

WEST OF ORKNEY WINDFARM

Compensation Implementation and Monitoring Plan

OWPL Document Number	Originator Document Number	Revision	Status	Date
WO1-WOW-CON-EV-RP-0072	N/A	03	IFU	15/09/2023

Important Notice and Disclaimer: This document and any information therein are confidential property of West of Orkney Windfarm and without infringement neither the whole nor any extract may be disclosed, loaned, copied or used for manufacturing, provision of services or other purposes whatsoever without prior written consent of West of Orkney Windfarm, and no liability is accepted for loss or damage from any cause whatsoever from the use of the document. West of Orkney Windfarm retains the right to alter the document at any time unless a written statement to the contrary has been appended.

Approved by S. Kerr

Document Control 15/09/2023

Document Role

Role	Company	Name	Aconex Signature
Author	MacArthur Green	RMG	N/A
Checker	OWPL	JF	N/A
Acceptor	OWPL	SK	N/A

OWPL Revision History

Revision Number	Issue Date	Document Status
1	17/07/2023	First draft issued for review
2	14/08/2023	Second draft issued for review
3	09/09/2023	Final draft

Contents

- 1. Introduction.....4
- 1.1 Project background.....4
- 1.2 Aims and objectives of compensation measures.....4
- 1.3 Purpose of this document.....5
- 2. Summary of proposed compensation measures6
- 2.1 Predator-proof fencing.....6
- 2.2 Invasive mammal removal and eradication6
- 2.3 Securing and implementing the compensatory measures6
- 3. Implementation mechanisms8
- 3.1 Stage 1: Pre-compensation desk studies and field studies8
- 3.2 Stage 2: Construction of predator-proof fencing..... 11
- 3.3 Stage 3: Mammalian predator control (rat eradication, feral cat trapping and removal) 12
- 3.4 Stage 4: Post-implementation monitoring and reporting..... 15
- 4. Adaptive management..... 17
- 5. References 19

1. Introduction

1.1 Project background

The Applicant, Offshore Wind Power Limited (OWPL) is proposing the development of the West of Orkney Windfarm ('the Project'), an Offshore Wind Farm (OWF), located at least 23 km from the north coast of Caithness and 28 km from the west coast of Hoy, Orkney. Crown Estate Scotland (CES) awarded OWPL the Option Agreement Area (OAA) in January 2022 for the development of the Project following the ScotWind leasing round which began in late 2019.

The Applicant has produced a Report to Inform Appropriate Assessment (RIAA). Based on the approach taken, following the advice and guidance from NatureScot, the RIAA concluded that an adverse effect on site integrity of three Special Protection Areas (SPAs) could not be excluded for:

- East Caithness Cliffs SPA;
- North Caithness Cliffs SPA; and
- Sule Skerry and Sule Stack SPA.

Four qualifying features designated under these SPAs may be impacted by the Project. The number of birds (rounded up to the nearest whole bird) of each of the four key species predicted in to be impacted by the development of the Project include:

- Common guillemot = 174 individuals;
- Atlantic puffin = 1 individual;
- Black-legged kittiwake = 12 individuals; and
- Great black-backed gull = 1 individual.

The RIAA states that while it was not possible to conclude no adverse effect on site integrity for the above SPAs using the advice and guidance from NatureScot, by applying additional "best scientific knowledge in the field" (Section 6.23.1 in the RIAA) it is highly likely that predicted impacts on the four qualifying species would be greatly reduced, both from the Project alone and in-combination. Depending on the conclusions presented in the Appropriate Assessment prepared by the Scottish Ministers, compensation measures may or may not be required to offset the impact of the Project on these four key species.

Potential compensation options for each key species as reviewed by Furness et al. (2013) are presented in the Compensation Measures Plan that has been submitted as part of the Derogation Case. Furness et al. (2013) identified that for each key species impacted by the Project, the eradication of rats from islands where these species are present is likely to be an effective form of compensation. The Compensation Measures Plan reviewed seabird colony count data (obtained from the Seabird Monitoring Programme, SMP¹) from islands where rat eradication has previously place in the UK. The report concluded that removal of mammalian predators from an island where the four key species breed is likely to benefit these populations, especially guillemot and puffin.

As discussed in the Compensation Measures Plan, several islands in the Orkney archipelago off the north coast of mainland Orkney, has been identified as a potentially suitable location where breeding seabirds are under pressure from predation from brown rats, *Rattus norvegicus* and, to a lesser extent, feral cats.

It is considered that compensation measures to reduce mammalian predation pressure on guillemot, puffin, kittiwake and great black-backed gull populations on one or more of the selected islands would increase seabird survival and productivity and thereby benefit the SPA network as a whole (Defra, 2021). Therefore, it is proposed that the reduction of mammalian predation at seabird colonies on one or more of the identified islands will compensate for the potential impacts of the Project on the key seabird species.

1.2 Aims and objectives of compensation measures

This Compensation Implementation and Monitoring Plan proposes that two phases of compensation measures can be used to offset the impact of the Project on key seabird species:

1. Construction of a mammalian predator-proof exclusion fence(s) around some part(s) of the island(s) containing seabird colonies; and

¹ Seabird Monitoring Programme: <https://app.bto.org/seabirds/public/index.jsp>

2. Eradication (brown rats) or removal (feral cats) of invasive mammals within fenced off areas.

The aim of these two compensatory measures is to increase guillemot, puffin, kittiwake and great black-backed gull populations within the UK SPA network through the removal of mammalian predation pressure.

Several other seabird species (non-key species) that currently breed on the islands that may be used, or have done in the past, may also benefit from these compensation measures.

1.3 Purpose of this document

This document provides information on how the combined action of two compensatory measures proposed by the Applicant can be implemented and monitored, if required by the Scottish Ministers.

This document provides information to enable the Scottish Ministers to be satisfied that compensatory measures proposed by the Applicant can be delivered in a timely manner and can be relied upon to secure the overall coherence of the National Site Network. Information about monitoring, reporting, programming and management are included throughout this document.

