Fair Isle Harbour Improvement Works

Report to Inform Appropriate Assessment for Harbour Improvement Works at North Haven Bay, Fair Isle

On behalf of **Shetland Isle Council (SIC)**

Shetland Islands Council

Project Ref: 11168 | Rev: Version 1.0 | Date: April 2023

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Fair Isle Ferry Upgrade

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June 2023

Document Information

Document History and Authorisation		
Title	Fair Isle Ferry Upgrade	
	Report to Inform Appropriate Assessment for Harbour Improvement Works at North Haven Bay, Fair Isle	
Commissioned by	Stantec	
Issue date	June 2023	
Document ref	R.4124	
Project no	R/5177/1	
Date	**Version**	**Revision Details**
23/05/2023	1	Issued for client comment
05/06/2023	2	Issued for client use

Prepared (PM)	Approved (QM)	Authorised (PD)
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Suggested Citation

ABPmer, (2023). Fair Isle Ferry Upgrade, Report to Inform Appropriate Assessment for Harbour Improvement Works at North Haven Bay, Fair Isle, ABPmer Report No. R.4124. A report produced by ABPmer for Stantec, June 2023.

Notice

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1 Introduction

1.1 Background

Fair Isle is the United Kingdom's most remote community, lying 24 miles off the southern tip of the Shetland Islands. The island is separated from Shetland mainland by a body of water known as the 'Roost', which has a reputation of being one of the most demanding stretches of water in the UK, and indeed Europe. This means that the island is not just geographically remote but is also remote from a connectivity perspective – indeed, the island had no transport connections on 221 days in 2017.

The island is within the Shetland Islands Council (SIC) administrative area and is connected to mainland Shetland by two lifeline transport links. The main passenger link is through an air service by means of an eight seat Britten-Norman BN-2 Islander aircraft. The existing ferry service provides the critically important supply chain and freight link as well as capacity for 12 passengers per sailing.

SIC is progressing the Fair Isle Ferry Replacement Project ('the project') to replace the existing vessel, which is approaching the end of its life and does not meet modern standards, together with ferry infrastructure at both berthing sites at North Haven, Fair Isle and at Grutness, Sumburgh Head.

The Fair Isle and Grutness sites are both located within environmental designations including Special Protection Areas (SPA) and a Special Area of Conservation (SAC) (North Haven, Fair Isle). **This report covers the geographically distinct project activities which are proposed at North Haven, Fair Isle**. A separate Report to Inform Appropriate Assessment (RIAA) has been prepared in respect of the proposed works at Grutness.

1.2 Consultation

Consultation with NatureScot in relation to this project has included the following:

- Provision of screening advice relating to the planned geoinvestigative works at Fair Isle (9 April 2021)
- Advice received during a Teams meeting with NatureScot to discuss potential impacts upon bird features at North Haven from the proposed harbour improvement works (30 November 2022)
- Provision of screening advice relating to the proposed harbour improvement works at Fair Isle (6 December 2022)

1.3 Project description

The Fair Isle ferry berth is located within the harbour at North Haven (see Figure 1), on the north-east of the island. The harbour is sheltered from the east and west by high rocky cliffs, and notionally sheltered from the south by an isthmus (narrow strip of land between North Haven and Bu Ness), and to the north by a rock armoured breakwater approximately 80 m in length and 25 m in width, made up of Norwegian rock. However, northerly conditions cause significant wave motion at the berth and therefore a noust[1] is used to house the vessel overnight.

[1] A boat-shaped hollow, sometimes with walls, where a boat is hauled up for winter storage.

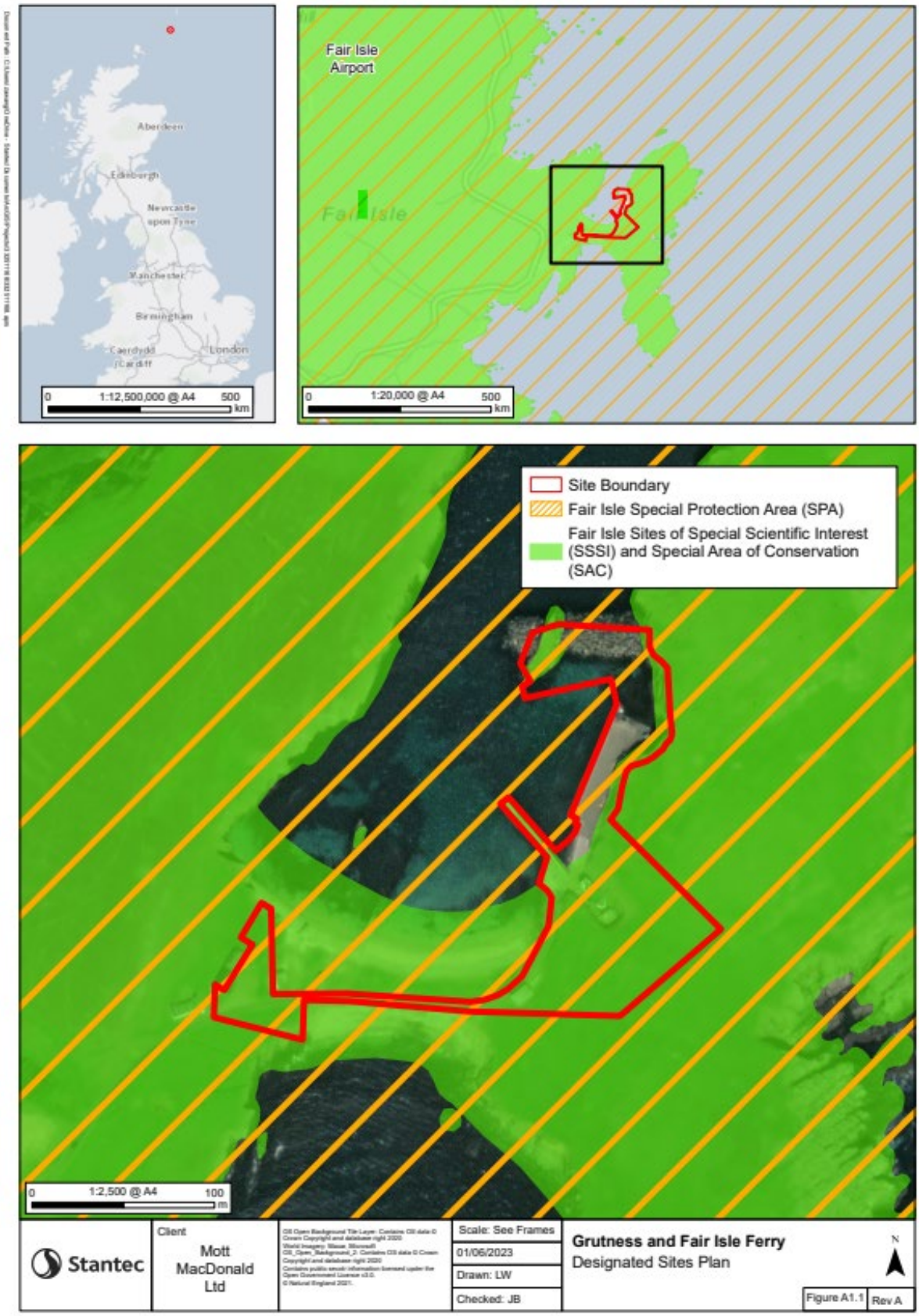

Figure 1. North Haven (Fair Isle) proposal and overlapping or adjacent designated sites

The proposal is to replace the existing vessel, which will require the berthing site at Fair Isle to be upgraded to facilitate this new ferry along with an enhancement of the existing ferry port (see Figure 2). The details of the works required are described below:

- A new quay structure will be formed between the northern end of the existing quay and the existing breakwater;
- A new linkspan to facilitate the new roll on – roll off (Ro-Ro) vessel;
- The existing breakwater is to be increased in size and height to provide greater shelter to the new quay structure and linkspan berth;
- Dredging to provide a sufficient water depth for the new vessel around the proposed pier extension and linkspan;
- Repairs and re-fendering of existing finger pier, aligning structure to accommodate new vessel;
- Substantial enlargement of existing noust, with room for a new access road up one side of the parked vessel, and a steel access steps;
- Construction of a new winch house building to accommodate a new winch and standby winch;
- Replacement of the existing cradle and slipway to accommodate the increased size of the new vessel; and
- New lighting will extend along the rear of the extended quay to the north of the existing quay.

The following activities will be undertaken during the construction phase of the Project (not in chronological order):

- Sustainable Drainage Systems (SuDS) installation;
- Noust expansion, existing winch house demolition;
- New winch house construction, winch installation and commissioning;
- Pier structure repaired;
- Breakwater extended and height increased;
- Solid quay constructed to form new linkspan berth; and
- New linkspan and supporting sub-structure installed.

Additional details in relation to the construction of the key elements are provided below.

- The linkspan will be a 'Type A' linkspan, the same as that used at various other ferry terminals operated by SIC. A 'Type A' linkspan is typically 14 m in length and 5.5 m wide at the nose.
- The cradle will be dimensioned to suit the chosen vessel (vessel max. 24 m in length and approximately 11 m in width).
- The slipway length will be confirmed based on results of the bathymetry survey carried out in June 2022 and the draught of the new vessel. It is anticipated that the existing slipway will be widened to allow use by the larger vessel, noting the general location of the noust will be unchanged.
- To upgrade the cradle and slipway, the existing cradle and associated mechanical equipment will be replaced. The extension to the slipway will be a reinforced concrete structure on top of the existing ground level to minimise excavation. The cradle will be a steel structure and will operate on steel rails that will be positioned on the slipway.
- The linkspan deck is a new structure and will be fabricated off-site. The linkspan deck will be shipped to site and installed on the newly constructed linkspan support structures alongside the breakwater once the new quay extension has been constructed.
- The dredging method will be determined from the results of the Ground Investigation and the materials that are encountered. Where sands / silts are to be dredged, an excavator will likely be used to dredge the seabed material to the required depth. If rock is to be dredged, the quality of the rock will determine whether an excavator can be used to 'rip' the rock from the seabed or if an alternative method will be used.

Figure 2. Boundary of project activities

Although traffic will be generated during the construction of the proposal at Fair Isle (the Proposed Development), it is not anticipated that the construction of the noust, quay and modification of the rock armour or the operation of the ferry will significantly increase the minimal traffic movements to, from or within Fair Isle.

The existing Fair Isle vessel, MV Good Shepherd IV, can carry 54 tonnes of cargo. The vessel can accommodate two small vehicles in fair weather conditions and one vehicle in poor weather conditions (when a car is not permitted to be carried on the open-deck).

As the vessel only makes three return crossings per week during the summer season timetable, and only one return crossing per week during the winter season timetable (and often fewer given weather conditions), vehicular traffic on the Fair Isle route is negligible. The air service is the main mode of transport for Fair Isle, with the ferry largely fulfilling a supply-chain role.

Given the limitations of the current vessel, little to no material for the Proposed Development will be shipped on the ferry. All materials are likely to be consolidated at an appropriate port or ports and shipped to Fair Isle on purpose-built vessels (e.g. barges). There will be a small workforce that will be moving backwards and forwards to accommodation at the start and end of their shifts. The potential for road traffic effects on the environment will therefore be negligible.

During the period of works, construction staff will likely travel home for long weekends on a Friday, returning to Fair Isle on a Monday morning. This will increase the pressure on aircraft seat capacity. Whilst there may be an opportunity to operate some additional off-timetable flights, the Fair Isle air service is highly constrained and thus the scope for service expansion is very limited. There are likewise significant constraints to any scaling-up of the ferry service.

As it is yet to be determined how much of the work will be carried out from sea and the likely requirements for vessel movements, a worst-case scenario has been adopted which assumes the following for marine based vessel activity:

2024:

- Vessel movement for delivery of materials/equipment/plant (maximum, on average, two vessels per week from March to September)

2025:

- One dredger (on site for 7 months)
- Vessel movement for delivery of materials/equipment/plant (maximum, on average, two vessels per week from March to September)

The volume of material to be dredged is considered to be small, with the maximum dredge volume estimated to be 3000 m^3. Assuming a layer of 0.5 m thick sediment deposit overlying the rockhead, it is currently estimated that approximately 1,280 m^3 of the dredge volume will comprise soft sediments, with approximately 1,450 m^3 being rock. It is currently anticipated that dredged material will be removed by a combination of backhoe dredger (for soft material) and excavator for rock and transported by barge to a licensed offshore disposal site (Scalloway (FI095)). While duration of dredging operations is estimated as 29 hours assuming continuous activity. Accounting for downtime, weekends and sequencing of construction of activities it may be on site for 6-7 months with intermittent operation.

Rock armour will be placed on the existing breakwater. Rock armour for the breakwater may be delivered by vessel, or could be brought by road if this is sourced from a local quarry. A crane will be used to place each individual rock for the armouring. The rock armouring activity will take place in 2024 and therefore will not coincide with dredging.

The existing noust will be expanded to accommodate the new vessel. This will be achieved using an excavator with rock hammer (peckering[2]) in 2024. Excavated material will be used for backfilling of the quayside with the remainder disposed onshore, this will be confirmed during detailed design following the ground investigation results to ensure the material is suitable for backfilling.

1.3.1 Construction programme

The construction process is expected to take place over two summer seasons due to the weather restrictions during winter months:

- North Haven Construction Phase 1 (Noust, winch house, slipway, cradle, access stairs, fencing)– March to September 2024 (approximately 7 months); and
- North Haven Construction Phase 2 (Dredging, quayside, breakwater, linkspan, relocate pontoon, rock netting) – March to September 2025 (approximately 7 months).

Construction is expected to take place Monday – Friday 7am-7pm and Saturday 7am-1pm, with no working on Sundays or Bank Holidays. By exception some construction activities may need to be undertaken outside these hours, for which agreement would be sought from SIC and Marine Scotland Licensing and Operations Team (MS-LOT).

During this period there will be a combination of construction vehicles and Light Goods Vehicles (LGVs) for construction staff.

Any additional traffic movements will likely be restricted to construction workers getting to site outside the hours stated above. The Construction workforce is likely to be approximately 8-10 workers and they are likely to car share from their accommodation so will not result in a significant amount of additional traffic on Fair Isle.

Outside of these times, works will be limited to those required in an emergency where there is the potential of harm or damage to personnel, plant, equipment or the environment, provided the Principal Contractor (yet to be appointed) retrospectively notifies SIC of such works within 24 hours of their occurrence.

1.3.2 Good practice/management measures

A range of good/standard practice and management measures will be adopted by the successful contractor to minimise the potential for environmental effects and any disruption that could be caused by the construction works. These measures are outlined in the Fair Isle Environmental Management Plan (EMP) which sets out the principles, controls and management measures that will be implemented during construction and is provided as an Appendix to the Fair Isle EIAR (Stantec, 2023). Of specific relevance to the HRA are the following :

- The site supervisor will give toolbox talks prior to work commencing. These talks will highlight any sensitive features, including the designated sites (Special Protection Area (SPA), Special Area of Conservation (SAC) and Site of Special Scientific Interest (SSSI)) and qualifying features.
- In line with good practice, the contractor will follow the updated and relevant Guidance for Pollution Prevention (GPPs) including GPP 5 (Works and maintenance in or near water). Pollution Prevention Guidance (PPGs) will be followed if no corresponding GPP is available.
- Oils, fuels and chemicals will be stored in fully bunded areas.

[2] Powerful percussion hammer fitted to an excavator for demolishing hard (rock or concrete) structures.

- Spill kits will be available on site and workers trained in their use.
- The contractor will produce a contingency plan for dealing with spills or environmental incidents.
- Any waste generated will be removed from site and either recycled or disposed of in compliance with Waste Management Regulations.
- The successful Contractor will ensure vessels and plant involved in the operational activities for the works adhere to the industry recommended guidelines for preventing the introduction of Invasive Non-Native Species (INNS).
- Prior to and during construction activities, appropriate staff will be informed of relevant marine and terrestrial INNS. These staff will also be cognisant of guidance produced by NatureScot for the prevention of introduction of non-native species (Cook *et al.*, 2014) and draft guidance on biosecurity for the Outer Islands (RSPB, 2021).
- The Contractor will produce a Ballast Water Management Plan[3] (if relevant) to prevent the risk of introducing invasive non-native species into Fair Isle.
- Prior to use, all equipment will be washed and cleaned to ensure that no contaminants are brought into contact with the marine or terrestrial environment.
- Vehicle numbers and movement on the vegetation will be kept to a minimum.
- Vessels used for the works will adhere to the general principles in the Scottish Marine Wildlife Watching Code.
- The Contractor will contact the Fair Isle warden prior to works commencing in each year and inform the warden once works have finished in each year
- The Contractor will ensure a suitably qualified EcOW is present during the construction phase in both years (2024 and 2025) to ensure compliance with the good practice and management measures outlined above
- The EcOW will be on site at all times during both years to ensure that Fulmar nests are not damaged by construction work, specifically the placement of rock armour around the breakwater. They will also monitor the impact of the works on nearby breeding birds (primarily Fulmar, but also Puffin) to establish whether there are any detectable responses of the birds to the different construction activities to inform future work in the area. The EcOW will also liaise with the FIBO warden to ensure that the Arctic Tern colony is not negatively impacted.

1.4 Overview of HRA process

Detail on the legislative context for HRA was provided in the Fair Isle HRA screening report submitted to NatureScot in November 2022 (see Appendix A).

The European Commission's guidance on Planning for the Protection of European Sites: Appropriate Assessment (European Commission, 2001) identifies a staged process to the assessment of the effects of plans or projects on European sites. Cumulatively, these stages are referred to as an HRA, in order to clearly distinguish the whole process from the second stage within it, which is referred to as AA.

There are potentially up to four stages:

- Stage 1: Screening;
- Stage 2: AA;
- Stage 3: Consideration of Alternative Solutions; and
- Stage 4: Assessment of imperative reasons of overriding public interest (IROPI).

Each stage (except the last) defines the requirement for and scope of the next. The screening report (see Appendix A), comprising HRA Stage 1, reports the identification of Likely Significant Effect (LSE).

3 http://www.imo.org/en/OurWork/Environment/BallastWaterManagement/Pages/Default.aspx

The Report to Inform Appropriate Assessment (RIAA) (this report) is integral to Stage 2 and provides MS-LOT with the necessary information to allow an AA to be carried out.

1.4.1 Screening outputs

The screening report identified the potential for LSE. The approach, methodology and conclusions of the screening are detailed in Appendix A.

Following submission of the Fair Isle screening report to NatureScot in November 2022, advice was then received in December 2022 (see Section 1.2). The advice from NatureScot (as received on 6 December 2022) stated that they were broadly content with screening report outcomes for Fair Isle but recommended that under 'Potential Effects' for the Fair Isle SPA, that disturbance / displacement by vessel movements, and INNS (the introduction of predatory mammals) were included.

Acknowledging the recommendations from NatureScot an updated summary table of the sites and features screened into the assessment as well as potential effects from the Proposed Development at Fair Isle is provided (Table 1).

Table 1. Summary of potential effects to qualifying features screened into HRA

Site	Distance from Project	Qualifying Features Screened In	Potential Effects
Fair Isle SPA	Footprint	Arctic skua (*Stercorarius parasiticus*)* Arctic tern (*Sterna paradisaea*) Fair Isle wren (*Troglodytes troglodytes fridariensis*) Fulmar (*Fulmarus glacialis*)* Gannet (*Morus bassanus*)* Great skua (*Stercorarius skua*)* Guillemot (*Uria aalge*) Kittiwake (*Rissa tridactyla*)* Puffin (*Fratercula arctica*)* Razorbill (*Alca torda*)* Shag (*Phalocrocorax aristotelis*)* Seabird assemblage	Underwater noise disturbance and displacement Airborne noise disturbance and displacement Visual disturbance and displacement Damage/Loss of supporting habitat Accidental pollution of supporting habitat Changes to prey availability Translocation of INNS (inc. predatory mammals)
Fair Isle SAC	Footprint	Vegetated sea cliffs of the Atlantic and Baltic Coasts; European dry heaths	Damage of habitat Loss of habitat Accidental spills and pollution Translocation of INNS
Sanday SAC	51 km	Harbour Seal	Disturbance at seal haul out sites Disturbance from underwater noise Physical damage from underwater noise
Mousa SAC	54 km	Harbour Seal	Disturbance at seal haul out sites Disturbance from underwater noise Physical damage from underwater noise

1.4.2 Conservation objectives

The conservation objectives (in summary) for the protected sites and qualifying features screened into the assessment are provided in Table 2. Further detail on the conservation objectives for Fair Isle SAC is provided in Appendix B.

The process followed in this RIAA has been to assess the risk of the Proposed Development (either alone or in-combination with other plans or projects) having an adverse effect on the integrity (AEOI) of the Protected Sites and associated features that have been screened in for pressures associated with the Proposed Development activities, with reference to the conservation objectives for each of the relevant features where applicable. A conclusion of no adverse effect on the integrity (nAEOI) of a protected site, (with respect to a given feature) has been made if there is no indication of significant effect on any features of a site, recognising the good practice/management and mitigation measures that would be adopted, as relevant.

1.4.3 In-combination

Under the Habitats Regulations, it is necessary to consider the in-combination effects of the Proposed Development with other plans and projects on protected sites and associated features.

It is assumed that if the Proposed Development alone is capable of a significant effect, by extension it can also be assumed that the Proposed Development in-combination with other plans and projects is capable of a significant effect.

To inform this in-combination assessment, a review of existing plans and projects was initially carried out, allowing plans or projects with the potential to significantly affect the same features as the Proposed Development to be identified.

The only project/plan in the area is the proposal to rebuild the bird observatory which is planned to take place during summer and autumn 2022/2023. It would, therefore, not overlap with the proposal construction activities for the ferry replacement and upgrade which would not begin until end of Spring 2024. Furthermore, operation of the observatory and ferry upgrade would not vary significantly from baseline operations.

Hence, while in-combination effects were initially considered, as there were no projects or plans with the potential to significantly affect the same features as the Proposed Development, no in-combination assessment was required.

Table 2: Protected Sites and features screened in to the assessment along with a summary of their conservation objectives

Site	Qualifying Interest Features	Conservation Objectives
Fair Isle SPA	▪ Arctic Sk*ua (Stercorarius parasiticus)** ▪ Arctic tern *(Sterna paradisaea)* ▪ Fair Isle wren *(Troglodytes troglodytes fridariensis)* ▪ Fulmar *(Fulmarus glacialis)** ▪ Gannet *(Morus bassanus)** ▪ Great skua *(Stercorarius skua)** ▪ Guillemot *(Uria aalge)* ▪ Kittiwake *(Rissa tridactyla)** ▪ Puffin *(Fratercula arctica)** ▪ Razorbill *(Alca torda)** ▪ Shag *(Phalocrocorax aristotelis)** Seabird assemblage *Indicates assemblage qualifier only	To avoid deterioration of the habitats of the qualifying species (listed below) or significant disturbance to the qualifying species, thus ensuring that the integrity of the site is maintained; and To ensure for the qualifying species that the following are maintained in the long term: ▪ Population of the species as a viable component of the site ▪ Distribution of the species within site ▪ Distribution and extent of habitats supporting the species ▪ Structure, function and supporting processes of habitats supporting the species ▪ No significant disturbance of the species.
Fair Isle SAC	▪ Vegetated sea cliffs of the Atlantic and Baltic Coasts, Favourable Maintained; ▪ European dry heaths, Favourable Recovered.	Overarching conservation objectives for both qualifying features of Fair Isle SAC are as follows: To ensure that the qualifying features of Fair Isle SAC are in favourable condition and make an appropriate contribution to achieving favourable conservation status. To ensure that the integrity of Fair Isle SAC is maintained by meeting objectives **a, b and c** (see below) for each qualifying feature. When carrying out appraisals of plans or projects the focus should be on maintaining site integrity, specifically by meeting the objectives outlined in **a, b and c** for each qualifying feature. If these are met, then site integrity will continue to be maintained. Temporary impacts on these objectives resulting from plans or projects can only be permitted where there is certainty that the features will be able to quickly recover.

Site	Qualifying Interest Features	Conservation Objectives
		The Conservation objectives for **Vegetated sea cliffs of the Atlantic and Baltic coasts (Vegetated Sea Cliffs)** are: **a). Maintain the extent and distribution of the vegetated sea cliffs habitat within the site.** **b). Maintain the structure, function and supporting processes of the vegetated sea cliffs habitat** **c). Maintain the distribution and viability of typical species of the vegetated sea cliffs habitat** The Conservation objectives for **European Dry Heaths** (Dry Heaths) are: **a). Maintain the extent and distribution of the dry heath habitat within the site** **b). Maintain the structure, function and supporting processes of the dry heath habitat** **c). Maintain the distribution and viability of typical species of the dry heath habitat** Further detail specific to achieving the conservation objectives of both of these features is provided in Appendix B
Sanday SAC	▪ Harbour Seal (*Phoca vitulina*) Annex I habitats are also a qualifying feature of Sanday SAC however, there is no realistic mechanism for a LSE to occur from the Proposed Development on habitat features of this site (see Appendix A)	To avoid deterioration of the habitats of the qualifying species (listed below) or significant disturbance to the qualifying species, thus ensuring that the integrity of the site is maintained and the site makes an appropriate contribution to achieving favourable conservation status for each of the qualifying features; and to ensure for the qualifying species that the following are maintained in the long term: ▪ Population of the species as a viable component of the site ▪ Distribution of the species within site ▪ Distribution and extent of habitats supporting the species ▪ Structure, function and supporting processes of habitats supporting the ▪ species ▪ No significant disturbance of the species

Site	Qualifying Interest Features	Conservation Objectives
Mousa SAC	▪ Harbour Seal (*Phoca vitulina*) Annex I habitats are also a qualifying feature of Mousa SAC however, there is no realistic mechanism for a LSE to occur from the Proposed Development on habitat features of this site (see Appendix A)	To avoid deterioration of the habitats of the qualifying species (listed below) or significant disturbance to the qualifying species, thus ensuring that the integrity of the site is maintained and the site makes an appropriate contribution to achieving favourable conservation status for each of the qualifying features; and to ensure for the qualifying species that the following are maintained in the long term: ▪ Population of the species as a viable component of the site ▪ Distribution of the species within site ▪ Distribution and extent of habitats supporting the species ▪ Structure, function and supporting processes of habitats supporting the ▪ species ▪ No significant disturbance of the species

2 Appropriate Assessment

For the purposes of this assessment, it is assumed that the good practice/management measures listed above (Section 1.3.2) would be adhered to where applicable.

The Protected Sites and relevant qualifying features, as listed in Table 2, are assessed in turn.

