GREEN VOLT

Offshore Ornithology Compensation Report

To be read alongside the Without-Prejudice HRA Derogation Case

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Revision history

Revision	Date	Description	Prepared	Checked	Approved
1	25/08/2023	First draft	APEM	APEM	Flotation Energy
2	13/09/2023	Client review amendments	APEM	APEM	Flotation Energy
3	19/10/2023	Amendments	APEM	APEM	Flotation Energy
4	31/10/2023	Minor format amends	RHDHV	RHDHV	Flotation Energy
Flotation Energy Document Number: FLO-GRE-REP-0025					

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Acronyms

Acronym	Acronym description
AA	Appropriate Assessment
AEoSI	Adverse Effect on Site Integrity
AON	Apparently Occupied Nests
AOS	Apparently Occupied Sites
EIA	Environmental Impact Assessment
ESCaRP	English Seabird Conservation and Recovery Pathway
FeAST	Feature Activity Sensitivity Tool
HRA	Habitat Regulations Assessment
MD-LOT	Marine Directorate Licensing Operations Team
MPA	Marine Protection Area
OWF	Offshore Wind Farm
PAH	Polycyclic Aromatic Hydrocarbon
RIAA	Report to Inform Appropriate Assessment
SAC	Special Area of Conservation
SMP	Seabird Monitoring Programme
SNCBs	Statutory Nature consideration Bodies
SOWEC	Scottish Offshore Wind Energy Council
SPA	Special Protection Area
SSSI	Site of Special Scientific Interest

1 Introduction

1.1 Background

1. Green Volt Offshore Wind Limited ('the Applicant') is proposing to develop the Green Volt Offshore Wind Farm (OWF) (from here on referred to as 'the Project') as a proposed floating OWF. The proposed site is approximately 75 km north-east of the Aberdeenshire coast in the northern North Sea, Scotland. The proposed array area covers an area of approximately 116.8 km^2, whilst the survey area included a 4 km buffer surrounding the array area providing a total study area of approximately 391 km^2. The Project will comprise both offshore and onshore infrastructure, including an offshore generating station (the wind farm), export cables to the Buzzard platform and landfall and an onshore transmission infrastructure for connection to the electricity network (please see Green Volt Offshore Wind Farm Environmental Impact Assessment Report Chapter 5: Project Description for full details on the Project Design).

2. To support an Appropriate Assessment (AA) decision by the Scottish Ministers, the Applicant has assessed all the sites and features listed within **Table 1.1** of the **Report to Inform Appropriate Assessment** (RIAA) (Royal HaskoningDHV, 2023) and presented the conclusions to the Marine Directorate Licensing Operations Team (MD-LOT) as part of the Project's Section 36 Application. As presented within the RIAA, the Applicant concluded that the potential for an Adverse Effect on Site Integrity (AEoSI) from the Project alone or in-combination could confidently be ruled out. Furthermore, for the majority of sites and features assessed, even when considering the Statutory Nature Consideration Bodies (SNCBs) highly precautionary approach to assessment, the resulting level of predicted impact was still less than a single breeding adult bird for the majority of assessments (as summarised in **Table 2.1**). A predicted impact level of less than a single breeding adult bird can be considered a *de minimis* contribution to any in-combination effect, as justified in the **Supplementary Ornithological Assessment Report**.

3. Following MD-LOT's review of the Project's Application, a request for additional information was made to aid in making a reasoned conclusion on the potential for significant effects from the Project on the environment if consented. This request was primarily in light of other recently submitted applications for Scottish OWF projects, concluding a potential in-combination AEoSI for some East Coast of Scotland SPAs, irrespective of the Project's effects. The Applicant has engaged with stakeholders (see **Table 1.1** in the **RIAA** (Royal HaskoningDHV, 2023)), and considered comments raised concerning the uncertainty around potential in-combination effects on seabird populations that may arise from planned OWF projects in Scottish waters. The Applicant has also engaged with stakeholders on matters relating to seabird collision risk and displacement assessment methods, and on seabird compensation measures. The detail regarding MD-LOT's request and any changes to assessment results are presented within the **Supplementary Ornithological Assessment Report**. Any changes in assessment predicted impacts presented within the **Supplementary Ornithological Assessment Report** have been incorporated within **Section 2** of this report.

4. In light of MD-LOT's request, this report has been drafted as part of the Project's without prejudice derogation case under the Habitats Regulations should Scottish Ministers conclude that the Project has potential to contribute a material level of impact to a designated site where current in-combination level of effects means the potential for an AEoSI cannot be ruled out for the Project in-combination. The aim of this report is to identify and present potential compensation options available to the Project to inform discussions with the regulators should the need for compensation be deemed necessary for the Project.

1.2 Report Structure

5. Currently there is no formal guidance from the Scottish Government publicly available, at the time of drafting this report, for developers to follow to aid in identification of potential compensation measures at an individual project level specifically for offshore ornithology. In the absence of such guidance, the following documentation has been used to aid in identification of potential compensation measures:

   - Best practice guidance for developing compensatory measures in relation to marine protected areas (DEFRA, 2021);
   - Guidance document on Article 6(4) of the 'Habitats Directive' 92/43/EEC (European Commission, 2007);
   - Framework to evaluate ornithological compensatory measures for offshore wind (DTA 2021);
   - Report to Crown Estate Scotland and SOWEC: HRA derogation scope b – review of seabird strategic compensation options (MacArthur Green 2021); and
   - Assessment of compensatory measures for impacts of offshore windfarms on seabirds (McGregor *et al*. 2022).

6. As outlined within the above documents, the following stepwise process is recommended to aid in identification of the potential compensation measures:

1. Quantify the level of adverse effect the project is predicted to have on the qualifying features and designated sites, including the confidence around such conclusions. This will include identification of the conservation objectives which may be undermined should the project be consented.

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2.Quantifiy the overall importance of the designated site in the context of overall network coherency and the level of effect the project is predicted to have on the network integrity.

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3.Compile a long-list of potential compensation measures which aim to compensate for the level of predicted effect identified in step 1 and 2. For each compensation measure included, detail on the compensation pathway, feasibility (technical, financial & legal), confidence in success and overall suitability will be provided to aid in selection of measures to be short-listed.

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4. Consult on the long-list of potential measures identified with the competent authority to agree a short list of measures for the Project to pursue and secure should the need for compensation be concluded.

7. In accordance with the stepwise process above the structure of this report is as follows:

   - **Step 1 - Report to Inform Appropriate Assessment Conclusions (Section 2)**: This section provides a summary of the conservation objectives assessed and predicted impacts of the Project for each SPA considered for compensation;

- **Step 2 - Species Ecology, Known Pressures and Site Network Coherency (Section 3)**: This section provides information on the species ecology, population trends, scale of impact and known pressures to aid in contextualisation of the predicted level of impact.
- **Step 3 - Identification of Potential Compensation Measures (Section 3.4.3)**: This section outlines potential compensation measures for the Project and considers both the suitability and feasibility of each compensation measure in relation to the Project; and
- **Step 4 - Identification of Short-listed Compensation Measures (Section 5)**: This section summarises the final short-listed measures the Project proposes for the without prejudice compensation case and provides a roadmap for the Project's next steps.

2 Step 1: Report to Inform Appropriate Assessment Conclusions and Conservation Objectives

2.1 Conservation Objectives

8. Conservation objectives are set to ensure that, subject to natural change, the integrity of the site is maintained or restored as appropriate, and that the site contributes to achieving Favourable Conservation Status of its quantifying features, by maintaining or restoring.
9. General conservation objectives for each SPA considered for the without prejudice derogation case are outlined below:
    - "To avoid the deterioration of the habitats of the qualifying species…or significant disturbance to the qualifying species, thus ensuring that the integrity of the site is maintained"; and
    - "*To ensure for the qualifying species that the following are maintained in the long term:*
        - ***Population of the species as a viable component of the site;***
        - *Distribution of the species within the site;*
        - *Distribution and extent of habitats supporting the species;*
        - *Structure, function and supporting processes of habitats supporting the species; and*
        - *No significant disturbance of the species.*"
10. The conservation objectives with respect to all offshore ornithological features, as highlighted in bold above, were appropriately assessed within the **RIAA** where there was potential for a likely significant effect (Royal HaskoningDHV, 2023).

2.2 Summary of Predicted Impacts

11. As part of the Project's Section 36 Application detailed assessments of designated sites and features, for which the Project was considered to have the potential for a likely significant effect, were provided within the **RIAA** (Royal HaskoningDHV, 2023). Subsequently, further additional clarity and updates to assessments based on revisions to assessment guidance were provided within the **Supplementary Ornithological Assessment Report**. A summary of the predicted impact levels on seabird qualifying features, accounting for any updates to assessments, is presented in **Table 2.1**, following both the Applicant's Approach and the SNCB's Approach to assessment for the Project alone. The details on the Applicant's Approach and the SNCB's Approach to assessments and differences between them are provided in the **RIAA** (Royal HaskoningDHV, 2023) and the **Supplementary Ornithological Assessment Report**. For clarity the Applicant's position with regard to all sites and features assessed is that the potential for an AESoI can confidently be ruled out for the Project either alone or in-combination.

Table 2.1: Summary of annual predicted impacts for each seabird qualifying feature for the Project alone.

SPA	Feature	Predicted Additional Annual Consequent Mortality (Breeding Adults)		Considered Within The without-prejudice Derogation Case?
		Applicant's Approach	SNCB Approach	
Buchan Ness to Collieston Coast SPA	Guillemot *Uria aalge*	5.1	15.9 – 28.2	No - no concerns raised by MD-LOT on the **RIAA** conclusions of no AESoI for the Project either alone or in-combination.
	Herring gull *Larus argentatus*	<0.1	<0.1	No – predicted impact less than a single breeding adult per annum, which is considered within the error margins of assessment and is concluded as de minimis. Therefore, no AEoSI concluded within the **RIAA** for the Project either alone or in-combination.
	Kittiwake *Rissa tridactyla*	0.8 – 1.0	1.1 – 1.4	Yes - species flagged by MD-LOT as potentially being subject to an in-combination level AEoSI.
Troup, Pennan and Lion's Head SPA	Guillemot	2.3	6.3 – 11.8	No - no concerns raised by MD-LOT on the **RIAA** conclusions of no AESoI for the Project alone and in-combination.
	Razorbill *Alca torda*	0.2	0.7 – 1.2	Yes - species flagged by MD-LOT as potentially being subject to an in-combination level AEoSI.
	Kittiwake	0.7 – 0.8	0.9 – 1.1	Yes - species flagged by MD-LOT as potentially being subject to an in-combination level AEoSI.
	Gannet *Morus bassanus*	1.3	1.4 – 1.5	No - no concerns raised by MD-LOT on the **RIAA** conclusions of no AESoI for the Project alone and in-combination.
	Herring gull	<0.1	<0.1	No – predicted impact less than a single breeding adult per annum, which is considered within the error margins of assessment and is concluded as de minimis. Therefore, no AEoSI concluded within the **RIAA** for the Project alone and in-combination.
Fowlsheugh SPA	Guillemot	2.4	2.9 – 8.6	Yes - species flagged by MD-LOT as potentially being subject to an in-combination level AEoSI.
	Razorbill	<0.1	<0.1	No - although this qualifying feature was flagged by MD-LOT as potentially being subject to an in-combination level AEoSI, the impact to the qualifying feature from the project is less than a breeding adult. This level of impact is within the error margins of assessment and can confidently be concluded as de minimis, therefore having no material contribution to any in-combination level of predicted impact regardless of the overall condition of the qualifying feature or site.
	Kittiwake	0.5 – 0.6	0.7 – 0.9	No - although this qualifying feature was flagged by MD-LOT as potentially being subject to an in-combination level AEoSI, the impact to the qualifying feature from the project is less than a breeding adult. This level of impact is within the error margins of assessment and can confidently be concluded as de minimis, therefore having no material contribution to any in-combination level of predicted impact regardless of the overall condition of the qualifying feature or site.
East Caithness Cliffs SPA	Guillemot	13.0	29.0 – 60.0	No - no concerns raised by MD-LOT on the **RIAA** conclusions of no AESoI for the Project alone and in-combination.
	Razorbill	0.7	2.5 – 4.2	Yes - species flagged by MD-LOT as potentially being subject to an in-combination level AEoSI.

SPA	Feature	Predicted Additional Annual Consequent Mortality (Breeding Adults)		Considered Within The without-prejudice Derogation Case?
		Applicant's Approach	SNCB Approach	
	Kittiwake	0.8 – 1.0	1.2 – 1.6	Yes - species flagged by MD-LOT as potentially being subject to an in-combination level AEoSI.
North Caithness Cliffs SPA	Guillemot	4.0	6.7 – 16.4	No - no concerns raised by MD-LOT on the **RIAA** conclusions of no AESoI for the Project alone and in-combination.
	Razorbill	<0.1	0.1 – 0.2	No – predicted impact less than a single breeding adult per annum, which is considered within the error margins of assessment and is concluded as de minimis. Therefore, no AEoSI concluded within the **RIAA** for the Project alone and in-combination.
	Puffin *Fratercula arctica*	<0.1	0.1	No – predicted impact less than a single breeding adult per annum, which is considered within the error margins of assessment and is concluded as de minimis. Therefore, no AEoSI concluded within the **RIAA** for the Project alone and in-combination.
	Kittiwake	0.1	0.2 – 0.3	No - although this qualifying feature was flagged by MD-LOT as potentially being subject to an in-combination level AEoSI, the impact to the qualifying feature from the project is less than a breeding adult. This level of impact is within the error margins of assessment and can confidently be concluded as de minimis, therefore having no material contribution to any in-combination level of predicted impact regardless of the overall condition of the qualifying feature or site.
Forth Islands SPA	Puffin	0.2	0.4 – 0.8	No - although this qualifying feature was flagged by MD-LOT as potentially being subject to an in-combination level AEoSI, the impact to the qualifying feature from the project is less than a breeding adult. This level of impact is within the error margins of assessment and can confidently be concluded as de minimis, therefore having no material contribution to any in-combination level of predicted impact regardless of the overall condition of the qualifying feature or site.
	Kittiwake	0.1	0.1	No - although this qualifying feature was flagged by MD-LOT as potentially being subject to an in-combination level AEoSI, the impact to the qualifying feature from the project is less than a breeding adult. This level of impact is within the error margins of assessment and can confidently be concluded as de minimis, therefore having no material contribution to any in-combination level of predicted impact regardless of the overall condition of the qualifying feature or site.
	Gannet	5.8 – 6.0	6.7 – 7.6	Yes - species flagged by MD-LOT as potentially being subject to an in-combination level AEoSI.
Copinsay SPA	Guillemot	0.8	1.8 – 3.6	No - no concerns raised by MD-LOT on the **RIAA** conclusions of no AESoI for the Project alone and in-combination.
	Kittiwake	<0.1	<0.1	No – predicted impact less than a single breeding adult per annum, which is considered within the error margins of assessment and is concluded as de minimis. Therefore, no AEoSI concluded within the RIAA for the Project alone and in-combination.
Hoy SPA	Puffin	<0.1	<0.1	No – predicted impact less than a single breeding adult per annum, which is considered within the error margins of assessment and is concluded as de minimis. Therefore, no

SPA	Feature	Predicted Additional Annual Consequent Mortality (Breeding Adults)		Considered Within The without-prejudice Derogation Case?
		Applicant's Approach	SNCB Approach	
				AEoSI concluded within the **RIAA** for the Project alone and in-combination.
	Kittiwake	<0.1	<0.1	No – predicted impact less than a single breeding adult per annum, which is considered within the error margins of assessment and is concluded as de minimis. Therefore, no AEoSI concluded within the **RIAA** for the Project alone and in-combination.
St Abb's Head to Fast Castle SPA	Kittiwake	0.1	0.1 – 0.2	No - although this qualifying feature was flagged by MD-LOT as potentially being subject to an in-combination level AEoSI, the impact to the qualifying feature from the project is less than a breeding adult. This level of impact is within the error margins of assessment and can confidently be concluded as de minimis, therefore having no material contribution to any in-combination level of predicted impact regardless of the overall condition of the qualifying feature or site.
Fair Isle SPA	Puffin	<0.1	0.1 – 0.2	No – predicted impact less than a single breeding adult per annum, which is considered within the error margins of assessment and is concluded as de minimis. Therefore, no AEoSI concluded within the **RIAA** for the Project alone and in-combination.
	Kittiwake	<0.1	<0.1	No – predicted impact less than a single breeding adult per annum, which is considered within the error margins of assessment and is concluded as de minimis. Therefore, no AEoSI concluded within the **RIAA** for the Project alone and in-combination.
	Gannet	0.3	0.3 – 0.4	No – predicted impact less than a single breeding adult per annum, which is considered within the error margins of assessment and is concluded as de minimis. Therefore, no AEoSI concluded within the **RIAA** for the Project alone and in-combination.
Calf Of Eday SPA	Kittiwake	<0.1	<0.1	No – predicted impact less than a single breeding adult per annum, which is considered within the error margins of assessment and is concluded as de minimis. Therefore, no AEoSI concluded within the **RIAA** for the Project alone and in-combination.
Rousay SPA	Kittiwake	<0.1	<0.1	No – predicted impact less than a single breeding adult per annum, which is considered within the error margins of assessment and is concluded as de minimis. Therefore, no AEoSI concluded within the **RIAA** for the Project alone and in-combination.
Marwick Head SPA	Kittiwake	<0.1	<0.1	No – predicted impact less than a single breeding adult per annum, which is considered within the error margins of assessment and is concluded as de minimis. Therefore, no AEoSI concluded within the **RIAA** for the Project alone and in-combination.
West Westray SPA	Kittiwake	0.1	0.2	No - although this qualifying feature was flagged by MD-LOT as potentially being subject to an in-combination level AEoSI, the impact to the qualifying feature from the project is less than a breeding adult. This level of impact is within the error margins of assessment and can confidently be concluded as de minimis, therefore having no material contribution to any in-combination level of predicted impact regardless of the overall condition of the qualifying feature or site.

