BRITISH TELECOMMUNICATIONS PLC

R100 Scottish Isles Fibre-Optic Project

Technical Appendix C: Protected Sites Assessment Report - Shetland

14 October 2021

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R100 Scottish Isles Fibre-Optic Project

Technical Appendix C: Protected Sites Assessment Report - Shetland

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CONTENTS

LIST OF TABLES AND FIGURES

Tables

Figures

GLOSSARY

AA
Appropriate Assessment

AIA
Apparently Incubating Adults

AON
Apparently Occupied Nests

BT
British Telecommunications Plc

BTO
British Trust for Ornithology

CHSR
The Conservation (Natural Habitats, &c.) Regulations 1994

DDV
Drop-down Video

FEAST
Feature Activity Sensitivity Tool

GIS
Geographical Information System

Global Marine
Global Marine Systems Ltd

HRA
Habitats Regulations Appraisal

INIS
Invasive Non-indigenous Sspecies

Intertek
Intertek Energy & Water Consultancy Services

JNCC
Joint Nature Conservation Committee

KM
Kilometre

LSE
Likely Significant Effect

M
Metre

MarLIN
The Marine Life Information Network

MARPOL
The International Convention for the Prevention of Pollution from Ships

MCAA
Marine and Coastal Access Act

MEA
Marine Environmental Appraisal

MHWS
Mean High Water Springs

MS-LOT
Marine Scotland Licensing Operations Team

MU
Management Unit

NCMPA
Nature Conservation Marine Protected Area

NS
NatureScot

PLGR
Pre Lay Grapnel Run

PSA
Protected Sites Assessment

pSPA
Proposed Special Protection Area

ROV
Remotely Operated Vehicle

SAC
Special Area of Conservation

SNCB
Statutory Nature Conservation Body

SOPEP
Shipboard Oil Pollution Emergency Plan

SPA
Special Protection Area

SSSI
Site of Special Scientific Interest

USBL
Ultra Short Baseline

ZOI
Zone of Influence

1. INTRODUCTION

This Protected Site Assessment (PSA) report has been prepared for British Telecommunication plc (BT) for the Scottish Isles R100 Project. It supports the Marine Licence applications to Marine Scotland Licensing Operations Team (MS-LOT) for installation of five submarine telecommunication cables in the Shetland geographical area. Separate Protected Sites Assessment reports have been prepared for the Orkney and Inner Hebrides geographical areas.

Global Marine Systems Ltd (hereafter referred to as Global Marine) has been sub-contracted by BT to install the cables. Intertek Energy and Water Consultancy Services (Intertek) has been appointed by Global Marine to provide permitting services for the installation project and has prepared this Protected Sites Assessment Report.

1.1 Project Background

BT is proposing to install and operate 16 submarine fibre optic cables to extend superfast broadband (30Mbps+) coverage in three geographical regions: Orkney, Shetlands and the Inner Hebrides. These new cables will form part of the Scottish Government's 'Reaching 100%' (R100) programme, contracted to BT.

BT propose to install five fibre optic cables in the Shetland geographical area (See Figure 1-1, Drawing P2308-LOC-001-D_SH).

This Protected Sites Assessment Report covers the marine components of five cable corridors in the Shetlands geographical area. Each cable listed below will have a separate marine licence application supported by the Marine Environmental Appraisal (MEA) and supporting documents. Each cable marine licence application will be for an application corridor, hereafter referred to as the cable corridor. The cable corridor covers a width of 500m within which the cable route will be installed. A corridor is applied for so that there is scope for refining the cable route following the identification of any environmental and engineering constraints identified as part of the consenting and route engineering process. The PSA has assumed that the cable route could be positioned anywhere within the cable corridor.

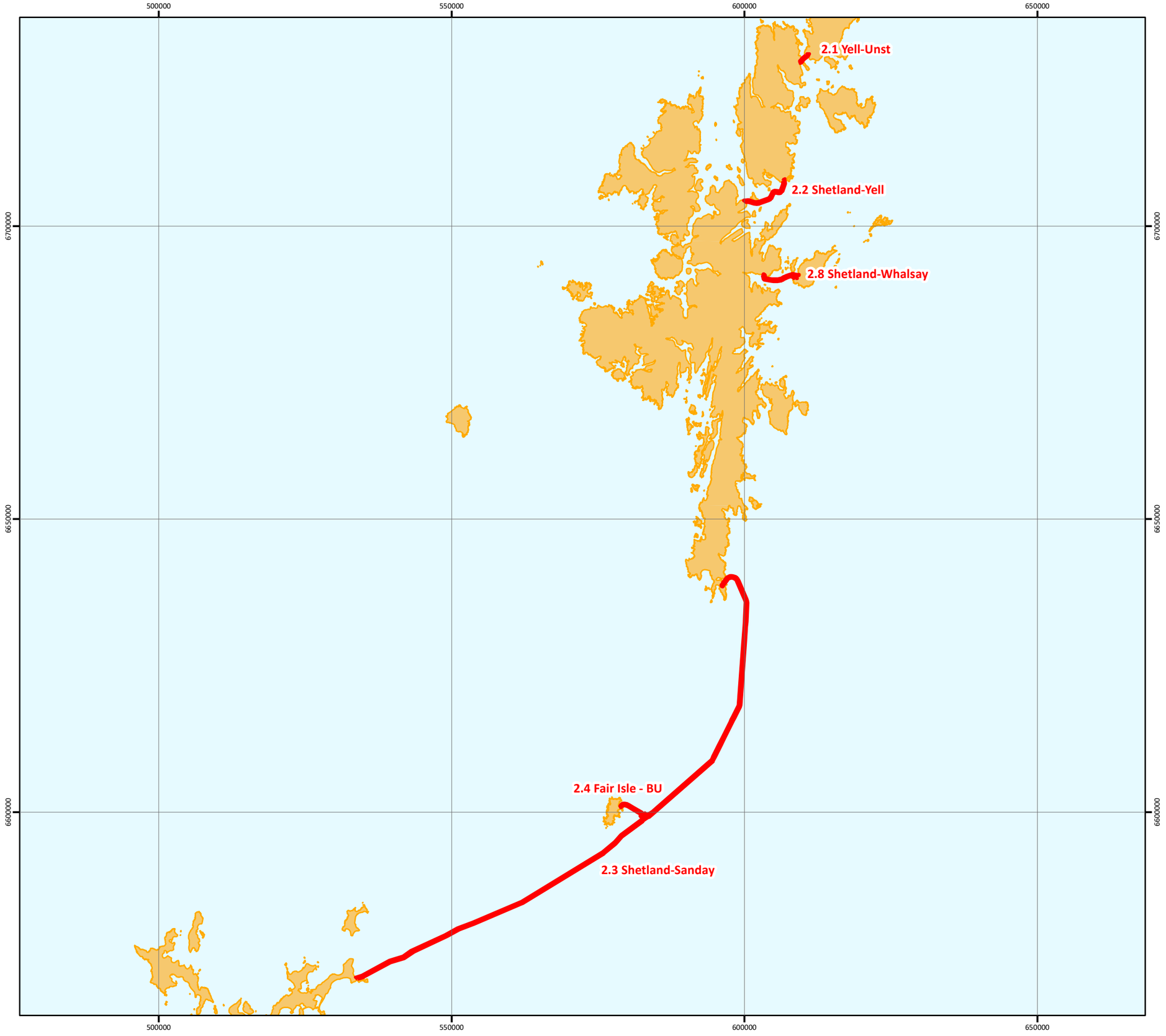
The cable corridors extend from mean-high water springs (MHWS) of the first landfall to MHWS at the second landfall. The Cable Corridors are as follows:

- Cable Corridor 2.1 - Yell to Unst
- Cable Corridor 2.2 - Shetland to Yell
- Cable Corridor 2.3 - Sanday to Shetland
- Cable Corridor 2.4 - Fair Isle to BU
- Cable Corridor 2.8 - Shetland to Whalsay

This is defined as the Project for the Shetland geographical area and comprises:

- The installation of five separate marine fibre-optic telecommunication cables; and
- All associated works required to install the five cables.

Cable Corridor 2.3 - Sanday to Shetland, crosses between the Shetland and Orkney geographical areas. As the Cable Corridor lies predominantly in the Shetland area it has been assessed as part of this Shetland Protected Sites Assessment report and includes an assessment of the section of this cable corridor that is within Orkney



SCOTTISH ISLES FIBRE OPTIC CABLE PROJECT

LOCATION OVERVIEW
Cable Route Application Corridors - Shetland

Drawing No: P2308-LOC-001_SH	D

Legend

Cable Route Application Corridor

N
W E
S

NOTE: Not to be used for Navigation

Date	14 October 2021
Coordinate System	WGS 1984 UTM Zone 30N
Projection	Transverse Mercator
Datum	WGS 1984
Data Source	ONS; MarineFind; ESRI;
File Reference	J:\P2308\Mxd\01_LOC\ P2308-LOC-001_SH.mxd
Created By	Chris Dawe
Reviewed By	Abigale Nelson
Approved By	Paula Daglish

0 10 20 30 40 km

1.2 Purpose and Scope of Report

When making a marine licensing decision, MS-LOT is required to consider the impacts of the proposed Project alone and in combination with other relevant plans or projects on designated sites. To inform this decision-making process the Applicant is required to provide assessments in accordance with specific legislation and guidance.

This report has been prepared to present the findings of a protected sites assessment to include the following components:

- Identification of Relevant Protected Sites (Section 2)
- Habitats Regulations Appraisal (HRA) Stage 1 Screening (Section 3)
- Nature Conservation Marine Protected Area (NCMPA) Assessment (Section 4)
- Sites of Special Scientific Interest (SSSI) Assessment (Section 5)
- HRA Stage 2 Information to Inform Appropriate Assessment (AA) (Section 6)

The assessments determine whether the Project, either alone or in combination with other plans or projects, is likely to have a significant effect on any European sites, hinder the conservation objectives of any NCMPA and/or effect the integrity of any SSSIs. The assessment approach and methodology are provided in Annex 1.

The protected sites included in this report are:

- **European sites** - A collective term for Special Areas of Conservation (SAC), Special Protection Areas (SPA) and Ramsar sites, including any sites which have not been formerly designated such as proposed Special Protection Areas (pSPA).
- **NCMPAs**
- **SSSIs**

This report has been prepared in accordance with the following guidance:

- Managing Natura 2000 sites. The provisions of Article 6 of the 'Habitats' Directive 92/43/EEC (EC, 2018).
- The Planning Inspectorate Advice note ten: Habitats Regulations Assessment relevant to nationally significant infrastructure projects (The Planning Inspectorate, 2017).
- Habitats Regulations Appraisal of Plans – Guidance for Plan-Making Bodies (Tyldesley, 2015).
- The European Commission Guidance - Article 6 of the Habitats Directive – "Rulings of the European Court of Justice. Final Draft", September 2014 (EC, 2014).
- EU Guidance document on Article 6(4) of the 'Habitats Directive' 92/43/EEC (EC, 2007).
- Assessment of plans and projects significantly affecting Natura 2000 sites: Methodological guidance on the provisions of Article 6(3) and (4) of the Habitats Directive 92/43/EEC (EC, 2002).

The assessment approach and methodology are provided in Annex 1.

1.3 Consultation

Table 1-1 summarises the relevant consultation undertaken to date for R100, received prior to and during preparation of the Protected Sites Assessment which is considered in this report.

Table 1-1 Consultation responses

Stakeholder	Comment
NatureScot	Introductory meeting to the project (22/3/2021). Confirmation from NatureScot that they would recommend submission of an initial screening prior to undertaking any applicable Stage 2 AA and prior to submitting the applications. This is to ensure sites selected are agreed and the appropriate level of data has been used to inform assessments. Highlighted there is an additional protected site – Fair Isle Demonstration and research MPA – a site which didn't quite meet the criteria for NCMPA. As this site does not fall under the legislative requirements of NCMPAs, this site has been assessed in the Biology chapter of the Shetland MEA (Document Reference: P2308_R5367_ Rev0 Chap 5 Biological).
NatureScot	17/06/2021 Meeting to discuss methods for PSAs including the selection of relevant protected sites for inclusion in the PSAs; mitigation and designated seal haul out sites. NatureScot thought the approach to selecting relevant sites could be over precautionary and recommended the following: **Relevant Protected Sites Selection** ▪ Cetaceans use Marine Mammal Management Unit (MU). ▪ Grey seal 100km search distance. ▪ Harbour seals 50km search distance. ▪ Birds – focus to be on nearby breeding colony SPAs and marine SPAs the cable corridors are either close by to or go through. Sites within 10km is sufficient without searching further afield. ▪ SSSIs at landfalls can use terrestrial guidance, no need to include sites to 10km. **Mitigation (timing restrictions, avoidance of peak periods)** ▪ Consider operational timings where possible – some species will only be sensitive at certain times. ▪ If going through or close to colony or marine SPAs then timing of works important. Appropriate mitigation would be to conduct works prior to the breeding season, because when birds are travelling back and forth with prey items for their chicks they are most sensitive. ▪ Advised for Orkney and Shetland if cable installation corridor within a SAC for harbour seal avoid breeding and moulting periods. **Seal Haul-out Sites** ▪ NatureScot advised Seal haul outs can be included in the MEA. **Other Discussion Points** The Fair Isle Demonstration and Research MPA can go in the MEA. The MEA should consider the objectives for the site and assess whether the planned cable installation works will overlap with any planned research and management programs.
NatureScot	13/07/2021 Meeting – follow up on discussion points from the previous meeting. Intertek presented a revised list of relevant protected sites which was sent separately to NatureScot for review. NS confirmed their agreement with this list by email on 04/08/2021. Screening tables were sent to NatureScot to review on 11/08/2021 NS advised that once assessments have been undertaken and the key seasonal sensitivities are understood they are willing to support the Applicant in agreeing appropriate seasonal restrictions (where necessary) that are cognisant of the requirements of the installation programme.
NatureScot	14/09/2021 Meeting – to present key findings of the protected sites assessments and the benthic surveys conducted for four of the cable corridors. Key points discussed: ▪ NS advised they had reviewed the PSA screening tables and thought the assessments seemed reasonable. ▪ Protected sites assessments for the Orkney geographical area identified potential requirement for mitigation/seasonal restrictions for seal, common eider (moulting) and red-throated diver (breeding).

