removal of debris from nesting sites during the winter period, including clipping any trailing net / rope or small pieces of plastic from nests, noting that complete removal is not possible as nests are reused annually. There is a potential for disturbance to offshore and intertidal ornithological receptors from the required trips for planning the work, and the physical removal of debris, as those undertaking the proposed work may cause disturbance and stress to birds on site. The assessment presented here is based on the MDS presented within Table 2.

118. The spatial extent of disturbance would be small, with any disturbance from human presence being temporary and short-term. The temporal extent is also anticipated to be small, with any disturbance caused being temporary (typically in terms of hours). Based on the small spatial and temporal extent, it is considered that the proposed activities have a magnitude of **low (adverse)**. As the debris removal activities will be undertaken within the winter period (November to March), it therefore avoids the breeding season for offshore and intertidal ornithological receptors. Based on the lack of interaction with receptors during the breeding season, it is considered that the receptors have a sensitivity of **negligible (adverse).**

119. Following the significance matrix utilised in this assessment (Table 4), a magnitude of low and sensitivity of negligible results in a **negligible to minor adverse** significance of effect, which is not significant in EIA terms.

Beneficial effect on seabird populations from removal of debris activities

120. The proposed measure involves the removal of debris from nesting sites during the winter period, including clipping any trailing net / rope or small pieces of plastic from nests, noting that complete removal is not possible as nests are reused annually. There is a potential for an increase to kittiwake breeding success from the removal of this debris as it may lead to more structurally sound nests. The assessment presented here is based on the MDS presented within Table 2.

121. The proposed measure is anticipated to result in a significant increase in the population of kittiwakes at Dunbar, to approximately 400 pairs (800 birds), and therefore it is considered that the magnitude of activities is **high (beneficial)**. Given the declining population of

kittiwakes at the site, it is considered that the measures being taken will be great importance and effectiveness, meaning that it is considered that their sensitivity is **high (beneficial)**.

122. Following the significance matrix utilised in this assessment (Table 4), a magnitude of high and sensitivity of high results in a **major beneficial** significance of effect, which is significant in EIA terms.

Temporary disturbance during camera/monitoring equipment installation and removal

123. The proposed measure involves setting up cameras/monitoring equipment during the winter season for monitoring purposes. There is a potential for disturbance to offshore and intertidal ornithological receptors from the required trips for planning / designing the work, and the physical installation and removal of the cameras/monitoring equipment, as those undertaking the proposed work may cause disturbance and stress to birds on site. The assessment presented here is based on the MDS presented within Table 2.

124. The spatial extent of disturbance would be small, with any disturbance from human presence being temporary and short-term. The temporal extent is anticipated to be small, with any disturbance caused being temporary (typically in terms of hours). Based on the small spatial and temporal extent, it is considered that the proposed activities have a magnitude of **low (adverse).** As the camera/monitoring equipment installation and removal will be undertaken within the winter period (November to March), it therefore avoids the breeding season for offshore and intertidal ornithological receptors. Based on the lack of interaction with receptors during the breeding season, it is considered that the receptors have a sensitivity of **negligible (adverse).**

125. Following the significance matrix utilised in this assessment (Table 4), a magnitude of low and sensitivity of negligible results in a **negligible to minor adverse** significance of effect, which is not significant in EIA terms.

Onshore ecology

Temporary disturbance during improvement of kittiwake nesting habitat

126. The proposed measure involves adding artificial ledges and overhangs in certain areas during the winter period. There is a potential for disturbance to onshore ecology receptors from the required trips for planning / designing the work, and the physical construction of the ledges / platforms, as those undertaking the proposed work may cause disturbance and stress to birds on site. The assessment presented here is based on the MDS presented within Table 2.

127. The spatial extent of disturbance would be moderate, with any disturbance from human presence being temporary and short-term. The temporal extent is also anticipated to be small, with any disturbance caused being temporary (typically in terms of days). Based on the small spatial and temporal extent, it is considered that the proposed activities have a magnitude of **medium (adverse).** As the castle grounds themselves are closed to the public, it is anticipated that onshore ecology receptors will not be used to much human activity at the site meaning the receptors may be sensitive to the activities. However, some disturbance does occur at the site (e.g. children throwing stones at the site or people heading into the site when they are not supposed to) and the wardening role is designed to reduce disturbance to the site as a whole. Therefore, factoring in the current level of disturbance, the reduced disturbance from the presence of the warden, it is considered that the sensitivity of the receptors is **low (adverse)**.

128. Following the significance matrix utilised in this assessment (Table 4), a magnitude of low and sensitivity of negligible results in a **negligible to minor adverse** significance of effect, which is not significant in EIA terms.

Temporary disturbance through access for debris removal activities

129. The proposed measure involves the removal of debris from nesting sites during the winter period, including clipping any trailing net / rope or small pieces of plastic from nests, noting that complete removal is not possible as nests are reused annually. There is a potential for disturbance to offshore and intertidal ornithological receptors from the required trips for planning the work, and the physical removal of debris, as those undertaking the proposed work may cause disturbance and stress to birds on site. The assessment presented here is based on the MDS presented within Table 2.