2. Summary of proposed compensation measures

From reviews on seabird compensation measures produced by Furness et al. (2013) and Furness (2021), the Compensation Measures Plan concludes that the control of mammal predation (especially rats) on seabird colonies is likely to be an effective means of compensation for guillemot, puffin, kittiwake and great black-backed gull populations potentially impacted by the Project alone and in-combination with other projects.

It is proposed that the reduction of mammalian predation on the key species would be best achieved through the construction of predator-proof fence(s) followed by a programme of feral cat removal and rat eradication within fenced off area(s).

2.1 Predator-proof fencing

The construction of predator-proof fencing to exclude invasive mammalian predators is provided as the first phase of the compensation measures. Modern permanent predator-proof fencing usually requires little maintenance and is known to be effective in excluding all mammalian predators (Cooper, 2013).

From a review of studies undertaken around the world, Furness et al. (2013) identified that permanent predator-proof fences can be constructed to create predatory-mammal-free areas and improve habitat for ground-nesting seabirds.

Predator-proof fencing has been used to control a wide range of invasive mammals including rats, feral cats, mink, foxes, hedgehogs, mice, rabbits and other mammals (see Furness et al. 2013 for review). For example, predator proof fences constructed in the United States were deployed very effectively in Hawaii at Ka'ena Point Natural Area Reserve to protect vulnerable populations of wildlife (Young et al. 2012). Fences two meters tall were set up in November 2010 to February 2011 around 20ha of coastal habitat within Ka'ena Point to prevent predators (including dogs, cats, mongooses, rats and mice) from entering the protected area. Predators were eradicated within the enclosed 20 ha – it took three months to complete for all predators except mice, which were eradicated within an additional six months. Cooper (2013) listed a further ten examples of successful deployment of predator-proof fencing around seabird colonies in New Zealand, Hawaii (USA) and Azores (Portugal), and these are also reviewed in detail by White and Hirons (2019).

Predator-proof fencing has recently been used as a compensation measure to protect lesser black-backed gulls from the Alde-Ore Estuary (AOE) SPA impacted by the development of the Norfolk Boreas and Norfolk Vanguard offshore wind farm projects (MacArthur Green and Royal Haskoning DHV, 2022).

2.2 Invasive mammal removal and eradication

The removal of feral cats and eradication of rats from within predator-proof fenced off enclosures is provided as the second phase of the compensation measures.

Mammal removal and eradication from islands is a well-established procedure that has now been carried out at hundreds of sites world-wide and at a small number of islands in the UK (see Furness et al. 2013, and Furness 2021 for review). For example, in Scotland, eradication programmes include eradication of black rats from the Shiantis and eradication of brown rats from Ailsa Craig, Canna, and Handa (MacArthur Green 2021). However, although eradication was initially successful at Handa, rats re-colonised the island about ten years later, indicating the importance also of biosecurity for islands that have been cleared or never had invasive alien predatory mammals.

Brooke et al. (2007), Ratcliffe et al. (2009a) and Stanbury et al. (2017) developed lists of top priorities for eradication of invasive predatory mammals from islands to conserve vulnerable seabirds. Twenty-two of the 25 top priority sites listed by Stanbury et al. (2017) were in Scotland. Although eradications have now been carried out or are underway at a few of these sites, many have still got invasive mammal predators impacting seabird populations and preventing recolonisation by seabirds that have been extirpated.

Feral cat eradication has been carried out on at least 48 islands (Nogales et al. 2004), but to date, cats have not been removed from any island in the UK.

2.3 Securing and implementing the compensatory measures

Implementation of these compensation measures will be carried out over four stages that include pre-compensation monitoring, predator-proof fence construction, cat removal, rat eradication, post-compensation seabird monitoring and implementing an incursion response plan in case of re-incursion. As such there are different approaches required to secure and implement the various stages.

It should be noted that the Applicant will fund this compensatory measure, including continued management of biosecurity, and any eradication associated with re-incursion events during the operational lifetime of the Project.

3. Implementation mechanisms

The proposed compensation measures will be implemented in four stages with each stage comprised of several sub-tasks. The Applicant will develop, manage and implement each of these stages with input from specialist experts as required.

3.1 Stage 1: Pre-compensation desk studies and field studies

3.1.1 Potential locations

Since the eradication of invasive mammals from the whole of the islands identified in the Compensation Evidence Review is considered unlikely to be effective (as these islands are inhabited and relatively large islands with mixed agriculture taking place), it is proposed that compensation measures to remove mammalian predators are targeted in one (or more) small areas on one (or more) of the islands with key breeding seabird colonies (guillemot, puffin, kittiwake, great black-backed gull).

However, details on which islands would be most beneficial to fence off and on which island(s) and whether or not an entire section may need to be fenced off will depend on the results of pre-compensation site visits to record seabird habitat (section 3.1.5.1) and advice from experts on the practicalities of erecting anti-predator fencing (section 3.1.5.2).

3.1.2 Landowner agreements

Key landowners have been identified via the land registry. Key landowners have been contacted via letters to secure access, if required. Land will be secured by a deed of servitude, or similar. Agreements will be sought with local landowners, tenants and the wider community. Land rental agreements will be required for a period of up to 35 years.

Furthermore, contact has been made with the Community Engagement Officer for the [Orkney Native Wildlife Project](#) and initial discussions have taken place about integrating the current proposed mitigation measures for the Project with existing stoat eradication work in Orkney.

3.1.3 Feasibility Study

An initial desk-based Feasibility Study will collate and assess all information available on seabird habitats, seabird populations and the potential scale of the invasive mammal population present on the selected islands. The Feasibility Study will include an assessment of the following:

- Abundance and distribution of rats and cats, where information (if any) is available;
- Assessment of any native predators (i.e. raptors, skuas and gulls);
- Current seabird census data reporting on the population trends and productivity of key seabird species potentially impacted by development of the Project (guillemot, puffin, kittiwake and great black-backed gull);
- Nesting habitat of key species currently available, supported by information from seabird colony assessments; and
- Availability of unoccupied habitat that could support an increased number of key species.