SPA	Feature	Predicted Additional Annual Consequent Mortality (Breeding Adults)		Considered Within The without-prejudice Derogation Case?
		Applicant's Approach	SNCB Approach	
Farne Islands SPA	Guillemot	3.0	3.6 – 10.8	No - no concerns raised by Natural England on **RIAA** conclusions of no AESoI for the Project alone and in-combination.
	Puffin	<0.1	<0.1 – 0.1	No - impact less than a single breeding adult per annum, also no concerns raised by Natural England on **RIAA** conclusions of no AESoI for the Project alone and in-combination.
	Kittiwake	0.1	0.1	No - impact less than a single breeding adult per annum, also no concerns raised by Natural England on **RIAA** conclusions of no AESoI for the Project alone and in-combination.
Cape Wrath SPA	Puffin	<0.1	<0.1	No – predicted impact less than a single breeding adult per annum, which is considered within the error margins of assessment and is concluded as de minimis. Therefore, no AEoSI concluded within the **RIAA** for the Project alone and in-combination.
	Kittiwake	<0.1	<0.1	No – predicted impact less than a single breeding adult per annum, which is considered within the error margins of assessment and is concluded as de minimis. Therefore, no AEoSI concluded within the **RIAA** for the Project alone and in-combination.
Sumburgh Head SPA	Kittiwake	<0.1	<0.1	No – predicted impact less than a single breeding adult per annum, which is considered within the error margins of assessment and is concluded as de minimis. Therefore, no AEoSI concluded within the **RIAA** for the Project alone and in-combination.
Handa SPA	Kittiwake	<0.1	<0.1	No – predicted impact less than a single breeding adult per annum, which is considered within the error margins of assessment and is concluded as de minimis. Therefore, no AEoSI concluded within the **RIAA** for the Project alone and in-combination.
Sule Skerry and Sule Stack SPA	Puffin	0.2	0.9 – 1.4	No - no concerns raised by MD-LOT on the **RIAA** conclusions of no AESoI for the Project alone and in-combination.
	Gannet	0.3	0.3 – 0.4	No – predicted impact less than a single breeding adult per annum, which is considered within the error margins of assessment and is concluded as de minimis. Therefore, no AEoSI concluded within the RIAA for the Project alone and in-combination.
Coquet SPA	Puffin	<0.1	<0.1	No – predicted impact less than a single breeding adult per annum, which is considered within the error margins of assessment and is concluded as de minimis. Therefore, no AEoSI concluded within the **RIAA** for the Project alone and in-combination.
	Kittiwake	<0.1	<0.1	No – predicted impact less than a single breeding adult per annum, which is considered within the error margins of assessment and is concluded as de minimis. Therefore, no AEoSI concluded within the **RIAA** for the Project alone and in-combination.
Noss SPA	Puffin	<0.1	<0.1	No – predicted impact less than a single breeding adult per annum, which is considered within the error margins of assessment and is concluded as de minimis. Therefore, no AEoSI concluded within the **RIAA** for the Project alone and in-combination.

SPA	Feature	Predicted Additional Annual Consequent Mortality (Breeding Adults)		Considered Within The without-prejudice Derogation Case?
		Applicant's Approach	SNCB Approach	
	Kittiwake	<0.1	<0.1	No – predicted impact less than a single breeding adult per annum, which is considered within the error margins of assessment and is concluded as de minimis. Therefore, no AEoSI concluded within the **RIAA** for the Project alone and in-combination.
	Gannet	0.6 – 0.7	0.7 – 0.8	No – predicted impact less than a single breeding adult per annum, which is considered within the error margins of assessment and is concluded as de minimis. Therefore, no AEoSI concluded within the **RIAA** for the Project alone and in-combination.
Foula SPA	Puffin	<0.1	0.1	No – predicted impact less than a single breeding adult per annum, which is considered within the error margins of assessment and is concluded as de minimis. Therefore, no AEoSI concluded within the **RIAA** for the Project alone and in-combination.
	Kittiwake	<0.1	<0.1	No – predicted impact less than a single breeding adult per annum, which is considered within the error margins of assessment and is concluded as de minimis. Therefore, no AEoSI concluded within the **RIAA** for the Project alone and in-combination.
North Rona and Sula Sgier SPA	Gannet	0.2	0.2	No – predicted impact less than a single breeding adult per annum, which is considered within the error margins of assessment and is concluded as de minimis. Therefore, no AEoSI concluded within the **RIAA** for the Project alone and in-combination.
Hermaness, Saxa Vord and Valla Field SPA	Gannet	0.9	1.0 – 1.2	Yes - species flagged by MD-LOT as potentially being subject to an in-combination level AEoSI.
Flamborough and Filey Coast SPA	Guillemot	3.6	4.3 – 12.8	No – no concerns raised by Natural England on **RIAA** conclusions of no AESoI for the Project alone and in-combination..
	Razorbill	<0.1	<0.1	No - impact less than a single breeding adult per annum, also no concerns raised by Natural England on **RIAA** conclusions of no AESoI for the Project alone and in-combination.
	Kittiwake	0.2 – 0.3	0.4 – 0.6	No - impact less than a single breeding adult per annum, also no concerns raised by Natural England on **RIAA** conclusions of no AESoI for the Project alone and in-combination.
	Gannet	0.5 – 0.6	0.6 – 0.7	No - impact less than a single breeding adult per annum, also no concerns raised by Natural England on **RIAA** conclusions of no AESoI for the Project alone and in-combination.
St Kilda SPA	Gannet	0.6 – 0.7	0.8 – 0.9	No – predicted impact less than a single breeding adult per annum, which is considered within the error margins of assessment and is concluded as de minimis. Therefore, no AEoSI concluded within the **RIAA** for the Project alone and in-combination.

12. As presented in **Table 2.1**, a total of four different species that are qualifying features (kittiwake, guillemot, razorbill and gannet) from six designated sites are to be considered for without prejudice compensation as requested by MD-LOT. The location of the six designated sites (all SPAs) considered for without prejudice compensation are presented in **Figure 2.1-Figure 2.4** in relation to the Project's array area.

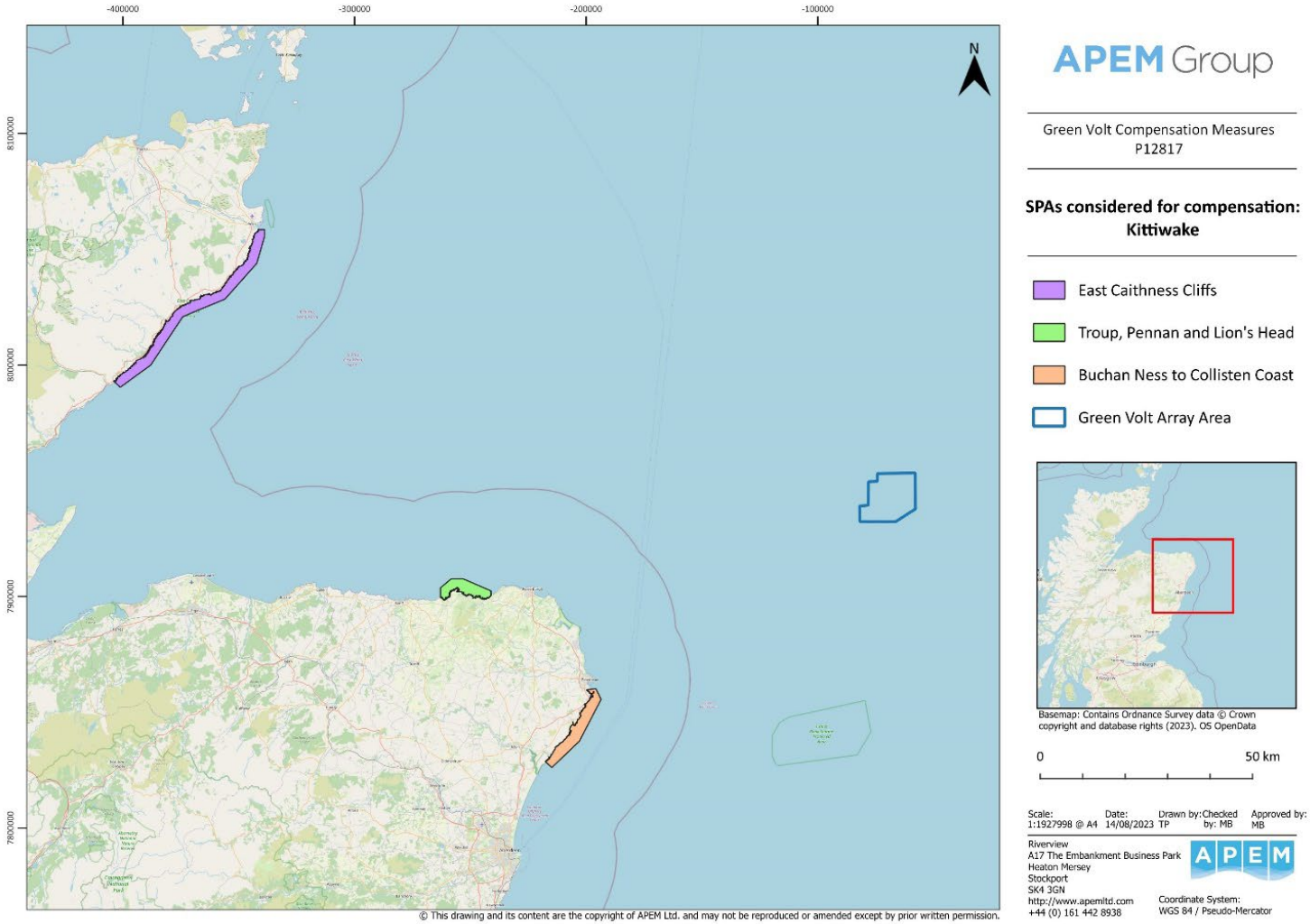


Figure 2.1: The location of SPAs considered for without prejudice compensation for kittiwake in relation to the location of the Project.

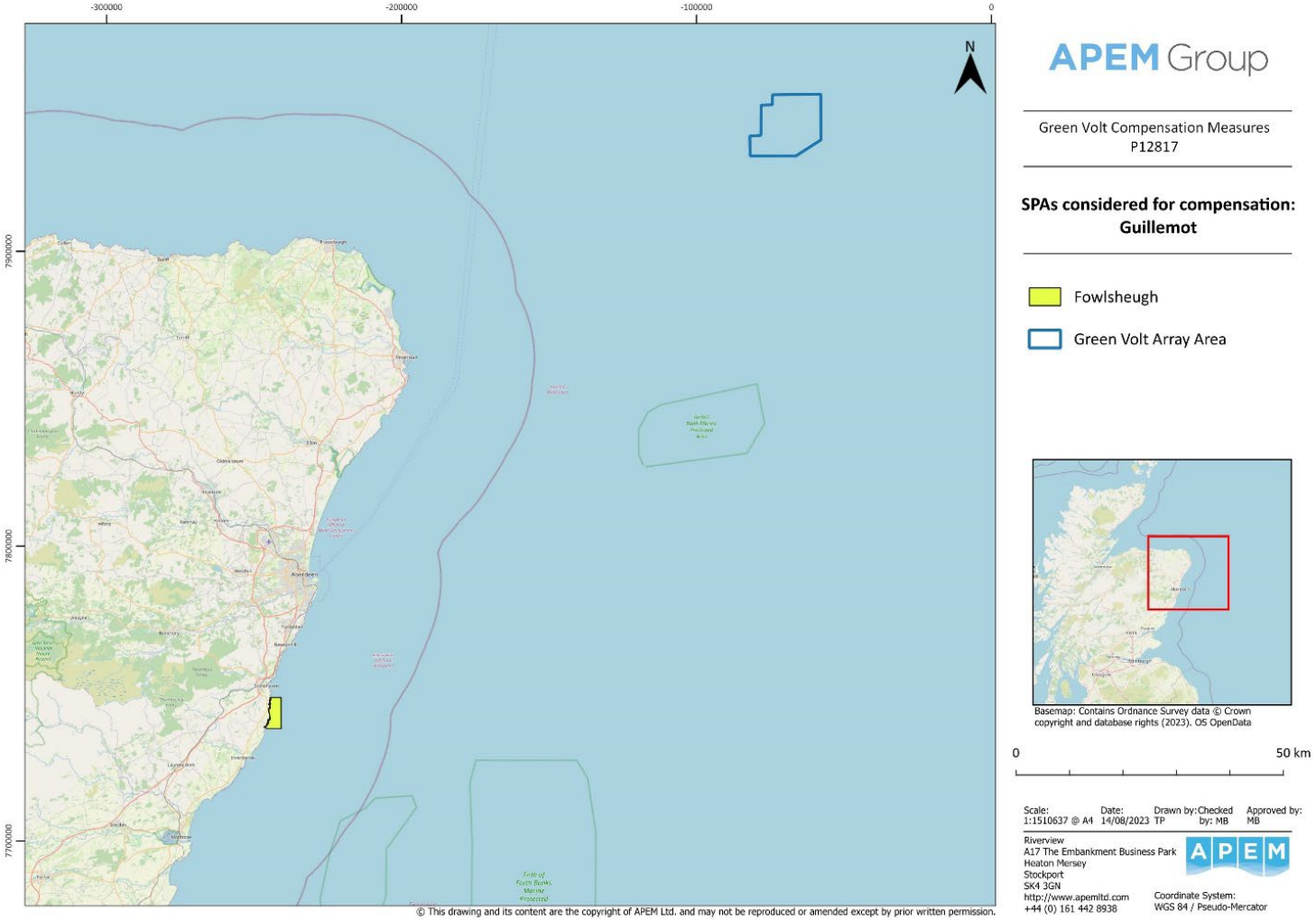


Figure 2.2: The location of SPAs considered for without prejudice compensation for guillemot in relation to the location of the Project.

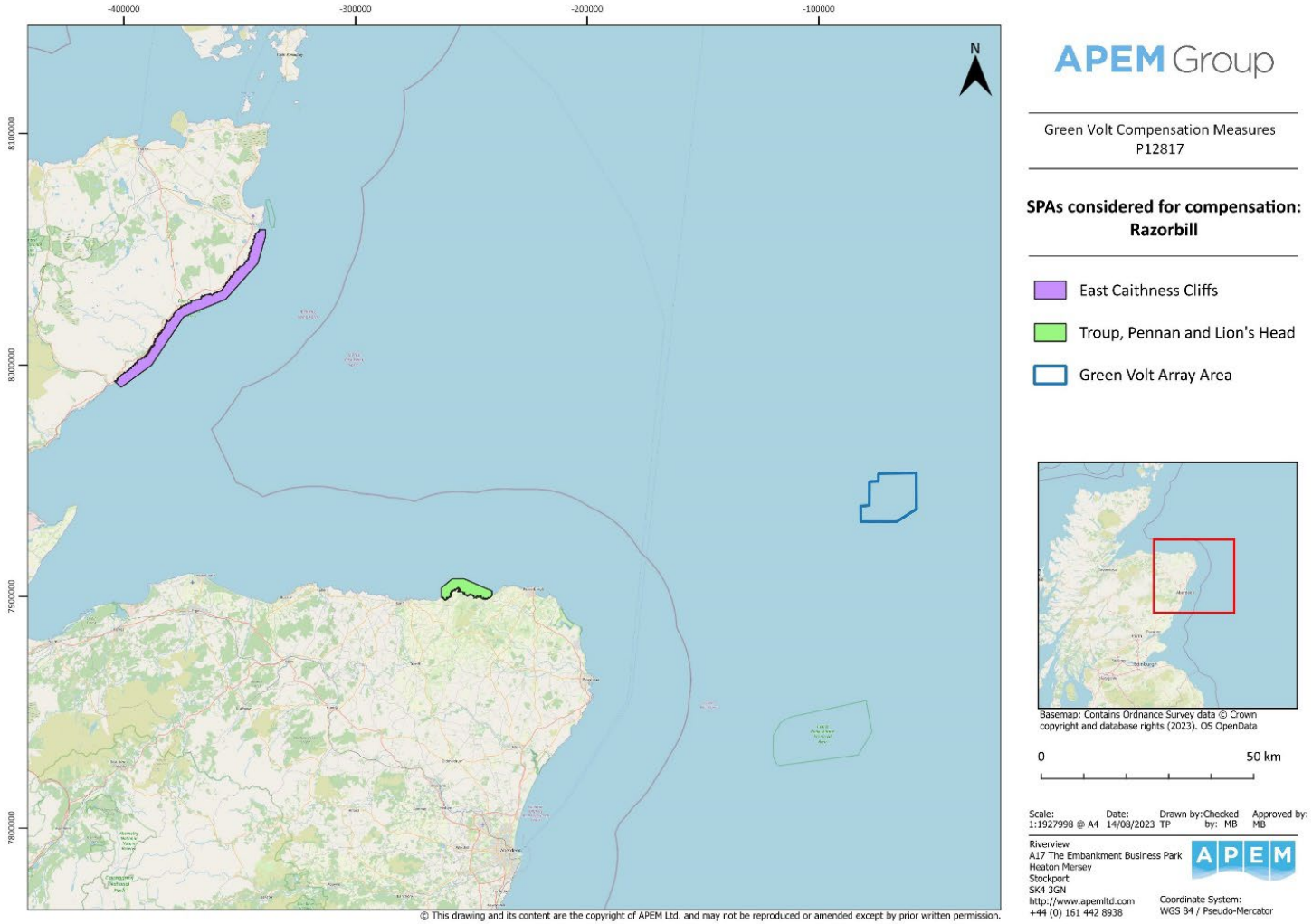


Figure 2.3: The location of SPAs considered for without prejudice compensation for razorbill in relation to the location of the Project.

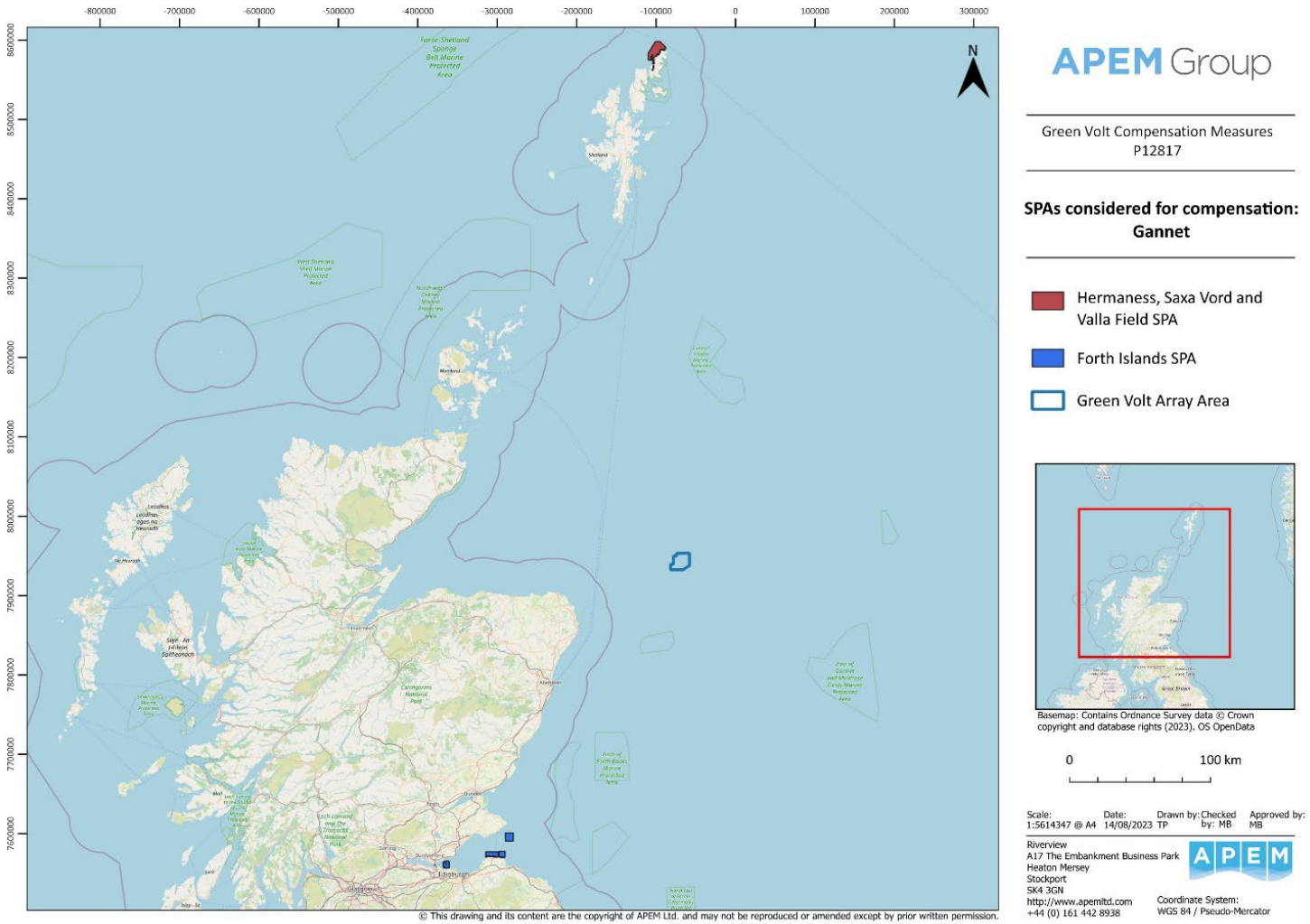


Figure 2.4: The location of SPAs considered for without prejudice compensation for gannet in relation to the location of the Project.