2.1 Fair Isle SPA

In terms of seabird colonies, Fair Isle supports significant colonies of Arctic Tern, Arctic Skua, Fulmar, Gannet, Guillemot, Great Skua, Kittiwake, Puffin, Razorbill and Shag, all of which are qualifying features of the Fair Isle SPA. All of Fair Isle and the surrounding water is designated a SPA with a total area of 561.05 ha. The marine extension was classified in September 2009 and extends approximately 2 km into the marine environment to include the seabed, water column and surface

The qualifying features of the SPA are predominantly seabirds with the exception of the Fair Isle wren (see Table 2).

Following consultation with NatureScot, the screening process for the harbour improvement works at North Haven (Appendix A) identified the following potential effects on qualifying bird features:

- Underwater noise disturbance and displacement
- Airborne noise disturbance and displacement
- Visual disturbance and displacement
- Damage/Loss of supporting habitat
- Accidental pollution of supporting habitat
- Changes to prey availability
- Translocation of INNS (inc. predatory mammals)

Given the existing operation of the ferry service, these potential effects are considered relevant to the construction phase only with the exception of 'damage/loss of supporting habitat', and 'visual disturbance and displacement' of Fulmar which are also considered relevant to the operation phase. Dependent on the location of nesting birds and their utilisation of the bay, not all the potential effects are relevant to all qualifying bird features.

The bay is sheltered, and as such is regularly visited by small numbers of migratory birds stopping temporarily to rest, and is also used by birds to shelter from poor weather. However, the bay is not heavily used by breeding birds as it is an active port and subject to reasonable levels of disturbance from people and vessels. The ferry service operates to/from North Haven Bay three times per week, with cranes regularly used to unload cargo. It is also visited by other yachts and leisure craft.

Of the qualifying seabird species, only Fulmar nest within the inner bay at North Haven. Puffin nest on the north-western edge of North Haven bay and the north end of Bu Ness, just outside the bay. There is an Artic Tern colony at Bu Ness, approximately 150 m from the Proposed Development at its nearest point. Small numbers of Arctic Tern are occasionally observed foraging within North Haven bay. Puffin, Guillemot, Black Guillemot, and Razorbill may occasionally use the outer bay for foraging and/or loafing. However, Furse, the bay to the west of North Haven, is an important loafing area for Guillemot, Black Guillemot, Razorbill, Puffin and Fulmar, with some rafts extending at times into the northernmost edge of North Haven Bay (D. Barr, FIBO, pers. comm.). However, there is very little use of the inner area of North Haven Bay, with observations generally limited to a few birds only (A. Penn, FIBO, pers. comm.).

2.1.1 Arctic Skua

Whilst Great Skua is a predator of other seabirds, Arctic Skua kleptoparasitises other species (i.e. steals fish from them). On Fair Isle, Arctic Skua nest in Johnny Arcus' Park and Ward Hill. They do not nest in or near to North Haven Bay.

Given that use of North Haven Bay by Arctic Skua is minimal and no nesting occurs within or proximal to North Haven Bay, the following potential effects are not considered further:

- Underwater noise disturbance and displacement
- Airborne noise disturbance and displacement
- Visual disturbance and displacement
- Damage/Loss of supporting habitat
- Accidental pollution of supporting habitat

Changes to prey availability

The kleptoparasitic nature of Arctic Skua means it is reliant on the feeding of other seabird species and the fish they catch. Use of the bay for foraging by auks, Arctic Tern and other seabird species is minimal. Occasional auks are seen loafing/foraging in the north edge of the outer bay (D. Barr, FIBO, pers. comm) and occasional Arctic Tern within the inner bay (A. Penn, FIBO, pers. comm).

Given that the bay is not a key foraging area for seabirds, any changes to prey availability from the construction activities, were they to occur, would have a *negligible* effect on foraging seabirds and therefore on A. Skua.

Translocation of INNS (inc. predatory mammals)

Fair Isle has always been free of rats (black and brown), presumably due to its distance from and lack of connectivity to other islands and the mainland. It has also never had feral ferret *Mustela furo*, red fox *Vulpes vulpes*, stoat *Mustela erminea* or American mink *Neovison vison*. However, it does have a small number of feral cats and domestic cats. The former is a known predator of Arctic terns nesting in the south of the island, and it is likely that storm petrel, black guillemot and puffin are also negatively impacted by cats. Fair Isle also has both field mouse *Apodemus sylvaticus* and house mouse *Mus domesticus*. Although not a separate species, it is of note that field mice on Fair Isle (and other Scottish islands) look different to those on the mainland, being much larger in size. Both field mouse and house mouse may predate seabird eggs when other food is scarce.

Detail has been provided on the good practice and management measures that will be adopted by the successful contractor (see Section 1.3.2); these include measures to prevent introduction of INNS.

In addition to these measures a Biosecurity Management Plan (BMP) has been produced (Appendix C). This outlines how the risks of introducing mammalian predators through the movement of vessels and importing of materials during construction will be minimised. The commitment to the measures outlined in the BMP will be secured through the Marine Licence conditions.

With the adoption of the good practice and management measures, and adherence to the BMP, it is concluded that any increased risk from the translocation of INNS during construction activities would have a *negligible* effect on A. Skua.

Conclusion

It is concluded that the conservation objectives for Fair Isle SPA in relation to A. Skua would be maintained, therefore no AEOI in relation to this feature will occur from the Proposed Development.

2.1.2 Great Skua

Great Skua is a predator of other seabirds and records from FIBO identify predation of Arctic Terns by Great Skua to be a key issue for the productivity of Arctic Terns at Bu Ness (Data source: FIBO 2014-2020).

Given that use of North Haven Bay by Great Skua is minimal and no nesting occurs within or proximal to North Haven Bay, the following potential effects are not considered further:

- Underwater noise disturbance and displacement
- Airborne noise disturbance and displacement
- Visual disturbance and displacement
- Damage/Loss of supporting habitat
- Accidental pollution of supporting habitat

Changes to prey availability

The predatory and kleptoparasitic nature of Great Skua means it is reliant on sustained productivity of other seabird species such as Puffins and Arctic Terns. The conclusions of the assessment in relation to these and other species is therefore relevant (see below).

There are huge numbers of breeding seabirds on Fair Isle and therefore a great availability of prey for Great Skua. The HRA has concluded no AEOI on Fair Isle SPA (see below) and the EIAR for Fair Isle (Stantec, 2023) concluded all impacts on birds to be minor adverse or insignificant. Therefore, as there is no significant impact on bird populations there would be no impact Great Skua in the long term, it is concluded that any changes to prey availability, were they to occur, from the construction activities would have a *negligible* effect on Great Skua.

Translocation of INNS (inc. predatory mammals)

The detail provided in Section 2.1.1 is equally relevant to this potential effect on Great Skua.

With the adoption of the good practice and management measures, and adherence to the BMP, it is concluded that any increased risk from the translocation of INNS during construction activities would have a *negligible* effect on Great Skua.

Conclusion

It is concluded that the conservation objectives for Fair Isle SPA in relation to Great Skua would be maintained, therefore no AEOI in relation to this feature will occur from the Proposed Development.

2.1.3 Fulmar

Both the cliffs and the stack are used by nesting Fulmars, although the fulmars do not nest on the breakwater itself. In 2022, a maximum of 40 pairs of Fulmar were estimated to be nesting on the stack (as discussed with A. Penn, FIBO). Within the rest of North Haven Bay it is estimated that there are around 100 Fulmar nests on the west side and around 50 nests on the east side. Low numbers of Fulmar loaf in the bay and may forage opportunistically.

As noted above, North Haven Bay is an active harbour with regular ferry crossings, particularly during the Fulmar breeding season (April to August). Fulmar approached directly by bird ringers rarely flush

and will instead spit foul smelling oil to ward off intruders. Due to this behavior, it is considered likely that fulmars will successfully raise chicks even in the presence of noise and visual disturbance from construction work, although it is possible that they may choose to nest elsewhere in following years.

Although numbers of Fulmar nesting on Fair Isle have declined, Fulmars remain the most abundant breeding seabird on Fair Isle. Whilst there were 43,000 pairs in 1996, by 2016 this had dropped to 32,061 pairs[4]. Monitoring of productivity plots shows that Fulmars on Fair Isle appear to be doing well compared to national trends.

Given the use of North Haven Bay by Fulmar, all potential effects are considered further:

- Underwater noise disturbance and displacement
- Airborne noise disturbance and displacement
- Visual disturbance and displacement
- Damage/Loss of supporting habitat
- Accidental pollution of supporting habitat
- Changes to prey availability
- Translocation of INNS (inc. predatory mammals)

Underwater noise disturbance and displacement

There will be no piling at North Haven. The key sources of underwater noise during construction will occur from dredging and vessel movements. An underwater noise report (ABPmer, 2023) considered the potential effects on diving seabirds from dredging and vessel movements and concluded that there was no risk of injury or significant disturbance to diving birds from these activities.

Fulmar are surface feeders and thus spend only very short amounts of time underwater relative to diving birds such as auks and Gannet. Furthermore, Fulmar are not considered to use the bay for foraging other than occasionally.

It is concluded that any effects from underwater noise disturbance and displacement on Fulmar will be *negligible*.

Airborne noise disturbance and displacement

During spring and summer, the area is frequented by yachts with a number of moorings available in the bay. The existing ferry service runs regularly during the spring and summer, providing transport between Fair Isle and Shetland (Grutness). The gap between the breakwater/stack and the adjacent side of the bay is narrow, with vessels passing close by the stack. The nearby ferry terminal, quay and access road are all regularly used in the spring and summer.

Given that the bay currently experiences a degree of vessel, vehicle and people activity, particularly during the spring and summer months, it is considered that the birds which breed in the bay and on the stack are habituated to some level of disturbance (noise, visual and light).

Over the duration of the construction phase a number of activities will generate airborne noise such as construction of the new quay and linkspan, repairs to the existing pier and enhancement of the breakwater. These activities will take place close to the stack and therefore to nesting Fulmar. However, the loudest noise source and therefore activity with the greatest potential for disturbance of Fulmar

4 Fair Isle Bird Observatory & Guesthouse

within the bay is the rock excavation of the noust (peckering). This activity is planned to occur in 2024 only, and has potential to overlap with the Fulmar breeding season during this year.

Research suggests that irregular construction noise at levels typically above 70 dB can cause behavioural responses in some waterbird species with flight responses generally occurring above 80 dB (Xodus, 2012; Wright *et al.*, 2013; IECS, 2013). Airborne noise modelling (Stantec, 2023) has assumed 128 dB Lmax Sound Power Level (SWL) will be generated by the peckering activity. This will result in a sound level of 74.9 dB Lmax at the Fulmar nests nearest to the noise source (~40 AON). This sound level reduces to 72.7 dB Lmax at the Fulmar nests (~100 AON) on the opposite (west) side of the bay and 66.8 dB Lmax at the Fulmar nests furthest from the source, on the cliff north east of the stack (~50 AON). These sound values represent the nearest point location from each of Fulmar nesting areas, when in reality the nests are not all found in one discrete location but spread out along the cliffs and thus further from the point source.

Once nesting sites are established, Fulmar are less likely to be displaced; however, displacement could still occur. Discussions with NatureScot (Juan Brown, pers. comm) have confirmed that starting construction activities before the key breeding season (15 April) would be preferable. This would minimise the likelihood of nesting birds being displaced, as Fulmar returning to breed would be choosing to nest within the bay despite the ongoing construction activities. However, it is also noted that there are sufficient nesting locations elsewhere on Fair Isle to support all Fulmars that nest within the bay.

As a worst case it has been assumed that all Fulmar nesting within the bay which could experience noise levels above 70 dB could be displaced (140 pairs) amounting to 0.43% of the breeding population (32,061 pairs) of the SPA. Yet given the nature of Fulmar to be relatively less sensitive to disturbance, the baseline activities of the bay and the spread-out nature of the nests, a displacement of 140 pairs is likely to be unrealistic. Furthermore, this assumes that all 140 pairs would be unsuccessful in the breeding season. As described above, in the mid 90's there were approximately 45,000 nesting pairs on Fair Isle, indicating there are >10,000 empty nesting sites available for Fulmar.

The potential for displacement effects is a temporary effect occurring over a single breeding season.

Given the above it is concluded that any effects from airborne noise disturbance and displacement on Fulmar would not affect the conservation objectives of the Fair Isle SPA.

Visual disturbance and displacement

It has already been noted that the bay regularly experiences a degree of vessel, vehicle and people activity, particularly during the spring and summer months, and thus the birds which breed in the bay and on the stack are habituated to some level of disturbance (noise, visual and light) and human activity (Douglas Barr, FIBO, *pers. comm.*).

As noted, Fulmar are relatively insensitive to visual disturbance as even when approached directly by bird ringers they rarely flush and will instead spit foul smelling oil as a defence mechanism.

In spring 2023, observations from the GI works, carried out at North Haven to inform detailed design of the Proposed Development, noted that Fulmar on the stack and cliffs did not respond to the presence of either the personnel or drilling equipment.

The construction activities (construction of the new quay and linkspan; enhancement of breakwater) will be directly adjacent to the nesting locations on the stack (~40 AON). However, Fulmar are highly site

faithful and may nest on the stack regardless of the construction work occurring next to the nesting location.

Similarly, as the proposed quay extension will abut the stack, the Fulmar will no longer be isolated during the operation phase and instead be adjacent to an area routinely used by people and vessels. It is thus unavoidable that people will be brought into close proximity to the Fulmars nesting area. As part of the design, the quay will be fenced to ensure that the public are physically separated from the Fulmars to maintain a safe environment for any pairs that continue to nest on the stack, understanding that this species is highly site faithful and acknowledging that some birds are likely to continue nesting even in adverse conditions. The design of the fence will be agreed with NatureScot to ensure that visual impacts are minimized, but that the fence completely restricts access onto the stack from the quay extension.

As a worst case it has been assumed that all Fulmar nesting on the stack (~40 AON) could be displaced, resulting in 0.12% of the SPA population being affected. Yet given the nature of Fulmar to be relatively less sensitive to disturbance, the baseline activities of the bay and the spread-out nature of the nests on the stack, a displacement of 40 pairs is likely to be unrealistic in the short-term. Furthermore, this assumes that all 40 pairs would be unsuccessful in the breeding season. As described above, in the mid 90's there were approximately 45,000 nesting pairs on Fair Isle, indicating there are >10,000 empty nesting sites available for Fulmar.

Given the above it is concluded that any effects from visual disturbance and displacement on Fulmar (in the construction or operation phases) would not affect the conservation objectives of the Fair Isle SPA.

To further minimise the risk of visual disturbance and displacement:

- During the breeding season, a suitably qualified EcOW will monitor all nesting locations around the stack and ensure contractors are made aware of sensitivities
- When work is not required adjacent to nesting locations a buffer zone will be established in discussion with the EcOW to minimise unintentional disturbance

Damage/Loss of supporting habitat

The SPA covers an area of ~6825 ha, most of which is marine. The Proposed Development will result in a permanent loss of 0.24 ha of subtidal, 0.04 ha of intertidal and a temporary loss of 0.20 ha of subtidal, representing 0.007% of the SPA being lost (0.0035 %) or damaged (0.0035 %). Functional value of the inner bay, and these affected areas, is considered to be very low for Fulmar. Key supporting (foraging) habitat is beyond the bay and thus the footprint of the Proposed Development. This would remain unaffected by the Proposed Development.

Given the above, any loss or damage to foraging habitat from the Proposed Development would have a *negligible* effect on key supporting (foraging) habitat for Fulmar.

Key supporting (nesting) habitat for Fulmar is present on the stack, which supports up to 40 AON. The project design has evolved to minimise loss of stack by placing the linkspan around it; however, as a worst-case, habitat supporting nesting locations could be lost (0.01 ha) for up to 7 pairs of Fulmar. This is based on the distribution and number of nests seen in 2022. This would be a permanent effect taking place in the second year of construction (2025).

As a worst case it has been assumed that habitat to support 7 nesting locations would be lost from the stack resulting in 0.02% of the SPA population being affected. This assumes that all 7 pairs would be unsuccessful in the breeding season and not utilise other nesting locations. It also assumes that an additional 7 nesting locations are not available on the stack itself. As described above, in the mid 90's

there were approximately 45,000 nesting pairs on Fair Isle, indicating there are >10,000 empty nesting sites available for Fulmar, therefore allowing these 7 nesting locations to be supported elsewhere within the SPA. Loss of 0.01 ha nesting habitat along with the subtidal and intertidal foraging areas lost (0.28 ha) and damaged (0.20 ha) results in a total of 0.49 ha. This value equates to 0.007% of the SPA.

Coastal process modelling was carried out to inform the degree of any changes resulting from the Proposed Development (Mott MacDonald, 2023a and b). Following the results of this modelling, the Fair Isle EIAR (Stantec, 2023) concluded that any changes to coastal processes would be *negligible* and therefore have a *negligible* indirect impact on supporting habitat for Fulmar.

Given all the above it is concluded that any effects from damage/loss of key supporting (nesting) habitat in relation to Fulmar would not affect the conservation objectives of the Fair Isle SPA, specifically the distribution and extent of habitats supporting Fulmar in the long term. Consideration is given to the relatively small loss of low value potential foraging habitat and high value nesting habitat. However, considering this loss against the large availability of high value foraging habitat and high value nesting habitat (>10,000 nesting sites available) it is concluded that overall supporting role of the habitats available for Fulmar would be maintained.

The potential for unintentional damage to Fulmar nesting habitat (on the stack) will be further minimised through the application of the following:

- Pre-construction surveys to identify nesting sites
- During the breeding season, a suitably qualified EcOW will monitor all nesting locations around the stack and ensure contractors are made aware of sensitivities
- Presence of suitably qualified EcOW throughout the breeding season to ensure that direct damage to nests will be avoided (beyond those nests permanently loss under the footprint of the linkspan (see above))
- When work is not required adjacent to nesting locations a buffer zone will be established in discussion with the EcOW to minimise unintentional damage
- Breakwater (BW) armouring blocks will be placed one by one using a crane in the presence of EcOW ensuring there is no possibility of a nest being physically impacted.

Accidental pollution of supporting habitat

Fulmar are not considered to actively forage in the bay itself other than infrequently and in very low numbers. Fulmar do loaf in the bay.

Adherence to the good practice and management measures as set out in Section 1.3.2 will minimise risk of accidental pollution occurring during the construction phase. During operation of the ferry, pollution controls (e.g. ballast water guidelines) would be adopted and applied in the same manner as for the existing ferry service.

Presence of an EcOW throughout the construction phases will ensure compliance with the relevant pollution prevention measures (see Section 1.3.2).

It is concluded that the potential for accidental pollution of supporting habitat would have a *negligible* effect on Fulmar.

Changes to prey availability

Fulmar feed on sand eels, other fish, crustaceans and jellyfish. Fulmar are not considered to actively forage in the bay itself other than infrequently and in very low numbers.

Given the low utilisation of the bay for foraging and the extensive foraging grounds near the bay which are used by Fulmar and other seabirds it is concluded that the potential effect of changes to prey availability would have a negligible effect on Fulmar.

Translocation of INNS (inc. predatory mammals)

Ground nesting Fulmar, such as those on the stack, are vulnerable to mammalian predators such as cats. Rats are not found on Fair Isle, nor are foxes, stoats or mink.

The detail provided in Section 2.1.1 is equally relevant to this potential effect on Fulmar.

With the adoption of the good practice and management measures, and adherence to the BMP, it is concluded that any increased risk from the translocation of INNS during construction activities would have a negligible effect on Fulmar.

Conclusion

It is concluded that the conservation objectives for Fair Isle SPA in relation to Fulmar would be maintained, therefore no AEOI in relation to this feature will occur from the Proposed Development.

2.1.4 Arctic Tern

Arctic Tern started breeding on Fair Isle in the 1980s and their numbers fluctuate greatly between years. Arctic Terns were badly impacted by the sandeel failures during the noughties, with the number of breeding pairs falling from 2,836 pairs in 2001 to just 248 AON in 2020 (in 2008 no Arctic Terns nested at all). Since Arctic terns are ground-nesting, creating shallow scrapes on bare ground, they are highly vulnerable to predation both from feral cats and from other avian species such as gulls and skuas. Most pairs (70-99%) nest at Bu Ness, which is ~150 m away from the pier, although small colonies also occur intermittently at Busta, Rippack and South Light. Productivity is very variable between years, with total failure in years of poor prey availability (Data source: FIBO 2014-2020). Low numbers of Arctic Tern are occasionally observed foraging in North Haven Bay.

The colony at Bu Ness is located over a hill from North Haven Bay. The hill will provide shielding from the works in the bay, both visually and in terms of noise attenuation.

Given the use of North Haven Bay by Arctic Tern, all potential effects are considered further:

- Underwater noise disturbance and displacement
- Airborne noise disturbance and displacement
- Visual disturbance and displacement
- Damage/Loss of supporting habitat
- Accidental pollution of supporting habitat
- Changes to prey availability
- Translocation of INNS (inc. predatory mammals)

Underwater noise disturbance and displacement

There will be no piling at North Haven. The key sources of underwater noise during construction will occur from dredging and vessel movements. An underwater noise report (ABPmer, 2023) considered the potential effects on diving seabirds from dredging and vessel movements and concluded that there was no risk of injury or significant disturbance to diving birds from these activities.

Arctic Tern are surface feeders and thus spend only very short amounts of time underwater relative to diving birds such as auks and Gannet.

It is concluded that any effects from underwater noise disturbance and displacement on Arctic Tern will be *negligible*.

Airborne noise disturbance and displacement

As described under this potential effect in Section 2.1.3, the bay is regularly used, especially during the breeding season. Thus, birds will be habituated to some level of disturbance (noise, visual and light) and human activity.

Over the duration of the construction phase a number of activities will generate airborne noise such as construction of the new quay and linkspan, repairs to the existing pier and enhancement of the breakwater. However, the loudest noise source and therefore the activity with the greatest potential for disturbance of Arctic Tern is the rock excavation of the noust (peckering). This activity is planned to occur in 2024 only, and therefore has potential to overlap with the Arctic Tern breeding season during this year.

As a colonial nesting species there is the potential for total colony abandonment if birds are disturbed. Research suggests that irregular construction noise at levels typically above 70 dB can cause behavioural responses in some waterbird species with flight responses generally occurring above 80 dB (e.g. Xodus, 2012; Wright *et al*., 2013; IECS, 2013). Airborne noise modelling (Stantec, 2023) has assumed 128 dB Lmax Sound Power Level (SWL) will be generated by the peckering activity. This will result in a sound level of 47.6 dB Lmax at the colony nearest to the noise source. These sound values represent the nearest point location from the colony to the peckering activity.

Arctic Tern may be displaced from foraging in the bay during construction activities; however, the bay is not a key foraging area, with observations generally limited to a few birds only (A. Penn, FIBO, pers. comm.). Given the low level of noise that the colony would experience, the temporary nature of the peckering activity and the low number of individuals which may be displaced from the bay during working hours, it is concluded that any effects from airborne noise disturbance and displacement on the Arctic Tern colony will be *negligible*.

To make sure disturbance is minimised a suitably qualified EcOW will:

- Ensure compliance with the working hours (see Section 1.3.1) – thus providing a minimum of 12 hrs of no construction activity in each 24 hr period
- Ensure construction workers are aware of the Arctic Tern colony sensitivities (see Section 1.3.2)
- Ensure personnel do not go beyond the construction site boundary and do not approach the colony
- Liaise with the warden to ensure colony is not affected

Visual disturbance and displacement

As previously noted, the bay regularly experiences a degree of vessel, vehicle and people activity, particularly during the spring and summer months, and thus Arctic Tern which use the bay will be habituated to some level of disturbance (noise, visual and light) and human activity.

The nesting colony at Bu Ness is shielded from the bay and therefore the construction activities will not be visible. There is no requirement for construction workers to approach the colony.

Given that the hill will shield construction activities from the Arctic Tern colony, the temporary nature of the construction activities (12 hrs within each 24 hr period) and the low number of individuals which may be displaced from the bay during working hours, it is concluded that any effects from visual disturbance and displacement on the Arctic Tern colony will be *negligible*.

To make sure disturbance is minimised a suitably qualified EcOW will:

- Ensure compliance with the working hours (see Section 1.3.1) – thus providing a minimum of 12 hrs of no construction activity in each 24 hr period
- ensure construction workers are aware of the Arctic Tern colony sensitivities (see Section 1.3.2)
- Ensure personnel do not go beyond the construction site boundary and do not approach the colony
- Liaise with the warden to ensure colony is not affected

Damage/Loss of supporting habitat

Several fish species that have spawning grounds within 3 km of Fair Isle, such as sandeel, herring, sprat and whiting (Coull *et al.,* 1998; Ellis *et al.,* 2012), are likely to be suitable prey for Arctic terns. Arctic terns take relatively small fish, which are likely to be transported by larval drift. Therefore, their occurrence within North Haven Bay is likely to be spatially and temporally patchy. Since only a small number of individuals are ever observed foraging within the bay, it is assumed that although prey may be present at times, it is not abundant. Arctic tern adults may also self-feed, taking small crustaceans and invertebrates, although they always provision chicks with fish, as it is of higher nutritional value.

The SPA covers an area of ~6825 ha, most of which is marine. The Proposed Development will result in a permanent loss of 0.24 ha of subtidal, 0.04 ha of intertidal and a temporary loss of 0.20 ha of subtidal, representing 0.007% of the SPA being lost (0.0035 %) or damaged (0.0035 %). Functional value of the inner bay, and these affected areas, is considered to be low for Arctic Terns. Key supporting (foraging) habitat is beyond the bay and thus the footprint of the Proposed Development. This would remain unaffected by the Proposed Development.

Coastal process modelling was carried out to inform the degree of any changes resulting from the Proposed Development (Mott MacDonald, 2023a and 2023b). Following the results of this modelling, the Fair Isle EIAR (Stantec, 2023) concluded that any changes to coastal processes would be *negligible* and therefore have a *negligible* indirect impact on supporting habitat for Arctic Tern.

Given all the above, any loss or damage to foraging habitat from the Proposed Development would have a *negligible* effect on key supporting (foraging) habitat for Arctic Tern. It is concluded that any effects from damage/loss of supporting habitat in relation to Arctic Tern would not affect the conservation objectives of the Fair Isle SPA, specifically the distribution and extent of habitats supporting Arctic Tern in the long term.

Accidental pollution of supporting habitat

Low numbers of Arctic Tern occasionally forage in the bay.

Adherence to the good practice and management measures as set out in Section 1.3.2 will minimise risk of accidental pollution occurring during the construction phase. During operation of the ferry, pollution controls (e.g. ballast water guidelines) would be adopted and applied in the same manner as for the existing ferry service.

Presence of an EcOW throughout the construction phases will ensure compliance with the relevant pollution prevention measures (see Section 1.3.2).

It is concluded that the potential for accidental pollution of supporting habitat would have a *negligible* effect on Arctic Tern.