130. The spatial extent of disturbance would be small, with any disturbance from human presence being temporary and short-term. The temporal extent is also anticipated to be small, with any disturbance caused being temporary (typically in terms of hours). Based on the small spatial and temporal extent, it is considered that the proposed activities have a magnitude of **low (adverse)**. As the castle grounds themselves are closed to the public, it is anticipated that onshore ecology receptors will not be used to much activity at the site meaning the receptors may be sensitive to the activities. However, given the nature of effects being small in nature (temporally and spatially) it is considered that onshore ecology receptors will be able to move away from the source of the impact, lowering the sensitivity of the receptors to **negligible (adverse)**.

131. Following the significance matrix utilised in this assessment (Table 4), a magnitude of low and sensitivity of negligible results in a **negligible to minor adverse** significance of effect, which is not significant in EIA terms.

Temporary disturbance during camera/monitoring equipment installation and removal

132. The proposed measure involves setting up cameras/monitoring equipment during the winter season for monitoring purposes. There is a potential for disturbance to onshore receptors from the required trips for planning / designing the work, and the physical installation and removal of the cameras/monitoring equipment, as those undertaking the proposed work may cause disturbance and stress to receptors on site. The assessment presented here is based on the MDS presented within Table 2.

133. The spatial extent of disturbance would be small, with any disturbance from human presence being temporary and short-term. The temporal extent is anticipated to be small, with any disturbance caused being temporary (typically in terms of hours). Based on the small spatial and temporal extent, it is considered that the proposed activities have a magnitude of **low (adverse).** As the castle grounds themselves are closed to the public, it is anticipated that onshore ecology receptors will not be used to much activity at the site meaning the receptors may be sensitive to the activities. However, given the nature of effects being small in nature (temporally and spatially) it is considered that onshore ecology receptors will be able to move away from the source of the impact, lowering the sensitivity of the receptors to **negligible (adverse)**.

134. Following the significance matrix utilised in this assessment (Table 4), a magnitude of low and sensitivity of negligible results in a **negligible to minor adverse** significance of effect, which is not significant in EIA terms.

Socio-economics:

Beneficial effect on local economy through the creation of an employed position

135. The proposed measure will result in a paid position for a minimum of five-years. This would be a beneficial effect to socio-economic receptors, specifically the individual (or individuals in the event that the role changes hands over the initial five-year time period) that is hired. The assessment presented here is based on the MDS presented within Table 2.

136. The proposed measure is anticipated to result in a single full-time position at any given time, which may change between individuals over the 5-year programme. On all scales (national and local) this constitutes a very minor impact on the economy (both national and local). Therefore, it is considered that the magnitude of this measure on socio-economic receptors is **negligible (beneficial).** The sensitivity of receptors will vary greatly depending on the individual chosen for the role and their previous background and financial standing at the time of starting the position. However, when considering the economy as a whole (national and local), it is considered that the sensitivity of socio-economic receptors to be **negligible (beneficial).**

137. Following the significance matrix utilised in this assessment (Table 4), a magnitude of negligible and sensitivity of negligible results in a **negligible beneficial** significance of effect, which is not significant in EIA terms.

8.3.3. CUMULATIVE EFFECT ASSESSMENT

138. As the potential adverse effects are exceedingly small in nature, no adverse effects are anticipated further afield than Dunbar Castle itself, and therefore the scoping undertaken for projects to be considered cumulatively is limited to those with direct spatial overlap with the proposed compensatory measures.

139. Following on from the above methodology, no projects have been identified for the consideration of cumulative effects. Therefore it can be concluded that there is no potential for any significant cumulative effects between the proposed measure and any other projects.

8.3.4. TRANSBOUNDARY IMPACTS

140. No transboundary impacts are predicted due to the localised and small-scale nature of this compensatory measure.

9. EIA – RAT ERADICATION: INCHCOLM

9.1. INTRODUCTION

141. This section considers the potential impacts arising from the rat eradication at Inchcolm island.

142. This measure is included as a secondary measure that may be implemented for adaptive management purposes. A complete account of this measure is provided although it should be noted that further stakeholder consultation would be required before this specific measure could be secured and the intention is not to take this measure forward as compensation at this stage.

143. A characterisation of the physical, biological, and human environmental baseline is presented followed by the results of an assessment of potential likely significant effects arising from the proposed compensatory measure (Section 9.2).

144. This compensatory measure proposes to eradicate black rat from Inchcolm, an island in the Firth of Forth, as shown in Figure 1. Following eradication the Applicant will implement biosecurity measures, implement appropriate seabird habitat management, undertake monitoring and address any re-incursions. The objective of this measure is to increase black-legged kittiwake, common guillemot, Atlantic puffin, and razorbill populations on the island through the removal of predation pressure from black rats.