13. For clarity, the expected operational timeframe of the Project is 35 years. Therefore, at a minimum **Table 2.1** presents the annual level of potential impact at a 1:1 ratio the Project would need to compensate for each year for the operational lifespan of the Project.

14. The scale of predicted impact presented in **Table 2.1** will be considered when factoring the suitability of compensation measures in **Section 4**, with respect to the potential for measures to either under or over compensate for such levels of predicted impact.

3 Step 2: Species Ecology, Known Pressures and Site Network Coherency

15. This section provides information on species ecology, population trends, overall network coherency and current known pressures for the different qualifying features considered for the without prejudice derogation case. This information is provided to aid in understanding the suitability and potential benefits of compensation measures identified in **Section 4,** in contrast to the scale of any potential impacts the Project may have with regard to the individual SPA and overall site network.

16. In order to outline the current known pressures for the four seabird species considered for without prejudice derogation (i.e. kittiwake, guillemot, razorbill and gannet), the Feature Activity Sensitivity Tool (FeAST)[1] and the Protected Nature Sites Application[2] were used. The FeAST tool is a web-based application, which provides evidence and information on the sensitivity of all Scottish marine features of conservation importance. This tool has since been used to underpin an English Seabird Conservation and Recovery Pathway (ESCaRP) as part of the work carried out for Spencer *et al.* (2022), for which assessment results are yet to be published. The Protected Nature Sites Application provides a visual analysis of the condition of Scotland's most important nature sites.

17. Identification of the current known pressures upon these four seabird species, using the resources highlighted above, were utilised to identify highly beneficial measures for species considered as presented in **Section 4**.

3.1 Kittiwake

3.1.1 Overview of Species Ecology

18. Kittiwakes are a small pelagic gull which typically nests in cliffside colonies. However, it also nests on artificial structures such as buildings, walls or bridges, where natural cliff sites are unavailable. Kittiwakes are predominantly marine species, mostly found offshore outside of the breeding season. Kittiwakes feed on small pelagic shoaling fish, including sandeel, sprat and herring, though they will also scavenge on offal or fishing discards (Thom, 1986).

3.1.2 Site Network Coherency

19. The majority of the UK population of kittiwakes (378,800 apparently occupied nests [AON]), which comprises 8% of the world population, are located in Scotland with 282,213 AON recorded during the most recent census in 2002. Distribution is determined largely by the availability of suitable nest sites with the largest colonies in Orkney, Shetland and the north coast of Scotland (Thom, 1986). Kittiwakes in north-east Scotland are described as a "very common resident, migrant breeder and passage migrant" (Francis and Cook, 2011). The most recent Scottish population estimates are shown in **Table 3.1** below.

[1] https://www.marine.scotland.gov.uk/FEAST/Index.aspx *(Accessed on 14/08/2023).*
[2] https://informatics.sepa.org.uk/ProtectedNatureSites/ *(Accessed 16/08/2023).*

Table 3.1: Scottish kittiwake population estimates and change between 1969-2002. Information taken from JNCC[3] (census data).

	Operation seafarer (1969-1970)	Seabird colony register (1985-1988)	Seabird 2000 (1998-2002)
Population estimate (AON)	346,097	359,425	282,213
% change since previous census	N/A	+4%	-21%

20. Census data in **Table 3.1** indicates that the kittiwake population in Scotland increased slightly between 1969-1988, with steady declines from 1988 to the last census in 2002. Given that the last full census was in 2002, the more recent population trends are presented in **Figure 3.1** below, which shows the trend in abundance of kittiwake in Scotland, based on Seabird Monitoring Programme (SMP) data (JNCC, 2021) taken from the JNCC species profile (Thom, 1986). These data indicate that the kittiwake population in Scotland declined between 1986-2013, with stabilisation and minor increases recorded in recent years. These trends generally align with those described by the national census data (**Table 3.1**) for the period covered.

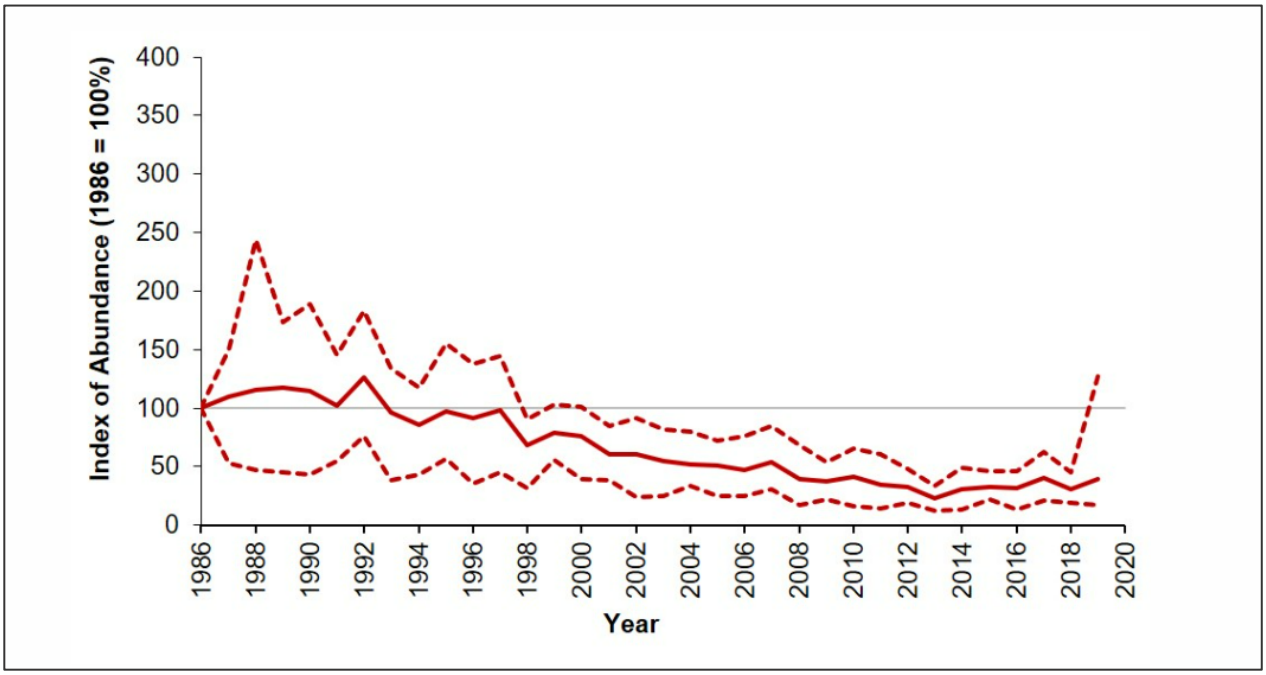


Figure 3.1: Kittiwake abundance in Scotland between 1986-2019 (showing 95% confidence limits). Figure taken from JNCC[3], based on SMP data (JNCC, 2021).

21. As presented in **Figure 2.1**, three East Coast Scottish SPAs are considered for without prejudice derogation for kittiwake.

22. The Buchan Ness to Collieston Coast SPA is known to support 22,530 breeding individuals based on the latest colony undertaken in 2019, though is currently assessed as being in unfavourable condition. This is broadly in line with national census trends presented in **Table 3.1**. This SPA makes up 4.0% of the Scottish site network and 3.0% of the UK site network for kittiwake (as presented in **Table 3.2**). The proportion of the SPA population estimated to be impacted by the Project is less than 0.01%.

23. The Troup, Pennan and Lion's Head SPA is known to support 19,400 breeding individuals based on the latest colony undertaken in 2021, though is currently assessed as being in unfavourable condition. This

[3] https://jncc.gov.uk/our-work/black-legged-kittiwake-rissa-tridactyla/ *(Accessed on 07/08/23)*

is broadly in line with national census trends presented in **Table 3.1**. This SPA makes up 3.4% of the Scottish site network and 2.6% of the UK site network for kittiwake (as presented in **Table 3.2**). The proportion of the SPA population estimated to be impacted by the Project is less than 0.01%.

24. The East Caithness Cliffs SPA is known to support 48,920 breeding individuals based on the latest colony undertaken in 2016 and is currently assessed as being in favourable condition. This SPA makes up 7.9% of the Scottish site network and 5.9% of the UK site network for kittiwake (as presented in **Table 3.2**). The proportion of the SPA population estimated to be impacted by the Project less than 0.01%.

25. It is unlikely that the level of effect described for the three SPAs considered above would cause any material change and it is expected that this level of impact would be indistinguishable from natural population fluctuations in isolation. Therefore, the Project is considered very low risk in terms of effect on the overall site network coherency for kittiwake.

Table 3.2: Summary of SPA's considered for kittiwake, including colony counts, condition of the site, importance of the site and proportion of the SPA population impacted by the Project.

SPA	Most recent published SPA population (whole site)	Summary condition	Percentage contribution to the Scottish site network[4]	Percentage contribution to the UK site network[5]	Proportion of SPA population impacted by Green Volt
Buchan Ness to Collieston Coast SPA	11,265 (AON) / 22,530 (Individuals)[6] in 2019.	Unfavourable	4.0%	3.0%	<0.01%
Troup, Pennan and Lion's Head SPA	9,700 (AON) / 19,400 (Individuals)7 in 2021.	Unfavourable	3.4%	2.6%	<0.01%
East Caithness Cliffs SPA	22,460 (AON) / 48,920 (Individuals)[7] in 2016.	Favourable	7.9%	5.9%	<0.01%
Proportion of the total Scottish site network impacted by Green Volt: <0.01%					

3.1.3 Known Species Pressures

26. In order to outline the current known pressures affecting kittiwake the FeAST tool[8] and the Protected Nature Sites Application[9] were used.

27. The FeAST tool flagged the following pressures as important for kittiwake (i.e. where kittiwake was assessed as having a sensitivity score of either High or Sensitive[10]):

[4] *Scottish site network (kittiwake population) – 282,213 (AON) as presented in **Table 3.1**.*
[5] *UK site network (kittiwake population) – 378,847 (AON) taken from https://jncc.gov.uk/our-work/black-legged-kittiwake-rissa-tridactyla/ (Accessed on 25/08/2023).*
[6] *https://app.bto.org/seabirds/public/data.jsp (Accessed on 25/08/2023).*
[7] *Swann, B. 2016. Seabird counts at East Caithness Cliffs SPA for marine renewable casework. Scottish Natural Heritage Commissioned Report No. 902.*
[8] *https://www.marine.scotland.gov.uk/FEAST/Index.aspx (Accessed on 14/08/2023).*
[9] *https://informatics.sepa.org.uk/ProtectedNatureSites/ (Accessed 16/08/2023).*
[10] *Sensitivity scores and definitions.*
High - A feature is assessed as having high sensitivity where the pressure causes severe or significant mortality of a species population (most individuals killed). Habitat features are highly sensitive where the pressure causes severe or significant mortality of key functional or structural species or those that characterise the habitat, and/or causes changes in the habitat such that environmental conditions are changed (e.g. the habitat type is changed). If recovery is possible, the feature is anticipated to take 10 years to recover from the impacts caused by the pressure.
Sensitive - Not enough information is available to complete one of the sensitivity assessment stages to give a final score, but due to concern over potential impacts on feature it has been assessed as sensitive.

- Collision above water - Sensitive (Cook et al. 2012; Furness et al. 2013; Johnston et al. 2014);
- Introduction of microbial pathogens - High (Toennessen et al. 2011);
- Nitrate and phosphate enrichment - Sensitive;
- Litter - High (O'Hanlon et al. 2017);
- Transition elements and organo-metal contamination - Sensitive (Tartu et al. 2016; Blévin et al. 2020;);
- Hydrocarbon and polycyclic aromatic hydrocarbon (PAH) contamination - High (Mitchell et al. 2004; Fox et al. 2016);
- Physical loss - Sensitive;
- Reduction in availability or quality of prey - High (Gill et al. 2002; Oro and Furness 2002);
- Removal of non-target species - High (Bradbury et al. 2017; Pott and Wiedenfeld 2017);
- Temperature change - High (regional);
- Water flow changes - Sensitive (Drew et al. 2013);
- Wave exposure changes - Sensitive (Tavares et al. 2016; Wolfaardt et al. 2012); and
- Climate change - High.

28. There are 30 SPAs in Scotland which are designated for breeding kittiwake, of which 24 are currently assessed as being in 'unfavourable' condition, five in 'favourable' condition and a single site remains unassessed. The Protected Nature Sites Application highlighted the following pressures on these SPA populations, though it is important to note that the pressures mentioned below are evaluated as being unimportant by the Protected Nature Sites Application for the SPAs considered for compensation:

    - Invasive species;
    - Invasive species (great skua);
    - Climate change;
    - Game/fisheries management; and
    - Interspecific competition.

3.2 Guillemot

3.2.1 Overview of Species Ecology

29. Guillemots are a medium-sized auk *Alcidae* (38-45cm in length) which typically nest in cliffside colonies. Guillemots feed on small pelagic shoaling fish, including sandeel, sprat and herring, as well as crustaceans, marine worms and squid. Guillemots are typically a strictly marine species, however, on occasion birds are known to penetrate far up the estuaries (Thom, 1986). Guillemots are pursuit diving species, foraging for food by diving from the sea surface and swimming underwater, using their wings for propulsion.

3.2.2 Site Network Coherency

30. The majority of the UK population of guillemots (1,416,300 breeding individuals), which comprises 12.9% of the world population are located in Scotland with 1,167,841 breeding individuals recorded during the most recent census in 2002[11]. Distribution is determined largely by the availability of suitable nest sites with the largest colonies in Sutherland, Caithness, the Northern Isles and the Outer Hebrides (Thom, 1986). Guillemots in north-east Scotland are described as a "very common resident and migrant breeder" (Francis and Cook, 2011). The most recent Scottish population estimates are shown in **Table 3.3** below.

Table 3.3: Scottish guillemot population estimates and change between 1969-2002. Information taken from JNCC12 (census data).

	Operation seafarer (1969-1970)	Seabird colony register (1985-1988)	Seabird 2000 (1998-2002)
Population estimate (Individuals)	519,461	943,098	1,167,841
% change since previous census	N/A	+82%	+24%

31. Census data in **Table 3.3** indicates that the guillemot population in Scotland increased between 1969-1988 and also between 1998-2002. Given that the last full census was in 2002, the more recent population trends are presented in **Figure 3.2** below, which shows the trend in the abundance of guillemot in Scotland, based on SMP data (JNCC, 2021) taken from the JNCC species profile (Thom, 1986). These data indicate that the guillemot population in Scotland increased slightly between 1986-2001, with steady declines from 2001-2007, followed by a steady increase to the present date. These trends generally follow those described by the national census data (**Table 3.3**).

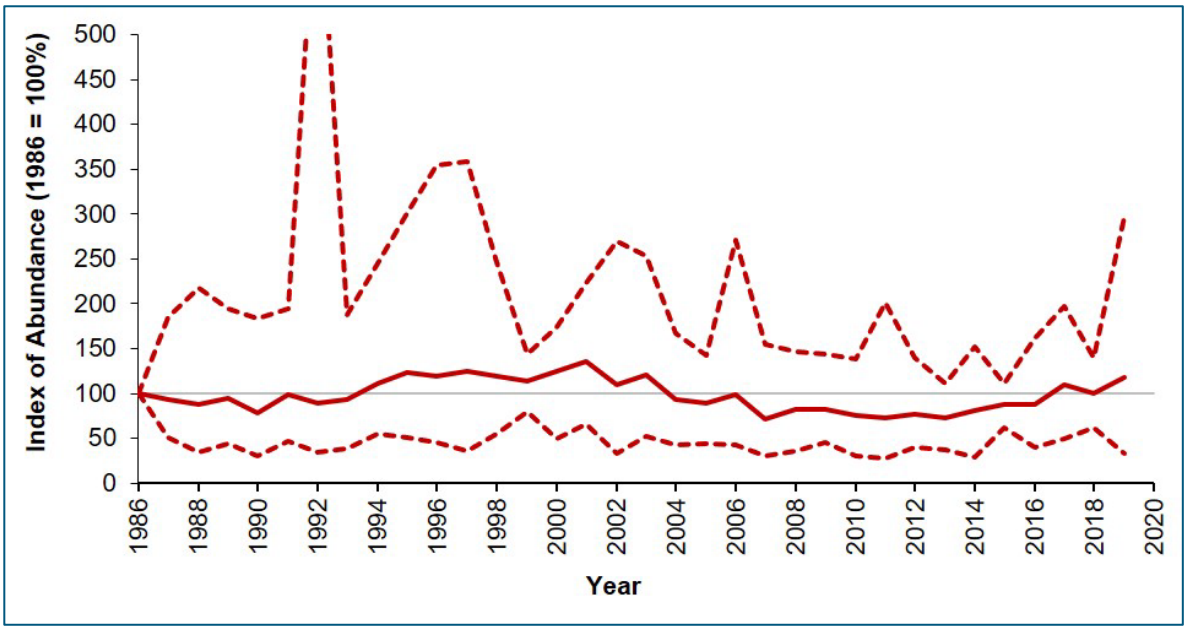


Figure 3.2 Guillemot abundance in Scotland between 1986-2019 (showing 95% confidence limits). Figure taken from JNCC[11], based on SMP data (JNCC, 2021).

32. As presented in **Figure 2.2**, only one SPA; Fowlsheugh SPA is considered for without prejudice derogation for guillemot.

[11] https://jncc.gov.uk/our-work/guillemot-uria-aalge/ *(Accessed 17/08/2023).*

33. The Fowlsheugh SPA is known to support 92,242 breeding individuals (based on the latest count in 2022) and is currently assessed as being in favourable condition, which is in line with both census trends and SMP trends (presented in **Table 3.1** and **Figure 3.2** respectively). This SPA makes up 5.9% of the Scottish site network and 4.9% of the UK site network for guillemot (as presented in **Table 3.4**). The proportion of the SPA population estimated to be impacted by the Project is less than 0.01%.

34. It is unlikely that the level of effect described for the Fowlsheugh SPA would cause any material change and it is expected that this level of impact would be indistinguishable from natural population fluctuations in isolation. Therefore, the Project is considered very low risk in terms of effect on the overall site network coherency for guillemot.

Table 3.4: Summary of SPA's considered for guillemot, including colony counts, condition of the site, importance of the site and proportion of the SPA population impacted by the Project.

SPA	Most recent published SPA population (whole site)	Summary condition	Percentage contribution to the Scottish site network[12]	Percentage contribution to the UK site network[13]	Proportion of SPA population impacted by Green Volt
Fowlsheugh SPA	68,837 (Individuals) / 92,242 (Corrected)[14] in 2022.	Favourable	5.9%	4.9%	<0.01%
Proportion of the Scottish site network impacted by Green Volt: <0.01%					

3.2.3 Known Species Pressures

35. In order to outline the current known pressures affecting guillemot the FeAST[15] tool and the Protected Nature Sites Application[16] were used.