Changes to prey availability

Arctic Tern feed on small fish such as sand eels, herring and sprat. Low numbers of Arctic Tern do occasionally forage in the bay.

Given the low utilisation of the bay for foraging and the extensive foraging grounds near the bay which are used by A, Tern and other seabirds it is concluded that the potential effect of changes to prey availability would have a *negligible* effect on Arctic Tern.

Translocation of INNS (inc. predatory mammals)

Ground nesting species such as Arctic Tern are particularly vulnerable to mammalian predators such as cats. Rats are not found on Fair Isle, nor are foxes, stoats or mink.

The detail provided in Section 2.1.1 for this potential effect is equally relevant to Arctic Tern.

With the adoption of the good practice and management measures, and adherence to the BMP, it is concluded that any increased risk from the translocation of INNS during construction activities would have a *negligible* effect on Arctic Tern.

Conclusion

It is concluded that the conservation objectives for Fair Isle SPA (see Table 2) in relation to Arctic Tern would be maintained, therefore no AEOI in relation to this feature will occur from the Proposed Development.

2.1.5 Fair Isle Wren

The Fair Isle wren is only found on Fair Isle, and is a subspecies of the Eurasian/winter wren *Troglodytes troglodytes* commonly found across the UK. The Standard Data Form for the Fair Isle SPA records a population of 33 calling males on the island. According to the Fair Isle Bird Observatory website[5]; the population is surveyed by counts of territorial males, and between 1950 and 2010 numbers have varied from a peak of 52 in 1964 to a low of just 10 in 1981. Between 2011 and 2017, the population has increased slightly and averaged 39 singing males.

According to the Fair Isle Bird Observatory website the breeding territories of Fair Isle wren's are almost entirely confined to the island's cliffs, nesting down steep cliffs and inaccessible gullies. Very few nest inland. However, desk study records show that a territory is regularly present at North Haven where the harbour is located. Historical data and consultation with local specialists suggest the nest location moves, but is often within the harbour behind a gabion wall, or on the noust itself.

Given Fair Isle Wren is a terrestrial species which does not forage underwater as several other Fair Isle SPA species do, the following potential effects are not considered further:

- Underwater noise disturbance and displacement

5 www.fairislebirdobs.co.uk (accessed 19/05/2023)

Disturbance and displacement

Nesting Fair Isle wrens potentially present within or adjacent to the Site could also be subject to disturbance and displacement through construction noise or visual stimuli. Given the choice of these birds to nest within an active harbour it is likely they are habituated to existing background levels of noise and visual disturbance associated with harbour activities and the movement of the boat in an out of the noust. However, given the elevated levels of noise and visual disturbance during construction, there remains a residual risk that construction activities could disturb the birds to a point where they abandon their nest, resulting in a failed nesting attempt.

Given the extreme environmental weather on Fair Isle, construction work will need to be undertaken during the period March – October, which conflicts with the typical nesting period of wrens typically April – July. It is hoped that construction within the noust will commence in March before breeding commenced, and as such this may encourage birds to nest outside the Site. However, this cannot be guaranteed. If a nest was disturbed to the extent that they abandoned the nest, the birds are likely to nest again in a different location, or certainly during the subsequent year. As such this potential effect would be short-term and temporary.

However, given the small population of Fair Isle wrens which nest within the SPA (approximately 33 pairs), potential effect to the Fair Isle SPA through construction disturbance of nesting adults resulting in nest abandonment, could result in a significant effect. As such further mitigation is set out below.

Damage/Loss of supporting habitat

Fair Isle wren are known to nest behind gabion wall at the harbour, and within the noust itself. Therefore construction activities, particularly the expansion of the noust, could result in damage or destruction of an active Fair Isle wren nest within the Site, if present at that time.

Given the extreme weather on Fair Isle, construction work will need to be undertaken during the period March – October, which conflicts with the typical nesting period of wrens typically April – July. It is hoped that construction within the noust will commence in March before breeding commenced, and as such this may encourage birds to nest outside the Site. However, this cannot be guaranteed. If a nest was damaged or destroyed, the birds are likely to nest again in a different location, or certainly during the subsequent year. As such this potential effect would be short-term and temporary.

However, given the small population of Fair Isle wrens which nest within the SPA (approximately 33 pairs), potential effects to the Fair Isle SPA through damaged or loss of a nest, could result in a significant effect. As such further mitigation is set out below.

Accidental pollution of supporting habitat

Fair Isle wren will forage along the vegetated sea cliffs, and the foreshore among seaweed. Adherence to the good practice and management measures as set out in Section 1.3.2 will minimise risk of accidental pollution occurring during the construction phase. Presence of an EcOW throughout the construction phases will ensure compliance with the relevant pollution prevention measures (see Section 1.3.2).

Changes to prey availability

Fair Isle wrens nesting at North Haven will forage along the vegetated sea cliffs around the bay, and the foreshore among seaweed. They will feed on small invertebrates including sandhoppers and other crustaceans, and the larvae of flies.

Whilst sea cliff habitat within the noust will be unavailable for foraging during construction, extensive areas of suitable foraging habitat will remain within North Haven including vegetated sea cliffs, and the foreshore outside the Site which will not be affected by the Project. As such effects from changes to prey availability will not be significant.

Translocation of INNS (inc. predatory mammals)

Nesting Fair Isle wren could be vulnerable to mammalian predators such as cats or other mammals. Rats are not found on Fair Isle, nor are foxes, stoats or mink.

Detail has been provided on the good practice and management measures that will be adopted by the successful contractor (see Section 1.3.2); these include measures to prevent introduction of INNS.

In addition to these measures a Biosecurity Management Plan (BMP) has been produced (Appendix C). This outlines how the risks of introducing mammalian predators through the movement of vessels and importing of materials during construction will be minimised. The commitment to the measures outlined in the BMP will be secured through the Marine Licence conditions.

With the adoption of the good practice and management measures, and adherence to the BMP, it is concluded that translocation of INNS during construction activities would be avoided.

Mitigation

Measures to protect Fair Isle wren (along with other breeding birds) during the construction phase will be set out within a Construction Bird Mitigation Plan. This will be secured through planning condition in agreement with consultees including NatureScot and SIC. Measures set out within the Construction Bird Mitigation Plan will include details of:

- All bird species likely to be found on site and their legal status
- Construction activities which could affect birds
- Pre-construction bird surveys to identify presence of Fair Isle wren nests within and adjacent to the site
- Protection of Fair Isle wren nest sites during construction, including the establishment of exclusion zones where required
- Ongoing monitoring of active Fair Isle wren nest sites within and adjacent to the Site and actions to be taken to avoid damage or destruction of nests, or unlawful disturbance

Conclusion

A number of potential construction effects to Fair Isle wren have been identified. Further mitigation measures set out above will ensure potential construction effects to Fair Isle wren are avoided. Following implementation of this mitigation there would be no adverse effect on integrity of the Fair Isle SPA.

2.1.6 Puffin

Fair Isle supports substantial Puffin colonies. Like many other species, Puffins have declined due to sandeel failures; however, unlike Arctic Tern, Kittiwake and Razorbill, young have been fledged in all years. Puffin numbers were at their highest in the late 1990s at around 23,000, falling to between 5,000-

10,000 following sandeel failures. However, a count of around 17,500 in 2020[6.] is encouraging. Monitoring of Puffin prey also shows that the mean mass of fish samples has improved (FIBO 2018).

Puffins nest on the north-western edge of North Haven Bay, where there are around 30-40 AOB. They also nest on the north end of Bu Ness, just outside of the bay. There are 50-100 AOB in this area (A. Penn, FIBO, *pers. comm.*). Nearby, Puffins also nest in South Haven Bay and Furse. Individuals may be sighted on occasion within the bay.

Given the use of North Haven Bay by Puffin, all potential effects identified during screening (Table 1) are considered further:

- Underwater noise disturbance and displacement
- Airborne noise disturbance and displacement
- Visual disturbance and displacement
- Damage/Loss of supporting habitat
- Accidental pollution of supporting habitat
- Changes to prey availability
- Translocation of INNS (inc. predatory mammals)

Underwater noise disturbance and displacement

There will be no piling at North Haven. The key sources of underwater noise during construction will occur from dredging and vessel movements. An underwater noise report (ABPmer, 2023) considered the potential effects on diving seabirds from dredging and vessel movements and concluded that there was no risk of injury or significant disturbance to diving birds from these activities.

It is concluded that any effects from underwater noise disturbance and displacement on Puffin will be *negligible*.

Airborne noise disturbance and displacement

As described under this potential effect in Section 2.1.3, the bay is regularly used, especially during the breeding season. Thus, birds will be habituated to some level of disturbance (noise, visual and light) and human activity.

Over the duration of the construction phase a number of activities will generate airborne noise such as construction of the new quay and linkspan, repairs to the existing pier and enhancement of the breakwater. However, the loudest noise source and therefore the activity with the greatest potential for disturbance of birds is the rock excavation of the noust (peckering). This activity is planned to occur in 2024 only, and therefore has potential to overlap with the seabird breeding season during this year.

Research suggests that irregular construction noise at levels typically above 70 dB can cause behavioural responses in some waterbird species with flight responses generally occurring above 80 dB (Xodus, 2012; Wright *et al.*, 2013; IECS, 2013). Airborne noise modelling (Stantec, 2023) has assumed 128 dB Lmax Sound Power Level (SWL) will be generated by the peckering activity. This will result in a sound level of 71-71.6 dB Lmax at the Puffin burrows nearest to the noise source. However, many of the burrows are located between the position utilised for the modelling exercise (Stantec, 2023) and the mouth of the bay. Therefore, it is anticipated that far fewer than 40 Puffin nests would actually receive >70 dB. It is also possible that, since Puffins nests in burrows, the noise levels received within the burrow could be less than the 70 dB behavioural impact threshold.

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As a worst case, if a maximum of 40 AOB are negatively affected by construction noise, this would represent 0.46% of the SPA population of 17,500 birds. This assumes that all 40 pairs would be unsuccessful in the breeding season. As described above, in the mid 90's there were approximately 23,000 nesting pairs on Fair Isle, indicating there are >5,000 empty nesting sites available for Puffin should they be displaced from North Haven.

Disturbance from the peckering operation would be temporary in nature, being limited to the duration of the works. Construction activities would be carried out for 12 hrs only within each 24 hr period.

Given the above it is concluded that any effects from airborne noise disturbance and displacement on Puffin would not affect the conservation objectives of the Fair Isle SPA.

To further minimise airborne noise disturbance a suitably qualified EcOW will:

- Ensure compliance with the working hours (see Section 1.3.1) – thus providing a minimum of 12 hr of no construction activity in each 24 hr period
- Liaise with the warden to ensure the Puffin are not affected

Visual disturbance and displacement

As previously noted, the bay regularly experiences a degree of vessel, vehicle and people activity, particularly during the spring and summer months, and thus Puffin which use the bay for nesting will be habituated to some level of disturbance (noise, visual and light) and human activity.

Loafing auks tend to be found in the next bay to the west, Furse, with rafts sometimes extending across the mouth of the North Haven Bay. Individual Puffin are infrequently seen loafing in the bay.

Dredging operations may last up to 6-7 months but will be highly localised with construction activities only lasting 12 hrs in each 24 hr period. The potential for visual disturbance effects would be temporary and coincide with each of the construction periods in 2024 and 2025.

Given all the above it is concluded that any effects from visual disturbance and displacement on Puffin will be *negligible*.

To make sure disturbance is minimised a suitably qualified EcOW will:

- Ensure compliance with the working hours (see Section 1.3.1) – thus providing a minimum of 12 hr of no construction activity in each 24 hr period
- Ensure personnel do not approach the Puffin burrows
- Liaise with the warden to ensure colony is not affected

Damage/Loss of supporting habitat

The detail provided in Section 2.1.4 for this potential effect is equally relevant to Puffin, noting that key supporting (foraging) habitat is beyond the bay and thus the footprint of the Proposed Development. This would remain unaffected by the Proposed Development.

Therefore, any loss or damage to foraging habitat from the Proposed Development would have a *negligible* effect on key supporting (foraging) habitat for Puffin. It is concluded that any effects from damage/loss of supporting habitat in relation to Puffin would not affect the conservation objectives of the Fair Isle SPA, specifically the distribution and extent of habitats supporting Puffin in the long term.

Accidental pollution of supporting habitat

Low numbers of Puffin occasionally loaf in the bay.

Adherence to the good practice and management measures as set out in Section 1.3.2 will minimise risk of accidental pollution occurring during the construction phase. During operation of the ferry, pollution controls (e.g. ballast water guidelines) would be adopted and applied in the same manner as for the existing ferry service.

Presence of an EcOW throughout the construction phases will ensure compliance with the relevant pollution prevention measures (see Section 1.3.2).

It is concluded that the potential for accidental pollution of supporting habitat would have a *negligible* effect on Puffin.

Changes to prey availability

Puffin feed on small fish such as sand eels, herring and sprat.

Given the low utilisation of the bay for foraging and the extensive foraging grounds near the bay which are used by Puffin and other seabirds it is concluded that the potential effect of changes to prey availability would have a *negligible* effect on Puffin.

Translocation of INNS (inc. predatory mammals)

Ground nesting species such as Puffin are particularly vulnerable to mammalian predators such as cats. Rats are not found on Fair Isle, nor are foxes, stoats or mink.

The detail provided in Section 2.1.1 for this potential effect is equally relevant to Puffin.

With the adoption of the good practice and management measures, and adherence to the BMP, it is concluded that any increased risk from the translocation of INNS during construction activities would have a *negligible* effect on Puffin.

Conclusion

It is concluded that the conservation objectives for Fair Isle SPA (see Table 2) in relation to Puffin would be maintained, therefore no AEOI in relation to this feature will occur from the Proposed Development.

2.1.7 Guillemot

There are no Guillemots nesting either within or close to North Haven Bay (A. Penn, FIBO, pers. comm.), although they do nest in South Haven Bay (392 AON in 2015). Furse (the bay to the west of North Haven) is an important loafing area for Guillemot, Black Guillemot, Razorbill, Puffin and Fulmar, with some rafts extending at times into the northernmost edge of North Haven Bay (D. Barr, FIBO, pers. comm.). However, there is very little use of the inner area of North Haven Bay, with observations generally limited to a few birds only (A. Penn, FIBO, pers. comm.).

Given that use of North Haven Bay by Guillemot is minimal and no nesting occurs within or proximal to North Haven Bay, the following potential effects are not considered further:

- Underwater noise disturbance and displacement
- Airborne noise disturbance and displacement
- Visual disturbance and displacement
- Damage/Loss of supporting habitat
- Accidental pollution of supporting habitat
- Changes to prey availability

Translocation of INNS (inc. predatory mammals)

Guillemot tend to nest on cliffs and are therefore less vulnerable to mammalian predators than some seabird species.

The detail provided in Section 2.1.1 for this potential effect is equally relevant to Guillemot.

With the adoption of the good practice and management measures, and adherence to the BMP, it is concluded that any increased risk from the translocation of INNS during construction activities would have a *negligible* effect on Guillemot.

Conclusion

It is concluded that the conservation objectives for Fair Isle SPA (see Table 2) in relation to Guillemot would be maintained, therefore no AEOI in relation to this feature will occur from the Proposed Development.

2.1.8 Razorbill

Razorbills do not nest within North Haven bay, although they nest in sheltered sea caves on the eastern side of Bu Ness. The nearest being ~400 m from the Proposed Development.

Given that use of North Haven Bay by Razorbill is minimal, and the nearest nests are in sea caves around the Bu Ness headland, the following potential effects are not considered further:

- Underwater noise disturbance and displacement
- Visual disturbance and displacement
- Damage/Loss of supporting habitat
- Accidental pollution of supporting habitat
- Changes to prey availability

Airborne noise disturbance and displacement

At ~400 m from the peckering activity (the noisiest activity), the nearest Razorbill nests would receive 41.2 dB Lmax (Stantec, 2023). This value is way below the potential behavioural disturbance threshold of 70 dB Lmax (see Section 2.1.6).

Given the low level of noise that the Razorbill would experience it is concluded that any effects from airborne noise disturbance and displacement will be *negligible*.

Translocation of INNS (inc. predatory mammals)

Razorbill tend to nest at the base of cliffs (e.g. within sea caves) and are potentially vulnerable to mammalian predators.

The detail provided in Section 2.1.1 for this potential effect remains relevant to Razorbill.

With the adoption of the good practice and management measures, and adherence to the BMP, it is concluded that any increased risk from the translocation of INNS during construction activities would have a *negligible* effect on Razorbill.

Conclusion

It is concluded that the conservation objectives for Fair Isle SPA (see Table 2) in relation to Razorbill would be maintained, therefore no AEOI in relation to this feature will occur from the Proposed Development.

2.1.9 Gannet

Gannets are a relatively recent colonist, with birds first breeding on Fair Isle in 1975, and steadily increasing to 4,683 AON in 2020 (FIBO 2020). Unlike many other seabird species, gannet has not obviously been impacted by the large scale sandeel failures, probably because they are able to take larger fish such as mackerel and because they have a competitive advantage over smaller seabird species due to their ability to dive deeper and forage further afield. There are several gannetries around Fair Isle's cliffs, including Sheep Rock in the south and several along the north-west coastline between Yellow Head and Lerness (including offshore stacks). Although gannet numbers have previously been increasing steadily, it is likely that numbers will be reduced following the avian influenza outbreak during the 2022 breeding season, although further monitoring will be needed to establish the scale of loss.

There are no breeding Gannet near to the development nor do Gannet use the bay. Hence, the following potential effects are not considered further:

- Underwater noise disturbance and displacement
- Airborne noise disturbance and displacement
- Visual disturbance and displacement
- Damage/Loss of supporting habitat
- Accidental pollution of supporting habitat
- Changes to prey availability

Translocation of INNS (inc. predatory mammals)

The detail provided in Section 2.1.1 for this potential effect remains relevant to Gannet.

With the adoption of the good practice and management measures, and adherence to the BMP, it is concluded that any increased risk from the translocation of INNS during construction activities would have a *negligible* effect on Gannet.

Conclusion

It is concluded that the conservation objectives for Fair Isle SPA in relation to Gannet would be maintained, therefore no AEOI in relation to this feature will occur from the Proposed Development.

2.1.10 Kittiwake

Of the gull species, Kittiwake is the most abundant, although numbers have declined severely from 19,340 pairs in 1988 to only 771 pairs in 2013 due to the impacts of sandeel failures[7].

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Kittiwakes formerly nested in the bay but is no longer present. A count conducted around the coastline between North Haven and South Haven in 2021 showed there to be 10 AON within this area. These birds are believed to nest within the same sheltered sea caves on the eastern side of Bu Ness used by Razorbill and Black Guillemot (A. Penn, FIBO, pers. comm.). Kittiwakes do not use the bay

Given that use of North Haven Bay by Kittiwake is minimal and no nesting occurs within North Haven Bay, the following potential effects are not considered further:

- Underwater noise disturbance and displacement
- Visual disturbance and displacement
- Damage/Loss of supporting habitat
- Accidental pollution of supporting habitat
- Changes to prey availability

Airborne noise disturbance and displacement

At ~400 m from the peckering activity (the noisiest activity), the nearest Kittiwake nests would receive 42.7 dB Lmax (Stantec, 2023). This value is way below the potential behavioural disturbance threshold of 70 dB Lmax (see Section 2.1.6).

Given the low level of noise that the Kittiwake would experience it is concluded that any effects from airborne noise disturbance and displacement will be *negligible*.

Translocation of INNS (inc. predatory mammals)

The detail provided in Section 2.1.1 for this potential effect remains relevant to Kittiwake.

With the adoption of the good practice and management measures, and adherence to the BMP, it is concluded that any increased risk from the translocation of INNS during construction activities would have a *negligible* effect on Kittiwake.

Conclusion

It is concluded that the conservation objectives for Fair Isle SPA in relation to Kittiwake would be maintained, therefore no AEOI in relation to this feature will occur from the Proposed Development.

2.1.11 Shag

Shags are a resident on Fair Isle being present all year round in high numbers. Shags nest on Fair Isle in a number of locations, including Maver's Geo, Lericum, Easter Lother, North and South Ramnigeo, Sout Naavergill and South Gunnawark. Numbers have fallen rapidly from 1,500 pairs to just 28 AON in 2021, which is attributed to declines in the sandeel populations on which they are heavily dependent. The number of fledged chicks is often very low with starvation being the key cause of chick mortality[8] .

Shag breed nearby, with 28 AON in Maver's Geo in 2020 (located 300-400 m from North Haven Bay). However, no birds breed within the bay itself.

Given that use of North Haven Bay by Shag is minimal and no nesting occurs within North Haven Bay, the following potential effects are not considered further:

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Airborne noise disturbance and displacement

At ~400 m from the peckering activity (the noisiest activity), the nearest Shag nests would receive 62.9 dB Lmax (Stantec, 2023). This value is way below the potential behavioural disturbance threshold of 70 dB Lmax (see Section 2.1.6).

Given the low level of noise that the Shag would experience it is concluded that any effects from airborne noise disturbance and displacement will be *negligible*.

Translocation of INNS (inc. predatory mammals)

The detail provided in Section 2.1.1 for this potential effect remains relevant to Shag.

With the adoption of the good practice and management measures, and adherence to the BMP, it is concluded that any increased risk from the translocation of INNS during construction activities would have a *negligible* effect on Shag.

Conclusion

It is concluded that the conservation objectives for Fair Isle SPA in relation to Shag would be maintained, therefore no AEOI in relation to this feature will occur from the Proposed Development.

2.1.12 Assessment conclusion for Fair Isle SPA

It is concluded that the conservation objectives for Fair Isle SPA will be maintained in relation to all qualifying features. Therefore, it is concluded that no AEOI will arise from the construction or operation activities of the Proposed Development, alone, with respect to the qualifying features of the Fair Isle SPA.

As there are no plans or projects which have the potential to exert the same effects as those assessed from the Proposed Development alone (see Section 1.4.3), there is no potential for an in-combination effect on Fair Isle SPA.

2.2 Fair Isle SAC

The Fair Isle SAC is designated for the presence of the qualifying features 'European dry heaths' and 'vegetated sea cliffs of the Atlantic and Baltic coasts'. The sea cliff vegetation of Fair Isle is principally oceanic and varies from spray-influenced maritime grassland swards to sub-maritime heather *Calluna vulgaris* moorland. Prostrate juniper *Juniperus communis* ssp. *nana*, now rare throughout the rest of Shetland, remains common over extensive areas of the moorland (JNCC, 2021). The SAC encompasses all terrestrial areas within the Site, excluding the existing wharf and breakwater, along with all terrestrial habitats surrounding the Site.

Semi-natural terrestrial habitat is present at a number of locations within the Site. Sparse vegetation is present on steep natural cliffs bordering the wharf, on artificial cliff faces created during construction of the noust, and on the rocky outcrop which forms part of the breakwater. Species were consistent with their coastal location and included thrift *Armeria maritima*, sea campion *Silene uniflora*, sea plantain *Plantago maritima*, sheep's-bit *Jasione Montana*. More common species included Yorkshire fog *Holcus lanatus*, yarrow *Achillea millefolium*, daisy *Bellis perenis* and silverweed *Potentilla anserina*. This habitat aligns with the description for UKhab habitat Vegetated Sea Cliffs.

On flatter ground above the cliffs surrounding the noust, a similar assemblage of species created a similar although less sparse and more uniform habitat. The habitat description for UKhab habitat Vegetated Sea Cliffs includes the cliff top habitat where this is influenced by exposure to the sea and sea spray, as is the case in this location.

Two areas of grassland are also present at the west of the Site to the north and south of the access road. These habitats also closely algin with the description for UKhab habitat Vegetated Sea Cliffs. Whilst some indicator species of coastal grasslands, including dominant red fescue *Festuca rubra*, thrift, sea plantain, and bird's-foot trefoil *Lotus corniculatus*, it should be acknowledged that other indicator species found elsewhere in coastal grassland on Fair Isle, such as wild thyme *Thymus praecox*, spring squill *Scilla verna* and kidney vetch *Anthyllis vulneraria* were not recorded. This suggests that these areas of grassland are not of the highest quality compared to other sites within the Fair Isle SAC. Furthermore, key indicator species were found to be most abundant in a narrow zone close to the cliff edge.

The UK habitat Vegetated Sea Cliffs aligns with and the SAC qualifying habitat Vegetated sea cliffs of the Atlantic and Baltic Coasts.

The qualifying habitat **European dry heaths is Not Present** within the Site boundary.

Potential effects to the Fair Isle SAC identified at HRA Screening stage (see Section 1.4.1) are: habitat loss, habitat damage, and habitat degradation through accidental spills and pollution or translocation of INNS.

2.2.1 Mitigation

The current design has been subject to review to enable potential effects to Fair Isle SAC to be avoided where possible. This has resulted in:

- The design minimising direct loss of SAC habitats to facilitate expansion of the noust and breakwater
- Following expansion of the noust, the rock sides will be left rough to accelerate recolonisation by local vegetation

The Environmental Management Plan (EMP) will include details of construction phase measures which will be used to protect grassland underneath temporary stockpile areas, such as geotextile membrane.

The EMP will include details on fencing of all designated areas and retained important habitat to ensure protection of from accidental damage.

In addition, the good practice/ management measures set out in Section 1.3.2 will be employed during construction which will avoid or minimise the risk of pollution and translocation of INNS.

2.2.2 Assessment of effects to Fair Isle SAC

The expansion of the noust required to accommodate the new larger vessel will result in the direct temporary loss of 90 m length of artificial cliff face within the noust supporting SAC qualifying habitat **Vegetated sea cliffs of the Atlantic and Baltic Coasts**. Based on an approximate average cliff height of 6 m this equates to approximately 540 m^2 of habitat temporarily lost. The habitat here has developed on the artificial cliff faces within the noust. As such it can be assumed that following construction, and the embedded mitigation measures, the new cliff face within the noust will also be colonised by the same vegetation and will in time support the same habitat type currently present. Given the extreme

environment, new habitat is likely to take 5-10 years to fully recolonise and so this loss would result in a long-term temporary impact.

The expansion of the noust will result in the direct loss of 1,947 m^2 (0.2 ha) of SAC qualifying habitat Vegetated sea cliffs of the Atlantic and Baltic Coasts that is present on the clifftop.

The expansion of the noust will also result in a direct increase of approximately 56 m of artificial cliff face. It is assumed that the same cliff face habitat currently present within the noust will develop here. Based on the current design the expanded noust will have an average cliff height of approximately 10 m, and an average 1:1 slope. As such this will result in a permanent increase of 790 m^2 of habitat present on the cliff face.