145. Section 5 of the IMP provides a detailed description of the proposed compensatory measure.

9.2. BASELINE

146. Table 10 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).

Table 10: The baseline environment for the receptor groups relevant to rat eradication at Inchcolm Island

Receptor	Description of Baseline Environment
Historic Environment	Inchcolm is thought to contain one of the last remaining island populations of black rats in the UK. Black rats declined or disappeared from many UK locations following the arrival of more competitive brown rats in the UK in the 18th century (Rielly, 2010; Puckett et al., 2020; Yu et al., 2022). Evidence suggests black rats may be more widespread across the UK and Europe than is currently appreciated by stakeholders. Observation records suggest black rat activity is under reported in the UK, even amongst trained pest control technicians and public health officials. This is understandable given the many similarities (particularly colour) between black rats and the UKs more common brown rat when sighted outdoors (Cain et al., 2022). There is a general impression that black rats may have existed on Inchcolm since the 12th Century. However, a review of available literature has found a record that suggests black rats may have arrived on Inchcolm as recently as the start of the 20th century (Dickson, J, 1899). Over recent years, black rats have been recorded in other locations in Scotland and the wider UK, including the Channel Islands (island populations are present on Alderney and Sark), and UK mainland ports including Rosyth, Southampton, Essex, and London. A 2022 survey by the British Pest Control Agency showed UK pest control companies often came

Receptor	Description of Baseline Environment
	across black rats during their work, again, mostly at docks and port cities (Cain et al., 2022). Black rats are currently listed as naturalised non-native species in the Red List for Britain's Terrestrial Mammals (Mathews & Harrower, 2020) but are also listed in Schedule 9 of the Wildlife and Countryside Act (1981) as a non-native species that should not be released into the wild. Black rats have been identified as one of the world's 100 worst invasive species (Lowe et al., 2000; ISSG, 2010). The index of rat abundance for Inchcolm was 8 rats per 100 trap nights (Cain et al., 2022). This suggests a low rat abundance across the island, but this result may be complicated by the trapping time (summer, June 2022) and abundance of natural food reducing trapping efficacy. This possibility is confirmed when the trapping results are compared to the index from the tracking tunnels (27 active tunnels per 100 trap nights). This suggests that black rat numbers are moderate to high on Inchcolm.
Infrastructure and Other Users	With the exception of the abbey and a small shop, there is no major infrastructure on the island. The island is regularly visited by tourist trips to Inchcolm Abbey. During the summer months, there are two ferry services and one yacht charter company that operate trips to the island. Visitors are normally allowed 1.5 hrs ashore. The ferry services normally operate between Easter and late October from South Queensferry. The island has two beaches and a network of footpaths that are used by visitors. There are up to four employees of HES living on the island during the summer to staff the abbey and shop. The abbey complex is Scotland's best-preserved group of monastic buildings and it may also be hired as a wedding venue.
Offshore and Intertidal Ornithology	Species: At least 19 species of seabird breed on the coasts of the North Sea, in particular large numbers of northern gannet, kittiwake, common guillemot, razorbill, and puffin (Wanless et al., 1998). The key species of relevance to this measure are kittiwake, guillemot, razorbill, and gannet, all of which are features at several designated sites nearby to the search area. Kittiwake have a mean-max foraging range of 156.1 km, guillemot have a range of 73.1 km, razorbill have a range of 88.7 km, and gannet have the largest range of 315.2 km (Woodward et al., 2019). Further details on the seabird usage of Inchcolm island is presented in the IMP. Designated national sites: Inchcolm island itself is not a designated site, however it does sit within the with the Outer Firth of Forth and St Andrews Complex SPA, and acts as supporting habitat to many other nearby sites within the Outer Firth of Forth and St Andrews Complex SPA including Forth Islands SPA, Fowlsheugh SPA, Firth of Forth SPA, Firth of Forth Ramsar site, and St Abb's Head to Fast Castle SPA. These sites cover a wide range of species including the ones listed above and additional seabirds and waterbirds. The seabirds nesting on Inchcolm were counted annually by the Forth Seabird Group and are now counted annually by the Forth Islands Heritage Group (FIHG). Only very small numbers nest there with the colony in 2021 numbering 63 AON for kittiwake, 12 AOS for razorbill, and 10 puffins (single birds). Guillemots have been observed there on land on several occasions (single birds in 2007 and 2008, and 14 individuals in 2014) and it was