The Feasibility Study will inform the preparation of an Operational Plan (section 3.1.7) to deliver and implement the programme of works as well as the associated monitoring, reporting Implementation and Monitoring Plan and adaptive management that will be required both for the fencing and invasive mammal removal programme.

3.1.4 Pre-compensation data analysis

Increased productivity is considered to be one key measure of achievement when reviewing the success of compensation measures aimed at improving the performance of seabird colonies. To measure the success of the proposed compensation measures (implementation of predator proof fencing and removal/eradication of mammalian predators), it will be necessary to set targets for colony performance for each of the key seabird species. The attainment of target productivity levels will be implemented once the removal/eradication of mammalian predator programme has been completed.

To estimate the increase in productivity required from each key seabird species in order to compensate for the development of the Project, a Resource Equivalency Analysis (REA), or an equivalent data analysis will be necessary. An analysis of this kind would likely require demographic variables including productivity rates of the key seabird species, annual subadult and adult survival and lifespan etc.

3.1.5 Pre-compensation field studies

In order to assess which coastal areas would be most appropriate, effective and feasible to apply compensation measures to, pre-compensation field surveys will be carried out.

It is proposed that a initial site visits will take place in the second half of 2023 with ornithology surveyors and consultees to assess ground conditions and prepare for more detailed surveys following the conclusions of the Appropriate Assessment provided by Scottish Ministers.

3.1.5.1 Seabird habitat and count surveys

Habitat walk-over surveys will be conducted by ornithologists where there are no steep sections of cliff (surveyors will avoid approaching closer than within 10 m of the edge of cliffs as stipulated in the Health and Safety Plan).

For inaccessible coastal areas, habitat surveys will be conducted by surveyors from a boat at sea around the circumference of the island. In addition, aircraft (with agreement from landowners) will be used to take photographic records, particularly around inaccessible cliff sections.

Habitat surveys will be conducted during the non-breeding season (September to February) to avoid disturbance to breeding birds.

The aim of these surveys will be to determine habitat suitability for the key species impacted by the Project (guillemot, puffin, kittiwake and great black-backed gull) and assess whether or not rats and/or cats could feasibly access seabird colonies (e.g. it is likely that sheer cliffs may be inaccessible for rats and cats and therefore compensation methods to remove these invasive mammals from very steep cliffs may not be effective). The following information will be collected:

- Adapted phase 1 habitat assessment including consideration of cliff ledge dimensions and evaluation of cliff gradients;
- Evaluation of habitat suitability for the four key seabird species (guillemot, puffin, kittiwake and great black-backed gull);
- Assessment of soil structure and presence of puffin burrows;
- Assessment of the presence of all mammals – invasive and native (e.g., footprints, holes, otter and stoat scats etc); and
- Assessment of potential sources of disturbance (e.g., presence of public footpaths and buildings etc).

During the breeding season (March to August), a seabird census will also be conducted to provide an up-to-date full colony baseline count on each selected island using recognised methods as detailed in Walsh et al. 1995, including photographic records and digital mapping. For key species, pairs of kittiwakes (apparently occupied nests, AON), great black-backed gulls (Apparently Occupied Territories AOT), either pairs or individual puffins (apparently occupied burrows, AOB or IND) and individual (IND) guillemots and will be counted. Although the focus will be on counting key species, all species would be included in the census, including the presence of any mammals.

Seabird counts will be conducted by ornithologists on land where access is possible and disturbance to breeding seabirds is minimal. Counts will be conducted by boat for inaccessible areas of the coast.

Data collected from the habitat surveys and seabird census will be analysed to assess which sections of the selected islands would benefit most from the application of the compensation measures (fencing followed by invasive mammal removal) and would therefore be most effective to offset the impacts of the Project.

All survey methodology, data and conclusions will be discussed and shared with NatureScot and the Royal Society for the Protection of Birds (RSPB).

3.1.5.2 Fencing feasibility surveys

Once a list of potentially suitable areas have been identified from the habitat surveys, the appointed fencing contractor (section 3.2.2) will conduct pre-compensation field surveys to determine the feasibility of fence construction in these areas. Surveys will focus on gathering the following information:

- Assessment of ground conditions and site access;
- Evaluation of the vegetation, soil structure and depth;
- Assessment of the route of the fence line as well as start and end points;
- Assessment of whether the fence can be buried all the way along the fence line;
- Assessment of the requirement and location of predator-proof gates (for humans to pass through) along the proposed fence line;
- Testing for positioning anchor stations for any rope access required; and
- Consideration of logistics and cost.

Results and conclusions of the fence line surveys will be shared with stakeholders in the form of a report written by the fencing contractor.

3.1.6 Communication and Engagement Strategy

Stakeholders, including the local community, NatureScot, RSPB and local planning authorities will be consulted on all aspects and stages of the compensatory measures and will be kept engaged throughout the implementation and monitoring stages. Compensation plans have been consulted upon with relevant stakeholders, most notably NatureScot and local planning authorities, prior to application submission, Residents of the selected island(s) will be consulted and kept fully informed.

To facilitate this, a Communication and Engagement Strategy will be prepared that will outline the approach to communicating and engaging with stakeholders, residents, visiting members of the public and the media.

Good communication and engagement may be achieved as follows:

- Regular consultation meetings held with stakeholders;
- Consultation with the community regarding microchipping and neutering of cats caught within fenced off areas;
- Regular community engagement meetings;
- Provision of information leaflets to every household on the selected island(s) explaining the compensation measures;
- Display panels explaining the compensation measures, why they are important for conservation as well as risk information regarding bait stations and the presence of rodenticides;
- Clear warning signs (detailing the eradication, bait station design and danger from bait) would be placed at any suitable landing beaches within the enclosed fenced area. Warning labels will be placed on all bait stations advising visitors not to touch the stations or bait;
- Education about seabird conservation through school and university teaching programmes;
- Education through popular science journalism; and
- Education through volunteering participation in citizen science monitoring of the seabirds.

The Communication and Engagement Strategy will be updated and adapted during the lifetime of the Project, depending on outcomes of the compensation measure programme.