The construction of the extended wharf will also result in the direct permanent loss of approximately 100 m^2 (0.0 1 ha) of SAC qualifying habitat Vegetated sea cliffs of the Atlantic and Baltic Coasts that is present on the stack within North Haven.

Overall, the balance of the direct habitat and loss verses direct habitat gain will result in a permanent loss of approximately 1,257 m^2 (0.1 ha). This is a small loss when considered in the context of the 129.04 ha of this habitat within the SAC. The effect of this is that the overall area of Vegetated sea cliffs of the Atlantic and Baltic Coasts present within the Fair Isle SAC will be reduced by 0.08%.

Whilst these short-term or medium-term temporary impacts could result in direct negative impacts, the quantum of overall habitat degraded within the SAC would be negligible and likely to be smaller than fluctuations in overall SAC habitat area attributed to natural processes such as grazing and coastal erosion.

When determining if effects are significant or not, the CIEEM EcIA Guidelines indicate consideration needs to be given to whether the Proposed Development is likely to:

1. Undermine THE CONSERVATION OBJECTIVES OF THE SAC
2. Affect the conservation status of habitats for which the SAC is designated
3. Effect on the condition of the SAC or its interest/qualifying features

An assessment against these three criteria is set out below.

1. Conservation Objectives and 2. Conservation Status

The conservation objectives for Fair Isle SAC are provided in Table 2 and Appendix B.

Whilst permanent and temporary habitat loss will reduce the extent of vegetated sea cliff habitat, the quantum of overall habitat loss relative to the SAC as a whole is *negligible* and likely to be smaller than fluctuations in overall SAC habitat area attributed to natural processes such as grazing and coastal erosion. It is not considered that this loss would either: prevent the achievement of maintaining conservation status, or prevent the overall maintenance of site integrity of the Fair Isle SAC.

3. Effect on the Condition of the SAC

The losses described above are incurred in an area already disturbed by the historical construction of the existing harbour and noust, and therefore these habitats are less natural and of lower ecological value than other areas of this habitat within the SAC. The condition of the overall area of habitat within

Fair Isle SAC is currently assessed as 'Favourable Maintained'[9]. The minor losses described above attributed to the Proposed Development, in an area subject to historical disturbance, will not alter the condition of the overall habitat parcel within the SAC.

A such, in light of the assessment set out above, effects from permanent and temporary habitat loss to Fair Isle SAC are considered to be **not significant**.

As well as habitat losses and gains, construction works (including earthworks, and spoil storage) have potential to result in short-term temporary impacts through habitat degradation. One of the options for expansion of the noust would involve a drilling rig being present on the cliff top vegetation to drill holes in which explosives would be placed. This trafficking of a drilling rig could result in degradation of retained SAC habitat adjacent to the work.

In addition, construction would result in an increased risk of pollutants such as silt, dust, or petrochemical degrading retained SAC habitat adjacent to the work. Given the localised nature of the construction work, only areas adjacent to the noust would be at risk, likely to be less than 100 m^2. Measures are set out in Section 1.3.2 which will avoid or minimise potential effects from pollution.

Whilst these short-term temporary impacts could result in direct negative impacts, the quantum of overall habitat degraded within the SAC would be negligible and likely to be smaller than fluctuations in overall SAC habitat area attributed to natural processes such as grazing and coastal erosion. A such, effects from habitat degradation to Fair Isle SAC will be **not significant**.

It is concluded that there would be no adverse effects on integrity of Fair Isle SAC.

2.3 Sanday SAC

A wide variety of marine mammal species are regularly sighted in the waters around Fair Isle, with 16 cetacean species sighted over the last few years. Marine mammal sightings are most likely to be recorded between May and October as a number of species move into coastal waters as food supplies increase, however some species are not migratory and can be seen year-round. The most common ceteacean species observed from Fair Isle are harbour porpoise, minke whale and orca. Passing pods of Risso's, white-beaked and white-sided dolphins are also possible. Grey seals are frequently seen within North Haven bay and occasional harbour seal (e.g. FIBO recorded 2 individuals in North Haven in 2021). Harbour seals do not breed on Fair Isle[10].

Sanday SAC is approximately 51 km from North Haven Bay. Following advice received from NatureScot for the Sectoral Marine Plan for Offshore Wind Energy (Scottish Government, 2020), the screening buffer used for harbour seal was 50 km. However, as a precautionary approach, Sanday SAC was screened in for harbour seal (see Table 1). The most recent condition of the harbour seal feature at Sanday SAC was assessed as 'unfavourable declining' in 2013.

Following consultation with NatureScot, the screening process for the harbour improvement works at North Haven (Appendix A) identified the following potential effects on harbour seal should be considered (see Table 1):

- Disturbance at seal haul out sites
- Disturbance from underwater noise
- Physical damage from underwater noise

9 SiteLink (nature.scot)
10 Fair Isle Bird Observatory & Guesthouse

2.3.1 Harbour Seal

Given that the distance of North Haven Bay from the haul out sites at Sanday SAC and that there is no reasonable mechanism for a disturbance effect from the Proposed Development on haul out areas at Sanday SAC, the following potential effects are not considered further:

- Disturbance at seal haul out sites

Disturbance from underwater noise

Unlike grey seal, the use of North Haven Bay by harbour seal is minimal. Records being infrequent of their presence in the bay. While the Shetland Isles have a number of hotspots for harbour seal indicated by at-sea usage maps, these are all a long way to the north of the Proposed Development at Fair Isle, the nearest being around Mousa (Carter *et al.*, 2020). Recent telemetry data presented by the Sea Mammal Research Unit (Carter *et al.*, 2020) estimates the mean number of harbour seals within 5 x 5 km cells at any given time. Around Fair Isle, this value is '0<1' and the lowest value provided by the study.

There will be no piling required for the works at North Haven. Underwater noise can cause injury effects marine mammal species at close range and behavioural reactions at greater distances. Underwater noise sources during construction include dredging activity and vessel movements. The area in which the construction will take place already experiences regular vessel operations from the existing ferry, and recreational vessel activity within the bay, and, therefore, marine mammals which use the bay are likely to be habituated to a certain level of intermittent anthropogenic background noise.

An underwater noise report (ABPmer, 2023) considered the potential effects on pinnipeds from dredging and vessel movements and concluded that there was no risk of injury or significant disturbance to pinnipeds (or any marine mammal) from dredging activity or vessel movements within the construction phase.

Given all the above, it is concluded that any effects from underwater noise disturbance and displacement on harbour seal from Sanday SAC will be *negligible*.

Physical damage from underwater noise

The detail provided in Section 2.3.1 for the potential effect of disturbance from underwater noise is relevant to physical damage from underwater noise on harbour seal.

Given the detail provided in Section 2.3.1 for the potential effect of disturbance from underwater noise, it is concluded that any effects from physical damage from underwater noise on harbour seal from Sanday SAC will be *negligible*.

It is concluded that the conservation objectives for Sanday SAC in relation to harbour seal would be maintained, therefore no AEOI in relation to this feature will occur from the Proposed Development.

2.3.1 Assessment conclusion for Sanday SAC

It is concluded that the conservation objectives for Sanday SAC will be maintained in relation to all screened in qualifying features. Therefore, it is concluded that no AEOI will arise from the construction or operation activities of the Proposed Development, alone, with respect to the qualifying features of the Sanday SAC.

As there are no plans or projects which have the potential to exert the same effects as those assessed from the Proposed Development alone (see Section 1.4.3), there is no potential for an in-combination effect on Sanday SAC.

2.4 Mousa SAC

Mousa SAC is approximately 54 km from North Haven Bay. Following advice received from NatureScot for the Sectoral Marine Plan for Offshore Wind Energy (Scottish Government, 2020), the screening buffer used for harbour seal was 50 km. However, as a precautionary approach, Mousa SAC was screened in for harbour seal (see Table 1). The most recent condition of the harbour seal feature at Mousa SAC was assessed as 'unfavourable declining' in 2009.

The detail and assessment conclusion for Sanday SAC (Section 2.3) are valid for Mousa SAC. The latter protected site being slightly further away from North Haven Bay and being screened in for the same qualifying feature.

Therefore, it is concluded that the conservation objectives for Mousa SAC in relation to harbour seal would be maintained, and no AEOI in relation to this feature will occur from the Proposed Development.

2.4.1 Assessment conclusion for Mousa SAC

It is concluded that the conservation objectives for Mousa SAC will be maintained in relation to all screened in qualifying features. Therefore, it is concluded that no AEOI will arise from the construction or operation activities of the Proposed Development, alone, with respect to the qualifying features of the Mousa SAC.

As there are no plans or projects which have the potential to exert the same effects as those assessed from the Proposed Development alone (see Section 1.4.3), there is no potential for an in-combination effect on Mousa SAC.

3 Conclusions of the RIAA

Acknowledging the good practice and management measures adopted by the successful contractor (see Section 1.3.2) it is concluded that the activities of the Proposed Development (construction and operation) will not lead to an AEOI.

Consideration has been given to the Proposed Development alone or in-combination with other activities, projects or plans, with respect to the sites' structure, function and conservation objectives.

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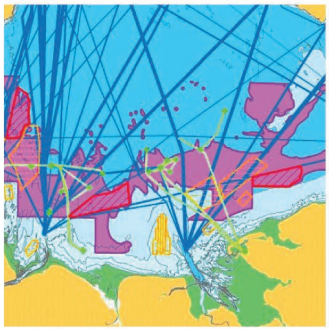
Appendices




Innovative Thinking - Sustainable Solutions

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A Fair Isle Screening Report

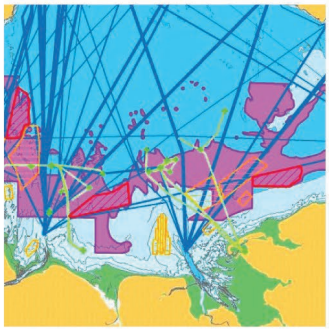
Stantec

Fair Isle Ferry Upgrade

HRA Screening for Fair Isle Harbour Improvement Works

November 2022

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Fair Isle Ferry Upgrade

HRA Screening for Fair Isle Harbour Improvement Works

November 2022

Document Information

Document History and Authorisation		
Title	Fair Isle Ferry Upgrade	
	HRA Screening for Fair Isle Harbour Improvement Works	
Commissioned by	Stantec	
Issue date	November 2022	
Document ref	R.4038	
Project no	R/5177/1	
Date	**Version**	**Revision Details**
19/10/2022	1	Issued for client comment
31/10/2022	2	Issued for further client comment
11/11/2022	3	Issued for client use

Prepared (PM)	Approved (QM)	Authorised (PD)
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Suggested Citation

ABPmer, (2022). Fair Isle Ferry Upgrade, HRA Screening for Fair Isle Harbour Improvement Works, ABPmer Report No. R.4038. A report produced by ABPmer for Stantec, November 2022.

Notice

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1 Introduction

1.1 Background

Fair Isle is the United Kingdom's most remote community, lying 24 miles off the southern tip of the Shetland Islands. The island is separated from Shetland mainland by a body of water known as the 'Roost', which has a reputation of being one of the most demanding stretches of water in the UK, and indeed Europe. This means that the island is not just geographically remote but is also remote from a connectivity perspective – indeed, the island had no transport connections on 221 days in 2017.

The island is within the Shetland Islands Council (SIC) administrative area and is connected to mainland Shetland by two lifeline transport links. The main passenger link is through an air service by means of an eight seat Britten-Norman BN-2 Islander aircraft. The existing ferry service provides the critically important supply chain and freight link as well as capacity for 12 passengers per sailing.

SIC is progressing the Fair Isle Ferry Replacement Project ('the Project') to replace the existing vessel, which is approaching the end of its life and does not meet modern standards, together with ferry infrastructure at both berthing sites at North Haven, Fair Isle and at Grutness, Sumburgh Head.

The Fair Isle and Grutness sites are both located within environmental designations including Special Protection Areas (SPA) and a Special Area of Conservation (SAC) (North Haven, Fair Isle). **This report covers the geographically distinct project activities which are proposed at North Haven, Fair Isle.** A separate Habitat Regulations Assessment (HRA) screening report has been prepared in respect of proposed works at Grutness.

1.2 Purpose of screening report

This document provides the information to enable the screening of 'the Project' with respect to its potential to have Likely Significant Effects (LSE) on European and Ramsar designated sites, as required by the Habitats Regulations.

Potential impacts of both the onshore components (landward of Mean High Water Springs (MHWS)) of the Project and offshore components (seaward of MHWS) on either onshore or offshore European or Ramsar sites are within the scope of this screening report.

The screening exercise presented within this report is based on the current understanding of the baseline environment and proposed activities associated with the Project, which is based on project and site-specific information available.

This report covers designated sites for Annex I habitats, Annex I birds and Annex II species and will be provided to the relevant stakeholders to seek agreement on the sites of the UK site network that should be considered further. This is the first stage in the development of information to support the HRA (all steps in the HRA process and associated reporting requirements are described in Section 3).

Designated sites are proposed to be "screened out" where no LSE from the Project is predicted, alone or in-combination with other plans and projects. Where LSE cannot be ruled out at this stage, the designated site(s) will be "screened in" and assessed further during the second stage in the development of information to support the HRA.

2 Project Description

The Fair Isle ferry berth is located within the harbour at North Haven, on the north-east of the island. The harbour is sheltered from the east and west by high rocky cliffs, and notionally sheltered from the south by an isthmus (narrow strip of land between North Haven and Bu Ness), and to the north by a rock armoured breakwater approximately 80 m in length and 25 m in width, made up of Norwegian rock. However, northerly conditions cause significant wave motion at the berth and therefore a noust[1] is used to house the vessel overnight.

The proposal is to replace the existing vessel, which will require the berthing site at Fair Isle to be upgraded to facilitate this new ferry along with an enhancement of the existing ferry port (see Figure 1). The details of the works required are described below:

- A new quay structure will be formed between the northern end of the existing quay and the existing breakwater;
- A new linkspan to facilitate the new roll on – roll off (Ro-Ro) vessel;
- The existing breakwater is to be increased in size and height to provide greater shelter to the new quay structure and linkspan berth;
- Dredging to provide a sufficient water depth for the new vessel around the proposed pier extension and linkspan;
- Repairs and re-fendering of existing finger pier, aligning structure to accommodate new vessel;
- Replacement of the existing cradle, noust, slipway and winch to accommodate the increased size of the new vessel; and
- New lighting will extend along the rear of the extended quay to the north of the existing quay.

The following activities will be undertaken during the construction phase of the Project (not in chronological order):

- Sustainable Drainage Systems (SuDS) installation;
- Noust expansion;
- Cradle and winch house replaced;
- New slipway/rails installed;
- Pier structure repaired;
- Breakwater extended and height increased; and
- Solid quay constructed to form new linkspan berth;
- New linkspan and supporting sub-structure installed.

Additional details in relation to the construction of the key elements are provided below.

- The linkspan will be a 'Type A' linkspan, the same as that used at various other ferry terminals operated by SIC. A 'Type A' linkspan is typically 14 m in length and 5.5 m wide at the nose.
- The cradle will be dimensioned to suit the chosen vessel (vessel max. 24 m in length and approximately 11 m in width).
- The slipway length will be confirmed based on results of the bathymetry survey carried out in June 2022 and the draught of the new vessel. It is anticipated that the existing slipway will be widened to allow use by the larger vessel, noting the general location of the noust will be unchanged.

[1] A landing-place or indent into the shore for a boat to be moored in.

- To upgrade the cradle and slipway, the existing cradle and associated mechanical equipment will be replaced. The extension to the slipway will be a reinforced concrete structure on top of the existing ground level to minimise excavation. The cradle will be a steel structure and will operate on steel rails that will be positioned on the slipway.
- The linkspan deck is a new structure and will be fabricated off-site. The linkspan deck will be shipped to site and installed on the newly constructed linkspan support structures alongside the breakwater once the new quay extension has been constructed.
- The dredging method will be determined from the results of the Ground Investigation and the materials that are encountered. Where sands / silts are to be dredged, an excavator will likely be used to dredge the seabed material to the required depth. If rock is to be dredged, the quality of the rock will determine whether an excavator can be used to 'rip' the rock from the seabed or if an alternative method will be used.

Although a detailed construction methodology is yet to be determined, it is reasonable to assume for the purposes of this assessment that the construction of the Project will likely utilise a small amount of construction plant. Best practice construction practices will be used throughout the works to minimise the potential for environmental effects and any disruption that could be caused by the construction works.

Given the limitations of the current vessel, little to no material for the Fair Isle construction project will be shipped on the ferry. All materials are likely to be consolidated at an appropriate port or ports and shipped to Fair Isle on purpose-built vessels (e.g. barges). There will be a small workforce that will be moving backwards and forwards to accommodation at the start and end of their shifts. Road traffic impacts associated with construction will therefore be negligible.

2.1 Construction programme

The construction process is expected to take place over **two summer seasons** due to the significant weather restrictions during winter months:

- North Haven Construction Phase 1 (Noust slipway, cradle and pier) – February to September 2024 (approximately 8 months); and
- North Haven Construction Phase 2 (Breakwater and Linkspan) – March to September 2025 (approximately 7 months).

Limited construction activities are expected to take place outwith the hours 7 am to 7 pm. Some construction activities may need to be undertaken outside these hours, for which agreement would be sought from SIC and Marine Scotland-Licensing Operations Team (MS-LOT). Outside of these times, works will be limited to those required in an emergency where there is the potential of harm or damage to personnel, plant, equipment or the environment, provided the Principal Contractor (yet to be appointed) retrospectively notifies of such works within 24 hours of their occurrence.

During this period there will be a combination of barge movements for the component deliveries and Light Goods Vehicles (LGVs) for construction staff.

Traffic movements will be minimal given the nature of the site with the workforce expected to arrive ~15 minutes before shift start and leave ~15 minutes after shift finish. Material/component delivery times would be limited to suitable tides during site operation hours (see above).

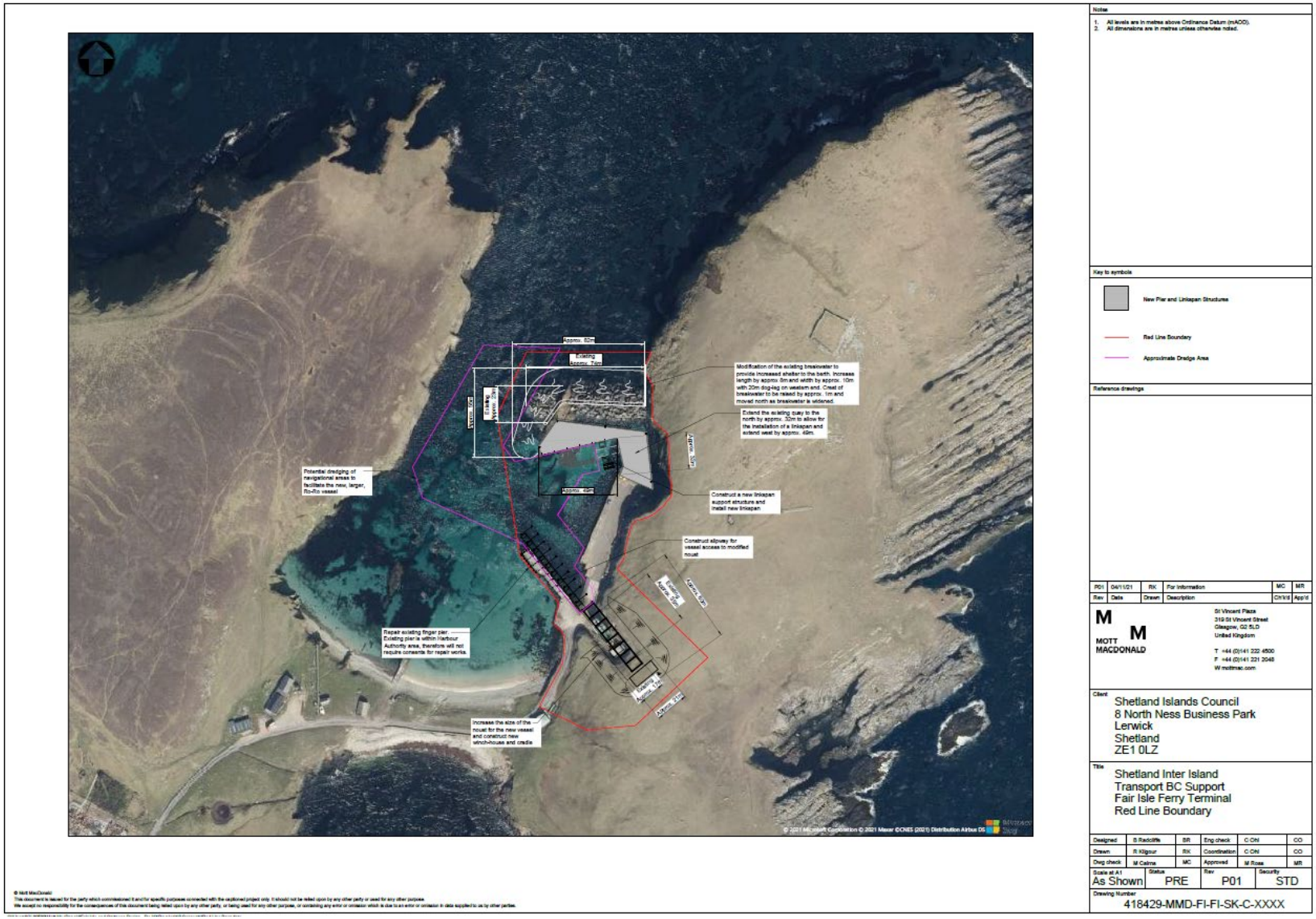

Figure 1. Boundary of Project activities

3 HRA Process

3.1 Legislative context

The HRA process covers features designated under the European Council Directive 2009/147/EC on the conservation of wild birds (the 'Birds Directive') and European Council Directive 92/43/EEC on the Conservation of natural habitats and of wild fauna and flora (the 'Habitats Directive').

The UK exited the European Union on 31 January 2020. However, the application of the HRA process currently remains largely unchanged due to the introduction of the EU Exit Regulations 2019. Policy on the protections and standards afforded by the Habitats Regulations remains unchanged, but there have been some changes in terminology and the Scottish Ministers now exercise some functions that were previously carried out by the European Commission. This report will hereafter refer to the 'Habitats Regulations' as including any changes enacted by the EU Exit Regulations.

The Habitats Regulations is the collective term for the regulations which implement the Habitats Directive, and certain aspects of the Birds Directive, in Scotland. The following regulations are applicable:

- The Conservation of Habitats and Species Regulations 2017
- The Conservation (Natural Habitats, &c.) Regulations 1994 (as amended)
- The Conservation of Offshore Marine Habitats and Species Regulations 2017 (referred to as the "Offshore Marine Regulations 2017") (applies to Marine Licence and Section 36 consent applications within Scottish waters beyond 12 nm).

The relevant sections of the Habitats Directive are Articles 6(3) and 6(4) (as implemented under the 1994 Habitats Regulations by Regulations 48 and 49) and as similarly covered in the 2017 Habitats Regulations and the Offshore Habitats Regulations. Under Article 6(3) of the Habitats Directive, an Appropriate Assessment (AA) is required where a plan or project is likely to have a significant effect upon a European site either individually or in combination with other reasonably foreseeable plans or projects. European sites include the following:

- SACs designated under the Habitats Directive for their habitats and/or species (except birds) of European importance; and
- SPAs designated under the Birds Directive for rare, vulnerable and regularly occurring migratory bird species and internationally important wetlands.

In the UK, the requirements of the Habitat Regulations also extend to the consideration of effects on sites that are proposed for designation and inclusion in the European network and sites that are currently in the process of being classified such as potential SPAs (pSPAs), candidate and possible SACs (cSACs and pSACs) and Sites of Community Importance (SCIs).

The Habitats Regulations specify, amongst other issues, how development control decisions which could directly or indirectly affect European sites are to be reached. Within the Scottish Planning Policy (Scottish Government, 2014), the Scottish Government sets out their policy that the Habitats Regulations should also apply to sites identified as Ramsar sites (under the Ramsar Convention on Wetlands of International Importance).

Article 6(3) of the Habitats Directive (92/43/EEC) states: "*Any plan or project not directly connected with or necessary to the management of the site but likely to have a significant effect thereon, either individually or in combination with other plans or projects, shall be subject to appropriate assessment of its implications for the site in view of the site's conservation objectives*".

It is therefore necessary, in the first instance, to determine whether it is possible to conclude that there is no LSE on the site. Only where it is not possible to conclude this, does an AA need to be carried out by the competent authority. The European Court of Justice ruling in the case of Waddenzee (Case C-127/02), stated that an AA of a project is necessary "*if it cannot be excluded, on the basis of objective information, that it will have a significant effect on the site*". It is therefore clear that if it cannot be objectively ruled out, then an effect is likely. The test is therefore negative and embeds precaution within it.

Regulation 48 of the 1994 Habitat Regulations states that a competent authority shall make an AA before any decision to give consent for any plan or project that is not directly connected with or necessary to the (conservation) management of a European site and which could likely have a significant effect on that site (either alone or in combination with other known plans or projects). An AA is therefore required for all plans or projects 'likely to have a significant effect' on a European site in view of the conservation objectives of the European site. The competent authority can only agree to the plan or project having ascertained that it will not adversely affect the integrity of the European site. In order to ascertain this, the competent authority must give regard to the manner in which the plan or project is proposed to be carried out or to any conditions or restrictions proposed for the consent or permission.

As the Project is not directly connected with or necessary to the management of a European (or Ramsar) site, an HRA is required.

3.2 Overview of HRA process

The European Commission's guidance on Planning for the Protection of European Sites: Appropriate Assessment (European Commission, 2001) identifies a staged process to the assessment of the effects of plans or projects on European sites. Cumulatively, these stages are referred to as an HRA, in order to clearly distinguish the whole process from the second stage within it, which is referred to as AA.

There are potentially up to four stages:

- Stage 1: Screening;
- Stage 2: AA;
- Stage 3: Consideration of Alternative Solutions; and
- Stage 4: Assessment of imperative reasons of overriding public interest (IROPI).

Each stage (except the last) defines the requirement for and scope of the next. This screening report comprises HRA Stage 1, where the identification of LSE is reported (see above).

The HRA process is applied to both effects from the project alone and 'in-combination' with other plans and projects.

The latter stages become relevant if the AA cannot exclude an adverse effect on site integrity. These stages will be addressed in the event there is a negative outcome to HRA Stage 2 (AA).