Stakeholder	Comment
	▪ NS advised the 900m distance for disturbance to seals hauled out on land Intertek has applied could be over precautionary and 500m could be used. ▪ NS advised that any disturbance to eider (moulting) and red-throated diver (breeding) wouldn't be significant as the vessels will be so slow moving and the works very short-term. NS advised that nesting birds are most vulnerable at the beginning of the breeding season when they are first settling in their nests. Therefore, installation works close to any nest sites should be programmed for later in the breeding season if the entire breeding season cannot be avoided.
NatureScot	22/09/2021 Meeting – follow up on discussion points from previous meeting NS provided the following advice: ▪ The 500m buffer for visual disturbance of seals onshore, can definitely be applied instead of 900m. This 500m buffer for seals is based on common sense, it is not in legislation but is NS's advisory guidance. ▪ Where the works may be within the 500m disturbance distance, they should avoid seal pupping period in June/July. ▪ It might be useful to include in the method statement the use of screens/barriers around onshore works to prevent visual disturbance. ▪ Common eider (moulting) should not be significantly affected if vessels go slowly so they have time to move away. As they can't fly during the moulting period, they would need more time to move away. ▪ Red-throated diver (breeding) should not be significantly affected unless the works are close to nest sites. ▪ The Scottish marine wildlife watching code provides guidance on appropriate speeds for vessel movements.
NatureScot	07/10/2021 Meeting to seek advice on 4 landfalls within/adjacent to European Sites **Cable Corridor 2.1 – Yell to Unst: Unst Landing Point within Bluemull & Colgrave Sounds SPA** The marine approach to the landing point at Unst is within the Bluemull & Colgrave Sounds SPA. The SPA is entirely marine, designated for breeding foraging red-throated diver which are highly sensitive to visual and noise disturbance. However, as the installation vessel will be extremely slow moving and present for a short time (approx. 3-7 days). Intertek has concluded in the PSA that there will be no LSE on red throated diver. The site designation information refers to nesting red throated diver onshore in lochs however these are outside the SPA boundary and there is no information on which lochs they nest in. NS - Confirmed timing restrictions wouldn't be required for this site and advised that there would be no issue from the Project on nesting red throated diver in lochs outside the SPA. NS – queried what ancillary vessels would be on site and when. NS would like to better understand what the ancillary vessel does as they do not want ancillary vessels speeding through a raft of birds. **Cable Corridor 2.3 – Sanday to Shetland: Sanday landing point within Sanday SAC** Harbour seals could be breeding on the bay the cable corridor lands at within Sanday SAC discussion had on whether seasonal restrictions during the harbour seal breeding season (June and July) would be required. NS – advised some pre-installation measures to deter seals from breeding on the bay at the landing point could be possible. Also, if works commence early enough before the breeding season, they could deter seals from attempting to breed on the bay and allow works to potentially overlap into June if required. NS would need to consult internally on this to seek advice from experts on measures and timings. NS would want the Project to

Stakeholder	Comment
	consult with NatureScot on the Construction Method Statement to agree measures and timings. **Cable Corridor 2.3 – Sanday to Shetland: Sanday landing point within East Sanday Coast SPA** East Sanday Coast SPA is designated for overwintering wading birds. Discussion had on the potential requirement for seasonal restrictions. NS advised it is likely that a winter seasonal restriction may need to be applied to minimise the disturbance to migratory and overwintering bird species within this SPA. Overwintering restrictions apply 1st October – 31st March inclusive. NS would need to confirm any likely restrictions with internal ornithologists, post application submission. A seasonal restriction may be reduced in consultation with NatureScot in drafting the Construction Method Statement. **Cable Corridor 2.3 – Sanday to Shetland: Shetland landing point within Sumburgh Head SPA** Sumburgh Head SPA qualifying species of concern is Breeding Arctic tern which could nest on the beach that the cable will land on. Other features of the site are cliff nesting birds which will be present on the steep cliffs away from the landfall. Given the slow vessel speed and short time that the activities will be within the SPA the PSA concluded no likely significant effect for the cliff nesting birds. NS advised there is a 3km foraging / loafing radius surrounding the cliff nesting sites however NS did not think there would be significant effects to the seabirds which will have plenty of other marine areas to forage in. NS to consult with internal ornithologists on whether Arctic tern could be nesting on the beach and likely restrictions. A seasonal restriction may be reduced in consultation with NatureScot in drafting the Construction Method Statement. **Cable Corridor 2.4 – Fair Isle to BU: Marine approach to Fair Isle landing point within Fair Isle SPA** Fair Isle SPA qualifying species of concern are Breeding Arctic tern (potentially nesting on the beach and adjacent areas) and Fair Isle Wren – one pair in an identified territory adjacent to landing site. Based on a literature review it appears that the wren are not sensitive to human activity. Also breeding cliff nesting birds either side of the inlet at North Haven are likely to be habituated to vessel disturbance as there is a ferry route into North Haven. NS – agreed that Fair Isle wren probably would not be disturbed by the works as they appear to nest in close proximity to human activities and structures. NS – confirmed that the cliff nesting birds would not be adversely affected by the installation vessels coming through the inlet as there is a ferry route there. NS – agreed that Arctic tern could be disturbed as could nest on the beach although it is not known if they will be nesting there as Arctic tern can move around with their nesting sites. NS would need to consult with internal ornithologists to see if their use of the landfall area is known.

1.4 Project Assumptions and Footprints

1.4.1 Assumptions

To determine the likely significant effect (LSE) of a project activity on Interest Features of protected sites, key information and assumptions from the project description have been used. These are summarised in Table 1-2 for ease of reference. The Project will typically involve one main installation lay vessel and one ancillary support vessel. Al cable lay and associated activities will take place within

approximately 22 to 24 days per cable corridor (except for Cable 2.3 and Cable 2.4 which due to longer cable route and crossing construction (Cable 2.3) and branching unit integration (Cable 2.4) will take 68 days each). This broadly reflects all activities associated with the route preparation, shore end beach works, cable lay, post-lay burial and actual vessel activity will be for a shorter duration within this period (approximately 6 days for most routes – indicative timings can be seen in Chapter 2 Project Description). These durations include contingency and may be less in practice. The longer timing windows are included to encompass a period within which vessels may be temporarily in the vicinity.

The majority of cable installation operations will be 1knot (2km/hour) or less; approximately 1 knot (2km/hour) for surface lay and 0.3 knots (0.6km/hour) for plough installation, with potential for a small amount of time up to 6 knots (11km/hour) for vessel movement within the cable corridor when not laying the cable) of installation vessels.

A full Project Description is included in the R100 Marine Environmental Appraisal (MEA), Chapter 2 (Document Reference: P2308_R5367_Rev0 MEA Chapter 2).

Table 1-2 Project assumptions and footprints

Project Activity	Description / Assumption	Footprint
Vessel positioning	The cable lay will be performed by an installation vessel with a dynamic positioning system. Anchors are unlikely to be used due to current speeds, however where divers are deployed anchors may be a requirement for safety reasons. The anchor will be within the cable corridor.	Within Cable Corridor
Cable Installation (burial)	Cable trench will be up to 0.5m wide.	0.5m wide
	Excavation tools have the following seabed footprints: Plough **2.6m wide** (plough share 0.5m and plough skids 1.05m each side) Jetting ROV **1m wide** (2 x 0.5m wide tracks)	Worst case scenario 2.6m wide
	Coarse sediments deposition – probable fate is to settle back in the very near field (~100m) (Gooding et al 2012)	Within 100m
	Fine grained sediment deposition may travel farther afield (within 1-2km of the cable corridor) (Gooding et al 2012)	Within 2km
	Underwater noise from positioning equipment ultra-short baseline (USBL) used during plough operations Impulsive sound (USBL positioning system for remotely operated vehicle, ROV)	1.1km radii
External cable protection	Crossings – Individual design parameters are defined for each crossing location, as described in the project description.	see Table 1-3 for footprint
Stabilisation	Where the cable is surface laid and metocean conditions are such that stabilisation of the cable is required, rock bags may be placed on the surface laid cable every 50m, as required.	see Table 1-3 for footprint

1.4.2 Overview of installation methods and footprints per cable corridor

This section provides a summary of key information regarding installation techniques (burial, surface laid or a combination of the two) and temporary and permanent footprints for each proposed cable corridor.

To determine the temporary and permanent impacts to the seabed from cable installation activities and external cable protection for each cable corridor, information has been taken from the project description and summarised in Table 1-3. Where applicable, estimated overall footprint areas have been used to assess what percentage of a protected site will be affected.

There are two power cable crossings within the Shetland geographical area. Cable Corridor 2.2 Shetland to Yell and Cable Corridor 2.3 Sanday to Shetland each cross a power cable however, no protected sites intersect these cable corridors at the crossings.

The contingency measures provided state the worst-case deposits, which could occur anywhere along the cable corridors, including within protected sites. All assessments have therefore taken into consideration the worse-case deposits, although actual contingencies used could be much less or they may not be required at all.

Table 1-3 Summary of installation methods and footprints per licence application

Cable Corridor	**Pre lay grapnel run (PLGR) / Route Clearance** Note 1	**Installation method** Note 2 **Approximate footprint of installation (width of tool x length of installation)**					**Contingency measures (worst case deposits)** ***Contingencies will be carefully engineered in water depths less than 10m so that they will not reduce the water depth by more than 5%**		
		Surface lay Note 3	**Plough** Note 4 2.6m wide x length of cable corridor	**Trenching** 2m deep x width of excavator bucket (assumed to be 2m)	**Rock Berm** Note 5 Worst case footprint: Height 1.7m (total) Length 40m (20m either side) Width 13m	ROV Note 6	Boulder relocation Note 7	No. Rock Bags Note 8 3m diameter = 7m² per rock bag (8T bag)	**No. Concrete Mattress** Note 9 6m x 3m = 18m² per mattress
Cable 2.1 – Yell to Unst	✓	✓	0.005km²	✓		✓	✓	28 bags 196m²	3 mattresses 54 m²
Cable 2.2 – Shetland to Yell	✓	✓	0.028km²	✓	1 power crossing 0.00052km²	✓	✓	66 bags 462m²	3 mattresses 54 m²
Cable 2.3 – Sanday Shetland	✓	✓	0.28km²	✓	1 power crossing 0.00052km²	✓		186 bags 1302m²	12 mattresses 216 m²
Cable 2.4 – Fair Isle to BU	✓	✓	0.013km²	✓		✓		13 bags 91m²	3 mattresses 54 m²
Cable 2.8 – Shetland to Whalsay	✓	✓	0.017km²	✓		✓	✓	32 bags 224m²	3 mattresses 54 m²

Notes: Definitions of installation activities are given in the project description (Document Reference: P2308_P5367_Rev0 MEA_Chapter 2).

1.5 Data Sources

The following data sources, listed in Table 1-4, have been used to inform the Protected Sites Assessment.

Table 1-4 Data Sources

Receptor	Sources
Birds	▪ Joint Nature Conservation Committee (JNCC) website (https://jncc.gov.uk) ▪ NatureScot website (https://www.nature.scot) ▪ The Royal Society for the Protection of Birds (RSPB) website (https://www.rspb.org.uk) ▪ Scottish Wildlife Trust website (https://scottishwildlifetrust.org.uk/) ▪ Wetland Bird Survey (WeBS) Core Count Data (BTO, 2021) ▪ BTO report 724: Desk-based revision of seabird foraging ranges used for HRA screening (Woodward *et al.,* 2019) ▪ JNCC Interim Displacement Advice Note (Joint SNCB, 2017) ▪ JNCC Report No. 567 An assessment of numbers of wintering divers, seaduck and grebes in inshore marine areas of Scotland (Lawson *et al*., 2015) ▪ JNCC Report No. 541 Identification of important marine areas in the UK for red-throated divers (*Gavia stellata*) during the breeding season (Black *et al*., 2015) ▪ Population Trends of Breeding Seabird Colonies in Scottish SPAs (The Scottish Government, 2012)
Mammals and Marine Mammals	▪ Otter survey reports (Aquatera, 2021) ▪ Estimates of cetacean abundance in European Atlantic waters in summer 2016 from the SCANS-III (Hammond et al. 2017) ▪ Atlas of Cetacean distribution in north-west European waters (Reid et al., 2003) ▪ Sea Watch Foundation sightings data (Sea Watch Foundation, 2021) ▪ Marine Scotland NMPi tool (Marine Scotland, 2021) ▪ Updated seal usage maps: The Estimated at-sea Distribution of Grey and Harbour Seals (Russel et al, 2017) ▪ Seal haul out sites (Marine Scotland, 2021)
In-Combination Effects	▪ Marine Scotland Marine Licence Application Public Register (Marine Scotland 2021a) ▪ Marine Scotland (2021b) National Marine Plan interactive (NMPi) (Marine Scotland, 2021b) ▪ Sea Fish Industry Authority (SEAFISH) Kingfisher Information Service

2. IDENTIFICATION OF RELEVANT PROTECTED SITES

2.1 Identification of Relevant Protected Sites

The potential for a protected site to be significantly affected depends on whether receptors which are designating features of a protected site:

a. Can come into contact with the Project; and

b. Are sensitive to the installation activities to the extent that the activity is likely to have an adverse effect on the conservation objectives for the features (for European sites or NCMPAs) for the features or effect the integrity of a SSSI.