36. The FeAST tool flagged the following pressures as important for guillemot (i.e. where guillemot was assessed as having a sensitivity score of either High or Sensitive[10]):

- Collision below water - High (Grecian et al. 2010; Furness et al. 2012);
- Introduction of light or shading - Sensitive (Lieske et al. 2020);
- Introduction of microbial pathogens - High (Khan et al. 2019);
- Introduction of non-indigenous species - High (Burton et al. 2010);
- Transition elements and organo-metal contamination - Sensitive (Furness and Camphuysen 1997);
- Hydrocarbon and PAH contamination - High (Provencher et al. 2020);
- Physical loss - Sensitive;
- Reduction in availability or quality of prey - High (Furness and Tasker 2000; Harding et al. 2007b);
- Removal of non-target species - High (Bradbury et al. 2017);

[12] *Scottish site network (guillemot population) – 1,167,841 (Individuals) as presented in **Table 3.3**.*
[13] *UK site network (guillemot population) – 1,416,334 (Individuals) taken from https://jncc.gov.uk/our-work/guillemot-uria-aalge/ (Accessed 25/08/2023).*
[14] *https://app.bto.org/seabirds/public/data.jsp (Accessed on 25/08/2023).*
[15] *https://www.marine.scotland.gov.uk/FEAST/Index.aspx (Accessed on 14/08/2023).*
[16] *https://informatics.sepa.org.uk/ProtectedNatureSites/ (Accessed 16/08/2023).*

- Siltation rate changes (heavy) - Sensitive;
- Synthetic compound contamination - Sensitive (Bignert and Helander 2015);
- Temperature change - High (regional);
- Visual disturbance - High (Beale and Monaghan 2004);
- Wave exposure changes - Sensitive (Tavares et al. 2016; Wolfaardt et al. 2016); and
- Climate change - High.

37. There are 33 SPAs in Scotland which are designated for breeding guillemot, of which 19 are currently assessed as being in 'unfavourable' condition, 11 in 'favourable' condition and three sites remain unassessed. The Protected Nature Sites Application highlighted the following pressures on these SPA populations, though it is important to note that the pressures mentioned below are evaluated as being unimportant by the Protected Nature Sites Application for the SPAs considered for compensation:

- Invasive species;
- Climate change; and
- Game/fisheries management.

3.3 Razorbill

3.3.1 Overview of Species Ecology

38. Razorbills are a medium-sized auk *Alcidae* (37 – 39cm in length) which typically nest in cliffside colonies. Razorbills feed on small pelagic shoaling fish, including sandeel, sprat and herring, as well as crustaceans. Razorbills are a pursuit diving species, foraging for food by diving from the sea surface and swimming underwater, using their wings for propulsion.

3.3.2 Site Network Coherency

39. The majority of the UK population of razorbills (187,100 breeding individuals), which comprises 20.2% of the world population are located in Scotland with 139,186 breeding individuals recorded during the most recent census in 2002[17]. Distribution is determined largely by the availability of suitable nest sites with the largest colonies in Sutherland, Caithness, the Outer Hebrides and the Northern Isles (Thom, 1986). Razorbills in north-east Scotland are described as a "very common resident and migrant breeder" (Francis and Cook, 2011). The most recent Scottish population estimates are shown in **Table 3.5** below.

Table 3.5: Scottish razorbill population estimates and change between 1969-2002. Information taken from JNCC[17] (census data).

	Operation seafarer (1969-1970)	Seabird colony register (1985-1988)	Seabird 2000 (1998-2002)
Population estimate (Individuals)	111,038	123,586	139,186
% change since previous census	N/A	+11%	+13%

40. Census data in **Table 3.5** indicates that the razorbill population in Scotland is increasing steadily, with small increases from 1969 to the last census in 2002. Given that the last full census was in 2002, the more recent population trends are presented in **Figure 3.3** below, which shows the trend in the abundance of razorbill in Scotland, based on SMP data (JNCC, 2021) taken from the JNCC species

[17] https://jncc.gov.uk/our-work/razorbill-alca-torda/ *(Accessed 17/08/2023).*

profile (Thom, 1986). These data indicate that the razorbill population in Scotland increased between 1991-2003, with a subsequent decline and increase between 2003-2013, followed by fluctuations in trend to the present date. These trends generally align with those described by the national census data (**Table 3.5**).

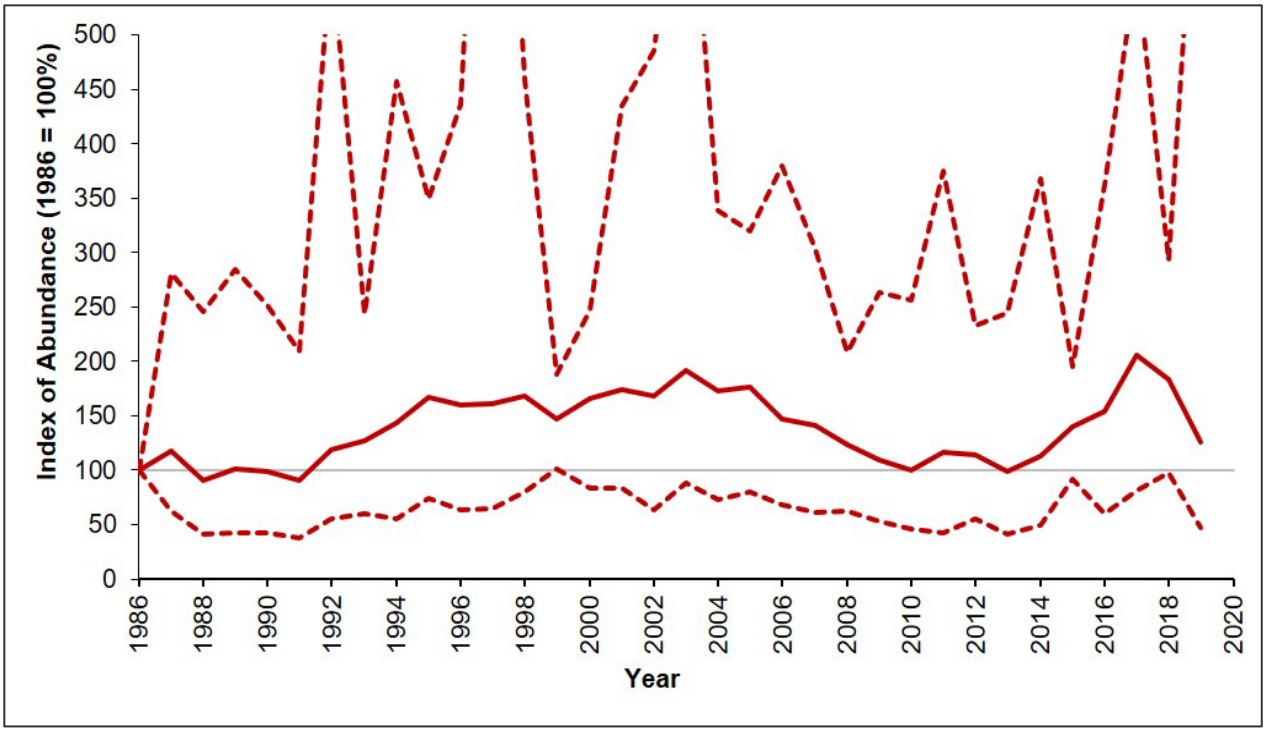


Figure 3.3: Razorbill abundance in Scotland between 1986-2019 (showing 95% confidence limits). Figure taken from JNCC[17], based on SMP data (JNCC, 2021).

41. As presented in **Figure 2.3**, two East Coast Scottish SPAs are considered for without prejudice derogation for razorbill.

42. The East Caithness Cliffs SPA is known to support 40,256 breeding individuals based on the latest colony undertaken in 2016 and is currently assessed as being in favourable condition. This SPA makes up 21.6% of the Scottish site network and 16.1% of the UK site network for razorbill (as presented in **Table 3.6**). The proportion of the SPA population estimated to be impacted by the Project is less than 0.01%.

43. The Troup, Pennan and Lion's Head SPA is known to support 6,054 breeding individuals based on the latest colony undertaken in 2017 and is currently assessed as being in unfavourable condition. This SPA makes up 3.3% of the Scottish site network and 2.5% of the UK site network for razorbill (as presented in **Table 3.6**). The proportion of the SPA population estimated to be impacted by the Project is less than 0.01%.

44. It is unlikely that the level of effect described for the two SPAs considered above would cause any material change and it is expected that this level of impact would be indistinguishable from natural population fluctuations in isolation. Therefore, the Project is considered very low risk in terms of effect on the overall site network coherency for razorbill.

Table 3.6: Summary of SPA's considered for razorbill, including colony counts, condition of the site, importance of the site and proportion of the SPA population impacted by the Project.

SPA	Most recent published SPA population (whole site)	Summary condition	Percentage contribution to the Scottish site network[18]	Percentage contribution to the UK site network[19]	Proportion of SPA population impacted by Green Volt
East Caithness Cliffs SPA	30,042 (Individuals) / 40,256 (Corrected)[20] in 2016.	Favourable	21.6%	16.1%	<0.01%
Troup, Pennan and Lion's Head SPA	4,621 (Individuals) / 6,054 (Corrected)[21] in 2017.	Unfavourable	3.3%	2.5%	<0.01%
Proportion of the Scottish site network impacted by Green Volt: <0.01%					

3.3.3 Known Species Pressures

45. In order to outline the current known pressures affecting kittiwake the FeAST[22] tool and the Protected Nature Sites Application[23] were used.

46. The FeAST tool flagged the following pressures as important for razorbill (i.e. where razorbill was assessed as having a sensitivity score of either High or Sensitive[10]):

- Collision below water - High (Grecian et al. 2010; Furness et al. 2012);
- Introduction of microbial pathogens - High (Wille et al. 2014);
- Introduction of non-indigenous species - High (Burton et al. 2010);
- Litter - Sensitive (Battisti et al. 2019; Costa et al. 2020);
- Transition elements and organo-metal contamination - Sensitive (Albert et al. 2021);
- Hydrocarbon and PAH contamination - High;
- Physical loss - Sensitive;
- Reduction in availability or quality of prey - High (Thaxter et al. 2009);
- Removal of non-target species - High (Bradbury et al. 2017);
- Siltation rate changes (heavy) - Sensitive;
- Synthetic compound contamination - Sensitive (García-Barón et al. 2019);
- Temperature change - High (regional);

[18] *Scottish site network (razorbill population) – 139,186 (Individuals) as presented in **Table 3.5**.*
[19] *UK site network (razorbill population) – 187,052 (Individuals) taken from https://jncc.gov.uk/our-work/razorbill-alca-torda/ (Accessed 25/08/2023).*
[20] *Swann, B. 2016. Seabird counts at East Caithness Cliffs SPA for marine renewable casework. Scottish Natural Heritage Commissioned Report No. 902.*
[21] *https://app.bto.org/seabirds/public/data.jsp (Accessed on 25/08/2023).*
[22] *https://www.marine.scotland.gov.uk/FEAST/Index.aspx (Accessed on 14/08/2023).*
[23] *https://informatics.sepa.org.uk/ProtectedNatureSites/ (Accessed 16/08/2023).*

- Underwater noise - Sensitive;
- Visual disturbance - Sensitive (Lyngs 1994);
- Water clarity changes - Sensitive;
- Wave exposure changes - Sensitive (Tavares et al. 2016; Wolfaardt et al. 2016); and
- Climate change - High.

47. There are 16 SPAs in Scotland which are designated for breeding razorbill, of which six are currently assessed as being in 'unfavourable' condition and 10 in 'favourable' condition. The Protected Nature Sites Application highlighted the following pressures on these SPA populations, though it is important to note that the pressures mentioned below are evaluated as being unimportant by the Protected Nature Sites Application for the SPAs considered for compensation:

- Climate change;
- Game/fisheries management; and
- Recreation/disturbance.

3.4 Gannet

3.4.1 Overview of Species Ecology

48. Northern gannets (gannet) are the largest seabird in the North Atlantic which typically nest in coastal cliffside colonies. Gannets perform plunge dives from heights of 30m to catch prey down to depths of 20m under the sea surface, feeding on small pelagic shoaling fish, including sandeel. However they will also scavenge on offal or fishing discards (Le Bot *et al.* 2019).

3.4.2 Site Network Coherency

49. The majority of the UK population of gannets (293,200 apparently occupied nests/sites [AON/AOS]), which comprises 55.6% of the world population, is located in Scotland with 243,505 AON recorded during the most recent census in 2014[24]. Distribution is determined largely by the availability of suitable nest sites with the largest colonies in the Firth of Forth, Shetland and the Outer Hebrides (Thom, 1986). Gannets in north-east Scotland are described as a "very common resident, migrant breeder and passage migrant" (Francis and Cook, 2011). The most recent Scottish population estimates are shown in **Table 3.7** below.

Table 3.7: Scottish gannet population estimates and change between 1969-2002. Information taken from JNCC[24] (census data).

	Operation seafarer (1969-1970)	Seabird colony register (1985-1988)	Gannet Census (2003-2004)	Gannet Census (2013-2014)
Population estimate (AON/AOS)	96,860	127,867	182,511	243,505
% change since previous census	N/A	+32%	+43%	+33%

50. Census data in **Table 3.7** indicates that gannet populations in Scotland have been steadily increasing since 1969/70 when 96,860 AON/AOS were recorded; numbers had increased by 32% by the time of the Seabird Colony Register and then by 43% by the time of the gannet census in 2003 and 2004. In 2013 and 2014 all 16 gannet colonies in Scotland were counted (**Table 3.7**), combined colony totals indicated that Scotland currently holds 243,505 AON/AOS (58% and 46% of the east Atlantic and world

[24] https://jncc.gov.uk/our-work/northern-gannet-morus-bassanus/ *(Accessed 17/08/2023).*

populations, respectively) (Murray *et al.* 2015). These colony totals showed that numbers were divided unevenly between colonies, with Bass Rock, St Kilda and Ailsa Craig combined holding 70% of the Scottish population.

51. As presented in **Figure 2.4**, two Scottish SPAs are considered for without prejudice derogation for gannet.

52. The Hermaness, Saxa Vord and Valla Field SPA is known to support 51,160 breeding individuals and is currently assessed as being in favourable condition, this is in line with census trends presented in **Table 3.7**. This SPA makes up 10.5% of the Scottish site network and 8.7% of the UK site network for gannet (as presented in **Table 3.8**). The proportion of the SPA population estimated to be impacted by the Project is less than <0.01%.

53. The Forth Islands SPA is known to support 150,518 breeding individuals and is currently assessed as being in favourable condition, this is in line with census trends presented in **Table 3.7**. This SPA makes up 31% of the Scottish site network and 25.7% of the UK site network for gannet (as presented in **Table 3.8**). The proportion of the SPA population estimated to be impacted by the Project is less than <0.01%.

54. It is highly unlikely that the level of effect described for the two SPAs considered above would cause any material change and it is expected that this level of impact would be indistinguishable from natural population fluctuations in isolation. Therefore, the Project is considered very low risk in terms of effect on the of overall site network coherency for gannet.

Table 3.8: Summary of SPA's considered for gannet, including colony counts, condition of the site, importance of the site and proportion of the SPA population impacted by the Project.

SPA	Most recent published SPA population (whole site)	Summary condition	Percentage contribution to the Scottish site network[25]	Percentage contribution to the UK site network[26]	Proportion of SPA population impacted by Green Volt
Hermaness, Saxa Vord and Valla Field SPA	25,580 (AOS) / 51,160 (Individuals)[27] in 2014.	Favourable	10.5%	8.7%	<0.01%
Forth Islands SPA	75,259 (AOS) / 150,518 (Individuals)[29] in 2014.	Favourable	31.0%	25.7%	<0.01%
Proportion of the Scottish site network impacted by Green Volt: <0.01%					

3.4.3 Known Species Pressures

55. In order to outline the current known pressures affecting gannet the FeAST[28] tool and the Protected Nature Sites Application[29] were used.

56. The FeAST tool flagged the following pressures as important for gannet (i.e. gannet was assessed as having a sensitivity score of either High or Sensitive[10]):

- Barrier to species movement - High (Leopold et al. 2013);

[25] *Scottish site network (gannet population) - 243,505 (AOS) as presented in **Table 3.7**.*
[26] *UK site network (gannet population) - 293,161 (AOS) taken from https://jncc.gov.uk/our-work/northern-gannet-morus-bassanus/ (Accessed 25/08/2023).*
[27] *https://app.bto.org/seabirds/public/data.jsp (Accessed on 25/08/2023).*
[28] *https://www.marine.scotland.gov.uk/FEAST/Index.aspx (Accessed on 14/08/2023).*
[29] *https://informatics.sepa.org.uk/ProtectedNatureSites/ (Accessed 16/08/2023).*

- Introduction of light or shading - Sensitive (Merkel and Johansen 2011);
- Introduction of microbial pathogens - Sensitive (Melville & Shortridge 2006);
- Introduction of non-indigenous species - Sensitive;
- N and P enrichment - Sensitive;
- Litter - High (Camphuysen 2020; O'Hanlon et al. 2019);
- Transition elements and organo-metal contamination - Sensitive (Albert et al. 2021);
- Physical loss - Sensitive;
- Removal of non-target species - High (Bradbury et al. 2017);
- Removal of target species - Sensitive;
- Synthetic compound contamination - Sensitive (Blevin et al. 2020);
- Temperature change - Sensitive (regional);
- Wave clarity changes - Sensitive;
- Wave flow changes - Sensitive;
- Wave exposure changes - Sensitive; and
- Climate change - Sensitive.

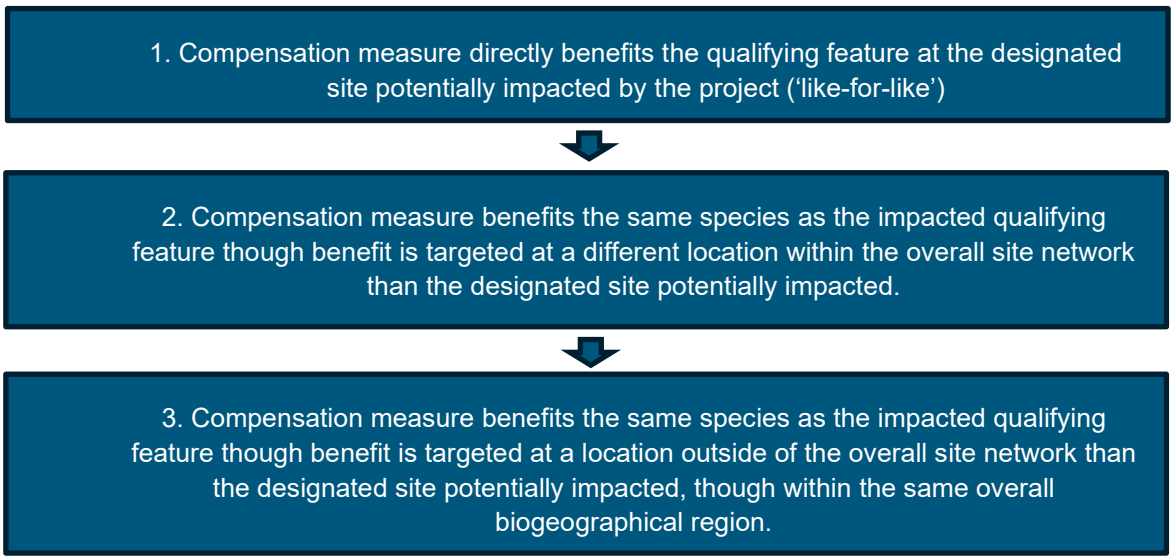
57. There are 10 SPAs in Scotland which are designated for breeding gannet, of which none are currently assessed as being in 'unfavourable' condition, with eight currently assessed as being in 'favourable' condition and two sites remain unassessed. The Protected Nature Sites Application did not highlight any pressures on these SPA populations.