Receptor	Description of Baseline Environment
	speculated that a very small number may breed there. However, they have not been sighted on more recent surveys (2015–2021). Kittiwake numbers on Inchcolm remained relatively stable during the period between 2004–2008 when numbers declined rapidly. However, numbers then dropped again between 2014-2018, when numbers have stabilised or even increased elsewhere. Comparison with Inchkeith, another non-SPA site in the Inner Forth, shows that kittiwake numbers were generally stable between 1996-2014 (unlike other sites in the Forth Islands) with numbers increasing post-2014. Although razorbill numbers have risen slightly over the last decade, the colony is still only very small relative to rodent-free islands in the Forth. Puffin counts are variable, but in recent years are always below 60 individuals, numbering only 10 individuals in 2021 (Forth Islands Heritage Group 2021). However, 28 puffins were seen by the Forth Island Heritage Group off the north-west cliffs of Inchcolm on 20th July, which is considered to be a more representative number of the population than the official count carried out on 31st May (Forth Islands Heritage Group 2021). Anecdotal evidence suggests that numbers of puffin were previously much higher on Inchcolm with peak numbers between 1992-1995 reaching 100 pairs. The puffins used to nest in a boulder field in the south-eastern corner of Inchcolm, but more recently have relocated to the steeper cliffs in the north-west, where there are now only a few pairs (R. Morris, FIHG pers. comm). Although guillemot does not currently breed on Inchcolm, it is also anticipated that rat removal would increase the value of the habitat and improve colonisation potential (Forth Islands Heritage Group (2020). Annual Report 2020). The number of large gulls (primarily lesser black-backed gull and herring gull) nesting on Inchcolm will be adversely impacting on auk numbers. The vegetation and ground cover means that conducting accurate counts is challenging, so in 2021 the Forth Islands Heritage Group conducted a large gull census on Inchcolm, which showed that numbers were much higher than previously anticipated with 1641-1789 lesser black-backed gull apparently occupied territories (AOT), 1694-1847 herring gull AOT and 7 great black-backed gull AOT. Large gulls were observed nesting in the grounds of the Abbey for the first time due to lack of visitors and maintenance during the 2020 closure due to covid lockdown.
Onshore Ecology	The EUNIS land cover data categorises Inchcolm island having the following habitat types: • Grasslands and lands dominated by forbs, mosses or lichens; • Temperate shrub heathland; • Coastal habitats; and • Buildings of cities, towns and villages/ low density buildings. Inchcolm supports a population of black rat. Black rat is not native to the UK, and is widespread throughout its native range in Asia, where populations are stable. It is also commonly encountered across the globe, where it has been introduced and has subsequently successfully colonised. Furthermore, the success of rat removal from the Shiants provides further support in favour of their removal from other seabird islands.
Shipping and navigation	The island is regularly visited by tourist trips to Inchcolm Abbey. During the summer months, there are two ferry services and one yacht charter company that operate trips to the island. Visitors are normally allowed 1.5 hrs ashore. The ferry services normally operate between Easter and late October from South Queensferry (Forth Boat Tours, undated; Maid of the

Receptor	Description of Baseline Environment
	Forth, undated). In the area around Inchcolm island, the average shipping density ranges from 25.96 to 644.6 hours of shipping traffic per square km per month (EMODnet, 2022).
Socio-economics	The island is regularly visited by tourist trips to Inchcolm Abbey. Inchcolm Abbey is owned by Historic Environment Scotland, with a current admission charge of £6.00 per adult or student, £3.60 per child, and £4.80 per concession. During the summer months, there are two ferry services and one yacht charter company that operate trips to the island for varying prices. Visitors are normally allowed 1.5 hrs ashore. The ferry services normally operate between Easter and late October from South Queensferry ((Forth Boat Tours, undated; Maid of the Forth, undated; Visit Scotland, undated). Additionally, on the island there is a small gift shop and visitor centre which sell a variety of goods to bring some money into the local economy and provided several jobs (Visit Scotland, undated).

9.3. ASSESSMENT

9.3.1. IDENTIFICATION OF IMPACTS AND SCOPE OF ASSESSMENT

147. Based on the information presented in this document, the IMP, CCM and FCM Evidence Reports, all activities associated with the proposed rat eradication at Inchcolm were defined and potential impact pathways identified. The following potential impacts were identified and scoped in:

- Historic Environment:
  - Impact to cultural heritage from loss of black rats
- Infrastructure and other users:
  - Impacts to tourism due to biosecurity measures
- Offshore and intertidal ornithology:
  - Potential for disturbance from increased human activity due to implementation of eradication programme e.g. regular setting of baits or traps and monitoring work; and
  - Beneficial effect on seabird populations from reduced predation on eggs/juveniles.
- Onshore ecology:
  - Impacts to onshore plants and animals other than the targeted rat species;
  - Potential for disturbance due to increased human activity due to implementation of eradication programme e.g. regular setting of baits or traps and monitoring work; and
  - Beneficial effect on onshore ecology from reduced predation from rats.
- Shipping and navigation:
  - Potential disturbance to usual operating procedures to factor in biosecurity measures
- Socio-economics:
  - Beneficial effect on local industry resulting from increased birds on site
  - Impacts to tourism operators due to biosecurity measures

9.3.2. IMPACT ASSESSMENT ALONE

148. The assessment for the effects of the compensation alone (that is not combined with any other plans or projects) is presented below:

Historic environment

Impact to cultural heritage from loss of black rats

149. The proposed measure will eradicate black rat from Inchcolm. This could potentially be considered to affect the cultural heritage of the island, as the colony of black rats represents one of the last remaining island colonies of black rats in the UK. The assessment presented here is based on the MDS presented within Table 2.