The HRA and NCMPA Assessment processes require that all European sites and NCMPAs in and around the proposed Project should be identified. In the absence of a stipulated search area, identification of relevant European sites has been achieved by applying the following steps:

1. Identify which receptors could be sensitive to the installation activities (Section 2.1.1);
2. Identify the potential pressures the proposed installation activities could have on these receptors and what the zone of influence for these receptors is, i.e. the spatial extent over which effects could extend (Section 2.1.2, Table 2-1);
3. Using the zones of influence as a guide, define a search area within which protected sites are identified to determine if the relevant receptor is a designated feature of the site (Section 2.1.2, Table 2-2);
4. Screen protected sites within the defined search areas to assess whether a pathway for effect (pressure-receptor pathway) exists between the interest features of the protected sites and the pressures exerted by the Project.

Under the Nature Conservation (Scotland) Act 2004, the local planning authority, all landowners and occupiers, and the Secretary of State must be provided with notification of any activities or works within or adjacent to a SSSI. Therefore, any SSSI within or adjacent to a proposed cable corridor has been identified as a relevant protected site for assessment in the SSSI assessment (Section 5).

Where a European site has been identified as a relevant protected site and it is also designated as a SSSI, the site has been assessed in the HRA only and has not been repeated in the SSSI assessment.

2.1.1 Identification of sensitive receptors

The receptors which could potentially be affected by the Project and could be the designating interest features of protected sites are:

- Intertidal and benthic habitats;
- Fish (including basking shark);
- Birds;
- Marine mammals (cetaceans and pinnipeds); and
- Otter

A geographical information system (GIS) was used to map the boundaries of protected sites in relation to the Project. Since the geographical scope of the Project is within the marine environment (below MHWS), protected sites with either a marine component or marine features (features which occur within or utilise the marine environment) have been included in the assessments. In addition to this, protected sites at the landfalls which may be defined as terrestrial and whose features may interact with the Project activities have been included in the assessments (see Figure 2-1; Drawing Reference: P2308-PROT_005_SH-B).

2.1.2 Defining a search area (identification of potential pressures and zone of influence)

The Joint Nature Conservation Committee (JNCC) pressure list 2021, which is based on the OSPAR Intercessional Correspondence Group on Cumulative Effects (ICG-C) pressure list and descriptions (OSPAR Commission 2011) has been used to describe the potential pressures expected from the proposed installation activities. Listed in Table 2-1, these potential pressures may be direct or indirect, temporary, or permanent, beneficial, or harmful to the protected site, or a combination of these.

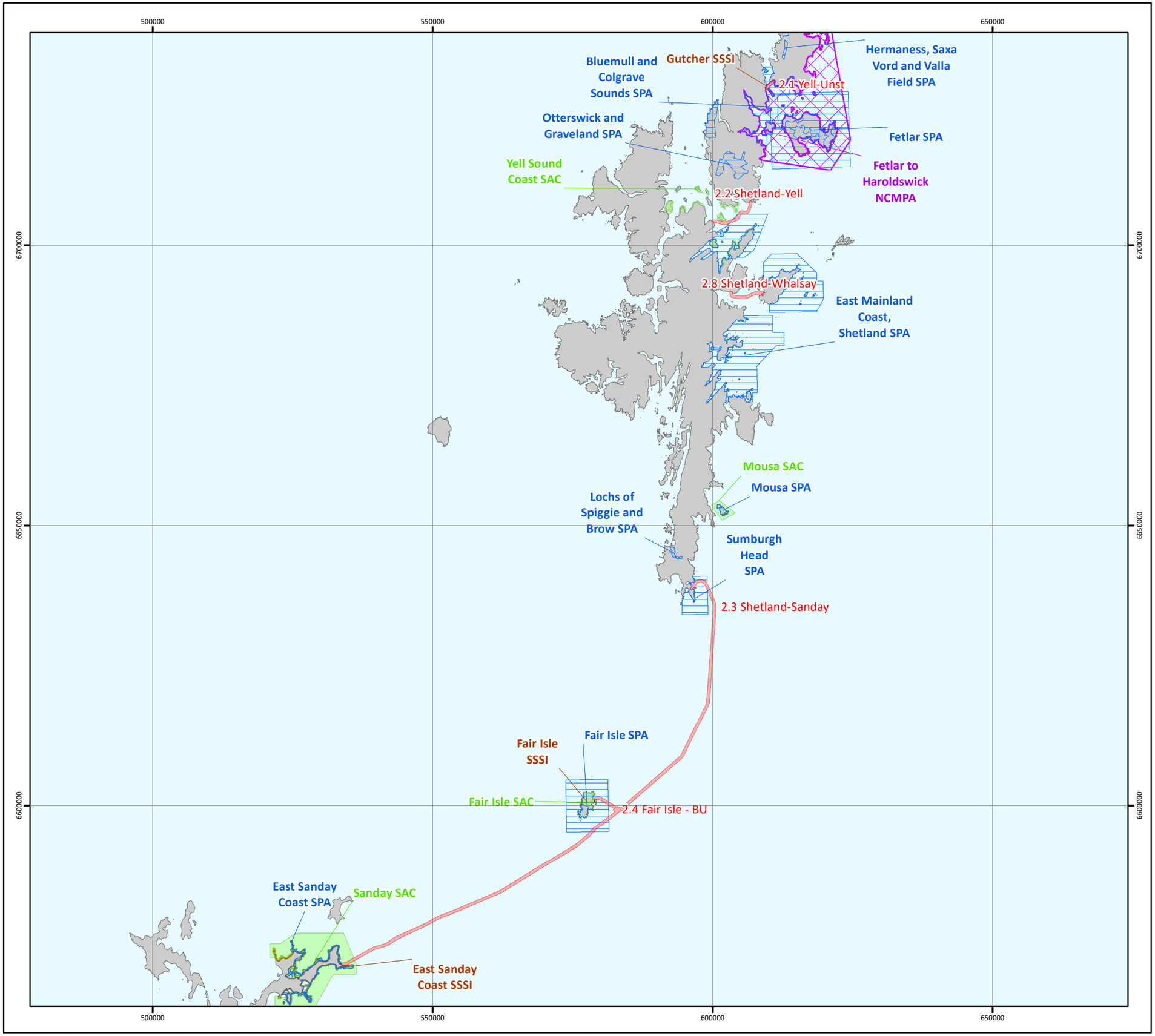
Table 2-2 identifies the pressures that have been scoped out of the protected sites assessment and the reason for the exclusion. These pressures will not be discussed further.

The zone of influence – the predicted spatial extent over which effects may extend – has also been defined. The zone of influence has been used to establish a search area within which protected sites are screened for a relevant qualifying interest feature. Since mobile species from protected sites further afield may travel into the zone of influence, the zone of influence cannot be used alone as a distance to screen in relevant protected sites. Therefore, search areas (distances from the Project) for each receptor group have been applied taking into consideration other information such as marine mammal management units, bird foraging distances and expert judgement. Justification for the spatial extent of the search area is provided in Table 2-1.

SCOTTISH ISLES FIBRE OPTIC CABLE PROJECT

PROTECTED SITES
Relevant Protected Sites
Shetland

Drawing No: P2308-PROT-005_SH | **B**



Legend

- Cable Route Application Corridor

Environmental Designation

- SAC
- SPA
- NCMPA
- SSSI

N
W E
S

NOTE: Not to be used for Navigation

Date	12 October 2021
Coordinate System	WGS 1984 UTM Zone 30N
Projection	Transverse Mercator
Datum	WGS 1984
Data Source	ESRI; OSOD; SNH
File Reference	J:\P2308\Mxd\02_PROT\ P2308-PROT-005_SH.mxd
Created By	Jessica Harvey
Reviewed By	Chris Dawe
Approved By	Jill Hobbs

BT Global Marine intertek

0 10 20 30 40 km

Table 2-1 Potential pressures, zones of influence and protected site search area

Receptor	Potential Pressure	Project Activity	Zone of influence	Search Area and Justification
Habitats	Siltation rate changes, including smothering (depth of vertical sediment overburden)	Cable burial	Coarse grained sediment 100m (Gooding et al 2012)	**Application area** Effects on the habitat because of the installation activities may occur along the entire route of each cable.
	Penetration and/or disturbance of the substrate below the surface of the seabed, including abrasion	Seabed preparation Cable burial	Within footprint of installation tools Installation Plough (skids + share) 2.6m wide (disturbance) Plough share width 0.5m x 1m deep (penetration)	
		Anchor placement	Within direct footprint of anchors - Immediate area of anchor placement within the application area	
	Abrasion/disturbance of the substrate on the surface of the seabed	Anchor placement Surface laid cable	Area where anchor chains drag on the seabed Footprint of surface laid cable	
	Change to another seabed type	Placement of rock bags for stabilisation of surface laid cable External cable protection at cable crossings and surface laid	Within footprint of rock bags (a rock bag may be placed every 50m along a section of surface laid cable) Within footprint of concrete mattresses (a concrete mattress may be used at cable crossings, or for protection of surface laid cable) Within footprint of rock berms (a rock berm may be used at the cable crossings)	
Fish	Collision below water with static or moving objects not naturally found in the marine environment (e.g., boats, machinery, and structures)	Presence of installation vessel	Specifically relating to basking shark, which are known to spend significant time at the surface and are more vulnerable to collision. Within path of the cable installation vessel	**Application area**
Birds	Visual and above water noise disturbance	Presence of installation vessel Cable burial	Radial distances from application corridor 10km Red-throated diver (pers coms Alex Robbins, Nature Scot, 13/07/2021) 4 km divers and sea ducks (JNCC 2017)	**10km** It is recognised that some seabirds from other SPAs will forage and loaf in the zone of influence. However, disturbance will be limited in extent and duration and there is sufficient space in the

			2 km all other seabird species (JNCC 2017)	surrounding environment for birds to temporarily relocate. Therefore, only sites within 10km of the Project have been screened for qualifying bird features.
	Changes to supporting habitat and prey availability	Cable burial	Installation Plough (skids + share) 2.6m wide (disturbance)	**Application area** Effects on the habitat because of the installation activities may occur along the entire route of each cable.
Cetacean and pinniped	Changes to underwater noise (impulsive sound)	Impulsive sound from use of an Ultra Short Baseline (USBL) positioning system for positioning the ROV during post cable lay inspection	Disturbance distance 1.1km radius (worst-case disturbance radius from USBL)	**Management Unit** In recognition of the highly mobile nature of cetaceans the relevant species management unit will define the search area.
Grey Seal	Visual (and above water noise) disturbance	Presence of installation vessel	500 m radius (pers comms – NatureScot 2021)	**100 km:** While the zone of influence for visual (and above water noise) disturbance of seals has been found to be 500m, grey seals have been found to forage up to 100km from their haul-out sites (Cunningham et al., 2009; SMRU, 2017).
Harbour Seal				**50 km:** Harbour seals prefer to come ashore in sheltered waters, and they usually feed within 40-50 km from their haul-out site (NatureScot website).
All	Changes in supporting habitat and prey availability	Cable burial	Installation Plough (skids + share) 2.6 m wide (disturbance)	**Application area** Effects on the habitat as a result of the installation activities may occur along the entire route of each cable.

Table 2-2 Pressures scoped out and reason for exclusion

Pressure scoped out	Receptor	Reason for Exclusion
Accidental hydrocarbon and PAH contamination	All receptors	Unplanned events (accidental oil or chemical spills) have been scoped out of the protected sites assessment for the following reasons: The likelihood of a large oil spill occurring from a Project vessel is extremely low and the risk is no greater than that for any other vessel in the region. It is illegal under the Regulation 26 of Annex I of MARPOL for vessels to pollute the marine environment. To ensure compliance with statute all vessels must have control measures and an approved shipboard oil pollution emergency plan in place. Legal compliance ensures that there are no significant effects on a protected site.
Siltation rate changes including smothering (depth of vertical sediment overburden)	Habitat	Far field effects have not been considered as deposition thicknesses are minimal and not sufficient to cause smothering past 100m. (Goodall et al., 2012).
Water flow (tidal current) changes including sediment transport considerations.	Habitat	The footprint of any placed cable protection will be limited to that required to ensure cable stability on the seabed and protection at crossings. The cable protection can cause localised scour in sedimentary environments; however, it will be limited in extent. No change to water flow (tidal current) is expected.
Introduction or spread of invasive non-indigenous species (INIS)	Habitat	The introduction of INIS (e.g. through discharge of ballast water from Project vessels) will be managed under the International Convention for the Control and Management of Ship's Ballast Water and Sediments. It is illegal under the IMO Ballast Water Management Convention for vessels to pollute the marine environment. To ensure compliance with statute all vessels must have control measures and an approved Shipboard Oil Pollution Emergency Plan in place. Legal compliance ensures that there are no significant effects on a protected site.
Visual (and above water noise) disturbance	Fish	During cable installation, the presence of the installation vessels and equipment (and associated noise) could result in the Visual (and above water noise) disturbance of fish within the vicinity of operations, with some displacement of fish within the water column. However, the disturbance from installation operations will be temporary, localised, and given existing background levels of noise and shipping in Scottish waters, fish are likely to be habituated to such disturbance. Therefore, no significant effects will occur.
Siltation rate changes including smothering (depth of vertical sediment overburden)	Fish	There are three pathways for species to be smothered as a result of Project activities: by displaced sediments during trenching; by the re-deposition of suspended sediment; and by external cable protection material being placed on the seabed (i.e. at crossings or as a contingency). The effect from displaced sediment will be very localised, only affecting species in the immediate vicinity of cable installation. Suspended sediment settlement levels will be minimal with any material deposited quickly re-suspended and distributed by natural hydrodynamic processes. Therefore, no significant effect will occur.
Collision BELOW water with static or moving objects not naturally found in the marine environment (e.g., boats, machinery, and structures)	Marine mammals	Due to the limited spatial and temporal extent and slow speed (the majority of cable installation operations will be 1knot (2km/hour) or less; approximately 1 knot (2km/hour) for surface lay and 0.3 knots (0.6km/hour) for plough installation, with potential for a small amount of time up to 6 knots (11km/hour) for vessel movement within the cable corridor when not laying the cable) of installation vessels within the cable corridors, this pressure has been scoped out of the Protected Sites Assessment.