4 Step 3: Identification of Potential Compensation Measures

4.1 Guidance

58. With respect to identification of potential compensation measures, current guidance recommends that measures should aim to benefit the same feature and designated site potentially impacted by the proposed project. In relation to seabirds, however, it is accepted that delivering a 'like-for-like[30]' compensation measure is not always possible due to their mobile nature and complexity of current pressures affecting the marine environment (DTA, 2021; DEFRA, 2021). Accounting for this, a hierarchical approach is recommended when considering selection and appropriateness of any potential compensation measure. Each step down the hierarchical order results in the compensation measure having less connectivity to the impacted feature or certainty for success and, therefore, as you move further down the chain there is a potential that the extent of compensation required would need to be increased. Taking this information into account, the hierarchy for identification of compensation measures followed is summarised below, with Compensation Measure 1 providing the greatest connectivity and success and Compensation Measure 3 providing the least:

[30] *Compensation measure providing direct benefit to the impacted qualifying feature at the designated site considered.*



59. In relation to the scale of compensation required, this is determined on a case-by-case basis between the Applicant, the competent authority and SNCBs based on, but not limited to, the following factors:

- The extent of the impact – the number and status of the features affected;
- The environmental value and function of the affected feature;
- The environmental value and function of the proposed compensatory measure;
- The location of the proposed compensatory measure;
- How quickly compensatory measures are expected to be functioning and contributing to the designated sites network; and
- The confidence in the measure being entirely effective and the ability for its success to be monitored and managed accordingly.

60. Alongside measures aimed to benefit the specific species of the designated site potentially affected by the Project, complete non like-for-like measures have also been considered for other Scottish seabird species of concern.

61. The Applicant is also aware that there is current ongoing development between the offshore wind sector, UK Government and relevant stakeholders to establish a strategic funding system (such as the Marine Recovery Fund[31]) for individual developers to contribute towards to deliver improvements in the health of Scottish seas.

62. In accordance with the hierarchical approach to identification of compensation measures outlined above, combined with information on known species pressures in **Section 3**, a literature review has been undertaken to identify possible compensation measures for the Project. The review considered strategic compensation plans, recent derogation cases drafted by other Developers, latest academic research and expert opinion. The results of the literature review are presented in **Section 4.4** providing detail on the description of the measures identified, applicable species, spatial extent, implementation, feasibility (technical, financial and legal) and overall confidence in the measure. All measures identified were also ranked following the criteria set out in **Section 4.2**.

[31] *https://www.gov.uk/government/publications/energy-security-bill-factsheets/energy-security-bill-factsheet-offshore-wind-environmental-improvement-package*

4.2 Draft Sectoral Marine Plan (including Plan-level HRA)

63. At the time of writing, the draft sectoral marine plan for INTOG is currently being drafted by Scottish Government, with anticipated publication of the draft for consultation in December 2023. However, the initial findings and early draft of the plan-level HRA have now been completed and shared with the sectoral marine plan steering group for initial review and comments. The draft version of the HRA includes an assessment for both alone and in-combination impacts from all ScotWind and INTOG Option and Exclusivity Agreements to provide a plan-level perspective of the likelihood of impact from each potential development.

    In the draft plan-level HRA, Green Volt (TOG6) has been assessed against a number of environmental receptors and the assessment concludes that the potential impact for alone and in-combination for all receptors, including ornithology, is negligible. It is also noted that all TOG sites have been assessed as having negligible impacts alone or in-combination at the plan-level.

    All ScotWind and IN sites are, in the current draft, assessed as having an impact at plan-level HRA, with a number of ScotWind sites being assessed to have a high impact both alone and in-combination.

4.3 Ranking of Compensation Measures

64. The overall suitability of the identified compensation measures was assessed based upon the six ranking criteria set out within the European Commission (2007) and DEFRA (2021) compensation guidance. Each criterion was ranked from one to five, with five being the maximum score. This allocated each compensation measure a score out of 30, which provided a quantitative metric in which to rank each measure. Details of the criteria followed and descriptions of each ranking score are provided in **Table 4.1.** The aim of ranking the measures is to aid conclusions with the competent authority on recommendations of the most appropriate compensation measure(s) for the Project, should the competent authority conclude there is potential for an AEoSI on the qualifying feature(s) of designated site(s) assessed.

Table 4.1: Compensation measure suitability ranking criteria.

Metric	Specificity	Effectiveness	Delivery timeframe	Technical Delivery	Conservation Value	Extent
Description	The proposed compensation measure should focus on providing benefits to the conservation objectives of the potentially affected qualifying feature at the impacted location	How high is the confidence level that the measure will deliver effective and sustainable compensation for the impact of the project?	What is the timeframe within which the compensation measure is expected to be functioning and contributing to the network?	Can the measure be delivered successfully from a technical, financial and legal perspective, and be monitored and managed appropriately?	What is the wider environmental benefit provided by the proposed measure?	Can the scale of the proposed compensation measure be accurately quantified/predicted?
Ranking Score of 5	The compensation measure benefits the impacted feature at the impacted site	There is strong evidence of the effectiveness of the measure. It provides similar ecological function and does not negatively impact other sites or features.	There is certainty that the compensation measure will be functioning within immediate implementation.	There is strong evidence that the delivery of this compensation measure is achievable without substantial challenge and there is certainty in expected outcomes	In addition to benefitting the target feature, the measure will benefit other features and/or habitats, including sites and/or species of conservation interest or concern.	There is certainty that the benefit of the measure can be suitably quantified and amended to meet the requirements of the compensation ratio.
Ranking Score of 4	The compensation measure can be utilised by impacted feature from the impacted site	There is some evidence of the effectiveness of the measure and that it provides a similar ecological function.	The measure will require a lead in time of several years after implementation. There is certainty that the measure will be effective at the point of impacts being predicted to occur.	There is evidence that the delivery of this measure is achievable but with some challenge and/or uncertainty of the outcomes. Further evidence gathering may be beneficial to reduce uncertainty.	In addition to benefitting the target feature, the measure benefits multiple other features and/or habitats.	There is some uncertainty that the benefit of the measure can be suitably quantified but can be amended to meet the required compensation ratio.
Ranking Score of 3	The compensation measure benefits the impacted feature but at a different site	There is some evidence of the effectiveness of the measure on the impacted feature but at a different location	The measure will require a lead in time of several years after implementation. There is some certainty that the measure will be effective at the point of impacts being predicted to occur, but a higher compensation ratio may need to be assumed to accommodate for uncertainty.	There is some evidence of delivery of this measure being achievable, though some uncertainty exists regarding expected outcomes. Further evidence gathering would be recommended to reduce uncertainty.	In addition to benefitting the target feature, the measure benefits one additional feature or habitat.	There is certainty that the benefit of the compensation can be suitably quantified but the ability of the measure to meet the required compensation ratio is uncertain.
Ranking Score of 2	The compensation measure benefits a	There is little to no evidence on effectiveness of the measure on the	The measure will require a lead in time of up to 10 years from	There is little to no evidence currently of the delivery of this measure	The measure is expected to overcompensate (deliver more than the	There is some uncertainty of the predicted benefit of the measure and it is

Metric	Specificity	Effectiveness	Delivery timeframe	Technical Delivery	Conservation Value	Extent
	different feature at the impacted site	impacted feature at the impacted site but some evidence for effectiveness of the measure for a broadly similar feature/location	implementation to be functioning. There is little certainty that the measure will be effective at the point of impacts being predicted to occur and a higher compensation ratio would be required to accommodate for uncertainty.	with considerable uncertainty with regard to expected outcomes. Further evidence gathering would be required to reduce uncertainty.	compensation ratio), providing benefit to the impacted feature.	unlikely the required compensation ratio will be met.
Ranking Score of 1	The compensation measure benefits a different feature at a different site	There is little to no evidence of the effectiveness of the measure and no evidence of effectiveness of measure on other features.	There is no certainty and limited evidence that the compensation measure will be functioning within 10 years therefore a significantly high compensation ratio would be necessary.	There is no evidence of the technical delivery of this measure with considerable uncertainty regarding expected outcomes Or the feasibility of the measure is not possible to implement from either a technical, financial or legal perspective.	The measure is expected to deliver only the required compensation for the target feature at the ratio required.	There is significant uncertainty in the predicted benefits of the measure and it is unlikely the required compensation ratio will be met.

4.4 Potential Compensation Measures

65. The potential compensation measures identified for the Project are provided below in order of greatest suitability following the criteria set out in **Table 4.1**.

1. Strategic –Strategic funding	
Description of the measure	Strategic funding would identify specific projects aimed at providing recovery, resilience and restoration within the marine environment, incorporating the following aspects: Targeted Research – this might be to establish new methodologies / techniques for restoration or understanding better what is meant by resilience for habitats / species. Pilot projects to test techniques / suitability of projects at a small scale or specific location(s). Full-scale projects – using tried and tested techniques with anticipated outcomes compatible with the Fund. Ongoing monitoring and surveillance.
Applicable species	The applicable species would be dictated by the projects agreed through the steering group for implementation.
Spatial extent	The location would be dependent on the projects agreed through the steering group for implementation.
Implementation and duration of measure	At the time of drafting this report, UK strategic funding options for offshore wind are currently still in development and therefore not currently available. However, based on current expected timeframes for strategic funding implementation, the option should be available prior to the operation of the Project in 2027, though some uncertainty does remain.
Technical feasibility	A steering group would critically review and select projects for implementation which will offer the greatest benefit and chance of success.
Financial feasibility	It would be feasible to contribute to a fund collaboratively with other developers. The financial contribution could be linked to the impacts of the Project.
Legal feasibility	No legal constraints from the developers perspective.
Suitability rank	Specificity: 3 Effectiveness: 5 Delivery Timeframe: 3 Technical Delivery: 5 Conservation Value: 5 Extent: 5 Overall suitability: 26 Conclusion: Measures implemented through strategic funding would be dictated by appointed steering group and considered measures with the likelihood of providing the greatest ecological benefit to seabirds, though not necessarily benefiting key species and features potentially impacted by the Project. There is uncertainty as to if such measure would be available for the Project to utilise prior to operation.

2. Reduced anthropogenic impacts – Disturbance reduction at SPAs	
Description of the measure	Many seabird colonies are influenced by recreational activity (birdwatchers, walkers, water sports etc) which could result in disturbance of breeding birds. Implementation of measures such as providing additional wardens, erection of signage or access restriction through cordoning of areas, could lead to a decrease in human disturbance at the colony. If human access to colonies was limited this could lead to additional nesting in areas of previous high disturbance and / or increases in productivity at the colony.
Applicable species	Measure could benefit kittiwake, guillemot, razorbill (cited species pressure in Section 3) and gannet. Measure may also benefit other species known to be sensitive to human disturbance.
Spatial extent	A feasibility study would need to be undertaken to identify colonies where human disturbance is known to be impacting on seabird populations. This would preferably be at a site which is predicted to be directly impacted by the Project. If unfeasible at the colonies predicted to be directly impacted by the Project, then a different colony along the east coast of Scotland would be preferable, to allow for greatest potential for immigration back to the colonies potentially affected by the Project and ensuring connectivity with the overall site network.

2. Reduced anthropogenic impacts – Disturbance reduction at SPAs	
Implementation and duration of measure	This measure could be implemented throughout the operational lifespan of the Project.
Technical feasibility	Disturbance is known to impact breeding success, therefore if disturbance was limited it is likely that breeding productivity would increase. The number of breeding pairs could also increase if the amount of suitable breeding habitat which is now free from disturbance was increased. Feasibility as a compensation measure would rely on identification of suitable colonies where the implementation of measures targeted at reducing human disturbance is not part of a pre-existing conservation management measure to ensure additionality. The success of the measure would rely on either additional nesting space becoming occupied or increases being recorded in productivity, though clear identification that the measures have caused such results may prove difficult from natural colony population change.
Financial feasibility	No financial constraints identified, measure could be simply implemented through funding of contractors to undertake such work.
Legal feasibility	It is unlikely that there would be any legal constraints, and this measure would likely correlate with SPA conservation objectives.
Suitability rank	Specificity: 3 Effectiveness: 3 Delivery Timeframe: 4 Technical Delivery: 5 Conservation Value: 4 Extent: 4 Overall suitability: 23 Conclusion: The measure has the potential to benefit not only the key species but multiple other species known to be sensitive to human disturbance. The main area of uncertainty regarding this measure is in relation to identification of suitable locations for such a measure to be implemented. Therefore, if taken forward as a measure, the next steps would be undertake a feasibility study to identify colonies where human disturbance is known to be impacting seabird populations.

3a. Habitat modification – Reinstatement of habitat, management of invasives, scrub clearance etc	
Description of the measure	The presence of non-native plants or scrub colonisation can negatively impact colonies by reducing the availability of nest sites[32]. Habitat management at existing seabird colonies could be undertaken through the removal of invasive non-native plants or clearance of overgrown scrub encroaching nesting locations to allow for improved and / or additional nesting space. This has the potential to allow for additional breeding pairs to be supported by the colony, allowing for an increase in the amount of Juveniles fledged, leading to an increase in the population size.
Applicable species	The focus would be on improvement measures to benefit kittiwake, gannet, guillemot and razorbill, though will be dependent on the species composition at the colony where implemented.
Spatial extent	A feasibility study would need to be undertaken to identify colonies which would benefit from habitat management. This would preferably be at a site which is predicted to be directly impacted by the Project. If unfeasible at the colonies predicted to be directly impacted by the Project, then a different colony along the east coast of Scotland would be preferable, to allow for greatest potential for immigration back to the colonies potentially affected by the Project and ensuring connectivity with the overall site network. Due to the small number of birds which are to be compensated for, it is possible that management would be required at a single colony only.
Implementation and duration of measure	To provide compensation, this measure would need to be implemented throughout the operational lifespan of the Project. The duration of this measure would be dependent on the nature and frequency of works required.

[32] https://community.rspb.org.uk/ourwork/b/scotland/posts/tackling-invasive-tree-mallow-to-support-our-seabird-populations (Accessed on 17/08/23)

3a. Habitat modification – Reinstatement of habitat, management of invasives, scrub clearance etc	
	If the aim of the management works is to increase the carrying capacity of colony, any management works would need to be implemented several years prior to Project operation to allow for colonisation of any new nesting locations.
Technical feasibility	Habitat management is a key conservation strategy implemented at breeding SPAs as part of conservation management measures. Feasibility as a compensation measure would rely on identification of suitable colonies which would benefit from habitat management being undertaken, but not currently cited as a pre-existing conservation management measure to ensure additionality. Alternatively, this measure may be appropriate at colonies where the scale of habitat management required is currently unfeasible to be undertaken by the current site managers. Exact quantification of how the measure appropriately compensates for any potential impact from the Project on the sites and features considered may be difficult to monitor and not fully take account of the additional benefits habitat management could provide from a like-for-like compensation perspective.
Financial feasibility	The developer could either directly fund contractors to undertake discrete packages of work or by providing funding for an additional site manager.
Legal feasibility	It is unlikely that there would be any legal constraints associated with implementation of this measure unless any proposed management measures would conflict with the conservation objectives of a site, for example if designated as an SAC or negatively impact other qualifying features. There would need for an agreement with landowners prior to work being undertaken and ensure works are not carried out in the breeding season to minimise the potential for disturbance.
Suitability rank	Specificity: 4 Effectiveness: 3 Delivery Timeframe: 4 Technical Delivery: 3 Conservation Value: 4 Extent: 4 Overall suitability: 22 Conclusion: There is potential that this measure could be implemented at the designated sites potentially impacted by the Project providing direct benefit to the qualifying features potentially affected. There is uncertainty, however, regarding whether this measure can be constituted as providing additionality over already agreed management measures and how to appropriately quantify the scale of the measure in comparison to the Project's predicted impacts. If this measure was to be taken forward for further consideration, the next logical step would be to engage with the site managers of the potentially affected colony to gain insight on potential benefits yielded and whether the measure can be considered to provide additionality if implemented.

3b. Reduced anthropogenic impacts – Bycatch reduction	
Description of the measure	There is potential for seabirds to become entangled in commercial fishing gear, which can result in mortality (Northridge *et al.* 2020). Through the implementation of best practice for line-weighting, use of bird-scaring devices such as looming eye buoy and offal management (Anderson *et al. 2022*) the potential for bycatch can be reduced. A reduction in bycatch by altering fishing practices could reduce mortality, resulting in a population increase.
Applicable species	Deeper diving species such as guillemot, razorbill and gannet are known to be particularly at risk of mortality, although bycatch is also cited as species pressure for kittiwake (Section 3). There may also be benefits for diver species, cormorant, fulmar and shag. There are also potential benefits for other marine species, particularly marine mammals.
Spatial extent	The spatial extent of this measure would be dependent on locations where bycatch risk commercial fishing methods are implemented such as static gillnets, longline and trawling. For the measure to provide the greatest potential benefit to the species and sites potentially impacted from the Project, the focus would need to be on commercial fisheries within Scottish waters. A review would need to be undertaken to identify the different types of commercial fishing practices and scale within Scottish waters to inform the current bycatch risk and scale of potential compensation which could be feasibly provided.

3b. Reduced anthropogenic impacts – Bycatch reduction	
Implementation and duration of measure	Throughout the operational lifespan of the Project, though evidence gathering and bycatch baseline characterisation would need to be completed prior to operation.
Technical feasibility	A significant number of seabirds are known to be subject to bycatch related mortality per annum (Northridge *et al.* 2020), the implantation of measures which aim to deter birds from foraging within areas where commercial fishing equipment is deployed is therefore likely to lead to a reduction in mortality. There is ongoing research into methods to reduce bycatch, however the long-term success of the technologies is still being determined. An annual bycatch mortality baseline would need to be collected in order to understand the level of compensation the implementation of bycatch reduction technologies may yield. The success of the compensation measure could be monitored by comparing the level of bycatch pre and post implementation of bycatch reduction technologies.
Financial feasibility	Measure likely to have significant financial costs due to the level of monitoring required pre and post implementation of bycatch reduction technologies. Measure would be better suited as a collaborative measure with other developers providing funding into researching potential mitigation measures, rather than a project alone compensation measure.
Legal feasibility	There are unlikely to be any legal constraints to providing funding into research or providing vessels with bycatch technology for implementation.
Suitability rank	Specificity: 3 Effectiveness: 4 Delivery Timeframe: 5 Technical Delivery: 3 Conservation Value: 4 Extent: 3 Overall suitability: 22 Conclusion: Measure has the potential to benefit the species considered for compensation though uncertain if measure would directly benefit the sites potentially impacted by the Project. Bycatch is a known pressure for all key species, therefore, providing confidence that the measure will provide a positive benefit if implemented (Section 3). There is uncertainty with respect to the intensity of high risk bycatch fishing practices being implemented within the Scottish Waters and the exact quantification of potential benefits achievable if implemented. If measure is to be considered further the next step would be to review commercial fishing practices and locations within Scottish waters to better understand the level of current bycatch.