150. Historical records indicate black rats may have arrived on Inchcolm as recently as the start of the 20th century (post 1899), and are listed as a priority for conservation action on the Scottish Biodiversity List. Black rats are also listed as a naturalised, non-native species within the Red List for British Mammals. However, black rats are abundant in the Channel Isles (Sark and Alderney), continental Europe and globally, with further isolated populations understood to exist on mainland UK.

151. During stakeholder engagement, HES raised the concept of the cultural heritage of black rats. Neither NatureScot or the Mammal Society have objected during consultation to the rat eradication on Inchcolm, with the Mammal Society in particular regarding the black rat population on Inchcolm to be an “invasive alien species”.

152. It is considered that as black rat populations will remain around UK and Europe, and due to the fact that it is an invasive alien species, it is considered that the both the magnitude and sensitivity of the effect of the loss of black rats from Inchcolm is **negligible (adverse).**

153. Following the significance matrix utilised in this assessment (Table 2), a magnitude and sensitivity of negligible results in a **negligible adverse** significance of effect, which is **not significant** in EIA terms.

Infrastructure and other users

Impacts to tourism due to biosecurity measures

154. The proposed measure will involve the implementation of a biosecurity plan to ensure that no new rodents are brought onto the island. At the time of writing, details of the biosecurity plan have not yet been established, however it will be compatible with the Biosecurity for LIFE guidance (Biosecurity for Life, 2022), CRRU) and WMP document designed for the proposed measure. The plan is likely to include measures such as requiring boat operators to regularly check vessels for stowaways, storing waste securely in rodent proof bins, storing personal food in mouse-proof containers, using rat guards on mooring lines and anchor chains, deploying chew cards or wax chew blocks on the vessel, and not landing at the destination if a stowaway is spotted on board. The assessment presented here is based on the MDS presented within Table 1.

155. Given the nature of the anticipated measures, following the IMP and the Biosecurity for Life programme (Biosecurity for Life, 2022), it is anticipated that these measures many cause a minor inconvenience to boat operators and visitors to the island. Disturbance to tourism from these additional measures is therefore likely to be minor as the measures mainly involve additional management from the operator or small adjustments from individuals regarding personal food storage. Under a worst-case scenario if a stowaway was spotted on board this could result in the trip not continuing, which could adversely impact the trip operator and visitors onboard. However, the likelihood of this happening is considered to be relatively rare as the remainder of the measures as part of the biosecurity plan will aim to prevent stowaways from being on the vessel in the first place. Therefore, this potential effect has a high potential vulnerability but a low likelihood, enabling the magnitude of the effect to be **low (adverse)**. The proposed steps within the biosecurity plan (following the Biosecurity for Life programme (Biosecurity for Life, 2022) are not novel suggestions for

biosecurity, and they are implemented for other projects within Scotland (such as the Isle of May), with tourism vessel operators likely already familiar with them. Therefore, given the low impact of the majority of the measures within the biosecurity plan, the low likelihood of trips being curtailed, and the adoption of the measures elsewhere in the industry, the sensitivity of receptor is considered to be **low (adverse).**

156. Following the significance matrix utilised in this assessment (Table 2), a magnitude of low and a sensitivity of low results in a **negligible to minor adverse** significance of effect, which is not significant in EIA terms.

Offshore and intertidal ornithology

Potential for disturbance from human activity due to eradication and immediate monitoring phase of the programme

157. The proposed measure will involve the placement of approximately 170 bait stations during the eradication phase, and visits every two days to the stations for maintenance and monitoring purposes for the first four months. There is a potential for disturbance to offshore and intertidal ornithological receptors from these trips, as those undertaking the proposed work may cause disturbance and stress to birds on site. The assessment presented here is based on the MDS presented within Table 2.

158. The spatial extent of disturbance would be small, limited to within visual range of the bait stations and access to and from them. The temporal extent is also anticipated to be small, with any disturbance caused being intermittent and temporary (typically in terms of hours). When factoring in the small spatial and temporal extent and the comparatively low numbers of birds on the island it is considered that the magnitude of effect is **low (adverse)**. As the eradication and immediate monitoring phases will be undertaken within the winter period (November to March), it therefore avoids the breeding season for offshore and intertidal ornithological receptors. Additionally, kittiwake are often found in and around human population centres so it is considered that they have a moderate level of resilience to human disturbance, especially on Inchcolm island as there are regular visitors to the site. Therefore, it is considered that the receptors have a sensitivity of **negligible (adverse)**.

159. Following the significance matrix utilised in this assessment (Table 4), a magnitude of low and sensitivity of negligible results in a **negligible to minor adverse** significance of effect, which is not significant in EIA terms.

Potential for disturbance from human activity due to long-term monitoring phase of the programme

160. The proposed measure will involve the monitoring of the approximate 170-bait stations every four weeks for two years. There is a potential for disturbance to offshore and intertidal ornithological receptors from these trips, as those undertaking the proposed work may cause disturbance and stress to birds on site. The assessment presented here is based on the MDS presented within Table 2.