Key guidance documents that have been used to inform this screening exercise include:

- SNH (2001). Natura Casework Guidance: Consideration of Proposals affecting SPA and SAC. Guidance Note Series;
- SNH HRA guidance document 'HRA of Plans. Guidance for Planmaking Bodies in Scotland' (David Tyldesley and Associates 2015);
- SNH Guidance Note (undated). The handling of mitigation in Habitats Regulations Appraisal – the People Over Wind CJEU judgement;

- European Commission. (2001). Assessment of Plans and Projects Significantly Affecting Natura 2000 Sites: Methodological Guidance on the provisions of Article 6(3) and 6(4) of the 'Habitats' Directive 92/43/EEC. November 2001;
- DTA (2021a). The Habitat Regulations Assessment Handbook. https://www.dtapublications.co.uk/; and
- DTA (2021b). Advice to Marine Scotland. Policy Guidance Document on demonstrating the absence of Alternative Solutions and IROPI under the Habitats Regulations for Marine Scotland. November 2021. Draft for Comment.

3.3 Method

The types of effects will vary in their magnitude and significance, depending on a range of factors including the type of technology and process involved and the location and timing of activity. In respect of designated habitats and species populations, these effects may be direct (e.g. habitat loss associated with infrastructure installation) or indirect (e.g. via changes to coastal processes affecting benthic features).

Screening is based on a conceptual 'source-pathway-receptor' approach:

- Source: the origin of a potential effect (noting that one source may have several pathways and receptors), e.g., dredging.
- Pathway: the means by which the effect of the activity could impact a receptor, e.g., smothering from dredging.
- Receptor: the element of the receiving environment that is impacted, e.g., benthic habitats within the direct range of sediment smothering.

This approach identifies potential effects resulting from the proposed construction, operation and maintenance, and decommissioning of the project. Where there is no pathway, or the pathway has sufficient distance such that the effect from the source has dissipated to a negligible level before reaching the receptor, there may be justification for the screening out of that particular receptor (i.e., qualifying feature) for the site in question.

Sites are screened in if, for any one of their qualifying features (i.e., a species or habitat), a source-pathway-receptor relationship and potential for LSE cannot be ruled out (including in-combination effects). However, each qualifying feature of that site will be considered separately, and it may be that the screening process rules out LSE for some features at this stage. In accordance with the 2018 European Court of Justice ruling in the case of People Over Wind, Peter Sweetman v Coillte Teoranta (C-323/17), mitigation, including embedded mitigation has not been taken into account within the screening stage but will be considered, where relevant, in the AA.

The approach to screening for each receptor is based on the known distribution, ecology and sensitivities of each receptor group and, therefore, the potential for being affected by the Project. Where there is insufficient information available at this stage to screen out a site, the site is screened in for further consideration.

3.3.1 In-combination

As noted above, the Habitats Regulations require that the potential effects of a project on designated sites are considered both alone and in-combination with other plans or projects.

While confirmation from MS-LOT and NatureScot, will be sought to identify any other relevant plans and projects that should be included, current understanding indicates that there are no other marine or terrestrial projects currently planned or recently completed that have the potential to contribute to in-

combination effects, with the Project, on the qualifying features of designated sites. The re-building of the Fair Isle bird observatory, to the southeast of North Haven, is planned to be completed in early 2023 and therefore before the proposed works are due to commence (early 2024). Consequently, in-combination effects are not taken further within the screening exercise. This will be revisited within the Report to Inform Appropriate Assessment (RIAA) should plans/projects arise that may contribute towards an in-combination effect.

4 Screening

The following sections detail the results of the screening process to identify the designated sites and their corresponding qualifying features to be taken forward for determination of LSE based on the methodology outlined above. The screening proceeds by identifying receptors occurring within the area of influence of the work and identifying if there are pathways of effect to relevant European sites

In all cases, where any uncertainty existed regarding the exact detail/type of activity required, then a worst-case scenario was selected for any given feature. For example, the dredging method is still to be determined (see Section 2) and depending on the substrata encountered could require removal of sedimentary to coarse and rocky material. Removal of rock would be noisier than sediment and this source has been considered for potential generation of underwater noise and the effects on diving birds, marine mammals and fish. However, for possible effects from suspended sediment and smothering on benthic features, it is assumed that all dredging would require removal of soft sediments.

4.1 Habitats and communities

Potential impact pathways from the Project on habitats and communities are limited to habitat loss from the footprint, habitat damage and disturbance, increased suspended sediments, pollution (water and air). Indirect impacts (e.g. sediment plume) would be unlikely to extend beyond a few km from the Project location.

4.1.1 Benthic

The nearest European/Ramsar site with intertidal and/or subtidal features is Sanday SAC which is approximately 51 km from North Haven. As there is no reasonable mechanism for an impact pathway on qualifying benthic features beyond Fair Isle from the Project, these were screened out from further assessment.

Consequently, all benthic qualifying features of European/Ramsar sites beyond this distance were also screened out.

4.1.2 Terrestrial

The proposed activities will overlap with Fair Isle SAC which is designated for its 'Vegetated sea cliffs of the Atlantic and Baltic Coasts', and 'European dry heaths'. Given the overlap with the Project activities and this site, a conclusion of no LSE cannot be determined. Therefore, **Fair Isle SAC has been screened into the HRA for further assessment.**

As there is no reasonable mechanism for an impact pathway on qualifying terrestrial features beyond Fair Isle, all terrestrial features of European/Ramsar sites beyond Fair Isle have been screened out from further assessment.

4.2 Mammals

4.2.1 Marine mammals

Potential impact pathways from the Project on marine mammals include underwater noise (damage and/or disturbance), disturbance of seal haul out areas, changes in water quality, changes in prey availability, collision risk with vessels.

The most commonly occurring **Annex II** UK marine mammal species recorded around Fair Isle in the last 5 years[2] are:

- Harbour Porpoise;
- Grey Seal; and
- Harbour/Common Seal.

Other marine mammal species frequently recorded are Risso's dolphin, white-beaked dolphin, minke whale and killer whale[3]. The latter has been recorded assumed to be foraging in the mouth of the bay and inshore of the breakwater of North Haven Bay (see Dan Harries, pers comm), while Risso's dolphin account for the greatest number of cetacean sightings around Fair Isle. Neither of these species (killer whale; Risso's dolphin) are Annex II.

Cetaceans

Given the highly mobile nature of marine mammals, screening of cetaceans uses defined Marine Mammal Management Units (MMMU) for harbour porpoise (as per the UK Inter-Agency Marine Mammal Working Group (IAMMWG). The Project is located within the North Sea MMMU for harbour porpoise. While one screening approach is to screen in all European/Ramsar sites within this MMMU which have harbour porpoise as a qualifying feature and take forward to the assessment phase, consideration within this report was initially given to the nearest European/Ramsar site with harbour porpoise within the relevant MMMU (i.e. Southern North Sea). This is located approximately 470 km from Fair Isle. Given the significant distance from the nearest European/Ramsar within the North Sea MMMU, the proportion of the population of the SAC likely to be present within the area of influence of the project would be insignificant, thus any activities from the Project are unlikely to have any significant effects and therefore no LSE is concluded.

Consequently, all harbour porpoise qualifying features of European/Ramsar sites beyond this distance within the North Sea MMMU were also screened out. While it is acknowledged that the Inner Hebrides and Minches SAC is much closer to the proposed works at Fair Isle (~275 km), this SAC is located within the West Scotland MMMU.

Fair Isle is within the Greater North Sea MMMU for bottlenose dolphin. While the Moray Firth SAC is the closest SAC to Fair Isle with bottlenose nose dolphin as a qualifying feature, this population are considered inshore and part of the Coastal East Scotland MMMU, with individuals regularly ranging between the Moray Firth and Tay estuaries. For example, JNCC state[4] that since the mid-1990s, Moray Firth dolphins have increasingly made extended movements eastwards and southwards, and probably account for regular sightings off east Scotland including the Firth of Forth.

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2 Fair Isle Bird Observatory 2016 to 2020 annual reports and website; Shetland Record Centre – marine mammal sightings data

3 *ibid*

4 Bottlenose dolphin (*Tursiops truncatus)* - Special Areas of Conservation (jncc.gov.uk): https://sac.jncc.gov.uk/species/S1349/

The nearest European/Ramsar site with bottlenose dolphin within the Greater North Sea MMMU is Falaises du Cran aux Oeufs et du Cap Gris-Nez, Dunes du Chatelet, Marais de Tardinghen et Dunes de Wissant SAC. This is located more than 950 km from Fair Isle. Given the significant distance from the nearest European/Ramsar, any activities from the Project are unlikely to have any significant effects and therefore no LSE is concluded.

Consequently, all bottlenose dolphin qualifying features of European/Ramsar sites beyond this distance within the Greater North Sea MMMU were also screened out.

Pinnipeds

During the recent Sectoral Marine Plan for Offshore Wind Energy (ABPmer, 2020), NatureScot (formerly SNH) advised that the screening should apply 'buffer' distances of 50 km for harbour seals and 20 km for grey seals. These screening distances have been taken forward for this screening exercise.

The nearest European/Ramsar site with grey seal as a qualifying feature is Faray and Holm of Faray SAC. This is located more than 75 km from North Haven Bay and is thus more than 50 km beyond the screening buffer. Given the significant distance from the nearest European/Ramsar, any activities from the Project are unlikely to have any significant effects and therefore no LSE is concluded.

Consequently, all grey seal qualifying features of European/Ramsar sites beyond this distance were also screened out.

The nearest European/Ramsar site with common seal as a qualifying feature is Sanday SAC. This is located slightly more than 50 km from North Haven Bay and is thus beyond the screening buffer. The next nearest site is Mousa SAC which is approximately 54 km from North Haven Bay. As both these sites are only slightly beyond the screening buffer (50 km), **Sanday SAC and Mousa SAC have been screened into the HRA for further assessment.** However, the next nearest site, Yell Sound Coast SAC (~60 km from North Haven Bay) and all those sites beyond with common seal as a qualifying feature have been screened out.

4.2.2 Terrestrial mammals

There are no SACs with terrestrial mammals as qualifying features on Fair Isle. There is no reasonable mechanism for an impact pathway to occur from the Project on any SAC with terrestrial mammal qualifying features, including otter.

4.3 Birds

Potential effects from the Project on birds include underwater noise (disturbance to diving birds), airborne noise (disturbance), disturbance from human activity, habitat loss (direct under footprint), changes in water quality and changes in prey availability.

4.3.1 Seabirds

The proposed activities will overlap with Fair Isle SPA which is designated for:

- Arctic skua (*Stercorarius parasiticus*)*
- Arctic tern (*Sterna paradisaea*)
- Fair Isle wren (*Troglodytes troglodytes fridariensis*)
- Fulmar (*Fulmarus glacialis*)*
- Gannet (*Morus bassanus*)*

- Great skua (*Stercorarius skua*)*
- Guillemot (*Uria aalge*)
- Kittiwake (*Rissa tridactyla*)*
- Puffin (*Fratercula arctica*)*
- Razorbill (*Alca torda*)*
- Shag (*Phalocrocorax aristotelis*)*
- Seabird assemblage

(* Indicates assemblage qualifier only)

Given the overlap with the Project activities and this site, a conclusion of no LSE cannot be determined. Therefore, **Fair Isle SPA has been screened into the HRA for further assessment.**

The next nearest SPAs to North Haven Bay are Seas off Foula SPA (~34 km) and Sumburgh Head SPA (Shetland) (~36 km)

Seas off Foula SPA is designated for its important feeding grounds to a range of breeding and non-breeding seabirds:

- Great Skua *Stercorarius skua* (breeding and non-breeding)
- Fulmar *Fulmarus glacialis* (breeding and non-breeding)
- Arctic Skua *Stercorarius parasiticus* (breeding)
- Guillemot *Uria aalge* (breeding and non-breeding)
- Puffin *Fratercula arctica* (breeding)
- Assemblage of seabirds (breeding and non-breeding)

Sumburgh Head SPA is designated for breeding seabirds:

- Arctic tern (*Sterna paradisaea*)
- Fulmar (*Fulmarus glacialis*)*
- Guillemot (*Uria aalge*)*
- Kittiwake (*Rissa tridactyla*)*
- Seabird assemblage

(* Indicates assemblage qualifier only)

With the exception of Arctic Skua, the mean max foraging ranges (Woodward *et al.,* 2019) of the other protected species at Seas off Foula SPA all exceed 34 km and thus overlap with Fair Isle. The area covered by the Seas off Foula SPA (3,412 km^2) provides an important prey resource for seabirds and is designated as such. The proposed Project activities would not affect waters much beyond the immediate vicinity of North Haven Bay, while the bay itself is not a rich source of prey. Given the scale and nature of the Project activities, while it is considered that an impact pathway exists, it is concluded that any effect on the qualifying features of the Seas off Foula would be *de minimis* i.e. not significant. Thus, no LSE on the Seas off Foula SPA is concluded.

With the exception of Arctic Tern, the mean max foraging ranges (Woodward *et al*., 2019) of the other protected species at Sumburgh Head SPA all exceed 36 km. Important foraging areas exist well within 36 km from Sumburgh Head SPA and are recognised as such i.e. the Seas off Foula SPA and several km to the north of Sumburgh Head SPA, Mousa to Boddam Nature Conservation MPA. The proposed Project activities would not affect waters much beyond the immediate vicinity of North Haven Bay, while the bay itself is not a rich source of prey. Given the scale and nature of the Project activities, while it is considered that an impact pathway exists, it is concluded that any effect on the qualifying features of the Sumburgh Head SPA would be *de minimis* i.e. not significant. Thus, no LSE on the Sumburgh Head SPA is concluded.

For the reasons given above, it is concluded that there would be no LSE on the qualifying features of SPAs beyond 36 km from North Haven Bay.

4.3.2 Terrestrial birds

The Fair Isle wren is a qualifying feature of Fair Isle SPA. Given the overlap of the Project activities with Fair Isle SPA, **the Fair Isle wren qualifying feature of the Fair Isle SPA is screened into the HRA for further assessment.**

4.4 Fish

A scoping opinion for the EIA was received from Marine Scotland Science (MSS) on 27 July 2022, specific to the Project, recommending that consideration of diadromous fish can be scoped out of the corresponding EIA. MSS stated that there is no evidence that diadromous fish including salmon are present in any significant numbers around Fair Isle. The NBN Gateway (accessed online 12 October 2022) has no records for diadromous (Annex II) fish species for Fair Isle or the waters surrounding.

For the reasons given above, it is concluded that there would be no LSE on fish qualifying features of SACs.

5 Summary

The following sites and their qualifying features will be taken forward for assessment within the Report to Inform Appropriate Assessment (Table 1).

Table 1. Summary of potential effects to qualifying features screened into HRA

Site	Distance from Project	Qualifying Features Screened In	Potential Effects
Fair Isle SPA	Footprint	All features	Underwater noise disturbance and displacement Airborne noise disturbance and displacement Damage/Loss of supporting habitat Accidental pollution of supporting habitat Changes to prey availability
Fair Isle SAC	Footprint	All features	Damage of habitat Loss of habitat Accidental spills and pollution Translocation of INNS
Sanday SAC	51 km	Common Seal	Disturbance at seal haul out sites Disturbance from underwater noise Physical damage from underwater noise
Mousa SAC	54 km	Common Seal	As for Sanday SAC

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7 Abbreviations

AA	Appropriate Assessment
BN	Britten-Norman
CJEU	Court of Justice of the European Union
cSACs	Candidate Special Area of Conservation
DTA	David Tyldesley and Associate
EC	European Commission
EEC	European Economic Community
EIA	Environmental Impact Assessment
EU	European Union
HRA	Habitat Regulations Assessment
IAMMWG	Inter-Agency Marine Mammal Working Group
INNS	Invasive non-native species
IROPI	Imperative Reasons of Overriding Public Interest
JNCC	Joint Nature Conservation Committee

LGVs	Light Goods Vehicles
LSE	Likely Significant Effects
MHWS	Mean High Water Springs
MMMU	Marine Mammal Management Units
MPA	Marine Protected Area
MS-LOT	Marine Scotland Licensing Operations Team
MSS	Marine Scotland Science
NBN	National Biodiversity Network
pSACs	Possible Special Area of Conservation
pSPAs	Potential Special Protection Areas
RIAA	Report to Inform Appropriate Assessment
Ro-Ro	Roll on – roll off
SAC	Special Area of Conservation
SCIs	Sites of Community Importance
SIC	Shetland Islands Council
SNH	Scottish Natural Heritage
SPA	Special Protection Areas
SuDS	Sustainable Drainage Systems
UK	United Kingdom

Cardinal points/directions are used unless otherwise stated.
SI units are used unless otherwise stated.

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B Fair Isle SAC Detailed Conservation Objectives

Qualifying Interest Features	Conservation Objectives
Fair Isle SAC	Overarching conservation objectives for both qualifying features of Fair Isle SAC are as follows: To ensure that the qualifying features of Fair Isle SAC are in favourable condition and make an appropriate contribution to achieving favourable conservation status. To ensure that the integrity of Fair Isle SAC is maintained by meeting objectives **a, b and c** (see below) for each qualifying feature. The aim at this SAC is to maintain all qualifying features in a favourable condition as a contribution to their wider conservation status. Therefore any impacts on the objectives shown in **a, b , or c** below for each qualifying feature must not persist so that they prevent the achievement of this overall aim. When carrying out appraisals of plans or projects the focus should be on maintaining site integrity, specifically by meeting the objectives outlined in **a, b and c** for each qualifying feature. If these are met, then site integrity will continue to be maintained. Temporary impacts on these objectives resulting from plans or projects can only be permitted where there is certainty that the features will be able to quickly recover.
Vegetated sea cliffs of the Atlantic and Baltic Coasts, Favourable Maintained;	The Conservation objectives for **Vegetated sea cliffs of the Atlantic and Baltic coasts** (Vegetated Sea Cliffs) are: **a). Maintain the extent and distribution of the vegetated sea cliffs habitat within the site** Accurate measurement of the extent of this habitat is hard to achieve due to its location on vertical or near vertical slopes but does include, where appropriate, the clifftop maritime vegetation. The figure within the SAC standard data form (129 ha) is therefore used as a guide, and the objective is that there should be no loss of the habitat within the SAC. The extent of this habitat is largely determined by topography, being found on vertical or steeply sloping cliffs with exposure to salt spray and the wind. It is found on the ledges and tops of vertical or steeply sloping cliffs where there is exposure to salt spray and the wind. These factors limit the potential for expansion or loss of extent through natural processes. The inland extent of the habitat is limited in some parts of the site by historical agricultural practices, for example at the southern end of the island (which is excluded from the SAC). There are also localised changes in the natural vegetation around buildings within the SAC.

Qualifying Interest Features	Conservation Objectives
	b). Maintain the structure, function and supporting processes of the vegetated sea cliffs habitat The structure of the habitat is influenced by the geomorphological processes, degree of exposure to the wind and sea, and the associated salt spray on the cliff face and cliff tops. Exposed stretches of coast support salt-tolerant maritime grassland vegetation, while more sheltered areas support plant communities that transition into maritime heath. The structure and function of this habitat are dependent on natural marine processes and weather, in particular winter storms and summer droughts. The natural processes of the sea cliffs and transition to the clifftop areas can be disrupted and the habitats changed by alteration in livestock grazing regimes, application of fertiliser/reseeding or roads/parking areas. In the southern part of the island, where improved land adjoins the SAC, sheep usually have access to the cliffs and have modified the cliff vegetation to some extent. Although light grazing by sheep is important in maintaining the habitat, they can also contribute to localised damage by creating prominent contouring tracks and erosion scarps through rubbing against exposed banks of soil. Grazing levels should be low enough that typical plants (listed in 2c) can grow, flower and set seed. The natural processes of the sea cliffs and transition to the clifftop areas can be disrupted by coastal defences, roads and /or extraction of rock. The habitat is also influenced by the presence of breeding seabirds such as Fulmar *Fulmarus glacialis*, Herring Gull *Larus argentatus* and Great Black-backed Gull *Larus marinus*, whose guano fertilises some of the ledges and promotes lush plant growth. c**). Maintain the distribution and viability of typical species of the vegetated sea cliffs habitat** Maritime cliff vegetation (slope and cliff top) varies according to a number of physical and biological factors, but most important among these are climate, degree of exposure to sea-spray, geology and soil type, level of grazing, and the amount of seabird activity.

Qualifying Interest Features	Conservation Objectives
	Typical species that colonise the cliff slope on this site are: red fescue Festuca rubra; thrift *Armeria maritima*; Sea campion *Silene uniflora*; Scot's lovage *Ligusticum scoticum*; Ribwort plantain *Plantago lanceolata*; common sorrel *Rumex acetosa;* sea mayweed *Tripleurospermum maritimum*; scurvygrass sp. Cochlearia sp. The clifftop maritime grassland is dominated by red fescue Festuca rubra; thrift *Armeria maritima* and sea plantain *Plantago maritima*. Other typical species include Yorkshire fog *Holcus lanatus*; ribwort plantain *Plantago lanceolata*; buckshorn plantain *Plantago coronopus*; common sorrel *Rumex acetosa*; spring squill *Scilla verna*. Maritime heath is dominated by heather *Calluna vulgaris*. Other typical species include red fescue Festuca rubra; sea plantain *Plantago maritima*; bird's-foot trefoil *Lotus corniculatus*; cat's ear *Hypochoeris radicata*; spring squill *Scilla verna*; crowberry *Empetrum nigrum*; wild thyme *Thymus praecox*; tormentil *Potentilla erecta*. Light grazing at appropriate times of the year is required to allow flowering and fruiting of cliff top vegetation and maintain the maritime grassland and maritime heath. Colonisation of the vegetated sea cliffs by invasive native species such as creeping thistle *Cirsium arvense*; spear thistle *Cirsium vulgare*; perennial ryegrass *Lolium perenne*; broad-leaved dock *Rumex obtusifolius*; curled dock *Rumex crispus*; white clover *Trifolium repens*; stinging nettle *Urtica dioica* could result in loss of the typical species, although this is only likely in areas where the vegetation has already been modified by sheep grazing in the southern part of the site. The habitat is also used by breeding seabirds such as Fulmar *Fulmarus glacialis*, Herring Gull *Larus argentatus* and Great Black-backed Gull *Larus marinus*.
European dry heaths, Favourable Recovered.	The Conservation objectives for **European Dry Heaths** (Dry Heaths) are: **a). Maintain the extent and distribution of the dry heath habitat within the site** Maintain to approximately 300 ha. The area figure has been taken from the Standard Data Form, and is an estimate based on the fact that dry heaths can form complex mosaics with habitats such as grasslands and wet heaths. There should be no measurable net reduction in the extent of dry heath and its distribution throughout the site.

Qualifying Interest Features	Conservation Objectives
	The habitat is found on freely-drained, nutrient-poor, acidic soils. This can determine the extent and distribution of the habitat throughout the SAC, although it is also dependant on heathland management to maintain its extent including: ▪ Light level of grazing; and ▪ Avoidance of applying lime, fertiliser or re-seeding. **b). Maintain the structure, function and supporting processes of the dry heath habitat** Dry heaths are normally closely associated with scrub and woodland habitats, which would form the climax habitat without heathland management. However, exposure to wind and salt prevents the widespread growth of trees on Fair Isle where, at most, scrub might be able to develop in a few sheltered locations. Therefore, maintaining dry heath on Fair Isle only requires that grazing levels are low enough to prevent degrading to grassland as a result of intensive management. Sheep and cattle are the main herbivores on Fair Isle, and appropriate management of their numbers and distribution across the site is important to maintain dry heath habitat and to prevent habitat degradation from under/overgrazing or trampling. Rabbits are also present on the island, and their numbers should be controlled so that they do not have a detrimental effect on the dry heath habitat. The objectives for maintaining the structure of dry heath on this site are to: ▪ Maintain the height structure of the vegetation (less than 1/3 of the last complete growing season's shoots of dwarf-shrub species should show signs of browsing. ▪ maintain the ground cover structure of the heath by keeping trampling by livestock low enough that less than 10% of ground cover is disturbed bare ground (with an emphasis on 'disturbed' rather than 'bare'). ▪ 25-90% of vegetation should be dwarf shrub heath species. Heather *Calluna vulgaris* should remain the dominant species and should be present in all phases of growth (pioneer, building, mature and degenerative) to provide a wide range of ecological variety and conservation benefit to a variety of species. Cover by species that are not typical of this habitat should not increase. Examples of inappropriate species are bracken and non-native species.

Qualifying Interest Features	Conservation Objectives
	c). Maintain the distribution and viability of typical species of the dry heath habitat Heather *Calluna vulgaris* is the dominant plant in the dry heath on this site. Other typical species are Erica spp.; Crowberry *Empetrum nigrum*; and the moss *Racomitrium* Typical associated birds include Golden Plover *Pluvialis apricaria* and Twite *Carduelis flavirostris*. This habitat is also important for breeding Great Skua *Stercorarius skua* and Arctic Skua *Stercorarius parasiticus*.

C Fair Isle – Biosecurity Management Plan

Stantec UK Ltd
for Shetland Islands Council

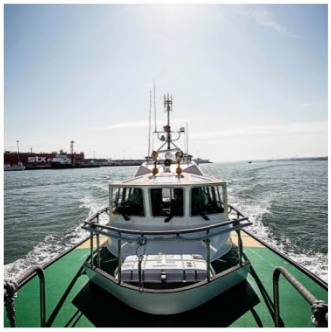
Fair Isle Harbour Improvement Works

A Biosecurity Management Plan - Final Draft for Discussion

May 2023







Innovative Thinking - Sustainable Solutions

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Fair Isle Harbour Improvement Works

A Biosecurity Management Plan - Final Draft for Discussion

May 2023

Document Information

Document History and Authorisation		
Title	Fair Isle Harbour Improvement Works	
	A Biosecurity Management Plan - Final Draft for Discussion	
Commissioned by	Stantec UK Ltd for Shetland Islands Council	
Issue date	May 2023	
Document ref	R.4243	
Project no	R/5177/3	
Date	**Version**	**Revision Details**
25/05/2023	1	Issued for client review
26/05/2023	2	Issued to support submission of improvement works application

Prepared (PM)	Approved (QM)	Authorised (PD)
Eleanor Skeate	Natalie Frost	Colin Trigg
[Redacted]	[Redacted]	[Redacted]

Suggested Citation

ABPmer, (2023). Fair Isle Harbour Improvement Works, A Biosecurity Management Plan - Final Draft for Discussion, ABPmer Report No. R.4243. A report produced by ABPmer for Stantec UK Ltd for Shetland Islands Council, May 2023.

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1 Introduction

1.1 Overview

This Biosecurity Management Plan (BMP) has been developed by ABPmer for Stantec to ensure the activities of contractors and sub-contractors always follow best practices for biosecurity during the Fair Isle Ferry Replacement project and during the operational life of the new ferry. It is a final draft for discussion pending further consultation with relevant stakeholders.