3c. Predator control - Mammalian	
Description of the measure	Invasive mammalian predation is known to have impacted breeding seabirds throughout the UK (Lock, 2006; Lambert et al. 2015) at a number of island colonies, resulting in significant decline or complete extinction in breeding seabird populations (Lock, 2006; Lambert et al. 2015; Jones et al. 2008). Removal of invasive mammalian predators (brown rat, mink, stoat, hedgehog etc) from seabird colonies through trapping or lethal control would likely result in a reduction in predation pressure primarily on chicks, resulting in higher productivity and population increases. The presence of invasive non-native species is cited as a known species pressure for all key features considered (Section 3).
Applicable species	Benefit to kittiwake, guillemot and razorbill, in locations where nests are accessible to predators. There is greater uncertainty on the likelihood of mammalian predation on gannet, though is classified as a species pressure in Section 3.4.3. This measure would likely benefit any ground or burrow-nesting species if also present at a colony where predator eradication is undertaken.
Spatial extent	All SPA colonies considered for kittiwake, guillemot and razorbill are all mainland colonies, therefore predator eradication is unlikely to yield any significant benefits due to the likelihood of reinvasion. To minimise the potential for reinvasion, predator eradication should be undertaken on island colonies within Scottish waters to provide a benefit to the overall site network. A feasibility study would be undertaken to identify sites where mammalian predation is a known pressure. Due to the small predicted impacts from the Project, it is likely that only a single colony would need to be targeted to adequately compensate.

3c. Predator control - Mammalian	
Implementation and duration of measure	Predator control would need to be undertaken with sufficient lead-in time to allow for confirmation of complete removal of predator. Following eradication, it would then be another 4 years for kittiwake, 6 years for guillemot and 5 years for razorbill for any saved fledged juveniles to reach breeding age (Horswill and Robinson, 2015), although increases in productivity may be evidenced immediately following the completion of complete eradication. Monitoring would be required to confirm that predators remain absent. If predators recolonise, then control measures would be resumed. Predator control and monitoring would be undertaken throughout the operational lifespan of the Project.
Technical feasibility	Eradication of invasive mammalian predators has previously been proven to lead to increases in breeding seabirds on colonies around the UK (Lock, 2006; Ratcliffe et al. 2009; Main et al. 2019). A Scottish island feasibility study would need to be undertaken to identify suitable sites where mammalian predation is a known pressure on the seabird species considered. The study would need to consider the likelihood for reinvasion based on island connectivity, the potential control methods and the likely population impacts of control. Given the small predicted impacts from the Project, it is likely that the measure will result in overcompensation. This measure could therefore be implemented as a collaborative measure with other developers or partners, rather than a project alone compensation measure. It should be noted that through Biosecurity for Life a significant number of SPA colonies[33] within the UK have already been identified and secured for predator eradication and biosecurity enhancement, therefore significantly limiting the location for a full eradication programme to be undertaken. However, depending on the length of time biosecurity for life have funding secured for, there may be potential for the Project to assist with ongoing monitoring for the duration of the operational lifetime.
Financial feasibility	Costs for this measure would be dependent on the location and scale of control, methods and their success. This would be determined through the results from a feasibility study
Legal feasibility	Feasible, as this measure is commonly implemented for conservation purposes. As part of the required feasibility study, an investigation would be undertaken with regard to any legal requirements associated with this measure. Licences would likely be required for lethal control. Access to sites would need to be agreed and adhered to. As this measure would target invasive species, no issues should arise in relation to EIA or HRA implications. Also worth noting the negative publicity which may result from a private developer pursuing lethal control of wildlife.
Suitability rank	Specificity: 3 Effectiveness: 4 Delivery Timeframe: 4 Technical Delivery: 4 Conservation Value: 4 Extent: 3 Overall suitability: 22 Conclusion: Measure has the potential to benefit the species considered for compensation in particular kittiwake, guillemot and razorbill, though not at the sites potentially impacted by the Project. The presence of non-native mammalian predators is cited as a species pressure for all features considered, therefore, providing confidence that such a measure would likely succeed in providing a positive benefit to the species considered (Section 3). The main area of uncertainty regarding this measure is in relation to identification of a suitable location for such a measure to be implemented with low risk of reinvasion. If this measure is to be taken forward the next steps would be to review potential feasible locations for implementation or engage with relevant stakeholders to see if there is the possibility of the Project to assist with ongoing eradication schemes.

[33] *https://biosecurityforlife.org.uk/admin/resources/biosecurity-for-life-spa-list.pdf*

4. Habitat enhancement – Seagrass restoration	
Description of the measure	Seagrass meadows have declined due to pressures including development, pollution and damage from fishing activities. Creation / enhancement of seagrass meadows would indirectly benefit breeding seabirds by providing important habitat for fish prey. Seagrass meadows are stated to have fish densities of 4.6 times higher than nearby sandy substrate (Gamble *et al.* 2021), therefore restoration of seagrass meadows has the potential to significantly increase the available prey biomass, the availability of prey species is cited as key pressures for the seabirds considered (Section 3). This could lead to increase foraging success providing both survival and productivity increases in seabird species. Restoration of seagrass also increases carbon capture and storage, which would directly contribute to a reduction in climate change impacts, which is cited as a significant species pressure for the seabirds considered within this report (Section 3). Fish species which are supported by seagrass includes plaice, pollock, herring and sandeel,
Applicable species	Seagrass restoration would benefit kittiwake, guillemot, razorbill and gannet as all prey on fish species supported by this habitat. However, there is the potential to benefit other seabirds and marine fauna due to increased prey ability.
Spatial extent	A presence / absence study would need to be undertaken to identify historic and current known locations and extent of seagrass in Scottish waters to identify areas requiring restoration. To yield the greatest benefit of restoration, potential candidate areas would need to be within the foraging range for species associated with SPAs impacted by the Project. Restoration of seagrass meadows outside of the SPA foraging ranges, but still within the Scottish waters would still provide an overall benefit to the site network.
Implementation and duration of measure	Restoration would need to be undertaken prior to operation, taking into account the amount of time for a seagrass meadow to be fully established to ensure additional prey availability would come into effect prior to the operational phase. It is likely that there would be a period of restoration followed by monitoring to establish the success. Continued monitoring would be required to determine whether any additional planting is necessary throughout the Project Operational lifespan. Future management agreements would be beneficial after the Project's lifespan would be useful to ascertain to ensure the longevity of the seagrass meadow.
Technical feasibility	Seagrass restoration has been undertaken within multiple locations around the UK, with well-established restoration and monitoring methods, as detailed within the current guidance documents (Gamble *et al.* 2021; Kent *et al.* 2021). Feasibility may be limited by the number of suitable areas available, where restoration isn't already ongoing. Although the Project may still be able to contribute to ongoing monitoring and management of existing restoration projects. The extent of restoration required to appropriately compensate for the Project may be difficult to quantify, though could potentially be based on the additional biomass of fish produced per hectare of seagrass per annum (Jänes *et al.* 2021) in contrast to the amount of biomass required to feed a chick prior to fledging for the respective species.
Financial feasibility	Financial costs would be dependent on the extent of restoration required and location accessibility.
Legal feasibility	There could be legal requirements surrounding land acquisition or access arrangements depending on the location of the site. There could also be conflicting management agreements, for example if the site is within a designated site boundary (SAC or SSSI), which may restrict the type of activities which could be undertaken.
Suitability rank	Specificity: 3 Effectiveness: 4 Delivery Timeframe: 3 Technical Delivery: 3 Conservation Value: 4

4. Habitat enhancement – Seagrass restoration	
	Extent: 4 Overall suitability: 21 Conclusion: The measure has the potential to benefit the species potentially impacted by the Project, though preferable location and potential overlap with designated sites considered remains uncertain without further investigation. Prey availability and / or climate change are cited as known species pressures for key species considered, therefore providing confidence in the measure providing a positive benefit if implemented. There is uncertainty regarding how to appropriately translate and quantify the scale of compensation required which will require further consideration if taken forward as a measure.

5a. Increase in prey availability – Cessation of sandeel and sprat fishing in UK waters	
Description of the measure	Cessation of fisheries in UK waters would involve either complete ban of commercial fisheries targeting sandeel and sprat from operation or a reduction in catch quotas, in order to increase key seabird prey density in UK waters. This measure has already been implemented for UK-based fisheries[34]. Increasing available prey for provisioning chicks, would likely lead to an increase in productivity / colony breeding success, especially for kittiwake, guillemot and razorbill, where prey availability is cited as a species pressure (Section 3). There would also likely be reduce energetic demands on breeding adult birds if the distance of foraging trips is decreased, which could lead to an increase in adult survival. This would also likely increase survival during winter by reducing foraging competition. Increase in both productivity and survival rates would lead to an increase in the number of juveniles fledged per annum and reduce the potential for mortality due to lack of prey resource, leading to an increase in population size.
Applicable species	This measure would benefit kittiwake, guillemot, razorbill and gannet as sandeel and sprat are a key prey item for all species (Daunt *et al.* 2008). However, this measure would also benefit any seabirds which feed on sandeel or sprat. This would also result in wider benefits for several marine species including fish and marine mammals. Sandeel fishing is predominately undertaken by trawling, which results in significant damage to benthic habitats.
Spatial extent	This measure would apply to all UK waters due to legislative action, rather than confined to discrete areas. This measure has the potential to directly benefit the qualifying features potentially impacted by the Project, as well as the overall site network.
Implementation and duration of measure	During 2023, for a third consecutive year, the UK government has decided not to permit sandeel fishing in the North Sea[34] for UK fishermen. This measure would require extending the ban to cover fishing by other nations and / or securing a continued UK ban over the operational phase of the Project. Preferably this measure would be implemented prior to the operational phase of the Project.
Technical feasibility	This measure would bring significant benefits for key ornithology species and there would be wider biodiversity benefits for marine species including fish and marine mammals. The cessation of commercial fisheries would need to be UK Government led, therefore not feasible for a private developer to implement. However, the Project could offer financial incentive. Fishery closure and most notably the cessation of sandeel and sprat fisheries can benefit seabirds, however, the relationship between commercial fisheries and seabirds are highly complex. Impacts to seabirds from fisheries vary between species and wider population dynamics may be influenced by fisheries in alternative ways (Searle *et al.* 2023). Commercial fisheries may decrease some seabird numbers due to reduction in small prey-fish abundance or increase others by increasing the abundance of prey fish through depletion of predatory fish stocks, or through provision of discards, which can be an important food resource for scavenging seabirds (Furness 2000; Votier *et al.* 2013). Some studies link fishery impacts to population-level parameters such as breeding success (Cook *et al.* 2014) and highlight benefits of fishery closures to seabirds sensitive to changes in prey abundance although the wider environmental conditions, before and after fishery closure, especially against a background of environmental change is an important consideration (Daunt *et al.* 2008; Searle *et al.* 2023).

[34] https://www.gov.uk/government/news/no-sandeel-fishing-for-2023-in-effort-to-protect-marine-ecosystem (Accessed on 15/08/23)

5a. Increase in prey availability – Cessation of sandeel and sprat fishing in UK waters	
	Considering the significant scale of the measure in contrast to the level of potential compensation required for this Project, if led by the Project alone this measure would lead to significant overcompensation. Therefore this measure could be better implemented as a collaborative measure with other developers.
Financial feasibility	This measure would need to be led by the UK Government, however developers could potentially contribute a financial incentive to deliver policy change. The amount of financial incentive necessary for the Project would be difficult to quantify and monitor with respect to adequately compensating for the level of impact predicted by the Project.
Legal feasibility	Cessation or stricter regulation of commercial fisheries would need to be implemented and regulated via the UK Government. The undertaking of such actions would not be feasible for a private developer to undertake solely. This measure is however legally feasible for the UK Government to implement as proven by the current ban already implemented for UK-based fisheries.
Suitability rank	Specificity: 3 Effectiveness: 3 Delivery Timeframe: 4 Technical Delivery: 1 Conservation Value: 5 Extent: 4 Overall suitability: 20 Conclusion: Measure has the potential to benefit not only the key species, but multiple other marine fauna. However, the measure is not considered feasible from a technical, financial and legal perspective, primarily due to no take zones designation being dictated by UK Government. This measure is, therefore, considered unfeasible for the Project unless the UK Government agrees to financial incentivisation, which could be used to aid research to evidence the need for change in regulation as suitable compensation.

5b. Increase in prey availability – No-take zones for fish prey	
Description of the measure	A zone where no fishing of sandeel or sprat is permitted would likely increase available prey, increasing breeding success by providing abundant prey for provisioning chicks, and increasing adult survival during winter by reducing foraging competition. Increase in both productivity and survival rates would lead to an increase in the number of juveniles fledged per annum and reduce the potential for mortality due to lack of prey resource, leading to an increase in population size.
Applicable species	This measure would benefit kittiwake, gannet, guillemot and razorbill, as sandeel and sprat are a key prey item for all species (Daunt *et al.* 2008). However, this measure would also benefit any seabirds which feed on sandeel or sprat. This would also result in wider benefits for several marine species including fish and marine mammals. Sandeel fishing is predominately undertaken by trawling, which results in significant damage to benthic habitats.
Spatial extent	Location of key spawning areas or areas of high density of sandeel and sprat would need to be identified in order to identify preferential locations for a no-take zone. There is potential that such areas could overlap directly with the potentially impacted SPAs considered. If located outside of foraging range of potentially impacted SPAs, but still within the UK North Sea then measure would still provide a benefit to the overall site network.
Implementation and duration of measure	This measure would need to be led by UK Government, therefore developers would not control the date of implementation. Preferably this measure would be implemented prior to the operational phase of the Project.
Technical feasibility	This measure would bring significant benefits for key ornithology species and there would be wider biodiversity benefits for marine species including fish and marine mammals. Current no take zones within the UK have been implemented through designation of an area as a Marine Protected Area (MPA) with clear evidence provided to demonstrate that commercial fishing activities were having a significant adverse effect on the site. The designation of a MPA would need to be UK Government led, therefore not feasible for a private developer to implement. However, the Project could offer financial incentive or assist with evidence gathering. Considering the significant scale of the measure in contrast to the level of potential compensation required for this Project, if led by the Project alone this measure would lead to significant

5b. Increase in prey availability – No-take zones for fish prey	
	overcompensation. Therefore, this measure could be better implemented as a collaborative measure with other developers.
Financial feasibility	This measure would need to be led by the UK Government, however could involve developers contributing a financial incentive to aid in designation. The amount of financial incentive necessary for the Project would be difficult to quantify and monitor with respect to adequately compensating for the level of impact predicted by the Project.
Legal feasibility	Designation of an MPA would need to be implemented by UK Government, therefore not feasible for a private developer to instigate solely. Designation of MPAs including no take zones is feasible for UK Government to designate, as currently multiple MPA no takes zones are already present within UK waters.
Suitability rank	Specificity: 3 Effectiveness: 3 Delivery Timeframe: 4 Technical Delivery: 1 Conservation Value: 5 Extent: 4 Overall suitability: 20 Conclusion: Measure has the potential to benefit not only the key species but multiple other marine fauna. However, the measure is not considered feasible from a technical, financial and legal perspective, primarily due to no take zones designation being dictated by UK Government. Measure is therefore considered unfeasible for the Project unless the UK Government agrees to financial incentivisation which could be used to aid in research to evidence the need for designation as suitable compensation.

5c. Reduced anthropogenic impacts – Removal of marine debris	
Description of the measure	Marine debris such as discarded fishing nets and lines have the potential to cause seabird mortality through entanglement or ingestion of debris, which can result in mortality (Ryan, 2018). Removal of debris would reduce the potential for mortality and result in population increase, whilst also bringing wider biodiversity benefits. Removal of marine plastic also likely to reduce plastic build up through trophic transfer from prey to predator species, leading to increase in survival. The developer could contribute to a fund which invests in clean-up of marine debris as removal of marine debris is currently being undertaken.
Applicable species	This measure would likely benefit the majority of seabird species, including kittiwake, guillemot, razorbill and gannet. There would also be wider benefits for other marine fauna.
Spatial extent	A focus on removal of marine plastic along the east coast of Scotland or within the North Sea would provide the greatest potential for benefit to the sites and features potentially impacted by the Project, especially if within species foraging ranges. The extent and intensity of debris removal will be dependent on the agreed amount of removal amount needed to compensate for the Project's predicted impacts.
Implementation and duration of measure	Implementation of this measure would be throughout the operational lifespan of the Project.
Technical feasibility	The developer could contribute funding to schemes and organisations which undertake removal of marine debris either within coastal or offshore environment, preferably close to the designated sites potentially affected. There is uncertainty on how to appropriately quantify the amount of marine debris required to be removed by the Project to compensate for any potential impacts. One method could be to utilise the predicted entanglement mortality and weight of nest plastic mass cited in Votier et al. (2011) to derive a plastic weight removal target.
Financial feasibility	It would be feasible to contribute to a fund for the Project alone or collaboratively with other developers.
Legal feasibility	There are unlikely to be any legal constraints associated with implementation of this measure if the mechanism is through funding of organisations to undertake the removal.
Suitability rank	Specificity: 4

5c. Reduced anthropogenic impacts – Removal of marine debris	
	Effectiveness: 3 Delivery Timeframe: 3 Technical Delivery: 3 Conservation Value: 4 Extent: 3 Overall suitability: 20 Conclusion: The measure has the potential to benefit the species potentially impacted by the Project and potentially could be implemented in close proximity to the designated sites potentially affected by the Project. The presence of litter is also cited as a known pressure for kittiwake, razorbill and gannet, therefore, providing confidence in the measure providing a positive benefit if implemented for those species (Section 3). There is uncertainty regarding exact quantification of the amount of litter removal which would be required by the Project. Additional investigation and consultation with key stakeholders would be required if this measure is considered further.

6a. Reduced anthropogenic impacts – Cessation of gannet chick harvesting	
Description of the measure	Gannet chicks are currently harvested under a NatureScot licence at Sula Sgier, an island north-west of the Scottish mainland. Up to 2,000 gannet chicks can be culled per annum. The undertaking of culling at the colony also results in disturbance to other breeding pairs. Removal of the licence would significantly decrease chick mortality, thus increasing the gannet population at the colony and overall site network. This could also offer additional future recruits to other colonies.
Applicable species	Gannet only.
Spatial extent	Sula Sgier only.
Implementation and duration of measure	Following change in the licence, it would take another five years for any saved fledged juvenile gannets to reach breeding age (Horswill and Robinson, 2015). This measure would ideally need to account for a five-year lead-in time so that the colony is producing enough additional birds to breeding age, prior to operational phase commencement to avoid build-up of compensation debt. Implementation would require a change in legislation and would therefore be implemented indefinitely.
Technical feasibility	The cessation of gannet harvesting would allow for a significantly greater number of chicks successfully fledging, ultimately leading to increases in the breeding population of the overall site network. Given the small number of gannets predicted to be impacted by the Project, rather than complete cessation of harvesting, the quota could be reduced to cover the level of compensation required from the Project.
Financial feasibility	An amendment to the Sula Sgier harvesting licence would need to be completed by NatureScot, with the developer potentially contributing to a compensatory fund for local communities to offset any impact on the local community.
Legal feasibility	An amendment to the Sula Sgier harvesting licence would need to be completed NatureScot on behalf of the developer.
Suitability rank	Specificity:3 Effectiveness: 4 Delivery Timeframe: 4 Technical Delivery: 1 Conservation Value: 2 Extent: 5 Overall suitability: 19 Conclusion: Measure highly likely to provide significant benefit to the wider UK gannet population. However, measure is not feasible from a legal perspective as the gannet harvesting at Sula Sgier is regulated and licenced by NatureScot. The measure also has local community socioeconomic complications if implemented.