Pressure scoped out	Receptor	Reason for Exclusion
Underwater noise changes (continuous and impulsive sound)	Fish	Data sources available (Popper et al. 2014 and OSPAR Commission 2012) consider that the potential for likely significant effects to fish from cable installation activities is low. Many species of fish lack the specialisations for receiving sound, therefore no effects to these groups of fish are anticipated. Potential effects are limited to fish with hearing specialties. To sustain an injury fish would need to be within close proximity of the vessel for 24 hours, which is extremely unlikely based on the migratory and predatory nature of these specialised species. Therefore, the effect of underwater noise changes to fish will not have a significant effect.
Underwater noise changes (continuous sound)	Marine mammals	Shipping and fishing activity are common across the Project area. Vessels transit the area routinely, generating relatively high levels of noise. As a result, it is likely that marine mammal populations in the Project area are habituated to continuous noise of the type generated during cable installation activity. Cable installation does not constitute a change from baseline vessel densities in the area. Therefore, the effect of underwater noise changes from cable installation will not have a significant effect.

2.2 Relevant Protected Sites

The initial examination of protected sites identified 17 sites where a possible pressure-receptor pathway exists within the Shetland geographical area. Of these, 14 were European Sites, one was a NCMPA and two were SSSIs.

European sites to be considered in the HRA Screening include:

- Fair Isle SAC
- Mousa SAC
- Sanday SAC
- Yell Sound Coast SAC
- Bluemull and Colgrave Sounds SPA
- East Mainland Coast, Shetland SPA
- Fair Isle SPA and SSSI
- Fetlar SPA
- Hermaness, Saxa Vord and Valla Field SPA
- Lochs of Spiggie and Brow SPA
- Mousa SPA
- Otterswick and Graveland SPA
- Sumburgh Head SPA
- East Sanday Coast Ramsar and SPA

Protected sites to be considered in the NCMPA Assessment include:

- Fetlar to Haroldswick NCMPA

Protected sites to be considered in the SSSI Assessment include:

- Gutcher SSSI
- East Sanday Coast SSSI

3. HRA STAGE 1 SCREENING

3.1 Screening Approach

3.1.1 Approach to Screening for Appropriate Assessment (AA)

One or more of the Shetland geographical area cable corridors is located within or adjacent to a European site, therefore there exists the potential for the Project to have a significant effect on a European site. As such the proposed Project must be screened to determine if Appropriate Assessment (AA) is required.

Screening for AA has been undertaken by applying the following steps:

1. Compile information on the qualifying interest features and conservation objectives of the identified relevant European sites.
2. Consider the Project activities and the changes that they may cause that may be relevant to the European sites.
3. Identify if any elements of the Project are likely to have a significant effect on any of the qualifying interest features, alone or in-combination with other projects and plans, directly or indirectly.
4. Provide screening statement with conclusions. If significant effects are likely or uncertain, proceed to AA.

Although the process is laid out as sequential steps, in practice steps 2 and 3 have been undertaken concurrently.

All current case law relevant to the Habitats Directive has been applied. The European Court of Justice ruling CJEU C-323/17 (People Over Wind and Peter Sweetman vs Coillte Teoranta) has clarified that mitigation measures should not be applied during Screening for AA.

No mitigation has been considered during the screening process.

All European sites have been mapped in GIS, with distances measured from the edge of the cable corridor to the edge of the European site at the closest point assessed in this report. Only marine European sites, and European sites containing marine features have been included. Screening conclusions have been determined based on the following criteria for 'screened in' and 'screened out':

- Screened in: A pathway between the Project and the interest feature can be identified that is likely to result in an effect, or a pathway between the activities and the interest features can be identified but it is uncertain whether or not a significant effect is likely.
- Screened out: Either a pathway between the project and the qualifying interest features cannot be identified or a pathway exists but there is no physical overlap of the pressure and the interest feature, or because any potential effects would be insignificant, being so restricted or remote from the site that they would not undermine the conservation objectives for the conservation site.

Screened out sites have not been assessed further; all screened in sites have been taken forward for further assessment in the Stage 2 Information to Inform AA (Section 6).

3.1.2 Approach to Screening the Project in-combination with other plans or projects

The Conservation (Natural Habitats, &c.) Regulations 1994 (CHSR) (as amended) requires that any plans or projects likely to have a significant effect either individually or in combination with other plans or projects, shall be subject to AA of its implications for the site in view of the site's conservation objectives.

Only plans or projects that would increase the likelihood of significant effects on a European site should be considered. Where the proposed Project could result in a likely significant effect it will automatically be taken forward to Stage 2 (AA) and therefore there is no need to assess during the screening stage if in-combination effects are possible.

Where the proposed Project has no likely significant effects, in-combination effects assessment is not required since the proposed Project is not contributing to an effect. It is only where the proposed Project could result in a minor effect on a European site that in combination effects with other plans or projects should be assessed to determine whether together with other plans or projects the Project could result in a significant effect.

3.2 Screening Relevant European Sites for AA

Table 3-1 presents the results of the screening of the identified relevant European sites for AA. The distances have been measured from the closest point on the European site to the closest point of the cable corridor.

Table 3-1 Screening relevant European sites for AA

Site Name & Code	Primary and qualifying features	Cable Corridor	Distance (km)	Potential pressure	Potential pressure-receptor pathway for LSE	Screening decision
Fair Isle SAC (UK0030149)	**Annex I habitats (Primary reason for site selection)** ▪ Vegetated sea cliffs of the Atlantic and Baltic coasts **Annex I habitats (Qualifying feature)** ▪ European dry heaths	Cable 2.4	0	Physical change to another seabed type Abrasion/disturbance of the substrate on the surface of the seabed Penetration and/or disturbance of the substrate below the surface of the seabed Siltation rate changes (including smothering)	These are terrestrial habitats. As the landing point is within a beach area, and will avoid cliffs, no pressure/receptor pathway exists. No LSE, AA is not required.	SCREENED OUT
		Cable 2.3	2.4			
		Cable 2.8	91.5			
		Cable 2.2	103.6			
		Cable 2.1	128.8			
Yell Sound Coast SAC (UK0012687)	**Annex II Species (Primary Reason for site selection)** ▪ Harbour seal (*Phoca vitulina*)	Cable 2.2	0.0	Visual (and above water noise) disturbance	Screened in for further assessment as seals can be disturbed at haul-out sites at a distance of 500m or less (pers comms – NatureScot 2021). Potential for LSE, AA is required.	SCREENED IN
		Cable 2.8	4.6		Seals typically can be disturbed at haul-out sites at a distance of 500m or less (pers comms – NatureScot 2021). As such, installation activities for these Cable Corridors will not lead to visual and above water noise disturbance of harbour seal. No LSE, AA is not required.	SCREENED OUT
		Cable 2.1	20.5			
		Cable 2.3	55.9			
		Cable 2.4	97.1			
		Cable 2.2	0.0	Underwater noise changes	Screened in for further assessment as underwater noise generated by installation activities could lead to disturbance of harbour seal in the vicinity of such noise. Potential for LSE, AA is required.	SCREENED IN
		Cable 2.8	4.6			
		Cable 2.1	20.5			
		Cable 2.3	55.9			SCREENED OUT

Site Name & Code	Primary and qualifying features	Cable Corridor	Distance (km)	Potential pressure	Potential pressure-receptor pathway for LSE	Screening decision
		Cable 2.4	97.1		While harbour seal can range far from their haul-out sites for feeding purposes, harbour seals typically forage 11-21km from their haul-out site (DECC, 2016). As such, the potential for individuals from this site to be found in significant numbers in the vicinity of installation activities is low. No LSE, AA is not required.	
		Cable 2.2	0.0	Changes in supporting habitat and prey availability	Including estimated worst-case rock protection (rock bags and mattresses), cable installation activities will disturb an area of less than 0.0009km^2 within the SAC, which is less than 0.0001% of the SAC's marine area. Temporary disturbance to such a small area of the protected site will not result in any significant adverse effects to supporting habitat and prey availability. No LSE, AA is not required.	SCREENED OUT
		Cable 2.8	4.6		No pressure/receptor pathway exists for changes in supporting habitat and prey availability due to the distance of these cable corridors from the SAC.	SCREENED OUT
		Cable 2.1	20.5			
		Cable 2.3	55.9			
		Cable 2.4	97.1			
	Annex II Species (Primary Reason for site selection) ▪ Otter (*Lutra Lutra*)	Cable 2.2	0.0	Visual (and above water noise) disturbance Underwater noise changes	Otter typically feed within 80m of the shoreline and regularly commute up to 500m over stretches of open water (NPWS, 2017). Therefore, the installation activities have the potential to disturb otters within the site. Potential for LSE, AA is required.	SCREENED IN
		Cable 2.8	4.6		Screened out as these cable corridors are outside otters aquatic commuting range. No LSE, AA is not required	
		Cable 2.1	20.5			
		Cable 2.3	55.9			SCREENED OUT

Site Name & Code	Primary and qualifying features	Cable Corridor	Distance (km)	Potential pressure	Potential pressure-receptor pathway for LSE	Screening decision
		Cable 2.4	97.1			
		Cable 2.2	0.0	Changes in supporting habitat and prey availability	Including estimated worst-case rock protection (rock bags and mattresses), cable installation activities will disturb an area of less than 0.0009km^2 within the SAC, which is less than 0.0001% of the SAC's marine area. Temporary disturbance to such a small area of the protected site will not result in any significant adverse effects to supporting habitat and prey availability. No LSE, AA is not required.	SCREENED OUT
		Cable 2.8	4.6		No pressure/receptor pathway exists due to the distance of these cable corridors from the SAC. No LSE, AA is not required.	SCREENED OUT
		Cable 2.1	20.5			
		Cable 2.3	55.9			
		Cable 2.4	97.1			
Mousa SAC (UK0012711)	**Annex I Habitats (Qualifying features)** ▪ Reefs ▪ Submerged or partially submerged sea caves	Cable 2.3	11.2	No pressure-receptor pathway identified	No pressure/receptor pathway exists due to the distance of these cable corridors from the SAC. No LSE, AA is not required.	SCREENED OUT
		Cable 2.8	36.3			
		Cable 2.2	49.2			
		Cable 2.4	54.0			
		Cable 2.1	73.8			
	Annex II Species (Primary Reason for selection) ▪ Harbour seal (*Phoca vitulina*)	Cable 2.3	11.2	Underwater noise changes	Screened in for further assessment as underwater noise generated by installation activities could lead to disturbance of harbour seal in the vicinity of such noise. Potential for LSE, AA is required.	SCREENED IN
		Cable 2.8	36.3			SCREENED OUT

Site Name & Code	Primary and qualifying features	Cable Corridor	Distance (km)	Potential pressure	Potential pressure-receptor pathway for LSE	Screening decision
		Cable 2.2	49.2		While harbour seal can range far from their haul-out sites for feeding purposes, harbour seals typically forage 11-21km from their haul-out site (DECC, 2016). As such, the potential for individuals from this site to be found in significant numbers in the vicinity of installation activities is low. No LSE, AA is not required.	
		Cable 2.4	54.0			
		Cable 2.1	73.8			
	Annex II Species (Primary Reason for selection) ▪ Harbour seal (*Phoca vitulina*)	Cable 2.3	11.2	Visual (and above water noise) disturbance	Seals typically can be disturbed at haul-out sites at a distance of 500m or less (pers comms – NatureScot 2021). As such, installation activities for these Cable Corridors will not lead to visual and above water noise disturbance of harbour seal. No LSE, AA is not required.	SCREENED OUT
		Cable 2.8	36.3			
		Cable 2.2	49.2			
		Cable 2.4	54.0			
		Cable 2.1	73.8			
		Cable 2.3	11.2	Changes in supporting habitat and prey availability	No potential pressure/receptor pathway exists as the cable corridors are not located within the SAC. No LSE, AA is not required	SCREENED OUT
		Cable 2.8	36.3			
		Cable 2.2	49.2			
		Cable 2.4	54.0			
		Cable 2.1	73.8			
Sanday SAC (UK0030069)	**Annex II Species (Primary Reason for selection)** ▪ Harbour seal	Cable 2.3	0.0	Visual (and above water noise) disturbance	Screened in for further assessment as seals can be disturbed at haul-out sites at a distance of 500m or less (pers comms – NatureScot 2021). Potential for LSE, AA is required.	SCREENED IN
		Cable 2.4	50.5		Seals typically can be disturbed at haul-out sites at a distance of 500m or less (pers comms – NatureScot 2021). As such, installation activities for these Cable Corridors will not lead to visual and above water noise disturbance of harbour seal.	SCREENED OUT
		Cable 2.8	133			
		Cable 2.2	143			
		Cable 2.1	168			

Site Name & Code	Primary and qualifying features	Cable Corridor	Distance (km)	Potential pressure	Potential pressure-receptor pathway for LSE	Screening decision
					No LSE, AA is not required.	
		Cable 2.3	0.0	Underwater noise changes	Screened in for further assessment as underwater noise generated by installation activities could lead to disturbance of harbour seal in the vicinity of such noise. Potential for LSE, AA is required.	SCREENED IN
		Cable 2.4	50.5		While harbour seal can range far from their haul-out sites for feeding purposes, harbour seals typically forage 11-21km from their haul-out site (DECC, 2016). As such, the potential for individuals from this site to be found in significant numbers in the vicinity of installation activities is low. No LSE, AA is not required.	SCREENED OUT
		Cable 2.8	133			
		Cable 2.2	143			
		Cable 2.1	168			
		Cable 2.3	0.0	Changes in supporting habitat and prey availability	Including estimated worst-case rock protection (rock bags and mattresses), cable installation activities will disturb an area of approximately 0.0069km^2 within the SAC, which is less than 0.0001% of the SAC's marine area. Temporary disturbance to such a small area of the protected site will not result in any significant adverse effects to supporting habitat and prey availability.	SCREENED OUT
		Cable 2.4	50.5		No pressure/receptor pathway exists due to the distance of these cable corridors from the SAC. No LSE, AA is not required.	SCREENED OUT
		Cable 2.8	133			
		Cable 2.2	143			
		Cable 2.1	168			
	Annex I habitats that are a primary reason for selection of this site: ▪ Reefs (Bedrock reef habitat)	Cable 2.3	0.0	Physical change to another seabed type	As cable protection measures are a contingency that might be utilised within the SAC boundary, there may be localised physical change to another seabed type.	SCREENED IN