Fair Isle is highly sensitive for both its cultural and natural heritage. The island has several designations:

- **Special Protection Area**: formerly designated under the EU Directive on the Conservation of Wild Birds, and now protected by the Conservation of Habitats and Species (Amendment) (EU Exit) Regulations 2019. The designation applies to the whole coastline and the northern half of the island within which North Haven bay is located. It is designated on account of hosting important breeding populations of ten seabird species and an endemic subspecies of Wren.
- **Special Area of Conservation:** formerly designated under the EU Habitats Directive, and now protected by the Conservation of Habitats and Species (Amendment) (EU Exit) Regulations 2019. The SAC covers the same area as the SPA. It is designated because of the presence and extent of two Annex 1 habitats: Vegetated Sea cliffs of the Atlantic and Baltic coasts, and European dry heaths.
- **Site of Special Scientific Interest:** designated under the Nature Conservation (Scotland) Act 2004. The designated area is coincident with the boundary for the SPA. The SSSI is designated on account of its plant fossils, moorland juniper, and colonies of breeding seabirds.
- **DR (Demonstration & Research) MPA:** designated by Scottish Ministers under the Marine (Scotland) Act 2010. The designation applies to the marine environment and seas around the island. The DR MPA differs from a conservation MPA in that rather than specifically protecting species of European Importance it is specifically targeted toward carrying out research to demonstrate sustainable marine management approaches. Fair Isle's designation was prompted by decades of declining natural resources, primarily seabird and inshore fish populations. The designation, developed in collaboration with the local fishing industry, sets out an ecosystem approach which includes: monitoring of seabirds and other mobile species; development and implementation of a local sustainable shellfish fishery; and development of a research programme into local fisheries including species composition, size, distribution and temporal/spatial changes in fish stocks.
- Awarded the **European Diploma of Protected Areas** of the Council of Europe. This applies to the whole island and is awarded because of the island's rich cultural and natural heritage, and the exemplary manner in which the island is managed.

The objective of this BMP is to protect the cultural and natural heritage of the island during the construction and operation of the Fair Isle Ferry Replacement service from the threat of introduced disease or invasive non-native species.

A key consideration in fulfilling this objective is prevention. The key threat to the island's heritage is the accidental introduction of potential mammalian predators. Once biosecurity has been compromised, it may be very difficult, if not impossible to eradicate these species, which could have locally devastating consequences. Once non-native species have become established, the effect on local biodiversity may be disastrous.

According to NatureScot, non-native species are "the second most serious threat to global biodiversity after habitat loss". Islands are among the most vulnerable places to this risk. The island hosts one of the largest seabird colonies in the north-east Atlantic and the introduction of land predators, notably rats, mustelids (ferrets and their hybrids and mink) and hedgehogs would pose a severe risk.

The principal agricultural stock on the island are sheep which number several hundred in total. There are some existing issues with non-native species and seabird populations - notably the presence of several feral cats on the island, some of which frequent seabird colonies. There is currently an RSPB led project to try and establish what impact these animals are having on the island's seabird populations. Two Hedgehogs were introduced into the island in the 1990s but have since died or been removed.

As well as invasive mammalian predators, it is possible that other non-native marine species, (e.g. wireweed *Sargassum muticum*, Japanese skeleton shrimp *Caprella mutica*), have the potential to be transported to Fair Isle in construction vessels through pathways such as the fouling of hulls and in ballast water. Furthermore, the extension of the pier would introduce a new surface in the marine environment which has the potential to facilitate the spread of non-native species. Therefore, the BMP will set out measures and to ensure that these risks are minimized through best practice and use of agreed procedures.

The risk of the introduction of non-native plants that are likely to cause issues on Fair Isle given its relatively extreme climate and latitude is considered generally low.

This document will examine the potential risks and set out effective steps to minimize them. It will be crucial to ensure that effective measures are in place to monitor and ensure contractor and supplier compliance. It is considered that this plan should be an iterative document that is updated when required to reflect advances or changes in practice or when new risks or threats have been identified.

1.2 Proposed development

The proposal is for the Fair Isle Ferry Replacement Project, a project to replace the existing ferry, which takes primarily supplies, but also passengers between Shetland (Grutness and Lerwick) and Fair Isle (North Haven). The current vessel, The Good Shepherd, is approaching the end of its operational life and does not meet modern standards. The Good Shepherd is an 18m workboat, and supplies must currently be loaded on and off. It is one of the last load-on, load-off (LoLo) ferries in operation within the UK.

The ferry resides in Fair Isle permanently, only mooring up at Grutness (or Lerwick) for loading and unloading, thus minimizing opportunities for the accidental transfer of invasive non-native species (INNS). The replacement ferry will operate in the same manner.

Although the new ferry is a replacement of the old one, the port infrastructure at both Grutness and Fair Isle will need to be upgraded to operate a roll-on roll-off (RoRo) service, bringing Fair Isle in line with other similar ferry services. The vessel, being of modern build, will also be slightly longer, wider and with a deeper draft.

The following work at North Haven, Fair Isle, will therefore be required to accommodate the new ferry. This project is being progressed by Shetlands Islands Council.

At Fair Isle this will involve:

- A new quay structure be formed between the northern end of the existing quay and the existing breakwater;

- A new linkspan to facilitate the new Ro-Ro vessel;
- The existing breakwater is to be increased in size and height to provide greater shelter to the new quay structure and linkspan berth;
- Dredging to provide a sufficient water depth for new vessel around the proposed pier extension and linkspan;
- Repairs and re-fendering of the existing finger pier aligning structure to accommodate the new vessel; and
- Replacement of the existing cradle, noust, slipway and winch to accommodate the increased size of the new vessel.
- New lighting will extend along the rear of the extended quay to the north of the existing quay.
- North Haven Construction Phase 1 (Noust slipway, cradle and pier)– February to September 2024 (approximately 8 months); and
- North Haven Construction Phase 2 (Breakwater and Linkspan) – March to September 2025 (approximately 7 months).

Although the differences between the current ferry service and the new ferry, and indeed any other vessels visiting Fair Isle, are relatively minor, there is an increased risk of transfer of invasive species both during the planned construction work, and during the operational life of the ferry. The improvements made to the ferry should ensure that the number of days of operation per year is increased. Furthermore, the improvements to North Haven bay, both in terms of the strengthened breakwater and the dredging, will make the area more accessible to yachts and other leisure vessels.

1.3 Scope of the works

This BMP has been developed for managing biosecurity during the construction work described above, and during the operational life of the new Fair Isle to Grutness ferry. This document, therefore, applies to:

- The export port, i.e. the Grutness ferry terminal, Shetland.
- The island landing port, i.e. North Haven bay, Fair Isle.
- Storage on -site
- Construction work on site
- All project-specific construction staff and project-related contractors
- The ferry operator, in this case Shetland Islands Council (SIC)

1.4 Project team roles and responsibilities

The contractor's Project Manager will:

- Maintain overall responsibility for ensuring that the project is conducted in accordance with the contract requirements, the BMP and the construction Environmental Management Plan (EMP).
- Ensure that the Site Manager and Project Manager are aware of the content of the BMP and EMP, and liaise closely with both before works commence.
- Ensure that all sub-contractors, operatives, managers and workers arriving at the site are briefed on the requirements of the BMP.
- Ensure that methods statements and risk assessments are prepared for each activity, and that these incorporate consideration of biosecurity related risks, and consideration of how these will be addressed, and the contingency plans in place.
- Liaise with third parties in response to communications involving the project.
- Deliver methods statement/risk assessment briefings to subcontractors/operatives.

The Contractor's Environmental Manager/Biosecurity Manager[1] will:

- Ensure that the project is completed in accordance with the BMP.
- Ensure that all sub-contractors, operatives, managers and workers arriving at the site are briefed on the requirements of the BMP.

- Deliver method statement/risk assessment briefings to sub-contractors/operatives.
- Authorise and implement procedures described in the BMP.

The Contractor will ensure that a Biosecurity Manager is present on Fair Isle to:

- Ensure compliance with and delivery of all biosecurity requirements at the port of departure. For the operational ferry this will be Grutness or Lerwick on Shetland, and a designated member of staff will fulfil this role. However, it is acknowledged that other specialised construction/dredging vessels may travel to Fair Isle from other ports. It is also considered likely that materials would be shipped to Lerwick via the Aberdeen ferry and then taken onto Fair Isle from Lerwick. In these circumstances the Biosecurity Manager will contact the port of departure to ensure that the requirements of the BMP are communicated and implemented.
- Ensure compliance with and delivery of all biosecurity requirements at North Haven, Fair Isle, particularly in relation to on-site storage areas and the construction site itself.
- Undertake regular review of current biosecurity risk and update the BMP as required.
- Ensure that monitoring is undertaken on Fair Isle,Grutness and Lerwick in compliance with this BMP.
- Ensure swift action is taken if biosecurity is compromised and that lessons are learned to avoid a repeat occurrence.
- Once the construction work is complete, this role will need to be transferred to a member of the SIC involved in the routine operation of the ferry.

1.4.1 Contact details of project team

Emergency Telephone Numbers of the project team responsible for the project BMP should be available to all staff and will be kept up to date as required.

Table 1. Contact details of project team

Role	Contact Name	Contact Number
Contractor's Project Manager	TBC	TBC
Contractor's Environmental Manager	TBC	TBC
Biosecurity Manager	TBC	TBC
Ecological Clerk of Works	TBC	TBC
SIC, ferry operator	TBC	TBC
Please send details of any incursions to the Biosecurity for LIFE website via their alert service: ▪ Resources (biosecurityforlife.org.uk): https://biosecurityforlife.org.uk/resources/#contact		

[1] I t is anticipated that the EcOW could also fulfil the role of Biosecurity Manager.

1.4.2 Other key contacts

Table 2. Other key contacts

Contact	Contact Details
Holly Paget-Brown Biosecurity for LIFE Officer for Shetland and Orkney Islands:	Holly.Paget-Brown@rspb.org.uk
Fair Isle Bird Observatory Trust:	warden@fairislebirdobs.co.uk
National Trust for Scotland, Inverness:	01463 732622
NAFC Marine Centre (for marine INNS):	01595 772000

1.5 Description of site and biosecurity control areas

Fair Isle is a remote island, lying 24 miles south of the Shetland Mainland and 27 miles from North Ronaldsay, the most northerly of the Orkney islands. It is administratively part of Shetland and is owned by the National Trust for Scotland (NTS). There is a permanent population of around 60 people, who mostly live in the south of the island. There are no dwellings present within or near site, the closest is located approximately 1.5 km to the southwest. Agricultural use is almost wholly sheep grazing with occasional cows and pigs and some limited cropping for food and livestock feed.

There are no invasive non-native mammal species present on Fair Isle other than the feral cats mentioned above and rabbit. The benthic surveys conducted at North Haven bay as a baseline for the Harbour Improvement Works, covering both intertidal and subtidal habitats, did not identify any marine INNS (ABPmer, 2023).

1.5.1 The construction site

The Fair Isle ferry berth is located within the harbour at North Haven, on the north-east of the island. The nearest Post Code is ZE2 9JU and the central Grid Reference is HZ 22498 72527.

The construction work described above will all take place within the approximate area inshore of the breakwater. This is defined as the construction site. The red line boundary for construction work is shown in the site plan, included as Figure 1.

1.5.2 Onsite storage areas

The two areas located near the Fair Isle Bird Observatory (hereafter FIBO) and delineated by the red line (Figure 1), show the small areas of field that will be utilised as onsite storage areas. These locations have been chosen as the fields are grazed and are considered to represent the least valuable SAC habitat available within the vicinity of the general works area.

1.5.3 Offsite fabrication areas & other vessels

It is possible that some construction materials may be transported between multiple destinations before reaching Fair Isle. It is considered likely that materials may be shipped to Lerwick via the Aberdeen ferry and then taken onto Fair Isle from Lerwick. Due to the limitations of North Haven port, it is unlikely that vessels would travel there directly, and would most likely arrive from either Lerwick or Grutness. However, the same biosecurity procedures need to be adopted regardless of the port of origin.

The Biosecurity Manager will need to identify the export port and communicate in advance to ensure that the relevant biosecurity procedures are in place. Even vessels that are working solely offshore (e.g. the dredge vessel), will also need to follow these biosecurity procedures as rats are very capable swimmers, and may swim distances of up to 2 km.

1.5.4 Construction waste

Construction waste expected to be generated by the proposed development includes non-hazardous construction materials such as off-cuts of timber, bricks, wire, fibreglass, cleaning cloths, paper, materials packaging and similar materials. Any waste that is generated will be managed in accordance with national and local policy, looking to reduce, reuse and recycle whenever possible. It is not anticipated that construction waste would be attractive to rats or other invasive species.

1.5.5 Workers

Workers will be housed in temporary accommodation on the island so that they will not have to commute each day. Although some staff may arrive by boat, it is anticipated that most staff and workers will arrive by aircraft.

1.5.6 The operational phase of the work

Since the replacement ferry will operate between Grutness/Lerwick (Shetland) and North Haven (Fair Isle), all ports will have routine biosecurity measures in place to ensure that rats or other invasive non-native species are not able to board the ferry and that other marine INNS are not transferred through fouling of vessel hulls and/or transfer of ballast water during the routine operation of the ferry.

Figure 1. **Red line boundary delineating the construction site at North Haven, Fair Isle**

2 Biosecurity Management Measures

2.1 Introduction

Biosecurity planning involves the identification of risk species and potential 'pathways', such as boats, aircraft and visitors. Prevention measures are required to ensure that invasive species are not transported to Fair Isle via these potential pathways.

An effective BMP will place multiple barriers along pathways, such as cleaning, disinfection, traps and checking on boats and surveillance.

This section aims to:

- Identify key risk species;
- Identify potential pathways of incursion;
- Put in place barriers reduce incursion risk;
- Describe the methods required to monitor for rats and other risk species (surveillance); and
- Define the procedures that need to be followed in the event of an incursion.

2.2 Risk species

Fair Isle has always been free of rats (black and brown), presumably due to its distance from and lack of connectivity to other islands and the mainland. It has also never had feral ferret *Mustela furo*, Red Fox *Vulpes vulpes*, Mountain Hare *Lepus timidus,* Stoat *Mustela erminea*, American mink *Neovison vison* or polecat-ferret *Mustela putorius x Mustela furo*. Previously Fair Isle has had individual hedgehogs *Erinacea Europaeus*, although they are no longer present. All of these species, with the exception of Black Rat and mink, are currently present on Shetland, and as such can be considered as risk species[2].

Other invasive mammalian predators present on mainland Scotland that may impact on nesting seabirds include Black Rat (*Rattus rattus*) and mink, although the risks of colonisation by Black Rat is considered very low as it is only left at a handful of sites. Colonisation risk posed by mink is considered much greater. Mink are voracious predators of bird eggs and/or chicks, with the Mink Control Project currently in operation across northern Scotland, aiming to eradicate them due to the damage they cause to native wildlife.

Fair Isle does have a small number of feral cats and domestic cats. The former are known predators of the Arctic terns nesting in the south of the island, and it is likely that Storm Petrel, Black Guillemot and Puffin are also negatively impacted by cats. Fair Isle also has both Field Mouse *Apodemus sylvaticus* and House Mouse *Mus domesticus*. Although not a separate species, it is of note that field mice on Fair Isle (and other Scottish islands) look different to those on the mainland, being much larger in size. Both Field Mouse and House Mouse may predate seabird eggs when other food is scarce.

The species considered to pose the greatest risk to birds is Brown Rat (*Rattus Norvegicus)* as it is abundant on both Shetland and the mainland around any human habitation and around ports. It is also a known predator of seabird eggs, with many seabird islands showing significant improvements in populations once Brown Rats are removed (Thomas *et al.* 2017).

[2] Land Mammals | Nature in Shetland (nature-shetland.co.uk)

The seabird species that are most vulnerable to egg/nest predation from any of the invasive non-native mammalian predators described above are smaller ground or burrow nesting species. On Fair Isle, these include Puffin, Storm Petrel and Arctic Tern. Razorbill and Black Guillemot may also nest in boulders and at the bottom of cliffs, in areas that may be easily accessible to rats. Rats also predate the nests of ground nesting shorebirds such as Oystercatcher [Redacted]

Since rats are highly capable climbers, there is also some risk to the endemic Fair Isle Wren *Troglodytes troglodytes fridariensis*, even though it nests almost exclusively on cliffs.

As well as impacts on birds, rats may also negatively impact on plants (by eating seeds), invertebrates, and other small mammals (Thomas *et al.* 2017).

In terms of invasive marine species, in Scotland there is a growing problem with various invasive non-native species. Specific acknowledgement is given to the following species which have all been found in Scottish waters: 'Wakame' (*Undaria pinnatifida*); 'Wireweed' (*Sargassum muticum*); the red alga (*Heterosiphonia japonica*); 'Orange-striped anemone' (*Haliplanella lineata*); 'Darwin's barnacle' (*Eliminius modestus*); 'Striped barnacle' (*Balanus amphitrite*); 'Japanese skeleton shrimp' (*Caprella mutica*); 'Slipper limpet' (*Crepidula fornicata*); 'Leathery sea squirt' (*Styela clava*); 'Carpet sea squirt' (*Didemnum vexillum*); 'Pacific oyster' (*Crassostrea gigas*); 'Chinese mitten crab' (*Eriocheir sinensis*). Illustrations of these species can be found within the Biosecurity Plan for the Shetland Isles[3]. A desk-based search of the species listed above showed no records of these species in Grutness or Fair Isle.
The following species have been recorded on Shetland at a distance greater than 3 km of Grutness: Orange-striped anemone' (*Haliplanella lineata*); 'Darwin's barnacle' (*Eliminius modestus*); Striped barnacle' (*Balanus amphitrite*); Japanese skeleton shrimp' (*Caprella mutica*).

The red alga *Bonnemaisonia hamifera* has been previously recorded at Fair Isle and the green alga *Codium fragile* has been recorded at Grutness bay, thus a potential pathway exists for transmission between the two sites via the passenger ferry. These are therefore considered risk species, although it is of note that they were not encountered in the recent benthic surveys undertaken as a part of the harbour improvement project. There are two marine INNS known to be present at Lerwick, namely Orange-tipped sea squirt *Corella eumyota* and the bryozoan *Bugula simplex*. Both are thought to spread primarily through fouling of vessel hulls. Lerwick harbour has been identified as a very high-risk port within the Shetland islands in relation to the introduction of INNS, due to high levels of shipping and boating activity. However, because of this, measures have been put in place by the NAFC Marine Centre to monitor regularly for the presence of INNS to enable the early detection of any new invasive species (Colin *et al.* 2015).

There are various invasive animal and plant species that could conceivably be introduced to Fair Isle. Up to date advice on these can be found on the UK Government website[4].

The procedures described to prevent spread of invasive mammals would be effective in preventing the spread of other animal species. In general, the risk of invasive plants is considered low for Fair Isle due to its high latitude and difficult weather conditions. However, the invasive plants that most routinely occur within the UK are Japanese Knotweed *Fallopia japonica,* Giant Hogweed *Heracleum mantegazzianum,* Himalayan Balsam *Impatiens glandulifera,* Rhododendrons *Tsusiophyllum Maxim* and New Zealand Pygmyweed *Crassula helmsii.* Illustrations and further information on potential control measures for these invasive plants may be found on the website listed above.

[3] A Biosecurity Plan for the Shetland Islands (researchgate.net) https://www.researchgate.net/publication/273137186_A_Biosecurity_Plan_for_the_Shetland_Islands#:~:text=The%20Biosecurity%20Plan%20for%20the%20Shetland%20Islands%20has,%28SMSP%29%2C%20which%20is%20now%20in%20its%20fourth%20edition.

[4] Invasive non-native (alien) animal species: rules in England and Wales - GOV.UK (www.gov.uk) , How to stop invasive non-native plants from spreading - GOV.UK (www.gov.uk)

2.3 Pathways

The key pathways associated with the harbour improvement works are limited to the established routes on and off the island. These are:

- Vessels, both in the construction phase (e.g. workboats) and the replacement ferry itself during the operational phase of the project.
- Aircraft, which are likely to be the main route on and off the island for construction workers and any other staff visiting the site.

Care should be considered in transporting any new material to Fair Isle, whether by boat or by plane, and careful checks should be made of everything from clothing and personal possessions to construction materials and plant machinery.

2.4 Barriers

Prevention measures, in the form of barriers to pathways, are considered for both the construction phase of the project, and the operational phase (i.e. relating to the operation of the new ferry).

2.4.1 Construction

Although a detailed construction methodology is yet to be determined, it is reasonable to assume for the purposes of this BMP that the construction activities will utilise excavators, dozers, cranes, dump trucks and possibly other small plant used during construction. The precise nature and quantity of plant employed during construction will vary with each of the activities described in paragraph 1.2.4. Therefore, the transport of plant and materials to and from the construction site, and the biosecurity measures required to minimize risk of incursion will need to be included within the risk assessments for each of these activities.

However, the following measures to control the arrival of vessels and/or construction materials from other locations (both Grutness and other ports) can broadly be applied across various scenarios. The Biosecurity Manager will need to liaise directly with the export port and vessel to ensure that the logistics are planned in advance and relevant storage areas are made available at the export port. However, the procedure adopted would be broadly as follows:

- **Measures to avoid transport of INNS through either fouling of hulls or ballast water.** The fouling of a vessel hull and other below-water surfaces can be reduced through regularly cleaning and the use of protective coatings. Therefore, copies of the vessel maintenance logbook should be obtained to ensure that a suitable cleaning regime is being regularly undertaken by the incoming vessel. If the vessel has not been cleaned recently (once per 2 years being a reasonable frequency), then it may be necessary to find out where the vessel has been working to assess likely risk on a case-by-case basis
- The vessels to be used for the construction of the proposed development will in the main originate from Scotland. Vessels operating in Scottish waters are advised against discharging water ballast in order to avoid causing an impact on the marine environment and to minimise the risk of transferring non-native species in ship's ballast water and sediments. All vessels must adhere to the International Maritime Organisation's (IMO) 'International Convention for the Control and Management of Ships' Ballast Water and Sediments', which introduced two performance standards seeking to limit the risk of non-native invasive species being imported (including distances for ballast water exchange and standards for ballast water treatment). The Convention came into force internationally in September 2017.

- **Measures to avoid accidental transport of rats or other invasive non-native species.** The export port will store the construction materials in a designated secure storage area, which should be constructed of concrete and disinfected to ensure there is no contamination. When unloaded at the export port, the construction materials should be unpacked and inspected to ensure that no rats or other non-native invasive mammalian predators are present. Rat poison and/or bait stations will be positioned around the storage area and regularly inspected. Paperwork detailing the inspections should be passed onto the Biosecurity Manager. Although the risk species may vary between ports, Brown Rat is of concern at virtually all locations.
- The vessel will need to ensure that rat traps/bait stations are deployed on board the vessel several days in advance of sailing and ensure that these are checked, and that the vessel is free of rodents prior to embarkation. Records of the checks will be kept and passed onto the Biosecurity Manager. If rats or signs of rats are found, then they will be removed. A 'Stop event' is then called by the vessel's skipper and the Biosecurity Manager will be contacted. A decision will be made on the correct course of action. If the vessel has already embarked, it may be returned to port, or may have to wait to ensure there are no other signs of rodents before being able to land.
- The skipper will communicate with the Biosecurity Manager in advance of arrival at North Haven, and the Biosecurity Manager will meet the vessel at the pier. The skipper will invite the Biosecurity Manager on board and pass over the relevant inspection paperwork. All parties will inspect the construction materials or plant before offloading. If any signs of rats are encountered, a 'Stop event' will be called, and the offloading of cargo suspended. A decision on the appropriate course of action will be made by the Biosecurity Manager as to whether to continue unloading or return the vessel to the port of origin.
- All materials, plant and equipment will be offloaded from the boat at the pier at North Haven. All arrivals shall be inspected by the Biosecurity Manager, prior to permission being granted to unload
- Even vessels that do not need to land, e.g. the dredge vessel, will also need to adhere to all the biosecurity measures listed above as they will be working within swimming distance of Fair Isle (as rats can swim up to 2km).

All equipment/construction materials will be stored on Fair Isle in the designated onsite storage area. This area will be regularly inspected by the Biosecurity Manager and the details of all inspections will be recorded in the Biosecurity log. Smaller items may be placed in sealed rodent-proof containers in a designated quarantine area.

All staff and workers will be briefed prior to their visit on how to check bags, clothing and any other items before embarking to Fair Isle, to ensure that rats and or/other invasive species are not accidentally transferred to with people and their luggage. Since Brown Rat is abundant elsewhere, commensal with humans, and attracted by food, then all workers should ensure that any edible items they carry with them are transported in rodent proof containers. All bags should be checked for rodents/signs of rodents prior to departure.

Whether arriving by air or boat, new arrivals will be met by the Biosecurity Manager, who should be kept informed of staff changes, worker arrivals and any changes to schedules. The Biosecurity Manager may choose to carry out checks as people arrive and will ensure that all workers understand the Biosecurity Management Plan and their responsibilities.

2.4.2 Operation

The operational ferry will need to adhere to strict biosecurity measures to protect Fair Isle's bird life from rats. Measures will likely include:

- Deploy chew cards or wax blocks around the vessel and check them regularly. Chew cards/wax blocks should be checked before embarking from Grutness and before arrival in Fair Isle[5].
- Ensure skipper and crew are aware of all biosecurity guidance.
- Secure possible rodent entry points on vessel.
- Provide advice for general public on biosecurity before boarding the vessel preferably in advance when booking tickets (see Appendix C for example of text that could be adapted for general public). Display biosecurity posters in ports and on vessel.
- Re-pack luggage before boarding, never leave luggage on the harbour side and advise passengers of these procedures.
- Public and crew to pack any food in rodent proof containers.
- Store any waste securely in rodent proof bins.
- Use rat guards on mooring chains and anchor lines.
- Regularly inspect vessel for other signs of rats, e.g. gnawed wires, droppings, entry holes, etc.

If a rat/other invasive species (or suspected evidence) is found on the ferry:

- A 'Stop event' should be called.
- The ferry should not land at Fair Isle if there is a rat (even a dead one) or a suspected rat /other invasive mammal species and should return to the port of departure.
- Do not push a rat overboard, dead or alive.
- Do not assume there is only one rat on board.
- Return to a mainland harbour and deploy appropriate control measures[6].

The potential for transfer of either Orange-tipped sea squirt or the bryozoan *Bugula simplex* from Lerwick harbour due to the fouling of the vessel hull during the regular operational life of the replacement ferry is acknowledged. The replacement ferry will ensure protective coatings are applied regularly, which coupled with a regular cleaning regime, will reduce the chances of accidental transfer.

2.5 Surveillance

During construction, surveillance of the following areas will be required:

- Any construction related vessels travelling to Fair Isle
- The designated storage areas
- The construction areas (e.g. the pier, the new quay, the noust).