6b. Reduced anthropogenic impacts – Reduction in commercial vehicle disturbance	
Description of the measure	Visual and noise disturbance from commercial vehicles such as (helicopters and commercial vessels (Dunnet, 1977; Garthe and Hüppop, 2004; Rojek *et al.* 2007; Fliessbach *et al*. 2019)) can result in disturbance and subsequent displacement, leading to increased energetic demands and potential restriction of access to key foraging grounds, which can lead to a reduction in survival (Ronconi and Clair 2002; Diele, 2018). Clearer definition of shipping lanes, restrictions in vessel speeds, alteration of flight paths or increase in helicopter flight heights, could lead to reduction in disturbance and displacement. This could lead to improved fitness of affected birds, leading to reduced potential for mortality.
Applicable species	This measure primarily benefits species which are known to be sensitive to the presence of vehicles such as guillemot and razorbill. Other species such as divers and common scoter would likely benefit.
Spatial extent	A review would need to be undertaken to identify locations where either high intensity of commercial shipping lanes or helicopter flights paths are known to overlap with favoured foraging habitat or rafting areas. A focus on vessel and helicopter activity along the east coast of Scotland or within the North Sea would provide the greatest potential for benefit to the sites and features potentially impacted by the Project, especially if within species foraging ranges.
Implementation and duration of measure	This measure would need to be implemented throughout the operational lifespan of the Project. This measure could be implemented seasonally, as species key areas of sea is likely to change seasonally due to the migratory and mobile nature of seabirds.
Technical feasibility	A feasibility study would need to be undertaken to understand and identify whether there are suitable areas for this measure to be implemented within Scottish waters, where vessels pre-existing vessel management plans or restrictions are not already in place. A feasibility study would also need to be undertaken to understand and identify whether there are any suitable areas for helicopter flight paths to be altered and the feasibility of increasing helicopter flight heights. In order to successfully monitor and quantify this measure, baseline surveys pre and post implementation of the measure would need to be undertaken to identify the levels of reduced disturbance and displacement.
Financial feasibility	This measure would likely have significant financial impacts for the shipping industry and would impact a number of stakeholders
Legal feasibility	Shipping lanes are managed by the International Maritime Organisation, therefore the developer would have limited control of the implementation of this measure.
Suitability rank	Specificity: 4 Effectiveness: 2 Delivery Timeframe: 4 Technical Delivery: 2 Conservation Value: 4 Extent: 3 Overall suitability: 19 Conclusion: The measure has the potential to benefit the species potentially impacted by the Project and potentially could be implemented in close proximity to the designated sites potentially affected by the Project. Visual disturbance from shipping traffic and aircraft is also cited as a known pressure for guillemot and razorbill, therefore providing confidence in the measure providing a positive benefit if implemented for those species (Section 3). The main area of uncertainty regarding this measure is in relation to identification of suitable locations for such a measure to be implemented and whether it is possible for those vessels and helicopters to divert to alternate routes that are suitable. If this measure is to be taken forward, the next steps would be to review potential feasible locations for implementation or engage with the relevant organisations (including the International Maritime Organisation) to further assess the feasibility of this measure.

7. Habitat enhancement – Removal of marine debris from nesting sites	
Description of the measure	Alongside inclusion of natural nesting material, incorporation of plastic debris is becoming more prevalent within seabirds (Thompson *et al.* 2020). The inclusion of plastic debris has the potential to lead to entanglement and subsequent mortality, especially in relation to juvenile birds (Votier et al., 2011). Removal of such debris from nest sites would remove risk of entanglement for chicks, which would reduce chick mortality and result in population increase.
Applicable species	Known to impact gannet (Votier et al., 2011), but also other nest building seabirds (Thompson et al., 2020).
Spatial extent	Measure would be best targeted at colonies within the east coast of Scotland where the inclusion of plastic debris is prevalent within nests, in particular the sites which the Project may potentially impact if entanglement is a known cause of mortality. The number of colonies where this measure would need to be targeted would be dependent on the prevalence of plastic debris within Scottish waters which would need to be identified from site investigations or engagement with site managers.
Implementation and duration of measure	Removal of any debris should need to be completed outside of the breeding season to minimise the potential for disturbance at the colony. Agreement on nest site access would need to be approved from respective site managers prior to commencement. Potential that access to nest site may only be feasible via rope access, the health and safety implications of which would need to be considered. The frequency of debris removal would be dependent on the rate of build-up and would need to monitored annually for the duration of the operational lifespan of the Project.
Technical feasibility	The level of mortality cited by Votier et al. (2011) suggested an average of 63 gannets per annum being subject to entanglement related mortality per annum but mortality levels could be as high as 109 birds per annum at a single site. As entanglement is known to result in chick mortality (Votier et al., 2011), removal of debris would directly reduce chick mortality, suggesting the measure would be feasible. This is a risk however that in trying to remove plastic debris, nests could in turn end up destroyed, which may lead to an increase in energetic demands for species to rebuild nests which could include further incorporation of plastic. Further consideration would therefore be needed on the feasibility of safely removing or partially removing plastic debris from nests without causing damage. An additional consideration with this measure would be is a shortage of natural nesting material causing seabirds to utilise plastic instead. If this potentially is the case, then provision of natural nesting material in close proximity to the colony may provide additional benefits alongside the measure. This could be undertaken in conjunction with other measures, for example paying for an additional warden who could complete a number of measures.
Financial feasibility	The cost would be dependent on the frequency of debris removal and the effort required. This could be undertaken by providing additional wardens at sites, or by paying for contractors to carry out debris removal. Costs would be higher if management was undertaken at remote sites.
Legal feasibility	If removal was undertaken during the breeding season while birds were nesting, there would be conflicts with wildlife legislation. Removal of debris could be classed as destruction of a nest, and there would likely be wider disturbance to other breeding birds. Access arrangements would need to be made, and material safely removed and disposed of.
Suitability rank	Specificity: 3 Effectiveness: 3 Delivery Timeframe: 4

7. Habitat enhancement – Removal of marine debris from nesting sites	
	Technical Delivery: 3 Conservation Value: 2 Extent: 3 Overall suitability: 18 Conclusion: The measure has the potential to benefit the species potentially impacted by the Project and potentially could be implemented at the designated sites potentially affected by the Project. Given the nesting ecology of the species concerned likely to only be feasible for kittiwake and gannet. The presence of litter is also cited as a known pressure for kittiwake, razorbill and gannet, therefore, providing confidence in the measure providing a positive benefit if implemented for those species. There is, however, uncertainty regarding the technical feasibility of actually removing the litter from nests and exact quantification of amount of litter removal which would require further investigation if this measure is considered further.

8. Habitat creation - Provision of artificial nesting structures	
Description of the measure	Artificial nesting structures could be established either onshore or offshore to provide additional nest sites. These would be established in areas close to feeding grounds to increase foraging success and reduce energetic demands on breeding adult birds, potentially providing a benefit to survival rates of breeding adult birds and increase in productivity. Establishment of additional nesting space would allow for an increase in the number of juveniles fledged per annum, increasing the population size of the overall site network and providing alternative nesting sites for colonies already at carrying capacity or floating populations of seabirds. Artificial nesting structures could also be designed to reduce the potential for predation pressure and allow for easier monitoring of seabirds with reduced disturbance in contrast to a natural colony.
Applicable species	Previous Artificial Nesting structures have been focussed on providing additional nesting space for kittiwakes due to being known to already nest on artificial structures, including offshore infrastructure (Orsted, 2022a,b). In relation to gannet, there is currently no known evidence of gannets nesting on offshore infrastructure within UK waters publicly available, though Australasian gannets (*Morus serrator*) are known to nest on a decommissioned lighthouse station (Orsted, 2022). In relation to guillemot and razorbill, surveys undertaken as part of the artificial nesting structure suitability surveys for Hornsea Four identified auk species present on offshore infrastructure, which included observations of potential breeding behaviours (Orsted, 2022). There is therefore potential for this measure to be suitable for auks though further evidence gathering would be required to provide greater confidence.
Spatial extent	An area of search assessment would need to be undertaken to identify a suitable location for artificial nesting structures, both for an offshore and onshore location. This would include consideration of connectivity to other colonies, foraging areas and other infrastructure. Location of an artificial nesting structure would preferably be on the east coast of Scotland (both onshore and offshore), to allow for greatest potential for immigration back to the colonies potentially affected by the Project and ensuring connectivity with the overall site network.
Implementation and duration of measure	Construction of an artificial nest structure would need to be completed with significant lead in time prior to operation of the Project. This is to allow for chance of colonisation and ensure that the colony is producing enough additional birds to breeding age, prior to operational phase commencement. If the measure is not implemented prior to operation, there is the risk compensation mortality debt would be accrued. It is recommended that a colony would need a minimum of several years for initial colonisation commencement following habitat enhancement. Following colonisation, it would then be another 4 years for kittiwake, 6 years for guillemot, 5 years for razorbill and 5 years for gannet for any fledged juveniles from the newly established colony to reach breeding age (Horswill and Robinson, 2015). The artificial structure would need to be in place for duration of the operational lifespan of the Project.

8. Habitat creation - Provision of artificial nesting structures	
	If implemented offshore, there could be significant health and safety issues which could limit the feasibility of installation and maintenance.
Technical feasibility	Colonisation of an artificial nesting structure considered likely for kittiwake as species is known to colonise man-made structures such as oil and gas platforms, bridges and buildings, while purpose-built structures in Gateshead have been readily used by breeding pairs (Orsted, 2022). Current evidence would also suggest the measure would be feasible for gannet, guillemot and razorbill, though there is a greater level of uncertainty around the feasibility of the measure for these species in contrast to kittiwake. A population analysis would need to be undertaken to identify whether there is an available floating population of breeding birds for each species considered that could occupy the structure. This would ensure the measure is providing additionality to the overall site network rather than a redistribution of birds from other colonies. It is likely that the provision of an artificial nesting structure would lead to significant overcompensation of the potential impacts from the Project, as the number of birds to be compensated for is low (**Table 2.1**). Considering the likelihood for overcompensation this measure would be better suited as a collaborative measure with other developers, rather than a project alone compensation measure.
Financial feasibility	This measure would be financially feasible if structures could be installed onshore. Structures are likely to require minimal ongoing management. The significant costs associated with an offshore structure and likelihood for overcompensation means collaboration with other developers would be preferable for an offshore structure.
Legal feasibility	If sited onshore, it is unlikely that any land acquisition would be required, however an agreement may be required prior to installation. For an offshore structure a marine licence application or acquisition of a pre-existing structure is likely to be required, which may require additional impact assessment. The structure would also need to adhere to MCA guidelines for lighting and marking to ensure safety of other marine users.
Suitability rank	Specificity: 3 Effectiveness: 3 Delivery Timeframe: 4 Technical Delivery: 2 Conservation Value: 2 Extent: 2 Overall suitability: 16 Conclusion: The measure has the potential to benefit the species potentially impacted by the Project, but not at the designated sites potentially affected, although evidence of success for guillemot, razorbill and gannet is limited. Lack of available nesting space was not identified as possible species pressure, which combined with the high level of uncertainty with regard to floating populations within Scottish waters to colonise a new site means potential effectiveness of the measure remains uncertain. Overall significant additional evidence gathering would need to be completed if this measure was to be taken forward for further consideration, the additional cost of which would likely be better spent on an alternative measure, given the low impacts predicted from the Project. Considering the scale and effort required measure would be better suited as a strategic measure in collaboration with other developers rather than for the Project alone to implement.

9a. Habitat enhancement – Creation of suitable breeding habitat	
Description of the measure	Creation of suitable breeding habitat by undertaking of vegetation clearance, grazing management or removal of invasive plant species to create suitable breeding habitat conditions. Establishment of a new colony would allow for additional nesting habitat for seabird species, leading to an increase in the number of juveniles fledged per annum, increasing the population size of the overall site network and providing alternative nesting sites for colonies already at carrying capacity or floating populations of seabirds.
Applicable species	The focus would be on suitable breeding habitat establishment for kittiwake, guillemot, razorbill and gannet. However, there is the potential to benefit other colonial nesting seabirds

9a. Habitat enhancement – Creation of suitable breeding habitat	
Spatial extent	A feasibility study would need to be undertaken to identify both the location and amount of cliff habitat which would be classified as currently 'unfavourable' for seabirds, but with the potential for enhancement to be undertaken. Due to the low number of individuals to be compensated for (**Table 2.1**), it is likely that at most a single new colony would need to be established even when considering any compensation ratios which may be required. This would be preferably located on the east coast of Scotland, to allow for greatest potential for immigration back to the colonies potentially affected by the Project and ensuring connectivity with the overall site network.
Implementation and duration of measure	Habitat enhancement would need to be completed with significant lead in time prior to operation of the Project. This is to allow for colonisation and ensure that the colony is producing enough additional birds to breeding age, prior to operational phase commencement. If the measure is not implemented prior to operation, there is the risk that compensation mortality debt would be accrued. It is recommended that a colony would need a minimum of several years for initial colonisation commencement following habitat enhancement. Following colonisation, it would then be another 4 years for kittiwake, 6 years for guillemot, 5 years for razorbill and 5 years for gannet for any fledged juveniles from the newly established colony to reach breeding age (Horswill and Robinson, 2015). Initial management would be required to make habitat suitable for colony establishment. Following this, monitoring and ongoing habitat management would be needed to ensure that habitats remain suitable during the operational lifespan of the Project.
Technical feasibility	A feasibility study would first be required to determine whether there is any cliff habitat which would be classified as currently 'unfavourable' for seabirds, but with the potential for enhancement to be undertaken. The study would also estimate the size of colony that could potentially be supported. An additional population analysis would need to be undertaken to identify whether there is an available floating population of breeding birds for each species considered that could occupy the site, or to identify whether current East coast colonies are at / close to reaching carrying capacity. This would ensure the measure is providing additionality to the overall site network / colony site rather than a redistribution of birds from other colonies. To ensure the greatest chance of success, consideration of methods to promote colonisation would need to be considered and implemented alongside undertaking habitat management such as, painting of the cliffs to imitate guano, playing of seabird calls and deployment of decoy birds. It is likely that the establishment of a new seabird colony would lead to significant overcompensation of the potential impacts from the Project, as the number of birds to be compensated for is low. Considering the likelihood for overcompensation this measure would be better suited as a collaborative measure with other developers, rather than a project alone compensation measure.
Financial feasibility	This measure would be financially feasible. The associated cost of undertaking habitat enhancement would be dependent on the nature and scale of works to establish the habitat as 'favourable' for seabirds and dependant on the level of ongoing management required. Should land acquisition be required, this has the potential to make the measure financially unfeasible for a project alone, especially considering the level of compensation required for Green Volt specifically.
Legal feasibility	As part of the required feasibility study, an investigation would be undertaken with regard to any legal requirements associated with this measure. It is likely there could be legal requirements surrounding land acquisition or access arrangements depending on the location of the site. There could also be conflicting management agreements, for example if the site is within a designated site boundary (SAC or SSSI), which may restrict the type of habitat management which could be undertaken.
Suitability rank	Specificity: 3 Effectiveness: 3 Delivery Timeframe: 3 Technical Delivery: 2 Conservation Value: 2 Extent: 2 Overall suitability: 15

9a. Habitat enhancement – Creation of suitable breeding habitat	
	Conclusion: Measure has the potential to benefit the species considered for compensation, but not at the sites potentially impacted by the Project. Lack of available nesting space was not identified as possible species pressure, which combined with the high level of uncertainty with regard to floating populations within Scottish waters to colonise a new site, means potential effectiveness of the measure remains uncertain. Overall, significant additional evidence gathering would need to be completed if this measure was to be taken forward for further consideration, the additional cost of which would likely be better spent on an alternative measure, given the low impacts predicted from the Project. Considering the scale and effort required measure would be better suited as a strategic measure in collaboration with other developers rather than for the Project alone to implement.

9b. Increase in prey availability - Supplementary feeding	
Description of the measure	Prey availability can be a key pressure on seabird species Where there is population decline of a species at a site which is associated with food availability, supplementary feeding of breeding pairs could be undertaken. Provision of supplementary food is likely to decrease competition, increase breeding productivity and reduce mortality in adult birds (Davis *et al.* 2005; Harris, 1978).
Applicable species	This measure has been previously trial for kittiwake only (Gill et al. 2002), there is therefore significant uncertainty on the effectiveness of the measure for the other three key species. Measure has been previously implemented for skuas[35] also, although there could be potential benefits for other seabirds where prey availability is a known pressure.
Spatial extent	A feasibility study would need to be undertaken to identify any sites where prey availability is a limiting factor to population growth, and where supplementary feeding would be beneficial. It is likely that this would only be feasible at a single colony.
Implementation and duration of measure	Measure would need to undertaken during each breeding season for the operation lifespan of the Project.
Technical feasibility	Provision of supplementary food is likely to benefit adults and chicks with decreased competition and energetic expenditure leading to increased productivity and decreased mortality. Whether this measure would be practical would be dependent on finding a suitable site and the scale and methods of supplementary feeding.
Financial feasibility	Likely to be expensive, however this would be determined following a feasibility study. The cost would be dependent on the mechanism by which supplementary feeding would be implemented, the extent of feeding (including the amount of food required and number of pairs to be fed) and the human effort required.
Legal feasibility	Likely to be feasible, however there could be access restrictions or conflicts with existing management plans at sites. If habitat modification is needed to install a feed station then this could impact other features of the SPA.
Suitability rank	Specificity: 3 Effectiveness: 2 Delivery Timeframe: 3 Technical Delivery: 3 Conservation Value: 2 Extent: 2 Overall suitability: 15 Conclusion: This measure has the potential to benefit species considered for compensation. However, this measure is likely to be expensive and there is little evidence on the effectiveness of the measure as this measure has only previously been trialled for kittiwake only. Therefore, a feasibility study would need to be undertaken to assess the effectiveness of the measure and to identify any sites where prey availability is a limiting factor to population growth.