Site Name & Code	Primary and qualifying features	Cable Corridor	Distance (km)	Potential pressure	Potential pressure-receptor pathway for LSE	Screening decision
	Annex I habitats present as a qualifying feature, but not a primary reason for selection of this site: ▪ Sandbanks which are slightly covered by sea water all the time ▪ Mudflats and sandflats not covered by seawater at low tide			Abrasion/disturbance of the substrate on the surface of the seabed Penetration and/or disturbance of the substrate below the surface of the seabed Siltation rate changes (including smothering)	Trenching installation methods penetrate the seabed and may result in damage/loss of sessile or low mobility species within the footprint of the trenching equipment Movement of surface laid cable has potential to result in repeated abrasion characteristics of the seabed. Siltation rate changes are likely to occur within 100m of the scheduled works for cable burial activities. Potential for LSE, AA is required	
		Cable 2.4	50.5		No pressure/receptor pathway exists due to the distance of these cable corridors from the SAC. No LSE, AA is not required.	SCREENED OUT
		Cable 2.8	133			
		Cable 2.2	143			
		Cable 2.1	168			
Mousa SPA (UK9002361)	**Article 4.1 Annex I (Breeding)** ▪ Arctic tern (*Sterna paradisaea*)	Cable 2.3	11.9	Visual (and above water noise) disturbance	Arctic tern are considered to be sensitive to visual and above water noise disturbance (JNCC, 2017) and the cable corridor is within the species mean max foraging range (25.7km) (Woodward et al., 2019). Potential for LSE, AA is required.	SCREENED IN
		Cable 2.8	36.9		These cable corridors are outside the Arctic terns mean max foraging range (25.7 km) (Woodward et al., 2019). No LSE, AA is not required.	SCREENED OUT
		Cable 2.2	49.9			
		Cable 2.4	54.7			
		Cable 2.1	74.4			
	Article 4.1 Annex I (Breeding)	Cable 2.3	11.9		Storm petrel are considered to have a low sensitivity to visual and above water noise	SCREENED OUT

Site Name & Code	Primary and qualifying features	Cable Corridor	Distance (km)	Potential pressure	Potential pressure-receptor pathway for LSE	Screening decision
	▪ Storm petrel (*Hydrobates pelagicus*) ▪	Cable 2.8	36.9		disturbance from vessel movements (JNCC, 2017a; NatureScot, 2017b). As such, the species will not be significantly disturbed by installation activities associated with these cable corridors. No LSE, AA is not required.	
		Cable 2.2	49.9			
		Cable 2.4	54.7			
		Cable 2.1	74.4			
	Article 4.1 Annex I (Breeding) ▪ Storm petrel (*Hydrobates pelagicus*) ▪ Arctic tern ▪	Cable 2.3	11.9	Changes in supporting habitat and prey availability	No potential pressure/receptor pathway exists as the cable corridors are not located within the SPA. No LSE, AA is not required	SREENED OUT
		Cable 2.8	36.9			
		Cable 2.2	49.9			
		Cable 2.4	54.7			
		Cable 2.1	74.4			
East Sanday Coast SPA and Ramsar (UK9002331)	**Article 4.1 Annex I (Wintering)** ▪ Bar-tailed godwit (*Limosa lapponica*) **Article 4.2 Migratory** ▪ Purple sandpiper (*Calidris maritima*) ▪ Turnstone (*Arenaria interpres*)	Cable 2.3	0.0	Visual (and above water noise) disturbance	Bar-tailed godwit, purple sandpiper and turnstone are wading birds which may utilise the intertidal area at the landing point. Potential for LSE, AA is required.	SCREENED IN
		Cable 2.4	52.0			
		Cable 2.8	135			
		Cable 2.2	145			
		Cable 2.1	170			
		Cable 2.3	0.0	Changes in supporting habitat and prey availability	Including estimated worst-case rock protection (rock bags and mattresses), cable installation activities will disturb an area of approximately 0.0006km^2 within the SPA, which is less than 0.0001% of the SPA's marine area. Temporary disturbance to such a small area of the protected site will not result in any significant adverse effects to supporting habitat and prey availability. No LSE, AA is not required	SCREENED OUT
		Cable 2.4	52.0			
		Cable 2.8	135			
		Cable 2.2	145			
		Cable 2.1	170			

Site Name & Code	Primary and qualifying features	Cable Corridor	Distance (km)	Potential pressure	Potential pressure-receptor pathway for LSE	Screening decision
Bluemull and Colgrave Sounds SPA (UK9020312)	**Article 4.1 Annex I (Breeding)** ▪ Red throated diver (*Gavia stellata*)	Cable 2.1	0.0	Visual (and above water noise) disturbance	Red-throated diver are considered to be sensitive to visual and above water noise disturbance and the cable corridor is within the species mean max foraging range (9km) (Woodward et al., 2019). Potential for LSE, AA is required.	SCREENED IN
		Cable 2.2	10.0		These cable corridors are outside of red-throated divers mean max foraging range (9 km). (Woodward et al., 2019). No LSE, AA is not required.	SCREENED OUT
		Cable 2.8	25.9			
		Cable 2.3	78.2			
		Cable 2.4	120.0			
		Cable 2.1	0.0	Changes in supporting habitat and prey availability	Including estimated worst-case rock protection (rock bags and mattresses), cable installation activities will disturb an area of approximately 0.008km^2 within the SPA, which is less than 0.0002% of the SPA's marine area. Temporary disturbance to such a small area of the protected site will not result in any significant adverse effects to supporting habitat and prey availability. No LSE, AA is not required.	SCREENED OUT
		Cable 2.2	10.0		No potential pressure/receptor pathway exists for Cable Corridor 2.2 Shetland to Yell, Cable Corridor 2.3 Sanday to Shetland, Cable Corridor 2.4 Fair Isle to BU and Cable Corridor 2.8 Shetland to Whalsay as they are outside the SPA.	SCREENED OUT
		Cable 2.8	25.9			
		Cable 2.3	78.2			
		Cable 2.4	120.0			
East Mainland Coast, Shetland SPA (UK9020311)	**Article 4.1 Annex I (Breeding)** ▪ Red throated diver (*Gavia stellata*)	Cable 2.2	0.0	Visual (and above water noise) disturbance	Red-throated diver are considered to be sensitive to visual and above water noise disturbance (JNCC, 2017b) and the route is within the species mean max foraging range (9km) (Woodward et al., 2019). Potential for LSE, AA is required.	SCREENED IN
		Cable 2.8	1.9			

Site Name & Code	Primary and qualifying features	Cable Corridor	Distance (km)	Potential pressure	Potential pressure-receptor pathway for LSE	Screening decision
		Cable 2.1	22.2		These cable corridors are outside of the mean max foraging range (9km). (Woodward et al., 2019). No LSE, AA is not required.	SCREENED OUT
		Cable 2.3	31.7			
		Cable 2.4	73.1			
	Article 4.1 Annex I (Non-Breeding) ▪ Great northern diver (*Gavia immer*) ▪ Slavonian grebe (*Podiceps auratus*)	Cable 2.2	0.0		Great northern diver and Slavonian grebe are considered to be sensitive to visual and above water noise disturbance. As there is no available data on foraging ranges for these species they have been screened in as a precautionary measure for all Shetland cable corridors (JNCC, 2017b). Potential for LSE, AA is required.	SCREENED IN
		Cable 2.8	1.9			
		Cable 2.1	22.2			
		Cable 2.3	31.7			
		Cable 2.4	73.1			
	Article 4.1 Annex I (Breeding) ▪ Red throated diver (*Gavia stellata*) **Article 4.1 Annex I (Non-Breeding)** ▪ Great northern diver (*Gavia immer*) ▪ Slavonian grebe (*Podiceps auritus*)	Cable 2.2	0.0	Changes in supporting habitat and prey availability	Including estimated worst-case rock protection (rock bags and mattresses), cable installation activities will disturb an area of approximately 0.015km^2 within the SPA, which is less than 0.0001% of the SPA's marine area. Temporary disturbance to such a small area of the protected site will not result in any significant adverse effects to supporting habitat and prey availability. No LSE, AA is not required.	SCREENED OUT
		Cable 2.8	1.9		No potential pressure/receptor pathway exists for these cable corridors as they are outside the SPA. No LSE, AA is not required.	SCREENED OUT
		Cable 2.1	22.2			
		Cable 2.3	31.7			
		Cable 2.4	73.1			
Fair Isle SPA (UK9002091)	**Article 4.1 Annex I (Breeding)** ▪ Fair Isle wren (*Troglodytes troglodytes fridariensis*)	Cable 2.3	0.0	Visual (and above water noise) disturbance	All species are screened in for further assessment as Cable Corridor 2.3 Sanday to Shetland and Cable Corridor 2.4 Fair Isle to BU are within the SPA (JNCC, 2017). Disturbance to individuals nesting	SCREENED IN
		Cable 2.4	0.0			

Site Name & Code	Primary and qualifying features	Cable Corridor	Distance (km)	Potential pressure	Potential pressure-receptor pathway for LSE	Screening decision
	▪ Arctic tern (*Sterna paradisaea*) **Article 4.2 (Breeding)** ▪ Guillemot (*Uria aalge*)				within the site could occur from installation activities. Potential for LSE, AA is required.	
	Article 4.2 Seabird Assemblage (Breeding) ▪ Arctic skua (*Stercorarius parasiticus*) ▪ Northern fulmar (*Fulmarus glacialis*) ▪ Northern gannet (*Morus bassanus*) ▪ Great skua (*Stercorarius skua*) ▪ Black-legged Kittiwake (*Rissa tridactyla*) ▪ European Shag (*Phalocrocorax aristotelis*)	Cable 2.8	88.8		Fair Isle wren are a terrestrial species which are only found on Fair Isle and so will not be found in the vicinity of these cable corridors. Therefore, there is no pressure-receptor pathway for this species to these cable corridors. Arctic tern, guillemot and shag have been screened out for these cable corridors because they are outside of the mean max foraging range for these species (4.8-25.7 km) (Woodward et al., 2019). No LSE, AA is not required. Arctic skua, fulmar, gannet, great skua and kittiwake are considered to have a low sensitivity to visual and above water noise disturbance from vessel movements (JNCC, 2017). As such, these species will not be significantly disturbed by installation activities associated with these cable corridors. No LSE, AA is not required.	SCREENED OUT
		Cable 2.2	101.1			
		Cable 2.1	126.2			
	Article 4.2 Seabird Assemblage (Breeding) ▪ Puffin (*Fratercula arctica*)	Cable 2.3	0.0		Screened in for further assessment for all cable corridors as puffin are considered to be sensitive to visual and above water noise disturbance (JNCC, 2017). In addition, disturbance to individuals nesting within the site could occur from installation activities within Cable Corridor 2.3 Sanday to Shetland and Cable Corridor 2.4 Fair Isle to BU. Potential for LSE, AA is required.	SCREENED IN
		Cable 2.4	0.0			
		Cable 2.8	88.8			
		Cable 2.2	101.1			
		Cable 2.1	126.2			
	Article 4.2 Seabird Assemblage (Breeding)	Cable 2.3	0.0			SCREENED IN

Site Name & Code	Primary and qualifying features	Cable Corridor	Distance (km)	Potential pressure	Potential pressure-receptor pathway for LSE	Screening decision
	▪ Razorbill (*Alca torda*)	Cable 2.4	0.0		Razorbill are considered to be sensitive to visual and above water noise disturbance (JNCC, 2017). In addition, disturbance to individuals nesting within the site could occur from installation activities within Cable Corridor 2.3 Sanday to Shetland and Cable Corridor 2.4 Fair Isle to BU. Potential for LSE, AA is required.	
		Cable 2.8	88.8			
		Cable 2.2	101.1		Screened out as these cable corridors are outside of razorbills mean max foraging range (88.7 km) (Woodward et al., 2019). No LSE, AA is not required.	SCREENED OUT
		Cable 2.1	126.2			
	Article 4.1 Annex I (Breeding) ▪ Fair Isle wren (*Troglodytes troglodytes fridariensis*) ▪ Arctic tern (*Sterna paradisaea*) **Article 4.2 Migratory** ▪ Guillemot (*Uria aalge*) **Article 4.2 Seabird Assemblage (Breeding)** ▪ Arctic skua (*Stercorarius parasiticus*) ▪ Fulmar (*Fulmarus glacialis*) ▪ Gannet (*Morus bassanus*) ▪ Great skua (*Stercorarius skua*) ▪ Kittiwake (*Rissa tridactyla*) ▪ Puffin (*Fratercula arctica*) ▪ Razorbill (*Alca torda*) ▪ Shag (*Phalocrocorax aristotelis*)	Cable 2.3	0.0	Changes in supporting habitat and prey availability.	Including estimated worst-case rock protection (rock bags and mattresses), cable installation activities will disturb an area of approximately 0.01km^2 within the SPA (for both Cable Corridor 2.3 and 2.4), which is less than 0.0002% of the SPA's marine area. Temporary disturbance to such a small area of the protected site will not result in any significant adverse effects to supporting habitat and prey availability. No LSE, AA is not required.	SCREENED OUT
		Cable 2.4	0.0			
		Cable 2.8	88.8		No potential pressure/receptor pathway exists as cable corridors are outside of the site. No LSE, AA is not required.	SCREENED OUT
		Cable 2.2	101.1			
		Cable 2.1	126.2			
Sumburgh Head SPA	**Article 4.1 Annex I (Breeding)**	Cable 2.3	0.0		Arctic tern are considered to be sensitive to visual and above water noise disturbance (JNCC, 2017)	SCREENED IN