Pre-consent, an expert topic group (ETG) will be used to engage with regulators and interested stakeholders. Should consent for the project be granted, a steering group will be convened by OWPL. This group will help steer the delivery of any compensation measure implementation and maintenance, monitoring, reporting and any other relevant matters as determined by OWPL. It is envisaged that core members of the steering group will be the relevant Statutory Nature Conservation Bodies (SNCBs), as well as the local planning authority and owners and/or managers of the site(s) at which predator fencing is planned to be implemented. The RSPB and other relevant parties will also be invited to form part of the steering group in an advisory capacity.

3.1.7 Operational Plan

An Operational Plan will be produced to define and collate the following information:

- Scope and method statements;
- Health and safety plan;
- Approach to permitting;
- Source of equipment (e.g. fencing contractor, mammal eradication/removal contractor);
- Organisational arrangements;
- Specialist subcontractor engagement;
- Mitigation planning;
- Non-key species management plan;
- Approach to adhering to Communication and Engagement Strategy; and
- Long term monitoring and biosecurity planning.

3.2 Stage 2: Construction of predator-proof fencing

This section outlines the current proposed approach to construct predator-proof fencing. This approach will be confirmed and agreed with stakeholders when preparing the operational plan.

3.2.1 Summary description

The fence design and positioning will be informed through discussions with the RSPB who have considerable experience of the pros and cons of fences to exclude mammalian predators (White and Hirons, 2019).

Furthermore, it will be ensured that the primary fencing contractor (section 3.2.2) appointed to do the work will have undertaken fence installation for the same purposes (i.e. protection of ground nesting birds from mammalian predators) at other nature conservation reserves.

Based on previous compensation measures using predator-proof fencing to protect ground nesting seabirds in the UK (MacArthur Green and Royal Haskoning DHV, 2022) and the design of modern predator-proof fencing which evolved in New Zealand (Cooper, 2013) it is likely that predator-proof fencing will have the following key aspects:

- Height of up to 2 m;
- Wire mesh of a gauge of at least 1 mm;
- Wire mesh size no more than 50 mm;
- At least 500 mm of the wire mesh buried horizontally at a depth of 100-150 mm below ground to prevent rats and cats burrowing underneath the fence – although the depth will depend on the habitat type and assessment of ground conditions along the fence line location as determined from the pre-compensation field surveys (section 3.1.5.2);
- Water crossings with mesh to the base of drainage channels to prevent access by aquatic species such as otter; and
- Overhanging top of 350-400 mm angled at approximately 45° to the outside to inhibit climbing.

A photograph of an example fence designed to exclude feral cats is provided below (Figure 3-1).

The installation of fence enclosures will be carried out with the use of common agricultural vehicles as well as by hand. Installation will be completed in two general steps (**Error! Reference source not found.**) as follows:

- Step 1 – Where ground conditions and site access allow, the fence posts which will provide the structural support required to carry the pest-proof mesh and hood structure, will be driven into the ground using a powered post driver. Where access is limited for the use of powered tools, posts will be hammered into the ground using hand operated post drivers.
- Step 2 – The pest proofing wire mesh and hood will be attached to the fence and any excavated earth will be reinstated around the base of the fence.

3.2.2 Contractor and indicative costing

It is proposed that Xcluder Pest Proof Fencing Limited, a specialist company from New Zealand which has around 20 years' experience in designing fences to exclude a wide range of predatory animals, including rats and cats, would be contracted for the fence design as well as to potentially provide advice for trapping feral cats within fenced off areas (section 3.3).

Permanent mammal-proof fences are a relatively expensive form of fencing compared with quickly constructed electric fences, but they require far less maintenance and are longer lasting. It is estimated that permanent fencing from Xcluder would cost in the region of up to £2000 per metre.

3.2.3 Monitoring and maintenance schedule

A critical feature of the compensation measure is that predator-proof fence enclosures continue to prevent entry by mammalian predators. Thus, it is critically important that the full length of the fence line is inspected on a regular basis and any damaged or weak areas are rapidly repaired.

During the breeding season a proposed maintenance schedule would be:

- Inspected on a two-weekly basis (March to August) as recommended by White and Hirons (2019); and,
- Any damaged or weak areas will be rapidly repaired if essential to maintain integrity or if possible, to do so with minimal disturbance.

During the non-breeding season, the following maintenance schedule is proposed:

- Less regular inspections (e.g., 2-3 times per winter), but inspections will also take place following periods of severe weather;
- More substantive maintenance, such as replacing rusted sections of wire or weak posts will be undertaken at this time to avoid undue disturbance to the breeding birds; and
- Routine inspections will take place at such times to allow sufficient time for any substantive repairs to be completed prior to the return of breeding birds (i.e., before the end of February).

At any time, if a breach in the fence is found, careful monitoring would be conducted to check for the presence of mammals within the fenced area.

3.2.4 Dependencies/Constraints

It is proposed that predator-proof fencing will be placed along suitable parts of the coastline on one or more of the selected islands. To assess the practicalities of fence installation and to choose areas where it is possible to construct a fence-line, pre-compensation field studies conducted by the fencing contractor will be carried out to assess potential routes.

Metal fencing would be at risk of corrosion from salt spray at most coastal locations on Orkney. To limit corrosion, fencing would be made from thick galvanized steel wire mesh that is resistant to corrosion. Rust preventative paint could also be periodically applied to prevent corrosion.

White and Hirons (2019) note that vandalism can be a significant issue with fences, especially where a few people consider the use of a fence to be an inappropriate limitation on their activities. As part of the Communication and Engagement Strategy, it is proposed that engagement with the community will take place and appropriate signage will be used as well as regular monitoring of the integrity of the fences (for monitoring refer to section 3.4.1).

The fence line may preclude any other land use and access within the fenced off area. As part of the pre-compensation Communication and Engagement Strategy, the final proposed location and land take would be agreed with landowners/tenants. Furthermore, it is possible to build in predator-proof gates into the fence line, the potential requirement and location of these gates will be discussed with all relevant parties as part of the Communication and Engagement Strategy.