During operation, surveillance of the following areas will be required:

- The ferry
- The ferry terminal at Gruntess
- The ferry terminal at Lerwick

2.5.1 Construction

Surveillance of vessels is typically carried out by using either wax blocks or chew cards[7].

5 Checking twice increases the number of barriers along this pathway.

6 Advice on rodent removal methods for vessels can be found here: found-signs-of-stowawys-onboard-your-boat-here-are-the-steps-to-take.pdf (biosecurityforlife.org.uk): https://biosecurityforlife.org.uk/admin/resources/found-signs-of-stowawys-onboard-your-boat-here-are-the-steps-to-take.pdf

7 The recipe to make wax blocks can be found here: recipe-for-making-flavoured-wax-blocks-1.pdf (biosecurityforlife.org.uk)

Flavoured wax blocks are attractive to rodents, and the teeth marks left in the wax can be used to identify the rodent[8]. The wax blocks may be positioned within wooden boxes (with rodent sized holes in each side) to ensure that wax blocks are interfered with by people, large gulls etc.

It would not be desirable to use poison/kill traps on a boat carrying members of the public due to risk to children, although it could be possible to deploy poison/traps in a sealed bait station on other workboats so that it cannot be accidently accessed.

Other surveillance methods, such as tracking tunnels and hair traps are more difficult to use, especially in a confined space. Usually identifying successful deployment locations requires careful consideration and knowledge of rats and how they use their habitat.

However, the use of a UV light (blacklight) is a very effective means of detecting rat urine, which fluoresces under UV light making it easy to detect. This is a helpful surveillance method that could be used on a vessel, especially if the presence of a rat is suspected but not confirmed. The wax blocks should be checked before every crossing to Fair Isle (pre-embarkation) and also before arrival at North Haven Bay. By checking twice this increases the number of barriers to this potential pathway.

Surveillance of storage areas would utilise similar methods of deploying and checking wax blocks. Poison should never be used for surveillance purposes on seabird islands due to the risks posed to non-target species.

Since the storage areas are in fields it may also be appropriate to use hair tubes and tracking tunnels, as multiple surveillance methods have been found to be more successful that reliance on a single methodology. Hair tubes need to be placed in long grass, in areas likely to be well used by rodents. Bait is placed at one end of the tube, and a small sticky pad is attached near the entrance so that when an animal takes the bait it leaves a hair sample behind. Tracking tunnels are filled with sand, so that if an animal enters then its tracks are recorded in the sand. They also need to be placed in long grass that is likely to be well used by rodents.

As described above, all construction materials taken into the storage area will be checked for rodents. Regular checks of the storage area (daily) and the surveillance devices deployed (wax blocks, hair tunnels, sand tunnels) will be undertaken by the Biosecurity Manager and recorded within the Biosecurity logbook.

Surveillance of the construction areas could adopt similar techniques as the storage areas, although wax blocks, hair tubes and sand tunnels will need to be deployed carefully so that they are not obvious to the general public.

2.5.2 Operation

The measures described above for vessels during construction should also apply to the operational ferry. Additional surveillance (deployment of wax blocks/chew cards) around the ferry terminal at Grutness could also be helpful.

2.6 Incursion response

If a rat/other invasive mammal is found, or possible signs of an invasive mammal are found on a vessel, either before boarding the vessel or whilst on route then a 'Stop event' should be called. The vessel

[8] See ID TOOL - Rodent identification and signs of stowaways (biosecurityforlife.org.uk).

should not depart for Fair Isle but should either stay in port or return to the port of origin. The following control measures recommended by the Biosecurity for LIFE project should then be adopted[9].

If a rat/other invasive mammal is found, or suspected signs of an incursion are detected within the storage area, then the matter needs to be progressed as a matter of urgency. Trapping may be straightforward if the animal is in a known area, but becomes increasingly more difficult as animals disperse, and in the case of rats, they breed rapidly. It is important never to assume that there is only one rat – if one rat is seen, there are likely to be more.

The nature of the incursion response depends on whether the rodent sighting is confirmed or whether it is speculative. For example, sightings may be fleeting, or reported by a member of the public, it is possible that tracks may be from a rat, but could also potentially be from a field mouse etc.

If it is not clear whether a rat (or other invasive mammal) is present, then the first stage is to gather information as rapidly as possible. In this instance, FIBO should be contacted, as they also have surveillance measures in place to detect incursion of rodents. Their Biosecurity logbook should be checked to find out whether there have been any potential signs of rats logged in their monitoring records.

Searches for droppings and other signs, such as tracks, hair, scratch marks should then be carried out as a matter of urgency. Any evidence should be photographed. If the evidence is going to be difficult to identify, send to more than one expert to review independently to give their opinion. Ask each of them why they came to the conclusion they did and what other opportunities there may be to further verify this. Always archive the evidence and record the incident in the biosecurity log.

If the presence of a rat is confirmed, then a team needs to deploy poisoned bait/traps as rapidly as possible. In this instance, non-target species (Field Mouse and House Mouse) may be vulnerable. Possible measures to avoid accidental poisoning of these species should be discussed as rapidly as possible with relevant experts, both from FIBO and from within the Biosecurity for LIFE team.

In the case of a probable or confirmed incursion, additional bait stations and/or traps need to be deployed in a grid across the island within 48 hours. For this to be possible, the mechanisms for responding to a reported sighting/sign find must be progressed rapidly and lines of responsibility need to be clear. This should be established with FIBO at the project outset, as it is will be necessary to work with them should an incursion occur. Transport arrangements for additional staff should be arranged as soon as possible, and all equipment should be ready and stored on the island. It is anticipated that FIBO will have additional bait stations, although it will be necessary for the Biosecurity Manager to liaise with FIBO in advance to ensure that incursion response procedures are agreed, and an incursion response kit is present on Fair Isle[10] so that an incursion response can be effectively implemented rapidly if needed.

Where there is already a network of stations in place on the island, this should be used as the basis for the response. It may need to be bolstered – e.g. if signs of a rodent are discovered on a large island in an area where there is no grid or only a sparse grid. 1 to 2 devices per ha targeting the preferred habitat is sufficient.

If a grid is already established, it may be possible to reduce the grid size around the area of the sighting/evidence. Traps should be placed around the area of the sighting/evidence where there is plenty of natural cover and where rodents are likely to be active (e.g. alongside large rocks or walls,

9 Found-signs-of-stowawys-onboard-your-boat-here-are-the-steps-to-take.pdf (biosecurityforlife.org.uk).
10 See Table 1.9 in island-biosecurity-manual-2 (1).pdf

around the base of trees, under logs, overhanging vegetation, and under buildings). Traps can be baited with a mixture of peanut butter and rolled oats for an easy, durable bait which can be stored as part of the Incursion Response Kit. Tracks are used by invading brown rats and mice. Brown rats tend to be coastal foragers while black rats might prefer interior forest and may avoid tracks.

Procedures for setting up a grid and monitoring procedures following an incursion are described in more detail in Appendix A, which is taken from the Biosecurity for LIFE manual[11].It is anticipated that these procedures would be followed collaboratively with FIBO staff. However, the practical details of an incursion response plan would need to be established by the Biosecurity Manager in collaboration with FIBO.

In relation to detection of a marine INNS, such as those described in Risk species the response to an INNS needs to be considered carefully. If the INNS has been detected on the hull of a vessel, options include exposure to air, mechanical/manual removal, exclosure, or chemical treatment. However careful choices need to be made to avoid impacts on non-target species. In extreme situations quarantine or eradication may be considered. However, in the first instance consultation with experts at the NAFC Marine Centre is recommended for advice on the best course of action.

Although the risk of invasive non-native plants is considered low, information on control is again species specific. In the first instance the advice given on the UK Government website should be consulted[12].

[11] MANUAL - Island Biosecurity (biosecurityforlife.org.uk)
[12] How to stop invasive non-native plants from spreading - GOV.UK (www.gov.uk)

3 Management of the Work

3.1 General site procedures

The requirements of this BMP shall be highlighted to all persons involved in the construction of the new Fair Isle Ferry Upgrade, directly or indirectly. This includes those visiting the island, working on the island, supplying materials, plant or equipment to the island. All suppliers of materials, plant or equipment to be used on the island shall be given copies of this BMP. Any material, plant or equipment found not to follow the requirements of the plan, shall be refused to be offloaded at the off-site storage area, or the export port and the cost of replacement borne by the supplier.

- Delivery vessels, on arrival at Fair Isle, shall comply with the 'Fair Isle Biosecurity Checks' described in Pathways.
- Workers arriving on the island shall be made aware of the BMP and their responsibilities through pre- travel brief, site induction and regular toolbox talks. A Biosecurity Log (see will be maintained centrally on-site, which will record the results of all actions undertaken to maintain biosecurity. Examples of Biosecurity log sheets are included as Appendix B

3.2 Sign off and responsibilities

All contractors and sub-contractors must be contractually obliged to follow this BMP. It will be the responsibility of each contracting organization to ensure that their employees and sub-contractors follow this plan and for them to layout clearly the measures that must be adhered to. Being able to demonstrate compliance should be included in the contract payment mechanism.

3.3 Project specific biosecurity actions

The BMP shall be in operation at all times during the duration of the construction work and should be consulted in relation to logistics and planning and incorporated within risk assessments. The measures identified below will be implemented in order to further minimize the risk of introducing invasive non-native species. The BMP is iterative and will be updated regularly considering advances in best practice, identification of emerging issues such as a new disease being recorded, changing advice from Government with regards to avian influenza control measures, or from lessons learned through the operation of the site.

Project-specific biosecurity actions and commitments to minimize risk are outlined in Table 3. Actions have been grouped into three categories, which relate to staff and workers: materials, plant and equipment or shipping. Where appropriate, responsibility for actions, timing and location has been included. The register of actions and commitments is a live document and will be reviewed as required during the project.

Table 3. Project specific biosecurity actions and commitments

Item.	Action	Timing	Location	Person Responsible
1.	**Project Workers (includes arrivals via plane and boat)**			
1.1	All workers to receive an appropriate written briefing on their biosecurity responsibilities prior to travel (Appendix C).	Before travelling to site	Pre-travel	Biosecurity Manager
1.2	All workers will be made aware of this BMP and their responsibilities through site induction and ongoing toolbox talks.	Pre and during construction	On arrival to site and whilst working on site	Biosecurity Manager
1.3	To avoid using PPE on different sites, PPE should be kept on Fair Isle for all staff and visitors	All times	Site office	Biosecurity Manager
1.4	Where this is not practical, PPE and footwear must be thoroughly checked, cleaned and dried before travel to Fair Isle.	Pre- travel	Pre-travel	All workers
1.5	All workers report suspected issues immediately to the Biosecurity Manager	All times	All locations	All workers
2.	**Materials, Plant and Equipment**			
2.1	All materials, plant and equipment should be stored in a dedicated biosecurity area (hard standing) at the export port, which would include washing and disinfection facilities and regular surveillance for rodents. All plant and materials are to be checked using a form provided in Appendix B. If any organic material or soil is found, then a two-step cleaning procedure is implemented: cleaning with water followed by disinfection (allowed to dry on).	Before leaving export port	Export port	Biosecurity Manager to liaise in advance with export port.
3.	**Vessels (construction and operational ferry)**			
3.1	Ensure boats regularly antifouled and checked for INNS as part of regular maintenance regime. Consider risks based on location of previous work if applicable.	Pre- and during construction	n/a	Biosecurity Manager to liaise with vessel company
3.2	Regular application of protective coatings to prevent fouling for the replacement ferry to reduce risk of transfer of INNS from Lerwick in particular due to its very high-risk status.	Operational ferry	n/a	SIC (ferry operator)
3.3	Prior to departure the skipper will confirm that the biosecurity checks (wax blocks/traps) have been undertaken, and will	Construction vessels, also operational ferry	Onboard the vessel	Skipper of vessel, Biosecurity Manager

Item.	Action	Timing	Location	Person Responsible
	ensure that they are checked again prior to arrival at North Haven. Should a suspected/confirmed invasive species be found then a 'Stop event' will be called. The Biosecurity Manager should be consulted and will then advise on the most appropriate course of action (if there is uncertainty the vessel should be returned to the export port).			
3.4	Mooring lines to be fitted with rat guards. Vessels should not use mooring lines unless necessary	All times	Both export port and North Haven	Skipper of vessel, Biosecurity Manager
3.5	Do not land at night, do not load vessels at night	All times	Both export port and North Haven	Skipper of vessel, Biosecurity Manager

3.4 Site monitoring and monitoring of the Plan

Daily checks of wax blocks and other surveillance devices around the construction site and storage areas will be undertaken by the Biosecurity Manager to ensure there are no signs of incursion.

The implementation of the BMP will need to be monitored and the biosecurity log will provide a clear recording system for the results of checks that have been made or actions are taken on and off-site, which will then allow the Biosecurity Manager to analyse the situation and take the appropriate action if and when breaches of biosecurity occur. Compliance monitoring of this BMP implementation and the associated biosecurity log will be undertaken by the biosecurity manager and the site environmental manager.

The biosecurity logbook will include:

- Details of routine inspections.
- Details of reporting chain following identification of potential problems. This will be directly to the Biosecurity Manager in the first instance.
- Details of workers arriving on site (name, date and time of visit. Company). It must also be ensured that visitors are aware of relevant biosecurity measures.
- Records of checks undertaken by the Biosecurity Manager. Note that negative results where no specimens are found are just as valuable in being able to identify when a population became established which may be able to be cross-referenced with operations being undertaken around that time and allow appropriate alterations to site practices to be made to minimize the risk in the future.

3.5 Incursion response

The Biosecurity Manager will be responsible for implementing the incursion response. The procedures that need to be followed are described in Section 2.6 above with more detail given in Appendix A.

The Biosecurity Manager will need to work collaboratively with FIBO to ensure that an agreed incursion response plan for invasive mammalian predators can be finalised prior to the work commencing, and to ensure that the required equipment is available on Fair Isle should an incursion occur. Although Appendix A provides information on what to do if a rat is detected, consideration needs to be given to the possibility of other INNS occurring, such as Mink for example, which would require different traps. For example, if using lethal traps for Mink, consideration needs to be given regarding risks to non-target species.

If marine INNS are detected then the Biosecurity Manager will need to consult with relevant experts, starting with the NAFC Marine Centre as specified within the Shetland Islands Biosecurity Plan. Similarly, if invasive plants are found, UK Government advice should be followed[13].

3.6 Implementation and review

3.6.1 Construction

The Biosecurity Manager is key to the delivery of actions in this BMP and has overall responsibility for ensuring that measures outlined in this plan are implemented as well as being able to demonstrate its effectiveness through the keeping of accurate records. They will also be responsible for ensuring that

[13] How to stop invasive non-native plants from spreading - GOV.UK (www.gov.uk)

contractors and the supply chain understand the risks and required measures and that effective procedures are in place to ensure these measures are followed. These measures should also be specified contractually.

3.6.2 Operation

Once the construction work is complete, then a new Biosecurity officer will need to be appointed to ensure that the ferry adheres to the biosecurity measures described above. It is anticipated that this will be either the Skipper of the new ferry or one of the crew. It will be necessary for all of the crew to understand the biosecurity management measures and ensure that these are implemented. It is anticipated that consideration of biosecurity could be incorporated within standard risk assessment procedures.

4 Risk Assessment

Risk is the likelihood of a harmful event occurring (in this case an invasive non-native species or notifiable disease), multiplied by the severity of the consequences if the event occurs. Risk analysis usually has four stages, namely:

- Likelihood of introduction
- Likelihood of establishment and spread
- Potential impacts
- Risk calculation and evaluation

4.1 Likelihood of introduction

Risk will be assessed during construction and during the operational life of the replacement ferry.

4.1.1 Construction

The increase in people travelling and staying on Fair Isle because of the construction work does increase the risk of a biosecurity incursion. However, tourists regularly visit Fair Isle, and therefore the nature of the risk does not fundamentally change. Ensuring that staff are made aware of the biosecurity concerns in advance, including contractually, is considered an effective means of reducing this risk.

The increase in different vessels travelling to Fair Isle also increases biosecurity risk. However, ensuring in advance that biosecurity measures are in place at the port of export will reduce risks.

4.1.2 Operation

It is possible that the harbour improvements will improve conditions for other vessels such as yachts and other leisure craft. However, improving the availability of biosecurity information for visitors (e.g. posters within harbours etc) will help to reduce risk.

Since the replacement ferry is likely to have greater number of operational days per year than old ferry then this may increase risk. However, ensuring that the skipper and crew are operating rigorous checks for INNS will reduce the risks.

The extension of the pier would introduce a new surface in the marine environment which has the potential to facilitate the spread of non-native species. The likelihood of introduction is considered low for most INNS assuming that the procedures above are followed. However, the potential for transfer of the green alga *Codium fragile* from Grutness to Fair Isle, and conversely the red alga *Bonnemaisonia hamifera* from Fair Isle to Grutness is acknowledged. However, whether this is a current concern needs to be confirmed as neither species was found during the recent benthic surveys conducted as part of the work for the ferry replacement project at either site. The potential for transfer of either Orange-tipped sea squirt or the bryozoan *Bugula simplex* from Lerwick harbour due to fouling of the vessel hull during the regular operational life of the replacement ferry is acknowledged. The replacement ferry will ensure protective coatings are applied regularly, which coupled with a regular cleaning regime, will reduce the chances of accidental transfer.

In summary, the INNS considered of greatest risk during both construction and operation is Brown Rat, due to its abundance and prevalence within most ports, its association with humans and its abilities to escape detection, and reproduce rapidly.

4.2 Likelihood of establishment and spread

For both marine and terrestrial pathways, there is no significant difference from the mainland environment that would prevent non-native species from becoming established and thus there is a high likelihood of establishment and spread for many species. This further highlights the importance of preventing these species from being transferred to Fair Isle.

4.3 Potential impacts

This is based on the potential harm that the non-native species could cause in the recipient environment. On Fair Isle the effects could be significant, the major threat being the risk mammalian predators, notably rats or ferret/polecat-ferret, could have on internationally important seabird species. Rodents are more likely to arrive on an island and remain undetected than many of the larger invasive mammals. Therefore rats are considered a high risk species.

Ferret and Polecat-ferret are also considered high risk species as they are present on Shetland, and may be devastating in terms of their impact on seabird species.

Although not present on Shetland, Mink is also considered a high risk species as it is present on the mainland, and may result in very significant damage to birds as it is a particularly voracious bird predator.

4.4 Risk calculation and evaluation

Risk can be estimated using a variety of methods, either qualitatively or quantitatively. Table 4 below shows a range of potential biosecurity risk scenarios, the likelihood of the risk occurring without mitigation, the recommended mitigation measures that will be adopted to reduce risk, and the residual risk that will remain once mitigation is in place.

Table 4. Assessment of most likely biosecurity risks for different incursion scenarios, recommended mitigation and residual risk

Scenario	Risk	Mitigation Measures	Residual Risk
Incursion of rats	High	Strict biosecurity measures to control pathways (people arriving by aircraft, and staff/construction materials arriving by vessel) as described in Section 2.4 Strict biosecurity measures to be adopted during the operational life of the ferry (as described in Section 2.4).	Minor level of residual risk, but acceptable to proceed with work.
Incursion of mink	Moderate		Low level of residual risk, acceptable to proceed with work
Incursion of polecat-ferret/ferret	Moderate		Low level of residual risk, acceptable to proceed with work
Incursion of stoat/weasel	Moderate		Low level of residual risk, acceptable to proceed with work
Incursion of hedgehog	Low		Very low level of residual risk, acceptable to proceed with work
Transfer of *Codium fragile* (from Grutness)	Moderate	Ensure that hulls of vessels are regularly cleaned. Biosecurity Manager to inspect Vessel Maintenance Logs prior to sailing. If cleaning has not been undertaken recently, Biosecurity Manager to assess likely risk on case-by-case basis considering export port, recent areas of operation and other influential factors. Operational ferry will ensure that the hull is cleaned regularly, and a protective coating is regularly applied to reduce the risk of accidental transfer of marine INNS via fouling.	Low level of residual risk, acceptable to proceed with work
Transfer of Orange tipped sea squirt	Moderate		
Transfer of the bryozoan *Bugula simplex*	Moderate		
Transfer of other marine INNS	Moderate		
Introduction of invasive plants	Low	Ensure that construction materials/plant clean and checked for presence of seeds, soils etc before embarkation. All staff and workers, whether travelling by vessel or aircraft, should also ensure that clothes, boots etc are clean and free from soil, seeds, etc.	Very low level of risk, acceptable to proceed with work.

5 Summary

In order to preserve Fair Isle's designated seabird colonies and habitats, strict biosecurity measures are recommended both during construction and during the operation of the replacement ferry. This BMP summarises the types of measures that are required. The BMP should be considered a live document to be updated as needed, and at this stage is a final draft for discussion pending further consultation with relevant stakeholders.

The highest risk is considered to be the potential incursion of Brown Rat, as rats are present both on Shetland and on the mainland in nearly all ports, they are associated with humans, and they are known to board vessels without attracting notice. They also disperse and reproduce rapidly, making control efforts laborious. They have a disastrous impact on breeding seabirds, in particular burrow and ground nesting species. There are internationally important colonies of ground/burrow nesting species on Fair Isle including Arctic Tern, Puffin and Storm Petrel. It is also possible that rats would be able to access the nests of the endemic Fair Isle Wren.

Although all invasive mammalian predators have the potential to result in detrimental impacts on seabirds, Mink is also notable as a particularly voracious bird predator.

The potential for transfer of either Orange-tipped sea squirt or the bryozoan *Bugula simplex* from Lerwick harbour due to fouling of the vessel hull during the regular operational life of the replacement ferry is acknowledged. The replacement ferry will ensure protective coatings are applied regularly, which coupled with a regular cleaning regime, will reduce the chances of accidental transfer.

This document identifies incursion pathways whereby incursions could occur and identifies measures to introduce multiple barriers for each pathway.

The success of the Biosecurity Management Plan will depend heavily on the Biosecurity Manager appointed to take forward the recommendations made within this document, and to ensure that the risk assessments for each of the construction activities also consider biosecurity according to the principles set out within this document.

The need for advance planning, specifically in relation to biosecurity measures at export ports, and also in relation to collaboratively developing an incursion response plan in coordination with FIBO are areas that will require consideration well in advance of construction start dates.

The need to inform vessels and staff of biosecurity arrangements well in advance of arrival is also of central importance, and it is important that biosecurity procedures are included in contractual documentation for all contractors.

With the relevant biosecurity measures in place, it is considered acceptable to proceed with the harbour improvement work.

This Biosecurity Management Plan should be considered as a live document, to be updated throughout the construction phase, and adapted as needed to take the project through to the operational phase. It is anticipated that various updates will be required to ensure that the skipper and crew of the new ferry are able to operate a secure service in terms of biosecurity, protecting Fair Isle's biodiversity into the future.

6 References

ABPmer, (2023). Fair Isle Ferry Upgrade, Benthic Survey Report, ABPmer Report No. R.4064. A report produced by ABPmer for Stantec, November 2022.

Collin, S.B., MacIver, K., Shucksmith, R. (2015). A Biosecurity Plan for the Shetland Islands.

Thomas, S., Brown, A., Bullock, D., Lock, L. Luxmoore, R., Roy, S., Stanbury, A., & Varnham, K. (2017). Island restoration in the UK – past, present and future. *British Wildlife* 28:4, p.231-243.

7 Abbreviations/Acronyms

ABP	Associated British Ports
BMP	Biosecurity Management Plan
FIBO	Fair Island Bird Observatory
INNS	Invasive non-native species

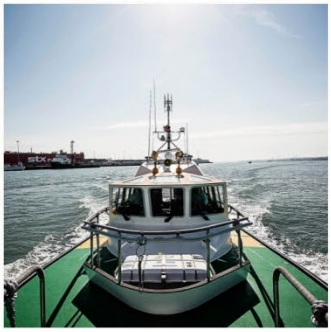
Cardinal points/directions are used unless otherwise stated.

SI units are used unless otherwise stated.

Appendices







Innovative Thinking - Sustainable Solutions

ABP mer

A Confirming and Responding to an Incursion

This information is taken from the Biosecurity for LIFE manual: MANUAL - Island Biosecurity (biosecurityforlife.org.uk). It has been edited to ensure that it is relevant to the project and is intended to show the procedures that would be followed collaboratively with FIBO in the event of a biosecurity incursion. However, these procedures would need to be agreed with FIBO and potentially refined as needed.

Correct identification of any sign of rodent incursion is crucial to making the right decision on how to respond. In some situations, the evidence of an incursion will be indisputable, e.g. a dead body in a trap. However, in many cases the evidence will be open to interpretation, e.g. sightings by third parties. It is important, therefore, that evidence collection techniques maximise the information available and minimise the chance of wrong conclusions being drawn from it. Table A1 provides advice on collecting and caring for different types of evidence indicating a rodent incursion.

If there is any uncertainty over the sign, ask at least two experts to help interpret the evidence. Experts prepared to offer advice should be identified in advance and their names and contact details should form part of the Incursion Response Kit (see below). As experts may be uncontactable in the field when you need their advice, ensure you gather details of several experts who are prepared to help.

In New Zealand, the first line of action if incursion is suspected is to use rodent detection dogs to help locate any individuals that are present. In the UK, there is currently one trained biosecurity dog. However, since guidance around the use of trained biosecurity dogs may change, the Biosecurity for LIFE website should be consulted for up to date guidance.

As a possible alternative, caged rats may prove an effective lure for wild brown rats. This has **not been extensively field tested**, but is a promising field of research. **Seek further advice**: the risks of the rat escaping must be managed effectively and there will be **animal welfare considerations** regarding the use of caged animals. There is evidence to suggest this method doesn't work for black rats, so only consider using if you know only brown rats are present.

The following decision tree procedures are designed to help you manage potential incursions promptly and effectively, however they can be **guides only** as so much depends on island circumstances. This is why independent review is so important. The general course of action is:

1. A sighting is reported
2. The person who sighted the rodent is interviewed as soon as possible
3. The location of the sighting is visited (preferably with the observer) and assessed
4. Any further evidence is collected and, if necessary, sent to experts
5. The sighting is considered either **uncertain** or **probable/confirmed**
6. Uncertain sightings trigger a monitoring response
7. Probable & confirmed sightings trigger incursion response involving traps and rodenticide
8. All sightings and follow up actions are recorded in the biosecurity log

If rodent evidence is found:

1. If there is any doubt about the evidence, the location where the evidence was found is assessed
2. Any further evidence is collected and, if necessary, sent to experts
3. The evidence is considered either uncertain or probable/confirmed rodent sign
4. Uncertain evidence triggers a monitoring response
5. Probable & confirmed evidence triggers incursion response involving traps and rodenticide
6. All evidence and follow up actions are recorded in the biosecurity log

If there is a **shipwreck**, the area is immediately **considered as a probable/confirmed incursion and triggers an incursion response.** Consider working with maritime authorities who get involved in the shipwreck response to get more information about the level of risk e.g. if salvage experts are going on board the vessel they could be trained to look for rodent sign in the galley. Knowing the cargo and the prospects for the ship breaking up could also forewarn your response.