161. The spatial extent of disturbance would be small, with any disturbance from human presence being temporary and short-term. The temporal extent is also anticipated to be small, with any disturbance caused being temporary (typically in terms of hours). When factoring in the small spatial and temporal extent and the comparatively low numbers of birds on the island it is considered that the magnitude of effect is **low (adverse)**. As the long-term monitoring phase will be undertaken year-round, and it therefore includes the breeding season for offshore and intertidal ornithological receptors, it therefore has a greater potential sensitivity than during other times of the year. Additionally, kittiwake are often found in and around human population centres so it is considered that they have a moderate level of resilience to human disturbance, especially on Inchcolm island as there

are regular visitors to the site. Therefore, it is considered that the receptors have a sensitivity of **low (adverse)**.

162. Following the significance matrix utilised in this assessment (Table 4), a magnitude of low and sensitivity of low results in a **negligible to minor adverse** significance of effect, which is not significant in EIA terms.

Beneficial effect on seabird populations from reduced predation on eggs/juveniles

163. The proposed measure will result in reduced rat populations, and therefore a reduction in the predation on offshore and intertidal ornithological receptors at Inchcolm Island. This would be a beneficial effect to the ornithological receptors. The assessment presented here is based on the MDS presented within Table 2.

164. The proposed measure is anticipated to result in a significant increase in the population of kittiwakes, puffin and razorbill on the island (Table 11 – taken from the CCM Evidence Report), and therefore it is considered that the magnitude of activities is **high (beneficial)**. Given the high sensitivity of the receptors to predation of eggs/juveniles from rats on the island, it is also considered that their sensitivity is **high (beneficial).**

Table 11: Preliminary conservation targets and associated increases for each key species on Inchcolm island. All numbers are expressed as single birds

Measurement	Puffin	Razorbill	Guillemot	Kittiwake
Current count	10	24	0	126
Max. recorded count	200	42	0	378
Additional birds (based on habitat availability)	500	162	258	352
Conservation target[7]	510	186	258	478
Additional birds generated per year	14	5	7	10

165. Following the significance matrix utilised in this assessment (Table 4), a magnitude of high and sensitivity of high results in a **major beneficial** significance of effect, which is **significant** (beneficial) in EIA terms.

Onshore ecology

Impacts to onshore plants and animals other than the targeted rat species

166. The proposed measure will involve the placement of bait stations during the eradication phase, which will remain in place for up to 5 months (November to March inclusive). There is a potential for accidental poisoning of non-target species (i.e. any species other than rats) and non-target species to be affected by secondary poisoning such as birds of prey

[7] Conservation targets for Inchcolm are expressed as the total number of birds that would be generated throughout the 35 year operational lifespan

ingesting poisoned rats. The assessment presented here is based on the MDS presented within Table 2.

167. A NTSMP will be developed, which will consider the timing and location of predator eradication programme to ensure that it is undertaken at the optimal time/location and that it will have a minimal effect on non-target species. The inclusion of the NTSMP will follow current good practise design to minimise impact on sensitive habitats, non-target species and disruption to land use. Alongside the NTSMP there will also be a Waste Management Plan (WMP) document designed to ensure that any waste is efficiently stored and disposed of to reduce the risk of re-introductions of rats to the island. Therefore, due to the implementation of the NTSMP and WMP, the magnitude of effect is considered to be **negligible (adverse)**. Furthermore it is anticipated that if any non-target species were to ingest bait or secondarily ingest a poisoned rat, only small numbers of animals would be affected and therefore resulting sensitivity is **negligible to low (adverse)** sensitivity.

168. Following the significance matrix utilised in this assessment (Table 4), a magnitude of negligible and sensitivity of negligible to minor results in a **negligible adverse** significance of effect, which is **not significant** in EIA terms.

Potential for disturbance to onshore ecology from human activity due to eradication, immediate monitoring and long-term monitoring phases of the programme

169. The proposed measure will involve the placement of bait stations during the eradication phase, and various visits to the stations for maintenance and monitoring purposes. During the immediate monitoring phase the monitoring will be undertaken every two days, and during the long-term monitoring phase visits will be undertaken every 4 weeks. There is a potential for disturbance to any onshore ecology receptors from these trips, as those undertaking the proposed work may cause disturbance and stress to animals on site. The assessment presented here is based on the MDS presented within Table 2.

170. The spatial extent of disturbance would be small, with any disturbance from human presence being temporary and short-term. The temporal extent is also anticipated to be small, with any disturbance caused being temporary (based on the intermittent nature of the monitoring trips and the short timescale associated with each trip, typically in terms of hours). Based on the small spatial and temporal extent, it is considered that the proposed activities have a magnitude of **low (adverse)**. As the island regularly has visitors, any onshore animals on the island are likely to be used to human foot traffic and therefore it is anticipated that the receptors have a sensitivity of **negligible (adverse)**.

171. Following the significance matrix utilised in this assessment (Table 4), a magnitude of low and sensitivity of low results in a **negligible to minor adverse** significance of effect, which is **not significant** in EIA terms.