Figure 3-1 Example of a fence designed to exclude feral cats. The photograph shows a 375m long predator fence across Omaha Spit, north of Auckland for the Omaha Shorebird Protection Trust. The aim of the fence is to assist with predator management (including neighbouring domestic cats) so that shorebirds can nest on the ground.

3.3 Stage 3: Mammalian predator control (rat eradication, feral cat trapping and removal)

This section outlines the current proposed approach to control invasive mammalian predators within the fenced off area(s). This approach will be confirmed and agreed with stakeholders when preparing the operational plan.

3.3.1 Summary description

3.3.1.1 Feral cat trapping and removal

Immediately prior to completion of the fence installation, a thorough inspection of the enclosure area(s) will be undertaken to ensure that as far as possible, there are no cats present inside the fenced off area. This is expected to take the form of a

group of personnel, walking a line across the (mostly complete) enclosed area, in a manner which flushes any cats in front and out through the last unfenced section of the enclosure. Several passes will be conducted (e.g. over the course of a day) to increase confidence that as many cats as possible have been flushed out.

Once the fenced off enclosure is complete, any cats remaining within the enclosure will be caught using humane cage traps (Ratcliffe et al. 2009b, Nogales et al. 2004). Initially, open cage traps will be left for one week or more (without the trap closing) so that the cats become accustomed to them and accept them as part of the terrain. Cage traps will be baited (using meat, fish or cat biscuits) and placed along likely cat thoroughfares in locations concealed from the public.

Traps will be set in the evening and checked early the following morning. It is anticipated that traps will be set for a period of up to six weeks, or less depending on the number of cats caught, with the number of trapped cats being reduced to zero by the end of the trapping period.

It is expected that the trapping phase will be carried out in the winter (September to February) when feral cat numbers are at their lowest (away from human habitation) due to naturally lower food resources.

The fate of any cats caught within the enclosed area will be fully discussed with the residents of the islands selected as well as stakeholders as part of the pre-compensation Communication and Engagement Strategy to reach a consensus. All pet owners will be offered the opportunity to have their cat registered and microchipped as well as given a reflective cat collar so that their pet can readily be recognized as domestic during day or night.

It is proposed that all captured cats within enclosed areas will be scanned for the presence of a microchip, and if the animal is not marked, it will be tagged, neutered and then released outside the fenced enclosure. Animal welfare organizations including the Scottish Society for Prevention of Cruelty to Animals (SSPCA) and the Cats Protection League will be consulted to agree acceptable practice.

3.3.1.2 Rat eradication

The proposed rat eradication operation will be assessed using the internationally recognised ethical principles of Humane Vertebrate Pest Control developed by RSPCA Australia (Humane Vertebrate Pest Control Working Group, 2004).

Rat eradication will follow advice and guidance presented in the UK Rodent Eradication Best Practice Toolkit (Thomas, Varnham, and Havery, 2017) which provides guidelines adapted from international standards for use in the UK².

The rat eradication programme will be a ground-based operation using bait stations that cats cannot access. The use of anticoagulant rodenticides is currently the most widely recognised effective method of eradicating rodents from islands (DIISE, 2018), therefore anticoagulant rodenticide (or an alternative) will be positioned in bait stations spread in a 25 metre x 25 metre grid across enclosed areas.

Each bait station will have an individual number, plotted using GPS and all data put into a GIS-linked database. Once all the bait stations are in position, they will be left for one week or more (without toxin in them) so the rats become accustomed to them and accept them as part of the terrain. Following this, the rodenticide will be added to the bait stations.

Bait stations will be checked a minimum of every two days, replacing bait as rats consume it. Partially eaten bait will be replaced with a new block. Old or partially eaten bait will be disposed of at a registered landfill or incineration facility as recommended by the safety data sheets. Checking bait stations enables constant monitoring of bait take and the resulting die-off of rats.

Bait take will be recorded into GIS-linked database apps in the field for ongoing analysis. Refinements to the eradication phase will be made from this real time data. Hot spots will be identified quickly and targeted throughout the programme allowing for real time adaptive management.

It is expected that the eradication phase will be carried out in the winter (September to February) when rodent numbers are naturally at their lowest, and when natural food supplies are low. This means that there are fewer rodents to catch, and those that do remain are more likely to take the bait in the absence of other food sources.

It is anticipated that stations will be baited for a period of up to six weeks during which time the bait taken is expected to be reduced to zero.

Where other species of small rodents (e.g. Orkney vole *Microtus arvalis orcadensis*) are present on the selected island(s) and are not targets of eradication, bait stations that preclude those species will be used.

² UK Rodent Eradication Best Practice Toolkit is available at: <https://www.nonnativespecies.org/non-native-species/management-guidance/hydrocotyle-ranunculoides-floating-pennywort/#UKrodentredication>

3.3.2 Monitoring schedule

3.3.2.1 Feral cats

Once fence enclosures are fully installed, as well as regular fence inspections it will be important that the presence of cats inside the fence is detected rapidly. Monitoring for cats during the breeding season will be combined with fence inspections. A combination of monitoring options will be used:

- Tracking sand pits (for example, those used by Ratcliffe et al. 2009b to track cats on Ascension Island comprised 1-m-diameter circles of smoothed sand with an attractant - either fish bait in a wire mesh basket or an auditory lure – the battery operated feline-attracting phonic manufactured by Westcare Electronics, (Bassendean, WA, Australia), secured by a stake in the centre) will be placed at intervals around the inside of the fence to help the detection of footprints. These could also be placed on the outside of the fence to record the presence of cats patrolling the fence;
- Camera traps located at corners and/or gateways, checked at least weekly, possibly twice per week; and
- Weekly night vision surveys from suitable vantage points.

If cats are detected at the end of the breeding season (i.e., September) a second trapping and removal programme will take place during the following winter followed by continued monitoring operation until all cats have been removed from enclosed areas.

During the non-breeding season, monitoring for cats will use the same methods as above, but at a reduced frequency of once per month (September to January).

During February a concerted effort to ensure the enclosure is predator free will be undertaken, with twice weekly checks and night-time visits until such time as monitoring staff are confident no cats are present within the fence.