Site Name & Code	Primary and qualifying features	Cable Corridor	Distance (km)	Potential pressure	Potential pressure-receptor pathway for LSE	Screening decision
(UK9002511)	▪ Arctic tern (*Sterna paradisaea*)			Visual (and above water noise) disturbance	and the cable corridor is within the species mean max foraging range (25.7km) (Woodward et al., 2019). In addition, disturbance to individuals nesting within the site could occur from installation activities within Cable Corridor 2.3 Sanday to Shetland. Potential for LSE, AA is required.	
		Cable 2.4	35.7		These cable corridors are outside of the mean max foraging range for Arctic tern (25.7 km) and shag (13.2 km) (Woodward et al., 2019). No LSE, AA is not required.	SCREENED OUT
		Cable 2.8	49.8			
		Cable 2.2	62.7			
		Cable 2.1	87.3			
	Article 4.2 Seabird Assemblage (Breeding) ▪ Guillemot (*Uria aalge*	Cable 2.3	0.0		Guillemot are considered to be sensitive to visual and above water noise disturbance (JNCC, 2017) and the cable corridors are within the species mean max foraging range (73.2km) (Woodward et al., 2019). In addition, disturbance to individuals nesting within the site could occur from installation activities within Cable Corridor 2.3 Sanday to Shetland. Potential for LSE, AA is required.	SCREENED IN
		Cable 2.4	35.7			
		Cable 2.8	49.8			
		Cable 2.2	62.7			
		Cable 2.1	87.3		Screened out as this cable corridor is outside of the mean max foraging range for guillemot (73.2 km) (Woodward et al., 2019). No LSE, AA is not required.	SCREENED OUT
	Article 4.2 Seabird Assemblage (Breeding) ▪ Fulmar (*Fulmarus glacialis*) ▪ Kittiwake (*Rissa tridactyla*)	Cable 2.3	0.0		Installation activities within Cable Corridor 2.3 Sanday to Shetland could lead to disturbance to individuals nesting within the site. Potential for LSE, AA is required.	SCREENED IN

Site Name & Code	Primary and qualifying features	Cable Corridor	Distance (km)	Potential pressure	Potential pressure-receptor pathway for LSE	Screening decision
		Cable 2.4	35.7		Fulmar and kittiwake are considered to have a low sensitivity to visual and above water noise disturbance from vessel movements (JNCC, 2017). As such, the species will not be significantly disturbed by installation activities associated with these cable corridors. No LSE, AA is not required.	SCREENED OUT
		Cable 2.8	49.8			
		Cable 2.2	62.7			
		Cable 2.1	87.3			
	Article 4.1 Annex I (Breeding) ▪ Arctic tern (*Sterna paradisaea*) **Article 4.2 Seabird Assemblage (Breeding)** ▪ Fulmar (*Fulmarus glacialis*) ▪ Guillemot (*Uria aalge*) ▪ Kittiwake (*Rissa tridactyla*)	Cable 2.3	0.0	Changes in supporting habitat and prey availability.	Including estimated worst-case rock protection (rock bags and mattresses), cable installation activities will disturb an area of approximately 0.007km^2 within the SPA, which is less than 0.0006% of the SPA's marine area. Temporary disturbance to such a small area of the protected site will not result in any significant adverse effects to supporting habitat and prey availability. No LSE, AA is not required.	SCREENED OUT
		Cable 2.4	35.7		No potential pressure/receptor pathway exists as cable corridors are not found within the site. No LSE, AA is not required.	SCREENED OUT
		Cable 2.8	49.8			
		Cable 2.2	62.7			
		Cable 2.1	87.3			
Fetlar SPA (UK9002031)	**Article 4.1 Annex I (Breeding)** ▪ Arctic tern (*Sterna paradisaea*)	Cable 2.1	0.9	Visual (and above water noise) disturbance	Arctic tern are considered to be sensitive to visual and above water noise disturbance (JNCC, 2017) and the cable corridors are within the species mean max foraging range (25.7km) (Woodward et al., 2019). In addition, disturbance to individuals nesting within the site could occur from installation activities within Cable Corridor 2.1 Yell to Unst. Potential for LSE, AA is required	SCREENED IN
		Cable 2.2	.6.7			
		Cable 2.8	21.9			
		Cable 2.3	74.4			SCREENED OUT

Site Name & Code	Primary and qualifying features	Cable Corridor	Distance (km)	Potential pressure	Potential pressure-receptor pathway for LSE	Screening decision
		Cable 2.4	116.3		These cable corridors as they are outside the Arctic tern mean max foraging range (25.7 km) (Woodward et al., 2019). No LSE, AA is not required.	
	Article 4.1 Annex I (Breeding) ▪ Red-necked phalarope (*Phalaropus lobatus*) **Article 4.2 Migratory** ▪ Great skua (*Stercorarius skua*) ▪ Whimbrel (*Numenius phaeopus* ▪ Dunlin (*Calidris alpina schinzii*) **Article 4.2 Seabird Assemblage (Breeding)** ▪ Artic Skua (*Stercorarius parasiticus*) ▪ Fulmar (*Fulmarus glacialis*)	Cable 2.1	0.9		All species have been screened in for further assessment as installation activities could lead to disturbance to individuals nesting within the site. Potential for LSE, AA is required.	SCREENED IN
		Cable 2.2	6.7		Arctic skua, great skua, red-necked phalarope and fulmar are considered to have a low sensitivity to visual and above water noise disturbance from vessel movements (JNCC, 2017a; NatureScot, 2017b). As such, the species will not be significantly disturbed by installation activities associated with these cable corridors.	SCREENED OUT
		Cable 2.8	21.9			
		Cable 2.3	74.4			
		Cable 2.4	116.3			
	Article 4.1 Annex I (Breeding) ▪ Arctic tern (*Sterna paradisaea*) ▪ Red-necked phalarope (*Phalaropus lobatus*) **Article 4.2 Migratory** ▪ Great skua (*Stercorarius skua*) ▪ Whimbrel (*Numenius phaeopus* ▪ Dunlin (*Calidris alpina schinzii*) **Article 4.2 Seabird Assemblage (Breeding)** ▪ Artic Skua (*Stercorarius parasiticus*) Fulmar (*Fulmarus glacialis*)	Cable 2.1	0.9	Changes in supporting habitat and prey availability.	No potential pressure/receptor pathway exists as cable corridors are not found within the site. No LSE, AA is not required.	SCREENED OUT
		Cable 2.2	6.7			
		Cable 2.8	21.9			
		Cable 2.3	74.4			
		Cable 2.4	116.3			

Site Name & Code	Primary and qualifying features	Cable Corridor	Distance (km)	Potential pressure	Potential pressure-receptor pathway for LSE	Screening decision
Otterswick and Graveland SPA (UK9002941)	**Article 4.1 Annex I (Breeding)** Red-throated diver (*Gavia stellata*)	Cable 2.2	4.3	Visual (and above water noise) disturbance	Red-throated diver are considered to be sensitive to visual and above water noise disturbance (JNCC, 2017; van Bemmelen *et. al* 2019). The cable corridors are within the species mean max foraging range (9km) (Woodward et al., 2019). Potential for LSE, AA is required.	SCREENED IN
		Cable 2.1	8.6			
		Cable 2.8	20.0		Screened out as these cable corridors are outside of the mean max foraging range for red-throated diver (9km) (Woodward et al., 2019). No LSE, AA is not required.	SCREENED OUT
		Cable 2.3	71.7			
		Cable 2.4	112.9			
		Cable 2.2	4.3	Changes in supporting habitat and prey availability.	No potential pressure/receptor pathway exists as the cable corridors are not located within the SPA. No LSE, AA is not required	SCREENED OUT
		Cable 2.1	8.6			
		Cable 2.8	20.0			
		Cable 2.3	71.7			
		Cable 2.4	112.9			
Hermaness, Saxa Vord and Valla Field SPA (UK9002011)	**Article 4.1 Annex I (Breeding)** ▪ Red-throated diver (*Gavia stellata*) **Article 4.2 Seabird Assemblage (Breeding)** ▪ Shag (*Phalacrocorax aristotelis*)	Cable 2.1	4.1	Visual (and above water noise) disturbance	Red-throated diver and shag are considered to be sensitive to visual and above water noise disturbance (JNCC, 2017a) and the cable corridor is within the species' mean max foraging range (9 and 21.5km, respectively) (Woodward et al., 2019). Potential for LSE, AA is required.	SCREENED IN
		Cable 2.2	25.8		These cable corridors are outside of the mean max foraging range for red-throated diver (9km), and shag (13.2 km) (Woodward et al., 2019). No LSE, AA is not required.	SCREENED OUT
		Cable 2.8	41.5			
		Cable 2.3	94.0			
		Cable 2.4	135.7			
	Article 4.2 Seabird Assemblage (Breeding)	Cable 2.1	4.1			SCREENED IN

Site Name & Code	Primary and qualifying features	Cable Corridor	Distance (km)	Potential pressure	Potential pressure-receptor pathway for LSE	Screening decision
	▪ Guillemot (*Uria aalge*)	Cable 2.2	25.8		Guillemot are considered to be sensitive to visual and above water noise disturbance (JNCC, 2017a) and these cable corridors are within the mean max foraging range (73.2 km) (Woodward et al., 2019). Potential for LSE, AA is required.	
		Cable 2.8	41.5			
		Cable 2.3	94.0		These cable corridors are outside of the mean max foraging range for guillemot (73.2 km) (Woodward et al., 2019). No LSE, AA is not required.	SCREENED OUT
		Cable 2.4	135.7			
	Article 4.2 Migratory (Breeding) ▪ Puffin (*Fratercula arctica*)	Cable 2.1	4.13		Puffin are considered to be sensitive to visual and above water noise disturbance and the cable corridors are within the species mean max foraging range (137.1km) (JNCC, 2017a). Potential for LSE, AA is required.	SCREENED IN
		Cable 2.2	25.8			
		Cable 2.8	41.5			
		Cable 2.3	94.0			
		Cable 2.4	135.7			
	Article 4.2 Migratory (Breeding) ▪ Gannet (*Morus bassana*) ▪ Great skua (*Catharacta skua*) **Article 4.2 Seabird Assemblage (Breeding)** ▪ Fulmar (*Fulmarus glacialis*) ▪ Kittiwake (*Rissa tridactyla*)	Cable 2.1	4.1		Fulmar, gannet, great skua and kittiwake are considered to have a low sensitivity to visual and above water noise disturbance from vessel movements (JNCC, 2017a; NatureScot, 2017b). As such, the species will not be significantly disturbed by installation activities associated with the cable corridors. No LSE, AA is not required.	SCREENED OUT
		Cable 2.2	25.8			
		Cable 2.8	41.5			
		Cable 2.3	94.0			
		Cable 2.4	135.7			
	Article 4.1 Annex I (Breeding) ▪ Red-throated diver (*Gavia stellata*) **Article 4.2 Migratory (Breeding)**	Cable 2.1	4.1	Changes in supporting habitat and prey availability.	No potential pressure/receptor pathway exists as the cable corridors are not located within the SPA. No LSE, AA is not required	SCREENED OUT
		Cable 2.2	25.8			
		Cable 2.8	41.5			

Site Name & Code	Primary and qualifying features	Cable Corridor	Distance (km)	Potential pressure	Potential pressure-receptor pathway for LSE	Screening decision
	▪ Gannet (*Morus bassana*) ▪ Great skua (*Catharacta skua*) **Article 4.2 Seabird Assemblage (Breeding)** ▪ Shag (*Phalacrocorax aristotelis*) ▪ Guillemot (*Uria aalge*) ▪ Puffin (*Fratercula arctica*) ▪ Fulmar (*Fulmarus glacialis*) ▪ Kittiwake (*Rissa tridactyla*)	Cable 2.3	94.0			
		Cable 2.4	135.7			
Lochs of Spiggie and Brow SPA (UK9002651)	**Article 4.1 Annex I (Non-Breeding)** ▪ Whooper Swan (*Cygnus cygnus*)	Cable 2.3	4.7	Visual (and above water noise) disturbance	Whooper swans are wetland species, and do not feed or roost in marine waters, they will not be found within/in the vicinity of installation activities for any of the cable corridors. No LSE, AA is not required.	SCREENED OUT
		Cable 2.4	44.6			
		Cable 2.8	45.7			
		Cable 2.2	58.1			
		Cable 2.1	83.2			
		Cable 2.3	4.7	Changes in supporting habitat and prey availability.	No potential pressure/receptor pathway exists as the cable corridors are not located within the SPA. No LSE, AA is not required	SCREENED OUT
		Cable 2.4	44.6			
		Cable 2.8	45.7			
		Cable 2.2	58.1			
		Cable 2.1	83.2			

3.3 Screening Statement and Conclusions

To determine whether the Project is likely to have a significant effect on any European sites, either individually or in-combination with other plans or projects, HRA Screening was carried out.

The HRA screening initially identified 14 relevant European sites where a possible pressure-receptor pathway existed between the sites and the Project activities. These 14 sites were subject to screening which involved further analysis taking into consideration the qualifying interest features. Screening identified 12 European sites where it could not be ruled out that the Project activities will not result in a LSE.

A review of the Project activities identified six pressures that could be exerted on qualifying features of the 12 European sites. These were:

- Visual (and above water noise) disturbance
- Underwater noise
- Physical change (to another seabed type)
- Penetration and/or disturbance of the substrate below the surface of the seabed
- Abrasion/disturbance of the substrate on the surface of the seabed
- Siltation rate changes (including smothering)

Of the 14 sites screened in Table 3-1 above, a total of 12 sites have been identified where a potential pressure-receptor pathway exists where LSE could occur. These 12 sites are composed of the following types:

- Three SAC.
- Nine SPA (including East Sanday Coast SPA which is also designated as a Ramsar site).