[35] https://www.soteag.org.uk/environmental-monitoring/monitoring-reports/ (Accessed 16/08/23)

10a. Predator control - Avian	
Description of the measure	Predation from large gulls, great skua and other avian predators is known to be a cause of mortality at seabird colonies (Lopez et al. 2023; Votier et al. 2004; Babcock & Booth, 2020). Lethal and non-lethal control of avian predators of seabirds could be undertaken to reduce predation pressure. This could include management of corvids, large gulls and other avian predators through deliberate human disturbance, nest removal or culling. This could reduce predation pressure on chicks and adult birds, resulting in higher productivity and lead to population increases on both an individual colony level, as well as the overall site network. A reduction in predator numbers which results in displacement of breeding birds (for example large gulls) could also result in less competition for nest sites and an increase in breeding pairs.
Applicable species	Implementation of this measure would benefit kittiwake, guillemot and razorbill, which are known to be affected by avian predators (Birkhead, 1977; Coulson, 2011). However, there is the potential to benefit other nesting seabirds susceptible to avian predation such as storm petrel and terns. There would be a negative impact on the avian predator species the measure is seeking to control.
Spatial extent	Behaviour of potential avian predators can vary considerably between different colonies (Coulson, 2011), therefore the prevalence of avian predation would need to be reviewed to identify potential colonies for implementation. If unfeasible at the colonies potentially impacted by the Project, then a different colony along the east coast of Scotland would be preferable, to ensure connectivity with the overall site network. The number of colonies and extent required would be dependent on the level of avian predation identified.
Implementation and duration of measure	Following implementation of predator control, it would then be another 4 years for kittiwake, 6 years for guillemot and 5 years for razorbill for any saved fledged juveniles to reach breeding age (Horswill and Robinson, 2015), although increases in productivity may be evidenced immediately following commencement of control. Continued monitoring would be required to confirm that the prevalence of avian predations remain minimal. If methods employed prove ineffective, then other control measures would need to be considered. Predator control and monitoring would be undertaken throughout the operational lifespan of the Project during the breeding season.
Technical feasibility	Avian control is widely implemented for urban gulls and at some seabird colonies, and in theory would reduce chick/adult mortality. Studies have shown avian control to be successful for some seabird colonies (Babcock & Booth, 2020), however there are uncertainties over whether this would provide sufficient compensation and whether the longevity of the measure would remain effective for the operational lifespan of the Project. This measure would negatively impact the predatory species targeted, which could be a species of conservation concern or SPA qualifying species.
Financial feasibility	Costs for this measure would be dependent on the location and scale of control, methods and their success. This would be determined through the results from a feasibility study.
Legal feasibility	Control of avian predators would require a licence if management results in disturbance of breeding birds or requires lethal control. This measure is also likely to impact on the predator species which could be of conservation concern or an SPA qualifying species, therefore measure could lead to EIA and HRA adverse effects. Also worth noting the negative publicity which may result from a private developer pursuing lethal control of wildlife.
Suitability rank	Specificity: 3 Effectiveness: 3 Delivery Timeframe: 4 Technical Delivery: 1 Conservation Value: 1 Extent: 1 Overall suitability: 13

10a. Predator control - Avian	
	Conclusion: Measure has the potential to benefit kittiwake, guillemot and razorbill, though there is uncertainty as to whether avian predation is a pressure at the sites potentially impacted by the Project. There is potential that the targeted species for this measure may be of conservation concern or an SPA qualifying species, therefore, measure could lead to different adverse effects for the targeted species. Therefore, overall benefits of this measure are considered limited in contrast to invasive mammalian eradication.

10b. Predator control – Diversionary feeding	
Description of the measure	Diversionary feeding would involve provision of an alternate food source for predators (avian or mammalian) to reduce predation pressure on chicks and adult birds, resulting in higher productivity and lead to population increases.
Applicable species	Implementation of this measure would benefit kittiwake, guillemot and razorbill, which are known to be affected by predation (Birkhead, 1977; Coulson, 2011). However, there is the potential to benefit other nesting seabirds susceptible to avian predation such as storm petrel and terns.
Spatial extent	A feasibility study would need to be undertaken to identify potential colonies where predation is known to be impacting on seabird populations, and where diversionary feeding may provide benefits. Implementation of this measure would preferably be at a site which is potentially impacted by the Project. If this is unfeasible, then a different colony along the east coast of Scotland would allow for greatest potential for immigration back to the colonies potentially affected by the Project and ensuring connectivity with the overall site network. The number and extent of diversionary feeding would be subject to the level of predation identified and success rate of diversionary feeding.
Implementation and duration of measure	Following implementation of diversionary feeding, it would then be another 4 years for kittiwake, 6 years for guillemot and 5 years for razorbill for any saved fledged juveniles to reach breeding age (Horswill and Robinson, 2015), although increases in productivity may be evidenced immediately following commencement of diversionary feeding. Continued monitoring would be required to confirm that the prevalence of avian predations remain minimal. If methods employed prove ineffective, then other measures would need to be considered. Predator control and monitoring would be undertaken throughout the operational lifespan of the Project during the breeding season.
Technical feasibility	Diversionary feeding would in theory reduce predation of seabirds and would be located close to the nest or roost site of the predatory species. For example, great skua foraging has changed over time, with predation on seabirds at Shetland increasing while sandeel stocks have decreased (Church *et al.* 2019). In theory, providing an alternative food source would reduce seabird predation. The overall feasibility of the measure remains uncertain however, as diversionary feeding in the long term could artificially inflate the predator population. This could result in increased competition for the diversionary food source and ultimately lead to predation reoccurring at the colony.
Financial feasibility	Costs for this measure would be dependent on the location and scale of control, methods and their success. This would be determined through the results from a feasibility study
Legal feasibility	This measure would be a suitable alternative to lethal control of predators which would require licensing.
Suitability rank	Specificity: 3 Effectiveness: 2 Delivery Timeframe: 4 Technical Delivery: 1 Conservation Value: 1 Extent: 2 Overall suitability: 13

10b. Predator control – Diversionary feeding	
	Conclusion: Measure has the potential to benefit kittiwake, guillemot and razorbill, though there is uncertainty as to whether predation is a pressure at the sites potentially impacted by the Project. Considering the 35yr lifespan of the Project there is considerable uncertainty on the long-term success such measure may have. In the long term the measure could eventually lead to artificial inflation of predatory species which could result in an overall negative impact.

10c. Non like for like – Diver/tern rafts	
Description of the measure	Tern and diver species are particularly susceptible to human disturbance, predation and flooding of nests (for divers) which can result in breeding failure (Hulka, 2010). Man-made rafts have been successfully used for conservation schemes and as a habitat enhancement measure for onshore wind farms. Rafts provide a safe nesting site which is not impacted by rising water levels. Provision of diver/tern rafts could significantly increase the breeding productivity of these species by reducing nest failure. Red-throated diver is negatively impacted by offshore wind farm and shows strong macro-avoidance. Although this measure would not mitigate this risk, it would benefit the species during the breeding season and increase the population.
Applicable species	The measure could benefit red- throated diver, black-throated diver, Sandwich tern, common tern and Arctic tern. This measure may also benefit other breeding species. This measure would not provide like-for-like compensation.
Spatial extent	A feasibility study would need to be undertaken to identify suitable waterbodies within the breeding range of applicable species. The spatial extent of the measure would be dependent on the number of rafts installed.
Implementation and duration of measure	This measure could be implemented throughout the operational lifespan of the Project. Rafts are likely to be long-lasting and it is possible that a single raft would provide breeding habitat throughout the lifespan of the Project. However, rafts may require maintenance or replacement which would be determined by monitoring.
Technical feasibility	This is a commonly implemented measure which has proven successful (Hancock, 2000)l[36], ,[37]. If installed in suitable habitat this is likely to provide additional nesting habitat for applicable species and increase productivity.
Financial feasibility	The cost of this measure would be dependent on the number, size and construction methods of the rafts.
Legal feasibility	It is unlikely that there would be any legal constraints associated with implementation of this measure. There would need to be agreements in place with landowners before implementation.
Suitability rank	Specificity: 1 Effectiveness: 1 Delivery Timeframe: 5 Technical Delivery: 3 Conservation Value: 1 Extent: 2 Overall suitability: 13 Conclusion: Measure would not provide benefit to key species of concern, therefore measure should only be considered further if all like for like compensation measures are exhausted.

[36] https://scotlandsnature.blog/2022/09/07/terrific-tern-rafts/ (Accessed on 16/08/23)
[37] https://www.hiwwt.org.uk/creating-new-nesting-sites-terns (Accessed on 16/08/23)

10d. Non like for like – Provision of artificial nest sites for storm petrel	
Description of the measure	Storm petrel breeding is constrained by mammalian predation, therefore the provision of safe nest sites could increase breeding productivity at existing colonies, or provide new breeding sites to be colonised by breeding pairs **Error! Bookmark not defined.**. The largest storm petrel colony breed within a broch on Mousa, Shetland. Therefore, storm petrel are known to use man-made structures for nesting. Provision of artificial nesting sites, for example building broch-like structures, could result in population increase.
Applicable species	This measure would benefit storm petrel, and therefore would not provide like-for-like compensation.
Spatial extent	Construction of a single structure would require a small area of land within the storm petrel breeding range. The structure should be constructed close to suitable foraging habitat.
Implementation and duration of measure	This measure could be implemented throughout the operational lifespan of the Project. Construction would be a one-off event, and structures would be long-lasting and unlikely to require maintenance.
Technical feasibility	Feasible. Storm petrel nests in artificial structures as shown at Mousa, therefore there is the potential for birds to occupy similarly constructed structures. There is uncertainty regarding whether structures would be colonised following construction. If structures were occupied, in theory this would provide additional nesting sites and lead to population increase by increasing the number of breeding pairs and reducing chick mortality.
Financial feasibility	A feasibility study would need to be undertaken to determine the potential cost of implementing of this measure. Likely to be relatively low cost.
Legal feasibility	It is unlikely that there would be any legal constraints, however land would be required for construction of artificial structures.
Suitability rank	Specificity: 1 Effectiveness: 1 Delivery Timeframe: 5 Technical Delivery: 3 Conservation Value: 1 Extent: 2 Overall suitability: 13 Conclusion: Measure would not provide benefit to key species of concern, therefore measure should only be considered further if all like for like compensation measures are exhausted.

10e. Non like for like – Cessation of gull control	
Description of the measure	Gull species can be controlled under NatureScot licence[38],[39], with large numbers of gulls culled. If control was ended, gull mortality would be reduced, and productivity increased. Gull species are controlled for public health and safety purposes, although gull species are listed as species of conservation concern.
Applicable species	This measure would benefit gull species and therefore would not provide like-for-like compensation.
Spatial extent	Implementation of this measure would require amendments to NatureScot licensing and would likely apply to the whole of Scotland.

[38] https://www.nature.scot/doc/guidance-gull-management (Accessed on 16/08/23)
[39] https://www.nature.scot/doc/licence-application-form-take-or-kill-wild-gulls-their-nests-or-eggs-serious-damage-or-public-health (Accessed on 16/08/23)

10e. Non like for like – Cessation of gull control	
Implementation and duration of measure	This measure could be implemented throughout the operational lifespan of the Project.
Technical feasibility	Feasible. This measure would be implemented by NatureScot, and would directly benefit gull populations by reducing mortality. It would also align with conservation objectives for declining species.
Financial feasibility	Feasible. Cessation of gull control would not result in any direct costs.
Legal feasibility	This measure would require implementation of licensing changes by NatureScot and is legally feasible, however would likely be unpopular due to conflicts between people and urban gulls.
Suitability rank	Specificity: 1 Effectiveness: 1 Delivery Timeframe: 5 Technical Delivery: 3 Conservation Value: 1 Extent: 2 Overall suitability: 13 Conclusion: Measure would not provide benefit to key species of concern, therefore measure should only be considered further if all like for like compensation measures are exhausted. Additionally measure could result in increased predation pressure on key species considered for compensation.

11. Reduced anthropogenic impacts – Oil spill prevention	
Description of the measure	Oil spills result in increased mortality for a number of species, species particularly at-risk are those that spend significant time on the sea surface (Piatt *et al.* 1990). Oil spills can also indirectly impact birds by affecting prey or habitats. A reduction in the number and/or scale of oil spills through implementation of good practice and more effective response to spills would reduce avian mortality and result in population increase. The developer could contribute to a fund which invests in promoting good practice and research into technology aimed at reducing likelihood and magnitude of pollution events.
Applicable species	Species which spend significant time at the sea surface are most at risk such as guillemot and razorbill, though kittiwake and gannet likely to be impacted by oil spills also. Implementation of this measure would benefit the majority of marine species and habitats.
Spatial extent	The location and scale of the measure would be difficult to quantify as it would be dependent on where any spills may occur during the operational lifespan of the Project. For the measure to be of benefit for the sites and features potentially impacted by the Project, or at least benefit the overall site network, the focus should be constrained to within the North Sea.
Implementation and duration of measure	Implementation of this measure would be throughout the operational lifespan of the Project.
Technical feasibility	A reduction in the number of and magnitude of pollution events would bring widespread benefits for seabirds and likely reduce mortality. By contributing to a fund to invest in oil spill prevention and response this measure would aim to eliminate spills entirely or at least minimise the extent and impact, which could make quantification of compensation success difficult. This is because there is uncertainty around the prevalence of oil spill(s) which may occur within the Project's operational timeframe and the impact the oil spill could have in the absence of the compensation measure. Oil spill mitigation commitments are already commonly agreed for offshore infrastructure, which may limit the additionality of the compensation measure.
Financial feasibility	It would be feasible to contribute to a research fund for new technologies or as an emergency fund to aid in response to an oil spill.
Legal feasibility	There are unlikely to be any legal constraints to providing funding into research or implementing measures.
Suitability rank	Specificity: 3 Effectiveness: 3 Delivery Timeframe: 1

11. Reduced anthropogenic impacts – Oil spill prevention	
	Technical Delivery: 1 Conservation Value: 3 Extent: 1 Overall suitability: 12 Conclusion: Measure wholly relies on a significant oil spill occurring in a situation where an oil spill management plan is not already agreed. This means there is significant uncertainty with respect to being able to appropriately quantify the level of compensation achievable and uncertainty as to whether measure would be classified as additionality.

5 Step 4: Identification of Short-listed Compensation Measures

5.1 Selection of Short-listed Compensation Measures

66. Following identification and ranking of potential compensation measures for the Project, the Applicant agreed an approach with MD-LOT (in a meeting on the 19th September 2023) to short-list the most appropriate measures and outline the next steps for the Project. During the meeting MD-LOT requested that the Project proceed with confirming the short-list of measures to be taken forward, associated additional data / evidence gathering and drafting of adaptive management plans.

67. Based on the Project-specific suitability rankings of the potential compensation measures presented within **Section 4.4**, the Applicant has selected the following three short-listed measures:

- Strategic – Strategic funding Disturbance reduction at SPAs;
- Reduced anthropogenic impacts – Disturbance reduction at SPAs; and
- Habitat modification – Reinstatement of habitat, management of invasives, scrub clearance or similar.

5.2 Next Steps for proposed short-listed measures

68. For each of the short-listed measures a summary of the Project's next steps are provided below.

5.2.1 Strategic – Strategic Funding

69. The Applicant will continue to monitor and engage with key stakeholders on the suitability of existing and development of new strategic compensation funding schemes for offshore renewable projects in Scotland.

70. This may include the Applicant investigating whether collaboration with the Scottish Marine Environmental Enhancement Fund (SMEEF) could be considered as a 'strategic' measure. Efforts will be made to understand how the Project can demonstrate that its financial contributions to SMEEF will deliver ecological compensation to specifically offset its impacts on the features of the sites presented in **Table 2.1**. The Applicant will collate evidence to demonstrate the benefits of collaborating with SMEEF (i.e., their experience of delivering successful projects or that a project is already being developed that would satisfy the requirements of the required compensation). The Applicant will also provide evidence to demonstrate collaboration amongst partners is likely to be more successful in providing ecological benefits via the designated network of sites than smaller, piecemeal measures that are geographically isolated.

5.2.2 Reduced anthropogenic impacts & habitat modification

71. The Project's next steps is summarised in the roadmap provided (**Figure 5.1**), with further clarity provided for each step in the sections below.

5.2.2.1 Identify sites

72. The Applicant will undertake a screening exercise to identify potential colonies (SPA & non-SPA), where the measures may be implemented. The screening exercise will be limited to the East coast of Scotland to ensure the greatest likelihood of connectivity to the qualifying features considered. The British Trust for Ornithology (BTO)'s Seabird Monitoring Programme will be used to search colonies by country, area, species, count, site type and year of last count. The connectivity of the colonies to the UK national site network will also be considered by looking at the conservation objectives of the site and how they contribute to the wider network.

5.2.2.2 Engage with site manager/landowner

73. Once potential colonies are identified, the Applicant will seek to engage with respective site managers and landowners to discuss potential opportunities for compensation measures. This will include discussion and review of any additional work packages not included within site management plans which could provide a conservation benefit to key receptors, alongside existing site management plans, for which site managers currently do not have any foreseeable mechanism to fund.

Discuss steering group partnership

74. As well as discussions around potential compensation work packages, the Applicant will seek to discuss with key stakeholders appointment of the steering group members. Members of the steering group are likely to include the Applicant, SNCBs, site managers/ landowners, any local authorities, and any other relevant party as necessary. The aim of the steering group is to review the success of any compensation measures if implemented based on the results from monitoring.

Revisit compensation suitability ranking

75. To account for the worst-case scenario, should no potential compensation packages be identified through stakeholder engagement aimed at reducing anthropogenic impacts or habitat modification, the project will proceed with additional data gathering for the next best potential compensation measures identified in **Section 4.4**. The Applicant will then proceed with steps highlighted below for the next most suitable measure.

5.2.2.3 Select site and measure according to feasibility

76. Following stakeholder engagement, the Applicant will evaluate all potential compensation work streams discussed. This will include confidence around the work package fully compensating for any potential impact from the Project, site access, local geography, associated costs, health and safety and the legal agreement requirements, to evaluate and rank the feasibility of implementation.

5.2.2.4 Secure memorandum of understanding

77. For the compensation measures concluded as having the greatest feasibility, the Applicant will secure any necessary memorandum of understanding to provide the competent authority with confidence that the Project has the means to implement compensation, should this be a requirement within the consent decision.

78. The conclusions from stakeholder engagement and review of potential compensation packages will be drafted up into the finalised short-listed compensation report, with critical appraisal undertaken on any potential measures identified. The finalised compensation report will also be inclusive of the suggested adaptive management plan for measures identified and provide clear details of any secured memorandums of understanding in place. As part of the adaptive management plan, a list of criteria will be set out and agreed with the steering group to monitor the success of the measures.

5.2.2.5 Await consent decision

79. Should the consent decision conclude a requirement for the Project to compensate for any potential impact, the Project will proceed with either of the following two options depending on the feasibility of either mechanism:

- Pursue strategic funding; or
- Implement individual project measure(s).

80. If it appears strategic funding is not foreseeably viable as an option at the point of consent, then the Applicant will proceed with implementation of the individual secured project measure(s). The individual measures will be implanted in accordance with the proposed adaptive management plan, accounting for any necessary lead in times required.

5.2.2.6 Ongoing monitoring & Adaptation

81. In accordance with the adaptive management plan, the steering group will routinely meet at pre agreed monitoring milestones to review the results of ongoing monitoring of implemented compensation measures. The steering group will review the results of both the compensation monitoring and the post-construction monitoring to conclude whether an amendment is required due to the measure either over or under compensating based on both monitoring results. If the measure is considered to be under compensating, the Project will seek to either scale up the proposed measure to make up for any compensation deficit or seek to implement an additional compensation package. This will be in line with the proposed adaptive protocol detailed within the adaptive management plan. Ongoing monitoring will be undertaken for the entire duration of the Project's operational life span.

Figure 5.1 Proposed compensation roadmap for the short-listed individual Project measures

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GREEN VOLT

Flotation Energy Ltd | 12 Alva Street | Edinburgh EH2 4QG | Scotland
Tel: +44 7712 864013 | enquiries@flotationenergy.com | www.flotationenergy.com