3.3.2.2 Rats

Following the initial period (up to six weeks) of baiting, it will be vital to establish an intensive monitoring programme to detect any rats which may have escaped eradication. This will involve searching, recovering and disposing of rat carcasses, installing and maintaining a monitoring network.

A grid of rat-attractive food items as well as chew cards would be pegged out as monitoring tools across enclosed area(s). Tracking tunnels and trail cameras would also be used. Beach surveys for footprints in the sand would also occur, where possible.

The coverage of the monitoring grid will extend beyond that of the bait stations; one monitoring point at the station and one in-between two stations. Each monitoring site will be checked every two days to detect rat sign (for example teeth marks or footprints or footage on camera). If any rat sign is detected, an intensive targeting programme would be started until rat signs in the area ceases.

All intensive monitoring points will be recorded on GPS, entered into the GIS-linked database, and mapped to ensure coverage of the island.

It is expected that the monitoring phase of the programme would start at the end of the winter following the eradication campaign. The bait station grid will be removed once the intensive monitoring phase has been completed and rat signs are absent. If rats are detected at the end of winter (i.e., February and/or March) a second baiting programme will continue in the following winter and will be followed by the continued monitoring operation. This cycle would be repeated until rats have been eradicated within fenced off areas.

3.3.3 Dependencies/Constraints

Eradication of feral cats can be more complex than eradication of rats, especially where there is a resident human population with pet cats. Residents are likely to have concerns about the trapping of feral cats within fenced off areas. It is important to note that on islands some cats may go 'feral' in the summer to feed on seabirds, but then return to the houses of residents for the winter. Furthermore, feral/semi-domesticated cats are often valued, especially when part of the farming community. As part of the pre-compensation Communication and Engagement Strategy, residents will be fully consulted regarding the treatment of feral cats with options of neutering and tagging discussed.

While the primary concern is predatory mammals, specifically rats and cats, the presence of non-predatory species such as rabbits may also reduce the productivity of burrow nesting puffins through disturbance, which may offer opportunities for avian predators (other species of gull and corvids) to steal eggs and chicks. There are also potential welfare issues from trapping such species within the fence. Hence inspections will also consider signs of the presence of these species.

If there are any holts within the enclosure the mammal flushing method may be ineffective. Therefore, as a precaution a survey for the presence of holts will be conducted prior to fence installation, with appropriate follow up actions to be taken if any are found.

3.4 Stage 4: Post-implementation monitoring and reporting

Following the programme of erecting predator-proof fencing, trapping, removal and eradication of mammalian predators, the Project will implement appropriate seabird habitat management, undertake monitoring and address any re-incursions.

3.4.1 Monitoring

The following activities derived from Gilbert et al. (1998) will form the core requirements for monitoring which will be undertaken annually following installation of the predator-proof fence and continue for the period the compensation is required:

- Counts of key species (kittiwake, great black-backed gull, guillemot, and puffin) will be undertaken inside and outside of the fenced off area(s) using the same methods detailed in Walsh et al. 1995 that were used for the pre-compensation baseline seabird census (section 3.1.5.1);
- The count frequency and total (per year) will be subject to agreement with Marine Directorate, following consultation with key stakeholders, counts may be higher in the first three years following fence installation and then reduced in later years on the understanding that the quality of data collection is not compromised (this would be informed by review of the data collected to date);
- Alongside the counts (as outlined above), productivity of key species will be estimated (number of eggs, chicks and fledged young/pair);
- In addition to count data, bird behaviour within the enclosure will be recorded at different stages throughout the breeding season. For example, any kind of behaviour indicating that birds are prospecting the colony, nest building, providing food to partners or chicks, are experiencing disturbance (e.g. alarm calling or flushing), showing aggressive encounters with conspecifics or heterospecifics etc. will be recorded;
- Because it is unlikely that all breeding locations will be visible from any given location it will be necessary to map observed birds to cross-check between vantage points. This will also permit tracking of nest success over the course of the breeding season;
- Counts will be conducted during the daytime (0900-1600) in conditions of good visibility; poor weather (heavy rain, fog, high winds) will be avoided;
- Surveyors will also collect opportunistic observations, such as instances of predation by avian species (e.g., other large gull species and corvids), in particular if these appear to be related to disturbance events such human activity (e.g., people walking and dogs) outside the fenced area(s) which may highlight the need for management changes or temporary movement restrictions. Any observations of avian predation (or suspected avian predation), for example egg stealing by corvids or other large gulls, will also be noted and included in the annual report;
- Surveyors will also record any observation that could have a bearing on the productivity of a colony, such as signs of disease or starvation within a colony, whether adult birds are recorded together with their eggs/chicks, changes in behaviour of key species (e.g. birds flushing from nests at an increasing distance on surveyor approach), appearance of plastic (or other sources of pollution) within the colony/used for nest construction and any sign of nest disturbance or gaps appearing within a colony etc;
- The above methods will be complemented with high resolution photography, to provide a permanent record of how the enclosure(s) is being used; and
- Consideration will be given to the use of drones to obtain aerial images over enclosed area(s), but only if this is agreed with the landowner and can be done without causing disturbance (a review of best practice drone use indicates that nesting large gulls are highly intolerant of drones, so this option will be progressed with great caution and will only be undertaken if there is high degree of confidence that it will not have negative effects).

3.4.2 Reporting

The monitoring outlined above should be considered as progress indicators to be used to measure the success of the compensation measures (i.e. enclosed areas being declared rat and cat free) against the outcomes of seabird monitoring and the progress towards the conservation targets for each species throughout the operational lifetime of the Project.

This will be detailed in annual monitoring reports. Although population increase within fenced off area is unlikely to occur in a linear fashion, as seabird counts always fluctuate, the conservation benefit is framed in annual terms to allow comparison with potential mortality estimates for the Project.

At the end of each year once the eradication programme has commenced, an annual report will be produced. The annual monitoring report is likely to follow this structure:

-
- Overview of evidence of rat and cat presence within fenced off areas;
 - Overview of the results from seabird monitoring (section only included once island is declared rat free)
 - Colony counts
 - Mapping nest locations
 - Productivity monitoring;
 - Assessment of whether productivity targets are being met;
 - Actions delivered;
 - Identification of emerging issues; and
 - Approach to monitoring for the following year.