A summary of the screening conclusion for each site is detailed in Table 3-2 below.

Table 3-2 Summary of Screening Conclusions

Site Name and Code	Applicable Qualifying Feature/s	Potential Pressure/s	Cable Corridor(s)	Screening Conclusion
Yell Sound Coast SAC (UK0012687)	Harbour seal	Visual (and above water noise) disturbance	2.2	**Screened in** Potential for LSE, AA is required
			2.1, 2.3, 2.4 and 2.8	**Screened out** No potential for LSE, AA is not required
		Underwater noise changes	2.1, 2.2 and 2.8	**Screened in** Potential for LSE, AA is required
			2.3 and 2.4	**Screened out** No potential for LSE, AA is not required
	Otter	Visual (and above water noise) disturbance Underwater noise changes	2.1, 2.2 and 2.8	**Screened in** Potential for LSE, AA is required
			2.3 and 2.4	**Screened out** No potential for LSE, AA is not required
	Harbour seal and otter	Changes in supporting habitat and prey availability	All Cable corridors	**Screened out**

Site Name and Code	Applicable Qualifying Feature/s	Potential Pressure/s	Cable Corridor(s)	Screening Conclusion
				No potential for LSE, AA is not required
Mousa SAC, (UK0012711)	Reefs and submerged or partially submerged sea caves	No pressure-receptor pathway identified	All cable corridors	**Screened out** No potential for LSE, AA is not required
	Harbour seal	Visual (and above water noise) disturbance Changes in supporting habitat and prey species	All cable corridors	**Screened out** No potential for LSE, AA is not required
	Harbour seal	Underwater noise changes	2.3	**Screened in** Potential for LSE, AA is required
			2.1, 2.2, 2.4 and 2.8	**Screened out** No potential for LSE, AA is not required
Sanday SAC (UK0030069)	Harbour seal	Visual (and above water noise) disturbance and underwater noise changes	2.3	**Screened in** Potential for LSE, AA is required
			2.1, 2.2, 2.4 and 2.8	**Screened out** No potential for LSE, AA is not required
		Changes in supporting habitat and prey availability	All cable corridors	**Screened out** No potential for LSE, AA is not required
	Bedrock reef habitat Sandbanks which are slightly covered by sea water all the time Mudflats and sandflats not covered by seawater at low tide	Physical change to another seabed type Abrasion/disturbance of the substrate on the surface of the seabed Penetration and/or disturbance of the substrate below the surface of the seabed Siltation rate changes (including smothering)	2.3	**Screened in** Potential for LSE, AA is required
			2.1, 2.2, 2.4 and 2.8	**Screened out** No potential for LSE, AA is not required
Mousa SPA (UK9002361)	Breeding Arctic tern	Visual (and above water noise) disturbance	2.3	**Screened in** Potential for LSE, AA is required
			2.1, 2.2, 2.4 and 2.8	**Screened out** No potential for LSE, AA is not required
	Breeding black guillemot and breeding storm petrel		All cable corridors	**Screened out** No potential for LSE, AA is not required
	Breeding Artic tern Breeding black guillemot Breeding storm petrel	Changes in supporting habitat and prey availability	All cable corridors	**Screened out** No potential for LSE, AA is not required
East Sanday Coast SPA and Ramsar (UK9002331)	Non-breeding Bar-tailed godwit	Visual (and above water noise) disturbance	All cable corridors	**Screened in** Potential for LSE, AA is required

Site Name and Code	Applicable Qualifying Feature/s	Potential Pressure/s	Cable Corridor(s)	Screening Conclusion
	Purple sandpiper Turnstone	Changes in supporting habitat and prey availability	All cable corridors	**Screened out** No potential for LSE, AA is not required
Bluemull and Colgrave Sounds SPA (UK9020312)	Breeding red-throated diver	Visual (and above water noise) disturbance	2.1	**Screened in** Potential for LSE, AA is required
			2.2, 2.3, 2.4 and 2.8	**Screened out** No potential for LSE, AA is not required
		Changes in supporting habitat and prey availability	All Cable corridors	**Screened out** No potential for LSE, AA is not required
East Mainland Coast, Shetland SPA (UK9020311)	Breeding red-throated diver and non-breeding great northern diver and Slavonian grebe	Changes in supporting habitat type.	All Cable corridors	**Screened out** No potential for LSE, AA is not required
	Breeding red-throated diver	Visual (and above water noise) disturbance	2.2 and 2.8	**Screened in** Potential for LSE, AA is required
			2.1, 2.3 and 2.4	**Screened out** No potential for LSE, AA is not required
	Non-breeding great northern diver and Slavonian grebe		All Cable corridors	**Screened in** Potential for LSE, AA is required
Fair Isle SPA (UK9002091)	Breeding Arctic skua, Arctic tern, Fair Isle wren, fulmar, gannet, great skua, kittiwake, puffin, razorbill, shag and guillemot.	Changes in supporting habitat and prey availability.	All cable corridors	**Screened out** No potential for LSE, AA is not required
	Breeding Arctic tern, Fair Isle wren, guillemot, Arctic skua, fulmar, gannet, great skua, kittiwake and shag	Visual (and above water noise) disturbance	2.3 and 2.4	**Screened in** Potential for LSE, AA is required
			2.1, 2.2 and 2.8	**Screened out** No potential for LSE, AA is not required
	Breeding puffin		All cable corridors	**Screened in** Potential for LSE, AA is required
	Breeding razorbill		2.3, 2.4 and 2.8	**Screened in** Potential for LSE, AA is required
			2.1 and 2.2	**Screened out** No potential for LSE, AA is not required
Sumburgh Head SPA (UK9002511)	Breeding arctic tern, fulmar, kittiwake	Visual (and above water noise) disturbance	2.3	**Screened in** Potential for LSE, AA is required
			2.1, 2.2, 2.4 and 2.8	**Screened out** No potential for LSE, AA is not required
	Breeding guillemot		2.2, 2.3, 2.4 and 2.8	**Screened in** Potential for LSE, AA is required

Site Name and Code	Applicable Qualifying Feature/s	Potential Pressure/s	Cable Corridor(s)	Screening Conclusion
			2.1	**Screened out** No potential for LSE, AA is not required
	Breeding fulmar, kittiwake and Arctic tern	Changes in supporting habitat and prey availability.	All Cable corridors	**Screened out** No potential for LSE, AA is not required
Fetlar SPA (UK9002031)	Breeding Arctic skua, Arctic tern, fulmar and red-necked phalarope, and migratory dunlin, great skua and whimbrel	Changes in supporting habitat and prey availability	All Cable corridors	**Screened out** No potential for LSE, AA is not required
	Breeding Arctic tern	Visual (and above water noise) disturbance	2.1, 2.2 and 2.8	**Screened in** Potential for LSE, AA is required
			2.3 and 2.4	**Screened out** No potential for LSE, AA is not required
	Breeding Arctic skua, fulmar and red-necked phalarope, and migratory dunlin, great skua and whimbrel		2.1	**Screened in** Potential for LSE, AA is required
			2.2, 2.3, 2.4 and 2.8	**Screened out** No potential for LSE, AA is not required
Otterswick and Graveland SPA (UK9002941)	Breeding red-throated diver	Visual (and above water noise) disturbance	2.2 and 2.1	**Screened in** Potential for LSE, AA is required
			2.3, 2.4 and 2.8	**Screened out** No potential for LSE, AA is not required
		Changes in supporting habitat and prey availability	All cable corridors	**Screened out** No potential for LSE, AA is not required
Hermaness, Saxa Vord and Valla Field SPA (UK9002011)	Breeding shag and red-throated diver	Visual (and above water noise) disturbance	2.1	**Screened in** Potential for LSE, AA is required
			2.2, 2.3, 2.4 and 2.8	**Screened out** No potential for LSE, AA is not required
	Breeding guillemot		2.1, 2.2 and 2.8	**Screened in** Potential for LSE, AA is required
			2.3 and 2.4	**Screened out** No potential for LSE, AA is not required
	Breeding puffin		All cable corridors	**Screened in** Potential for LSE, AA is required
	Breeding fulmar, gannet, great skua and kittiwake			**Screened out** No potential for LSE, AA is not required

Site Name and Code	Applicable Qualifying Feature/s	Potential Pressure/s	Cable Corridor(s)	Screening Conclusion
	Breeding shag, red-throated diver, fulmar, gannet, great skua and kittiwake, guillemot and puffin	Changes in supporting habitat and prey availability	All cable corridors	**Screened out** No potential for LSE, AA is not required
Lochs of Spiggie and Brow SPA (UK9002651)	Non-breeding whooper swan	Visual (and above water noise) disturbance and changes in supporting habitat and prey availability	All cable corridors	**Screened out** No potential for LSE, AA is not required

4. NCMPA ASSESSMENT

4.1 Assessment Approach

The following NCMPA was identified as a relevant protected site and as such has been considered in the NCMPA assessment:

- Fetlar to Haroldswick NCMPA

In accordance with Section 126 of the Marine and Coastal Access Act (MCAA) (2009), a Stage 1 NCMPA assessment was undertaken for identified relevant NCMPAs to determine whether the conditions in S.126(6) can be met. The assessment has determined whether:

- There is no significant risk that the Project activities, either alone or in combination with other plans or projects, will hinder the conservation objectives of the NCMPAs; and
- The competent authority can exercise its function to further the conservation objectives of the site.

If the condition in S.126(6) could not be met the Stage 1 assessment also considered whether the condition in S.127(7)(a) could be met by determining whether:

- There is no other means of proceeding with the act which would create a substantially lower risk of hindering the achievement of the conservation objectives stated for the NCMPA. This includes proceeding with it (a) in another manner, or (b) at another location.

The assessment of relevant NCMPAs has considered the feature(s) for which the NCMPA(s) has been designated, the current status of those features and the conservation objectives against each feature.

Table 4-1 below presents the results of the screening of the identified relevant NCMPAs for further assessment. The distances have been measured from the closest point on the site to the edge of each cable corridor.

Table 4-1 Screening relevant NCMPAs for assessment

Site Name & Code	Primary and qualifying features	Cable Corridor	Distance (km)	Potential pressure	Potential pressure-receptor pathway for adverse effect	Screening decision
Fetlar to Haroldswick NCMPA	**Biodiversity** Breeding birds ▪ Black guillemot (*Cepphus grylle*)	Cable 2.1	0.0	Visual (and above water noise) disturbance	Screened in for further assessment as guillemot are considered to be sensitive to visual and above water noise disturbance (JNCC, 2017a) and the cable corridors are within the species mean max foraging range (4.8km) (Woodward et al., 2019). Potential to hinder conservation objectives, Stage 1 Assessment required.	SCREENED IN
		Cable 2.2	7.4			
		Cable 2.8	23.2		These cable corridors are outside of the mean max foraging range for black guillemot (4.8 km) (Woodward et al., 2019). No potential to hinder conservation objectives, Stage 1 Assessment not required.	SCREENED OUT
		Cable 2.3	75.6			
		Cable 2.4	117.4			
		Cable 2.1	0.0	Changes in supporting habitat and prey availability	Including estimated worst-case rock protection (rock bags and mattresses), cable installation activities will disturb an area of approximately 0.007km^2 within the NCMPA, which is less than 0.001% of the NCMPA's marine area. Temporary disturbance to such a small area of the protected site will not result in any significant adverse effects to supporting habitat and prey availability. No potential to hinder conservation objectives, Stage 1 Assessment not required	SCREENED OUT
		Cable 2.2	7.4			
		Cable 2.8	23.2		No potential pressure/receptor pathway exists as cable corridors are not found within the site. No potential to hinder conservation objectives, Stage 1 Assessment not required.	SCREENED OUT
		Cable 2.3	75.6			
		Cable 2.4	117.4			
	Habitats	Cable 2.1	0.0		Screened in for further assessment.	SCREENED IN

Site Name & Code	Primary and qualifying features	Cable Corridor	Distance (km)	Potential pressure	Potential pressure-receptor pathway for adverse effect	Screening decision
	▪ Circalittoral sand and coarse sediment communities ▪ Horse mussel beds ▪ Kelp and seaweed communities on sublittoral sediment ▪ Maerl beds ▪ Shallow tide-swept coarse sands with burrowing bivalves	Cable 2.2	7.4	Change to another seabed type Penetration and/or disturbance of the substrate below the surface of the seabed Abrasion/disturbance of the substrate on the surface of the seabed Siltation rate changes (including smothering)	As cable protection measures are a contingency that might be utilised within the NCMPA site boundary, there may be localised changes to another seabed type. Trenching installation methods penetrate the seabed and may result in damage/loss of sessile or low mobility species within the footprint of the trenching equipment. Movement of surface laid cable has potential to result in repeated abrasion characteristics of the seabed. Siltation rate changes are likely to occur within 100m of the scheduled works for cable burial activities. Potential to hinder conservation objectives, Stage 1 Assessment required.	
		Cable 2.8	23.2	Change to another seabed type Penetration and/or disturbance of the substrate below the surface of the seabed Abrasion/disturbance of the substrate on the surface of the seabed Siltation rate changes (including smothering)	No potential pressure/receptor pathway exists as cable corridors are not found within the site. No potential to hinder conservation objectives, Stage 1 Assessment not required.	SCREENED OUT
		Cable 2.3	75.6			
		Cable 2.4	117.4			
	Geodiversity	Cable 2.1	0.0	Change to another seabed type Penetration and/or disturbance of the	The biodiversity features of the NCMPA are considered an integral functional part of the carbonate production system and form a component	SCREENED IN