Beneficial effect on onshore ecology from reduced predation from rats

172. The proposed measure will involve the removal of rats from the island of Inchcolm, with the aim of 100% eradication. There is a potential for a beneficial effect to onshore ecology receptors from a reduction in predation caused by rats. The assessment presented here is based on the MDS presented within Table 2.

173. Inchcolm is known to support a number of plants typical of coastal grassland and sand dune habitats. These include sea rocket *Cakile maritima* and various *Atriplex* species (Morris 2003). Both of these plant species (along with pygmy shrew *Sorex minutus,* slow worm *Anguis fragilis,* common lizard *Zootoca vivipara,* lesser white-toothed shrew *Crocidura suaveolens,* bank vole *Myodes glareolus* and even moths (Thomas et al. 2017)") increased significantly following previous rat eradication from Handa, and it is possible that rodent removal from Inchcolm could benefit both these, and other plant species (CCM Evidence Report). However, it is noted that the beneficial effects to plants is short lived as the increase in other onshore ecology receptors results in increased grazing and a subsequent

reduction in growth rates (CCM Evidence Report). Therefore the magnitude is considered to be **low (beneficial).** Given the previous history of eradications being beneficial, it is anticipated that the sensitivity of receptors to this effect is considered to be **medium beneficial.**

174. Following the significance matrix utilised in this assessment (Table 4), a magnitude of low and sensitivity of medium results in a **minor beneficial** significance of effect, which is **not significant** in EIA terms.

Shipping and navigation

Potential disturbance to usual operating procedures to factor in biosecurity measures

- The proposed measure will involve the implementation of a biosecurity plan to ensure that no new rodents are brought onto the island. At the time of writing, details on the biosecurity plan have not been established, however it will be compatible with guidance from the Biosecurity for Life programme (Biosecurity for Life, 2022), Measures to be taken may include regularly checking belongings and vessels for stowaways, storing waste securely in rodent proof bins, storing personal food in mouse-proof containers, using rat guards on mooring lines and anchor chains, deploying chew cards or wax chew blocks on the vessel, and not landing if a stowaway is spotted on board. The assessment presented here is based on the MDS presented within Table 1.

175. Given the nature of the anticipated measures, following the IMP and the Biosecurity for Life programme (Biosecurity for Life, 2022), it is anticipated that the disturbance to shipping and navigation receptors from these additional measures is likely to be minor, as the measures will only effect those vessels planning to land on the island, which would be limited to tourism vessels (see impacts to tourism due to biosecurity measures assessment above), private recreational vessels and ferries. Under a worst-case scenario if a stowaway was spotted on board a vessel this could result in the trip not continuing, which could adversely impact the vessel operator and visitors onboard. However, the likelihood of this happening is considered to be relatively rare as the remainder of the measures as part of the biosecurity plan will aim to prevent stowaways from being on the vessel in the first place. Therefore, this potential effect has a high potential vulnerability but a low likelihood, resulting in a magnitude of effect of **low (adverse)**. The proposed steps within the biosecurity plan (following the Biosecurity for Life programme (Biosecurity for Life, 2022) are standard for biosecurity, and they are implemented for other projects within Scotland (such as the Isle of May), with vessel operators likely already familiar with them. Therefore, given the low impact of the majority of the measures within the biosecurity plan, the low likelihood of trips being curtailed, and the adoption of the measures elsewhere in the industry, the sensitivity of receptor is considered to be **low (adverse).**

176. Following the significance matrix utilised in this assessment (Table 2), a magnitude of low and a sensitivity of low results in a **negligible to minor adverse** significance of effect, which is not significant in EIA terms.

Socio-economics

Beneficial effect on local industry resulting from increase birds on site

177. The proposed measure will result in increased bird populations, and therefore there is a potential for increased visits to the island through bird-watching trips. This would be a beneficial effect to local industry and socio-economic receptors, such as vessel operators and the gift shop on the island. The assessment presented here is based on the MDS presented within Table 2.

178. The proposed measure is anticipated to result in a significant increase in the population of kittiwakes on the island. This is anticipated to increase the number of trips a small amount, as many trips will be undertaken regardless of changes to bird numbers but additional trips may be needed for additional numbers of visitors. Therefore, it is considered that the magnitude of activities on socio-economic receptors is **low (beneficial)**. The various companies and receptors involved in this industry are sensitive to the amount of tourist activity so it is considered that their sensitivity is **medium (beneficial).**

179. Following the significance matrix utilised in this assessment (Table 4), a magnitude of **low** and sensitivity of medium results in a **minor beneficial** significance of effect, which is **not significant** in EIA terms.