The annual monitoring reports and data collected would be shared with key stakeholders including, the local community, NatureScot and RSPB and all data collected made publicly available where appropriate. The results of the monitoring report would be used to update adaptive management measures.

3.4.3 Programme for implementation and delivery

The Applicant expects the Compensation Measures will, subject to consent and condition(s), be in place two years prior to operation.

Predator-proof fence construction, cat trapping and removal as well as rat eradication within fenced off areas will be implemented outside of the seabird breeding season (April to August) to minimise disturbance to breeding birds.

Weather dependant, fences could be constructed over a period of 6-8 weeks.

Nogales et al. (2004) indicated that most feral cat removal programmes are now completed within 1-3 years, though that is removal from a whole island.

Rat eradications typically take two or three successive winters to complete, and pre-compensation planning may require a year in advance of implementation.

4. Adaptive management

Should post-implementation monitoring reveal that the predator exclusion program is unsuccessful, or less successful than anticipated, an assessment will be undertaken to determine the reasons underlying the lack of success, and to inform the next steps.

Principally, next steps will consist of identifying potential improvements to fenced off areas around compensation colonies, based on potential issues discovered during the monitoring assessment. Should the assessment determine that the compensation measures in place cannot be improved sufficiently, then alternatives, such as a reduction of fishing activities, vessel disturbance or recreational disturbance in key seabird foraging areas or a contribution to the Marine Recovery Fund³ (or equivalent), may be considered in consultation with the steering group.

One of the aims of compensation measures for the Project is to increase productivity within each key seabird species colony (section 3.1.4) and a key objective of the monitoring programme will be to record any observations that could potentially explain why productivity expectations might not be met. For example, evidence of avian predation, disease or starvation within the colony, disturbance from human activities (e.g. people with dogs walking along the coastline, recreational boating activity close to the coastline) are all potential reasons why there could be a shortfall in productivity against expectations. Thus, while productivity targets are a practical goal for compensation measures, this metric should be used as a framework for monitoring and it is just as important that consideration is given to understanding the status of key seabird colonies more widely, in order to determine the compensation colony's performance relative to other colonies not receiving compensation.

Therefore, the performance of key seabird colonies should not be viewed in isolation but should be assessed in the wider context of breeding success for key species locally (i.e. on the island where compensation measures are implemented) and regionally (e.g. Orkney archipelago). Hence, poor breeding success at the compensation colony in a year when poor breeding success is also seen at most other colonies of the key species either locally or regionally would be indicative of wider issues (e.g. reduced prey stocks, adverse weather conditions or disease etc) and would not automatically trigger remedial action at the compensation colony. However, under these circumstances the steering group would look to understand the reasons for poor reproductive performance at the compensation colony, attempt to identify potential remedies and collaborate with relevant groups to understand the wider context in terms of other local or regional colony breeding success.

Conversely, if the compensation colony performs less well than other monitored sites, this would be a strong indicator that remedial action is required to identify and address the causes.

During the first months and years of the monitoring period following the initial installation of the predator-proof fence, monitoring is expected to be focussed on understanding the mechanisms for colonisation. For example, there may be evidence that birds are not prospecting for nest sites within the fenced off enclosure(s), or prospecting but not settling, or settling but abandoning during nest building, etc. and each of these would lead to a requirement for different remedial measures. Monitoring data will be collected with the aim of understanding the reasons underlying bird behaviour in order to apply the most appropriate adaptive measure.

Other factors which will be monitored if feasible (e.g., if focal nests can be identified and monitored without itself causing disturbance) will include nest attendance rates and foraging trip duration, as these will indicate the degree of effort required by the breeding adults and may indicate reasons for reproductive failure. As noted above, it will also be necessary to conduct similar monitoring at a sample of other locations to understand if any observed patterns are replicated elsewhere.

If colonisation of key species within fenced off enclosures does occur in the initial years after predator removal and initial recruits have good breeding success, but the rate of colony growth appears to be lower than would be needed for the colony to reach capacity, then reasons for this will be investigated. This may highlight avoidance of particular areas of the enclosure (e.g. areas of less preferred habitat), which could be targeted for modification or highlight that additional effort in attracting birds would be beneficial (e.g. use of decoys and broadcasting colony calls).

The monitoring and requirements for adaptive management will be conducted on an annual basis at least until such time as it is agreed that the colony is self-sustaining and performing at least as well as other local colonies.

As discussed above the adaptive management measures to be considered will depend on the circumstances, however the following remedial actions may include:

³ Energy Security Bill Policy Statement available at: https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/1127791/Policy_Statement_Offshore_Wind_Environmental_Improvement_Package_Measures.pdf

-
- Extension of existing predator-proof fencing if it appears there is not enough enclosed area to reach target productivity levels;
 - Intensification of trapping and removal of invasive mammalian predators within fenced off areas if there is re-invasion after initial trapping efforts;
 - Consideration of trapping and removing non-predatory species such as rabbits (which can compete with puffins for burrows) within fenced off areas;
 - Consideration of avian (e.g. corvid) control if there is significant egg or chick loss through avian predation;
 - Consideration of supplementary feeding of skuas if there is a significant problem of egg or chick loss through predation at compensation colonies;
 - Increase monitoring during breeding seasons to gather more detailed data;
 - Testing for disease (e.g avian influenza) if disease is suspected or known to exist in the wider area;
 - Habitat improvement within fenced off areas, e.g. sward mowing and strimming to create suitable breeding areas for great black-backed gull and improve access to burrows for puffins;
 - Consideration of colony call playback and placement of decoy birds within the enclosure to encourage key species into enclosed areas if initial recruitment to the enclosure is below the target level;
 - Supplementary feeding of chicks of key species if there is significant problem of food supply and starvation at compensation colonies. This would need to be done in a manner that achieved the aim of improving chick health, whilst not encouraging other species (e.g. corvids). Furthermore, this option would require careful consideration to rule out other more systemic causes, such as collapse of prey stocks, that short-term feeding would be unable to make up for;
 - Increase public awareness for the requirement of the conservation programme and provision of advice on the ways the public can help (e.g. reduction of disturbance close to compensation colonies, reducing litter on the beaches and seas, reporting presence of dead birds and signs of pollution on the island etc.); and
 - Implementation of new additional fenced off areas to increase the number of target compensation colonies if initial enclosed areas remain under-utilised or unused.