The speed of a response is crucial. For a probable or confirmed incursion, you want a team on the island ready to deploy bait/set traps/bolster the grid **within 48 hours**. For this to be possible, the mechanisms for responding to a reported sighting/sign find must be slick and lines of responsibility need to be clear. Transport arrangements should be in place and all equipment ready for loading, if not stored on the island. As UK surveillance strategies are limited to detecting incursion events (by themselves they cannot deal with an incursion), it is even more imperative that plans for incursion response are in place and people are ready to respond immediately.

Where there is already a network of stations in place on the island, use it as the basis for the response. It may need to be bolstered – e.g. if rodent sign is discovered on a large island in an area where there is no grid or only a sparse grid. Speed is of the essence. A sparse but extensive network covering as much of the island as possible is probably better if a grid has to be established than a dense grid in a small area. 1 to 2 devices per ha targeting preferred habitat is sufficient – it doesn't need to be an exact grid because invading rodents are likely to travel. Cover all major habitat types, but focus on preferred sites and known invasion sites. If a grid is already established, you may have time to reduce the grid size around the area of the sighting/evidence.

Place traps around the area of the sighting/evidence where there is plenty of natural cover and where rodents are likely to be active (e.g. alongside large rocks or walls, around the base of trees, under logs, overhanging vegetation, and under buildings). Traps can be baited with a mixture of peanut butter and rolled oats for an easy, durable bait which can be stored as part of the Incursion Response Kit. Tracks are used by invading brown rats and mice. Brown rats tend to be coastal foragers while black rats might prefer interior forest and may avoid tracks.

Having a Rodent Incursion Kit stocked is crucial to preparedness. Some items in the Incursion Response Kit will need to be replaced periodically even if not used (*****). An annual inspection of the kit is highly recommended. The contents of the kit will depend on the characteristics of your island, but a starter list is provided in Table A2

Table A1. Collecting and archiving surveillance evidence

Evidence	Advice
Sightings	- Interview the person who made the sighting as soon as possible – preferably on the same day. Take account of their experience but do not judge a sighting on experience alone. The most important factors are how well they saw it, i.e. how close, how long, what visibility. *What made them think it was a rat/mouse?* - Ask open questions e.g. "tell me what you saw? how long did you observe it? What did it look like?" DO NOT ask leading questions e.g. "was it brown and about this big?" - Record or write <u>everything</u> down, including when the sighting took place, when the interview took place and who conducted the interview. - Ensure the exact location of the sighting is recorded, if necessary take the person back to the location where they saw the animal. - Always record the incident in the biosecurity log and check it against previous incident records. One vague sighting on its own may be dismissed but if you get a number of similar sightings in a similar area over time you may form a different conclusion. New techniques for identification may present themselves in the future which could allow the archived evidence to be reviewed. - Try to establish other evidence that supports or challenges the sighting (could it have been a vole or a shrew, or even a wren?). - Use a standard recording form to gather similar information from each sighting.
Droppings or feeding sign	- Photograph the evidence *in situ* where possible before disturbing it. If taking digital photographs, use high definition settings for at least some photos and provide a size comparator (e.g. coin, pen lid). - When retrieving evidence to take back, physically mark the spot and collect everything i.e. if there are 24 suspected rat droppings there pick up all 24 and take them back, not just one or two. - Take time to look around carefully for other sign such as tracks, hair, scratch marks etc. Remember you are not only looking for evidence of the suspected species, you're also looking for evidence which may support an alternative explanation. - Label the evidence, including photos with detail on when /where /who. - If sending evidence to an expert for identification, think about the security of transporting it e.g. this evidence may be the crucial factor in a decision to spend thousands of pounds in a contingency response, so don't save £5 by sending it in the post instead of by courier or other traceable/more secure transport system. - If the evidence is going to be difficult to identify, have more than one expert look at it independently to give their opinion. Ask each of them why they came to the conclusion they did and what other opportunities there may be to further verify this. - Always archive the evidence and record the incident in the biosecurity log. Reference it against previous incident records (see above).
Carcasses	- Photograph *in situ*. Preserve in alcohol or triple bag and freeze. Label the evidence with details on location, state, and who found it and when. If species cannot be determined (e.g. due to decomposition), consider gathering DNA evidence.

Table A2. Rodent incursion kit contents

Item
Reference Information - Consider having laminated copies
Biosecurity plan *
Map of island
Map and description of GPS locations of permanent monitoring devices / grid
Species identification material
Operating instructions (e.g. CPS, trail camera, traps, installing bait stations)
Contact details for experts *
Record Keeping
Waterproof notebooks
Copies of maps for note-making (incl. some laminated)
Pens/pencils
Vivid marker pens
GPS (loaded with locations of stations) and spare batteries*
Compass
Data sheets for recording activity at traps/tracking tunnels/monitoring stations
Flagging tape (at least two colours)
Specimen containers (jars, zip lock bags) & labels
1 litre of 70% ethanol
Sharp knife or dissecting tools (e.g. scalpel, tweezers)
Digital camera and spare batteries*
50m tape measure
Detection
Tracking cards*, ink* & tunnels
Bait for tracking tunnels - peanut butter/oats, pieces of coconut, etc *
Indicator baits - chocolate/peanut butter/coconut wax, soap, coconut, eggs, chocolate *
Trail camera(s) and spare batteries*
Headlamps/torches & spare batteries*
Eradication
Snap traps and covers with length of wire for each trap to attach to anchor-point. Mouse and rat-sized if both species a risk.
Bait for traps – e.g. peanut butter* and rolled oats*
Wire and bait stations – sufficient to create correct grid size across island, if required
Second Generation Rodenticide*- replace every couple of years: has limited shelf-life
Self-sealing bags
Disposable gloves* for handling baits, traps or dead animals
Tools e.g. hammers, spades, pliers, nails, thin wire, thicker wire
First Aid kit including blankets*
Boat & safety gear*
Rope access gear*
Two means of long-distance communications – two-way radio and/or satellite phone and/or emergency locator beacons, and spare batteries* or means to charge these.
Personal protective equipment
Tent and sleeping equipment (if no accommodation available on island)
Water* and cooking implements (take fresh supplies of food and water as well)
Generator and fuel (if no electricity on island)
Rodent-proof and waterproof containers for all equipment to be packed in
* Replaced periodically even if not used

Table A3. Interview guidelines for sightings

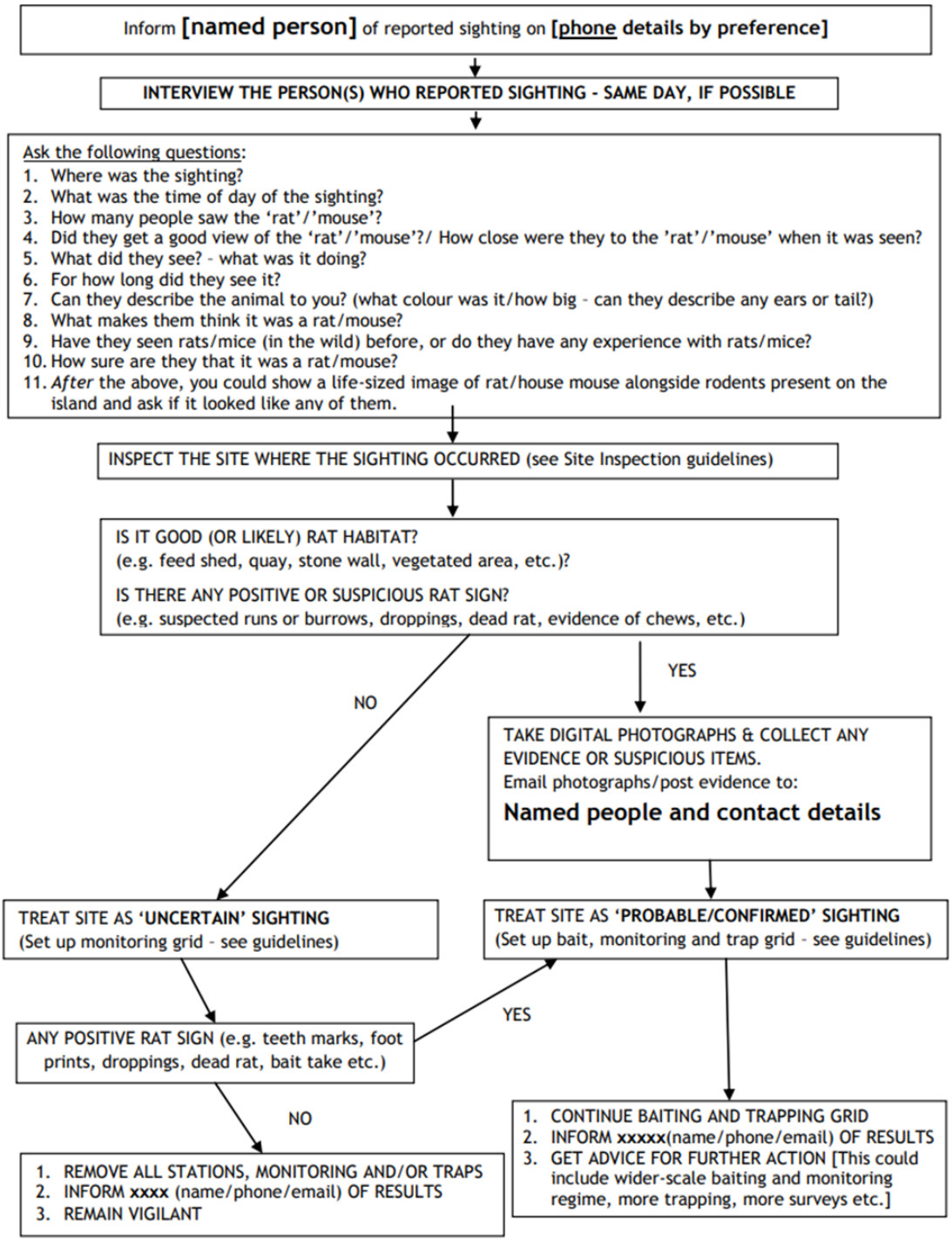


Table A4. Interview Recording Sheet for reported sightings

Interview Recording Sheet					
Name of person reporting sighting:			**Name of person who made sighting (if different)**		
Contact details of person reporting sighting			**Contact of person who made sighting (if different)**		
Email: Telephone:			Email: Telephone:		
Date of sighting:		**Date of interview:**		**Interviewer:**	
Overview of Action Taken:					
Circumstances (circle as appropriate):					
Live animal	Dead animal	Footprints	Droppings	Damage	Other
Time / conditions of sighting:					
Location of sighting - as much detail as possible:					
Any other observers? Names and contact details if known:					
Description of the Sighting					
What did you see?					
Can you describe the animal?					
What was it doing?					
How long did you observe it for?					
How close were you to it?					
Have you seen mice/rats in the wild before / Do you have any experience with mice/rats?					
What makes you think it was a rat/mouse?					
How sure are you that it was a rat/mouse?					
Does the observer wish to be notified of outcome of the monitoring?					
[Inform them that will take at least six weeks]					

Scaled, but not life size, from Bell *et al.* 2014

Figure A1. Image of brown rat (top) compared to house mouse (bottom left) and Scilly shrew (bottom right)

Table A5. Site inspection guidelines for reported sightings

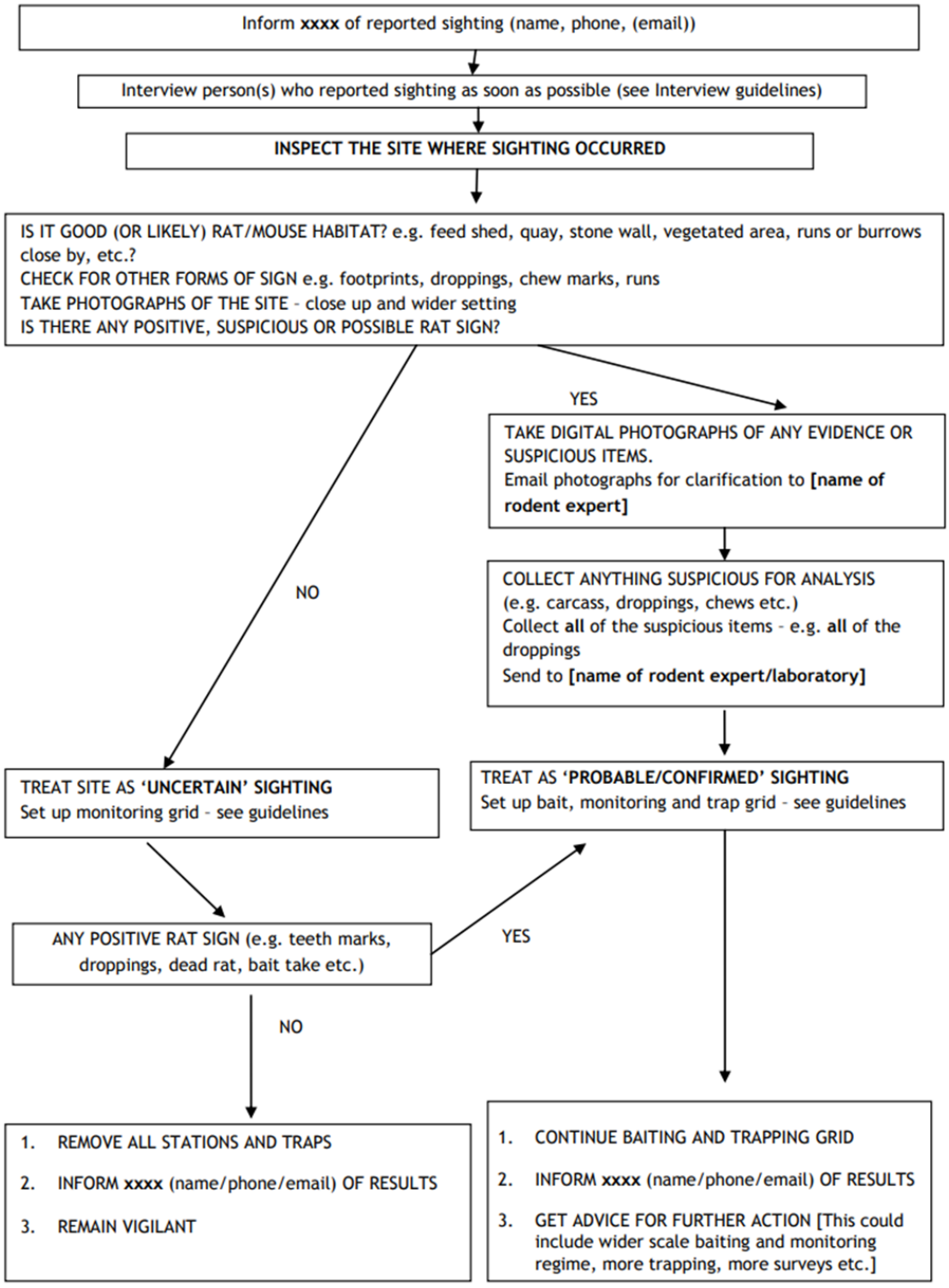


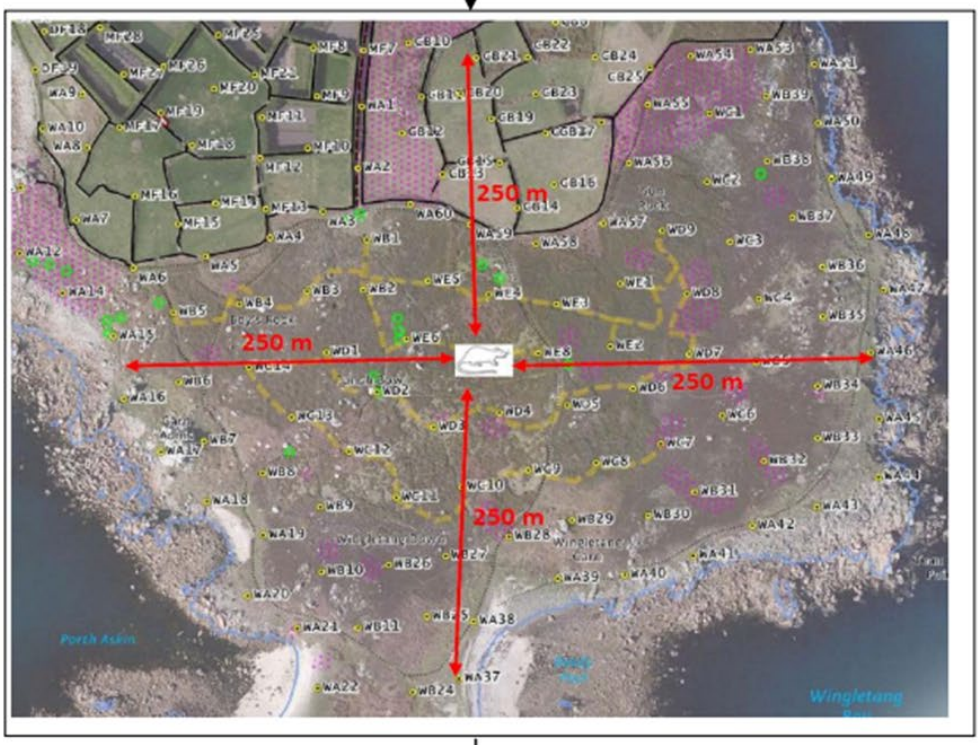
Table A6. Guidelines for "uncertain" sightings/ evidence

Guidelines for "uncertain" sightings/ evidence

Inform **xxxxx** of outcome of interview/site inspection (name/phone/email)

SET UP MONITORING GRID:

- Establish/bolster monitoring grid with stations 50 metres apart (closer if it is a mouse sighting) around the area of the reported sighting (use old bait station locations as mapped during the eradication operation for speed and ease of response)
- Spread monitoring stations to out up to 250 metres in all directions from sighting (terrain dependant).
- Put flavoured wax and/or tracking tunnels at each monitoring point. If you have more detection devices available, use them as well.
- **Check all points daily for three days, then once a week for four weeks**
- Check permanent detection devices across the whole island for any sign of rodent
- Enter daily monitoring data in to project database
- If there is any positive rodent sign, move immediately to a baiting, monitoring and trapping grid



ANY POSITIVE RAT SIGN? e.g. teeth marks, droppings, dead rat, monitoring take, etc.

NO

1. REVIEW THE SITUATION AFTER ONE MONTH, WITH EXPERT INPUT
2. REMOVE NON-PERMANENT MONITORING STATIONS
3. INFORM **xxxx** (name/phone/email) OF RESULTS
4. REMAIN VIGILANT

YES

1. IMPLEMENT BAITING, MONITORING AND TRAPPING GRID (see guidelines for **"probable/confirmed" sighting**)
2. INFORM **xxxx** (name/phone/email) OF RESULTS
3. GET EXPERT ADVICE FOR FURTHER ACTION [This could include wider-scale poisoning and monitoring regime, more trapping, more surveys etc.]

Table A7. Guidelines for "probable/confirmed" sightings/evidence and shipwrecks

Guidelines for "probable/confirmed" sightings/evidence and shipwrecks

Inform **xxxxx** of outcome of interview/site inspection (name/phone/email)

↓

UPDATE COMMUNITY/STAKEHOLDERS AND PUT RODENTCIDE WARNING SIGNS IN PLACE

↓

INCURSION RESPONSE TEAM (4 people minimum) ARRIVE ON ISLAND (preferably within 48 hours)

↓

SET UP BAIT, MONITORING AND TRAPPING GRID:

- Check permanent detection devices across the whole island for any further sign of rodent.
- Set bait stations 50 metres apart (or closer if establishing a mouse grid, e.g. 25m) using the locations from the original eradication operation (if applicable) spread out for 500 m in all directions from the sighting/evidence and any other sign picked up from island-wide check, dependant on terrain.
- Wire 3 20g blocks of rodenticide into each bait station in the permanent and incursion response/bolstered grid.
- Add a line of baited stations around the coast if one is not already in place.
- Place and set baited traps (or pairs of traps) (T) every 50 metres in all directions from the sighting/sign (i.e. N, NE, E, SE, S, SW, W, NW, total 8 or 16 traps).
- **Check all stations daily for five days, then once a week for six weeks, replenishing bait as required to keep it fresh.**
- **Check all traps twice daily:** set at night and disarm in the morning.
- After the first week of poison baiting, place monitoring stations halfway between each bait station and place flavoured wax and/or tracking tunnels at each - check with same regularity as bait stations.
- Use trail cameras in any areas with active sign to confirm the presence of rodents; if confirmed, place traps in the site and run for five nights
- Maintain communication with the community, and other stakeholders using weekly Progress Reports

↓

↓

AFTER SIX WEEKS: ANY POSITIVE RAT SIGN (e.g. teeth marks, droppings, dead rat, bait take

NO ↓

1. REVIEW THE SITUATION, WITH EXPERT INPUT
2. REMOVE NON-PERMANENT STATIONS & ALL TRAPS
3. INFORM (**name/phone/email**) OF RESULTS
4. REMAIN VIGILANT

YES ↓

1. CONTINUE BAIT, MONITORING AND TRAP GRID for **at least** two weeks after the last rodent sign
2. INFORM **xxxx** (name/phone/email) OF RESULTS
3. GET EXPERT ADVICE FOR FURTHER ACTION [This could include wider-scale baiting and monitoring regime, more trapping, more surveys etc.]

Table A8. Incursion response bait take form

Date	1/1/14		Date	2/1/14
Surveyor	Sophie Thomas		**Surveyor**	Sophie Thomas

Station	Bait Taken	Notes		Station	Bait taken	Notes
A1	2 blocks	Rat droppings found (all removed)		A1	0 blocks	Bait in good condition
A2	0.5 block	Suspected crow interference. Block replaced		A2	0.25 block	Block collected for tooth mark identification
A3	0 blocks			A3	0 blocks	bait replaced as damp around edges
A4				A4		
A5				A5		
A6				A6		
A7				A7		
A8				A8		
A9				A9		
A10				A10		
A11				A11		
A12				A12		
A13				A13		
B1				B1		
B2				B2		
B3				B3		
B4				B4		
B5				B5		
B6				B6		
B7				B7		
B8				B8		
C1				C1		

Table A9. Biosecurity Incident Log Example

Date	Recorder: Name/ Contact Details	Incident Description	Response/Action Taken	Outcome	Additional Information
12/3/14	Sophie Thomas Sophie.thomas @rspb.org.uk [Redacted]	Rat droppings found on 'Brenda' boat by visitor *en route* to island	Boat did not land on island – returned to port. Full search conducted of vessel and cargo. Baited and covered traps placed on board. ST discussed tighter quarantine measures for the boat with owner and provided refresher info on rat sign. Boat had recently come out of winter storage.	**NEAR MISS** No rat found. Assumed it left boat after being disturbed. Boat to obtain rodent-free certification next spring before being launched. Owner committed to checking for sign.	Contact details for 'Brenda' owner, [Redacted]
1/5/14	Sophie Thomas Sophie.thomas @rspb.org.uk [Redacted]	Member of public [Redacted] reported rat sighting at grid reference SU12341234	ST interviewed [Redacted] on same day and together visited location of sighting. Considered reliability of report to be poor (middle of day, middle of field), but instigated daily monitoring of surveillance grid 250m in each direction from sighting for four weeks, without further sign. Instigated one island wide check of all permanent surveillance stations	No confirmed rat sign. Regular surveillance checking resumed. **Assumed False alarm**	(Add hyperlink to completed interview form for this incident)
3/6/14	[Redacted]	Member of public [Redacted] reported rat sighting at grid reference SU14371398	BJ interviewed [Redacted] following day and visited location of sighting alone following detailed description. Considered reliability of report to be poor, but instigated daily monitoring of surveillance grid 250m in each direction from sighting for four weeks, without further sign. Instigated one island wide check of all permanent surveillance stations	No confirmed rat sign. Regular surveillance checking resumed. **Assumed False alarm**	(Add hyperlink to completed interview form for this incident)

Date	Recorder: Name/ Contact Details	Incident Description	Response/Action Taken	Outcome	Additional Information
9/8/14	[Redacted]	Member of public [Redacted] reported rat sighting at grid reference SU12381235	BJ interviewed [Redacted] same day and together visited location of sighting. Considered reliability of report to be poor, but noted almost identical location to that of 1.5.14 so instigated daily monitoring of surveillance grid 250m in each direction from sighting for four weeks and brought in additional detection methods (cameras and tracking tunnels baited with peanut butter). Instigated island wide check of all permanent surveillance stations. No sign of rats found.	No confirmed rat sign. Regular surveillance checking resumed. **Assumed False alarm**, but extra surveillance (camera) left in place around sighting	(Add hyperlink to completed interview form for this incident)

B Examples of Biosecurity Log Sheets

Table B1. Biosecurity log sheet example - Incoming vessels

Vessel Name	Call Sign	Skipper Name & Contact Details	Arrival Date	Biosecurity Information Sent to Vessel	Maintenance Log Received & Approved	Pre-Embarkation Checks Complete (Skipper to Sign)	Pre-arrival Checks Completed (Skipper to Sign)	Checks on Arrival Completed (Biosecurity Mgr to Sign))	Further Action Required
							(	(	

Table B2. Biosecurity Log Sheet example– Rodent checks of bait stations (wax blocks)

Date	Location (e.g. Pier, Storage Area etc)	Bait Station Number	Signs of Rodent activity (e.g. Tooth Marks in Wax)	Follow up Action Required (Y/N)

C Workers Pre-Travel Biosecurity Information

The following biosecurity information should be emailed to all staff and workers prior to travel to Fair Isle:

Fair Isle has several designations due to the international importance of its natural and cultural heritage. It is important to avoid introducing any animal or plant material that could compromise this ecosystem. Below are actions that support the Biosecurity Management Plan for the project and must be followed when packing personal baggage for travel to Fair Isle:

- All clothing should be washed to remove any seeds and soil.
- Seeds and organic matter should be removed by hand from inside bags and any equipment that cannot be washed. Particular attention should be paid to removing seeds from Velcro.
- Ensure all footwear has been thoroughly washed to remove any soil and other organic matter.
- Pack bags in a clean area to reduce the chances of accidentally getting seeds or soil on clean items.
- Ensure all zips and openings are closed to reduce the risk of insects crawling into bags.
- If boarding a vessel, do not leave luggage unattended on the port side.
- If bringing food, ensure that it is kept in a rodent proof container. Also ensure any rubbish is kept in a rodent proof container.

This information should be regularly reviewed and adapted to incorporate any changes in Government guidance, including potential access restrictions and advice related to avian influenza.

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