Impacts to tourism due to biosecurity measures

180. The proposed measure will involve the implementation of a biosecurity plan to ensure that no new rodents are brought onto the island. At the time of writing, details of the biosecurity plan have not yet been established, however it will be compatible with the Biosecurity for LIFE guidance (Biosecurity for Life, 2022), and CRRU. The plan is likely to include measures such as requiring boat operators to regularly check vessels for stowaways, storing waste securely in rodent proof bins, storing personal food in mouse-proof containers, using rat guards on mooring lines and anchor chains, deploying chew cards or wax chew blocks on the vessel, and not landing at the destination if a stowaway is spotted on board. The assessment presented here is based on the MDS presented within Table 1.

181. Given the nature of the anticipated measures, following the IMP and the Biosecurity for Life programme (Biosecurity for Life, 2022) and CRRU, it is anticipated that these measures may cause a minor inconvenience to boat operators and therefore potentially knock-on small scale economic effects. The measures mainly involve minor additional management from the operator regarding personal food storage and waste. However, under a worst-case scenario if a stowaway was spotted on board this could result in the trip not continuing, which may result in a refund for any tourists on the vessel, and a financial loss for the tourism operator. However, the likelihood of this happening is considered to be relatively rare as the remainder of the measures as part of the biosecurity plan will aim to prevent stowaways from being on the vessel in the first place. Therefore, this potential effect has a high potential vulnerability but a low likelihood, resulting in the magnitude of the effect to be **low (adverse).** The proposed steps within the biosecurity plan (following the Biosecurity for Life programme (Biosecurity for Life, 2022) are standard suggestions for biosecurity, and they are implemented for other projects within Scotland (such as the Isle of May), with tourism vessel operators likely already familiar with them. Therefore, given the low impact of the majority of the measures within the biosecurity plan, the low likelihood of trips being curtailed, and the adoption of the measures elsewhere in the industry, the sensitivity of receptor is considered to be **low (adverse).**

182. Following the significance matrix utilised in this assessment (Table 2), a magnitude of low and a sensitivity of low results in a negligible to minor adverse significance of effect, which is **not significant** in EIA terms.

9.3.3. CUMULATIVE EFFECT ASSESSMENT

183. As the potential adverse effects are small in nature (spatial and temporal) with no significant adverse effects alone, no adverse effects are anticipated further afield than Inchcolm island itself, and therefore the scoping undertaken for projects to be considered cumulatively is limited to those with direct spatial overlap with the proposed compensatory measures.

184. Following on from the above methodology, no other plans or projects have been identified as being planned on Inchcolm Island. Therefore it can be concluded that there is no potential for any significant cumulative effects between the proposed measure and any other projects.

9.3.4. TRANSBOUNDARY IMPACTS

185. No transboundary impacts are predicted due to the localised and small-scale nature of this compensatory measure.

10. CONCLUSIONS

186. This Derogation Case EIAR has considered the environmental impacts associated with the implementation of the following proposed compensatory measures:

- Management of SA4 sandeel fishery;
- Rat Eradication: Handa;
- Dunbar Castle wardening role; and
- Rat Eradication: Inchcolm (as a secondary measure)

187. The assessment provided in this document is based on the current understanding of the location, scope and nature of the proposed compensatory measures as provided within the IMP. For each of the proposed compensatory measures, the MDS has been defined (Table 1 and Table 2) and the potential impacts identified (Table 5) following the process outlined in Section 5, with some impacts scoped out and others taken forward for assessment. The magnitude of impact and sensitivity of each receptor has been considered, and the level of significance have been derived following the matrix approach (Table 4).

188. Following the above methodology, a range of impacts were identified and assessed with respect to each compensatory measure. Those impacts which were identified as with a significance of effect with respect to the EIA regulations are summarised in Table 12. No adverse impacts were considered to be significant in EIA terms with respect to any of the proposed compensatory measures, with all of the significant effects identified considered to have a beneficial impact (see Table 12).

Table 12: Summary of impacts considered to have significance in EIA terms

Receptor	Significant Effect Identified	Level of significance in EIA terms
Management of SA4 sandeel fishery		
Benthic and intertidal ecology	Beneficial effect on benthic ecology populations through reduction in habitat degradation	Minor or Minor to Moderate beneficial
Fish and shellfish ecology	Beneficial effect on fish and shellfish populations through reduction in fishing pressure	Minor or Minor to Moderate beneficial
Marine mammals	Beneficial effect on marine mammals through an increase in prey resource	Major beneficial
Offshore and intertidal ornithology	Beneficial effect on seabirds through an increase in prey resource	Major beneficial
Rat eradication: Handa		
Offshore and intertidal ornithology	Beneficial effect on seabird populations from reduced predation on eggs/ juveniles	Major beneficial
Socio-economics	Beneficial effect on local industry resulting from increased birds on site	Minor beneficial
Dunbar Castle wardening role		
	Beneficial effect on seabird populations from improved nesting habitat	Major beneficial

Receptor	Significant Effect Identified	Level of significance in EIA terms
Offshore and intertidal ornithology	Beneficial effect on seabird populations from removal of debris activities	Major beneficial
Rat eradication: Inchcolm (as a secondary measure)		
Offshore and intertidal ornithology	Beneficial effect on seabird populations from reduced predation on eggs/ juveniles	Major beneficial

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