The Adaptive Management Plan is intended to be a live document that will change with stakeholder input and feedback from ongoing monitoring and reporting. Key elements of plan will need to be expanded as the location and type of implementation is agreed and land access agreements reached. Until that point is reached the plan must remain high level.

The Project can commit to the establishment of a Compensation Measures Steering Group that will consider and agree on the Adaptive Management Plan, as implementation is progressed. It is expected that this will include representatives from local and national stakeholders and it will meet as necessary as required, particularly as plans are developed and implemented.

5. References

- Brooke ML, Hilton G, Martins T 2007. Prioritizing the world's islands for vertebrate-eradication programmes. *Animal Conservation* 10:380–390. Available at: [Prioritizing the world's islands for vertebrate-eradication programmes - Brooke - 2007 - Animal Conservation - Wiley Online Library](#)
- Cooper, J. 2013. <http://www.acap.aq/index.php/en/news/latest-news/1359-predator-proof-fences-are-helping-to-protect-procellariiform-seabirds-including-acap-listed-albatrosses-and-petrels>
- Defra (Department for Environment, Food and Rural Affairs), 2021. Best practice guidance for developing compensatory measures in relation to Marine Protected Areas. Version: For consultation. Available at: https://consult.defra.gov.uk/marine-planning-licensing-team/mpa-compensation-guidance-consultation/supporting_documents/mpacompensatorymeasuresbestpracticeguidance.pdf
- DIISE (2018). The Database of Island Invasive Species Eradications. Island Conservation, Coastal Conservation Action Laboratory UCSC, IUCN SSC Invasive Species Specialist Group, University of Auckland and Landcare Research New Zealand. <http://diise.islandconservation.org>.
- Furness, R.W. 2021. HRA Derogation Scope B - Review of seabird strategic compensation options. Report to Crown Estate Scotland and SOWEC. Available at: <https://www.offshorewindscotland.org.uk/media/12970/hra-derogation-scope-b-report.pdf>
- Furness, R.W., MacArthur, D., Trinder, M. and MacArthur K. 2013. Evidence review to support the identification of potential conservation measures for selected species of seabirds. MacArthur Green, Glasgow.
- Gilbert, G., Gibbons, D.W. and Evans, J. 1998. Bird Monitoring Methods: a manual of techniques for key UK species. RSPB/British Trust for Ornithology, The Wildfowl and Wetlands Trust, Joint Nature Conservation Committee, Institute of Terrestrial Ecology and The Seabird Group.
- Humane Vertebrate Pest Control Working Group 2004. A National Approach Towards Humane Vertebrate Pest Control. An unpublished discussion paper arising from the proceedings of an RSPCA Australia/AWC/VPC joint workshop, August 4-5, Melbourne. RSPCA Australia, Canberra, Australia.
- MacArthur Green and Royal HaskoningDHV, 2022. Norfolk Projects Offshore Wind Farms Lesser black-backed gull Implementation and Monitoring Plan. Ref PB5640.009.0005.
- Nogales, M., Martin, A., Tershy, B.R., Donlan, C.J., Veitch, D., Puerta, N., Wood, B. and Alonso, J. 13 2004. A review of feral cat eradication on islands. *Conservation Biology* 18: 310-319.
- Ratcliffe, N., Mitchell, I., Varnham, K., Verboven, N. and Higson, P. 2009a. How to prioritize rat management for the benefit of petrels: a case study of the UK, Channel Islands and Isle of Man. *Ibis* 151: 699-708.
- Ratcliffe, N., Bell, M., Pelembe, T., Boyle, D., Benjamin, R., White, R., Godley, B., Stevenson, J. and Sanders, S. 2009b. The eradication of feral cats from Ascension Island and its subsequent recolonization by seabirds. *Oryx* 44: 20-29.
- Stanbury, A., Thomas, S., Aegerter, J., Brown, A., Bullock, D., Eaton, M., Lock, L., Luxmoore, R., Roy, S., Whitaker, S. and Oppel, S. 2017. Prioritising islands in the United Kingdom and crown dependencies for the eradication of invasive alien vertebrates and rodent biosecurity. *European Journal of Wildlife Research* 63: 31. Available at: [Prioritising islands in the United Kingdom and crown dependencies for the eradication of invasive alien vertebrates and rodent biosecurity | SpringerLink](#)
- Thomas, S., Varnham, K. & Havery, S. 2017: UK Rodent Eradication Best Practice Toolkit (Version 4.0). Available at: [Vertebrates » NNSS \(nonnativespecies.org\)](#)
- Thomas, S., Brown, A., Bullock, D., Lock, L., Luxmoore, R., Roy, S., Stanbury, A. and Varnham, K. 2017. Island restoration in the UK -past, present and future. *British Wildlife* (April 2017): 231-242
- Walsh, P.M., Halley, D.J., Harris, M.P., del Nevo, A., Sim, I.M.W. & Tasker, M.L. 1995. Seabird monitoring handbook for Britain and Ireland. JNCC / RSPB / ITE / Seabird Group, Peterborough. ISBN 1 873701 73 X.
- White, G. & Hiron, G. (2019). The Predator Exclusion Fence Manual: Guidance on the use of predator exclusion fences to reduce mammalian predation on ground-nesting birds on RSPB reserves Version 3, October 2019.

Young, L.C., Vanderwerf, E.A., Mitchell, C., Yeun, E., Miller, C.J., Smith, D.G. and Swenson, C. 2012. 17 The use of predator proof fencing as a management tool in the Hawaiian Islands: a case study of 18 Ka'ena Point Natural Area Reserve. University of Hawaii Pacific Cooperative Studies Unit Technical Report 180: 1-87.