Site Name & Code	Primary and qualifying features	Cable Corridor	Distance (km)	Potential pressure	Potential pressure-receptor pathway for adverse effect	Screening decision
	▪ Marine geomorphology of the Scottish Shelf Seabed	Cable 2.2	7.4	substrate below the surface of the seabed Abrasion/disturbance of the substrate on the surface of the seabed Siltation rate changes (including smothering)	of the geodiversity feature. The Marine Geomorphology of the Scottish Shelf Seabed geodiversity feature is primarily considered sensitive to changes in tidal flow, physical change (deposition of materials on the seabed such as concrete mattresses, rock dumping, and moorings) and physical removal (sediment extraction) (NatureScot, 2021a). As cable protection measures are a contingency that might be utilised within the NCMPA site boundary, there may be localised changes to another seabed type Trenching installation methods penetrate the seabed and may result in damage/loss of sessile or low mobility species within the footprint of the trenching equipment Movement of surface laid cable has potential to result in repeated abrasion characteristics of the seabed. Siltation rate changes are likely to occur within 100m of the scheduled works for cable burial activities. Potential to hinder conservation objectives, Stage 1 Assessment required.	
		Cable 2.8	23.2	Change to another seabed type Penetration and/or disturbance of the substrate below the surface of the seabed Abrasion/disturbance of the substrate on the surface of the seabed Siltation rate changes (including smothering)	No potential pressure/receptor pathway exists as cable corridors are not found within the site. No potential to hinder conservation objectives, Stage 1 Assessment not required.	SCREENED OUT

The Stage 1 screening (Table 4-1) identified one NCMPA where there is the potential for likely significant effect and further assessment is required:

- Fetlar to Haroldswick NCMPA

4.2 Fetlar to Haroldswick NCMPA

4.2.1 Screening conclusion

The screening identified that the pressure 'Visual (and above water noise) disturbance' could have a potential significant impact on the qualifying features:

- Black guillemot (breeding)

The screening also identified that the pressures 'physical change to seabed type', 'penetration and/or disturbance of the substrate below the surface of the seabed', 'abrasion/disturbance of the substrate on the surface of the seabed' and 'siltation rate changes (including smothering)' could have a potential significant impact on the protected features:

- Circalittoral sand and coarse sediment communities
- Horse mussel beds
- Kelp and seaweed communities on sublittoral sediment
- Maerl beds
- Shallow tide-swept coarse sands with burrowing bivalves
- Marine geomorphology of the Scottish Shelf Seabed

4.2.2 Conservation objectives

- The conservation objectives of the Fetlar to Haroldswick NCMPA are that the protected features—
  a. so far as already in favourable condition, remain in such condition; and
  b. so far as not already in favourable condition, be brought into such condition, and remain in such condition.
- "Favourable condition", with respect to a mobile species of marine fauna, means that—
  c. its extent is stable or increasing;
  d. its structures and functions, its quality, and the composition of its characteristic biological communities are such as to ensure that it is in a condition which is healthy and not deteriorating.
- The reference to the composition of the characteristic biological communities of a marine habitat includes a reference to the diversity and abundance of species forming part of, or inhabiting, that habitat.
- Any temporary deterioration in condition is to be disregarded if the marine habitat is sufficiently healthy and resilient to enable its recovery from such deterioration.
- "Favourable condition", with respect to a mobile species of marine fauna, means that;
  e. the species is conserved or, where relevant, recovered to include the continued access by the species to resources provided by the MPA for, but not restricted to, feeding, courtship, spawning or use as nursery grounds;

f. the extent and distribution of any supporting features upon which the species is dependent is conserved or, where relevant, recovered; and

g. the structure and function of any supporting feature, including any associated processes supporting the species within the MPA, is such as to ensure that the protected feature is in a condition which is healthy and not deteriorating.

- "Favourable condition", with respect to a feature of geomorphological interest, means that;

h. its extent, component elements and integrity are maintained;

i. its structure and functioning are unimpaired; and

j. its surface remains sufficiently unobscured for the purposes of determining whether the conditions in paragraphs (a) and (b) are satisfied.

- For the purpose of determining whether a feature of geomorphological interest is sufficiently unobscured, any obscuring of that feature entirely by natural processes is to be disregarded.
- For the purpose of determining whether a protected feature is in favourable condition, any alteration to that feature brought about entirely by natural processes is to be disregarded.

4.2.3 Assessment against conservation objectives, including feature assessment

4.2.3.1 Site description

The Fetlar to Haroldswick NCMPA (Figure 4-1) incorporates the sea area used for foraging by black guillemots, encompassing most of the marine extension of the existing Fetlar SPA. Beyond this, the NCMPA extends up the east coast of Unst to The Nev at Haroldswick, across the bottom end of Bluemull Sound and down the east coast of Yell to Aywick taking in Basta Voe, Mid Yell Voe and Colgrave Sound. The NCMPA covers a total of 216km^2.

The inlets, sounds and stretches of open coastline support a range of seabed habitats and species. The Northern Isles are the British stronghold of black guillemot (Mitchell et al., 2004) and the NCMPA is one of the most important wintering areas in Shetland (Ewins and Kirk, 1988). Seabed habitats present include extensive and biologically diverse maerl and horse mussel beds, as well as more widely distributed shallow tide-swept sands with burrowing bivalves and coarser sediment community's representative of Scotland's seas more generally. The protected seabed habitats thrive in tide-swept conditions and form mosaics, with maerl beds, horse mussel beds and kelp and seaweed communities on sublittoral sediments merging into one another. These habitats are considered an integral functional part of the Shetland carbonate production system, as they produce marine sediments with a high calcium-carbonate content, representing the Marine Geomorphology of the Scottish Shelf Seabed geodiversity feature (Brooks et al., 2012).

4.2.3.1 Visual (and above water noise) disturbance

A summary of the qualifying features and cable corridors screened in for visual (and above water noise) disturbance in Fetlar and Haroldswick NCMPA is provided in Table 4-2.

Table 4-2 Summary of LSE for visual (and above water noise) disturbance of the qualifying features of Fetlar and Haroldswick NCMPA

Feature	Cable 2.1	Cable 2.2	Cable 2.3	Cable 2.4	Cable 2.8
Black guillemot					

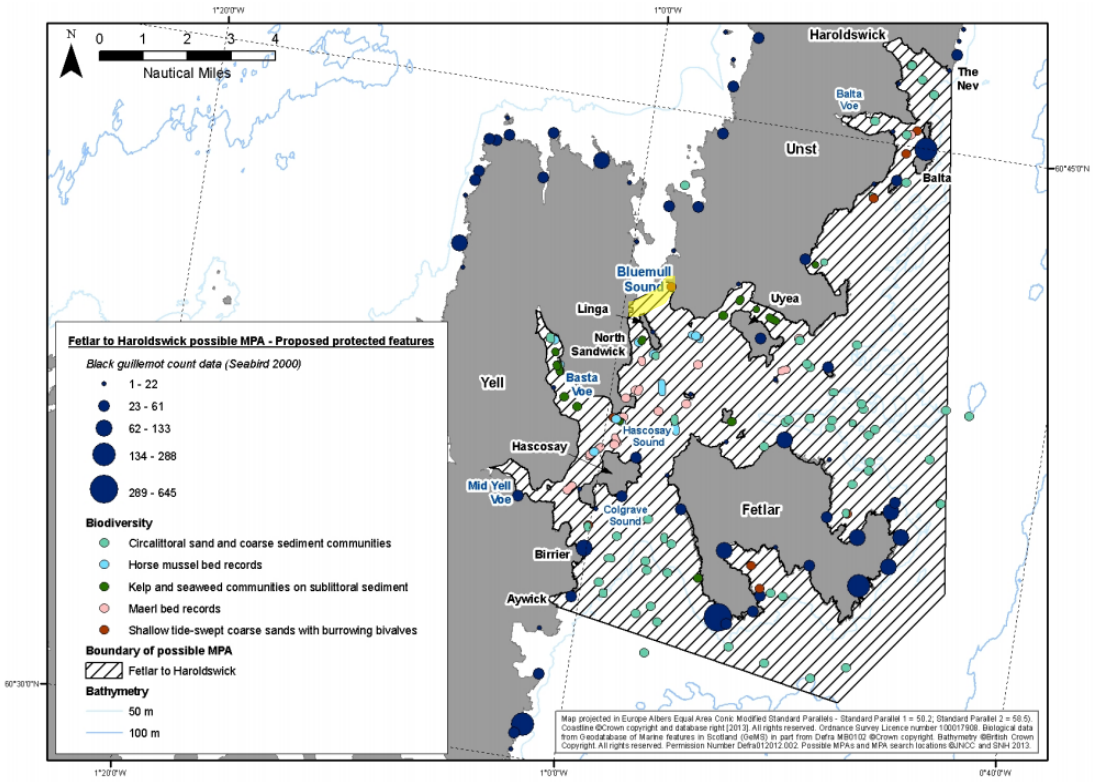
Note: Dark blue cells denote where cable corridors are within the NCMPA.

Cable Corridor 2.1 Yell to Unst overlaps with the north-western edge of the NCMPA between Yell and Unst. Both landfall approaches are within the NCMPA. Installation of Cable Corridor 2.1 Yell to Unst therefore has potential to disturb nesting black guillemot and breeding black guillemot feeding within the NCMPA. Due to the foraging range of black guillemot (4.8km), there is no potential for disturbance to birds from the site foraging within the other cable corridors, which are at least 25.2km (for Cable Corridor 2.8 Shetland to Whalsay) from the NCMPA.

The last population estimate for the site (recorded in 2012) indicated that the site supports 2,050 breeding black guillemot, which was equivalent to approximately 5.2% of the GB population (NatureScot, 2021a). They utilise the NCMPA for breeding and are present year-round during their moulting and overwintering periods. Breeding black guillemot are widely distributed along most of the coastline within the NCMPA and have a strong association with the fringing kelp habitats in nearshore waters where they forage. Whilst their mean-max foraging range is 4.8km, they typically only forage up to several hundred meters from the colony when breeding (Marine Scotland, 2021). They are most sensitive to disturbance during breeding months from April to August (Woodward et al., 2019), when disturbance could impact nesting success and chick survival.

In the 'Site Assessment against the MPA Guidelines' document (NatureScot, 2021a), which was prepared during the site's proposal, the distribution of protected features within Fetlar and Haroldswick NCMPA has been mapped and is provided in Figure 4-1. This figure shows that no black guillemot were recorded in the vicinity of Cable Corridor 2.1 Yell to Unst. There are also no kelp habitats recorded within the cable corridor, which black guillemot use for foraging.

Figure 4-1 Distribution of protected features within Fetlar and Haroldswick NCMPA (Brooks et al., 2012 within NatureScot, 2021a)



Note: Yellow line indicates approximate location of Cable Corridor 2.1 Yell to Unst

Installation vessels will be slow moving (approximately 2km/hr) which is slower than walking speed (generally assumed to be 5km/hr), and at times stationary. At such slow speeds, the vessels are effectively stationary in terms of bird displacement. Studies have shown that slow moving vessels cause little disturbance to birds and birds may habituate to frequent and relatively benign events and noises (Natural England and Suffolk Coast and Heaths, 2012). It is therefore concluded that any temporary disturbance will be brief, minimal and localised and will not result in any likely significant effects on black guillemot. The extent and distribution of black guillemot will not be significantly impacted, and the structure, functioning and integrity of the site will be maintained.

The assessment has also considered the potential for in-combination effects with other projects on the NCMPA qualifying feature. One relevant project has been identified[1], the Nova Innovation Shetland Tidal Array, where there is a common receptor pathway that could lead to in-combination visual disturbance on black guillemot. The Nova Innovation project is described in Section 6.3.7. It is possible that visual disturbance could occur from the increased vessel traffic from both projects. A study carried out at another tidal array site, the EMEC at Fall of Warness Shetland, identified that there was some disturbance and redistribution of birds, including black guillemot, during construction however, numbers returned to previous levels once the turbines were operational (Long, 2017). The analysis suggested the temporary effects of disturbance were likely to be due to increased vessel movements (Long, 2017; Xodus Group, 2019b). However, Nova Innovation has specified that the multicat vessels being used for installation at the Shetland Tidal Array are considerably smaller and less intrusive than those used at the EMEC site. Additionally, Cullivoe Pier is a busy fishing port located

[1] Method for identifying relevant projects is described in Section 6.3.7.

1km from the SPA and has traffic year-round indicating a base level of traffic noise and visual disturbance.

While there will be an increase in the area of vessel activity due to the Cable Corridor 2.1 Yell to Unst cable installation, installation vessels will be slow moving (approximately 2km/hr), slower than walking speed (generally assumed to be 5km/hr), and at times stationary. At such slow speeds, the vessels are effectively stationary in terms of bird displacement. Studies have shown that slow moving vessels cause little disturbance to birds and birds may habituate to frequent and relatively benign events and noises (Natural England and Suffolk Coast and Heaths, 2012). In addition, whilst black guillemot are sensitive to visual disturbance, negligible disturbance has been shown to occur by vessels moving at less than 2km/h (Burger et al., 2019). It is therefore concluded that any temporary disturbance will be brief, minimal and localised and will not result in any likely significant effects on black guillemot. The extent and distribution of black guillemot will not be significantly impacted, and the structure, functioning and integrity of the protected sites will be maintained. No significant in-combination effects will occur.

4.2.3.1 Physical change to seabed type

The pressure 'physical change (to another seabed type)' can lead to a permanent change in substrate type which in turn would lead to the habitat or biotope being re-classified (MarLIN 2021). Activities considered by the assessment that cause the pressure include surface laying of the cable (including integral protection) and any form of external cable protection that alters the seabed. For example, rock bags and concrete mattresses, included as contingency cable protection in this application.

The cable is proposed to be buried to 1m. However, for short section where it is not possible to bury the cable, such as in areas of hard ground or rock, the cable will be surface laid using heavier armoured cable as protection. Articulated pipe may also be used as additional integral protection to prevent abrasion to the cable. Any sections of the cable surface laid will be pinned or clamped to the seabed to avoid any movement of the cable while minimising the footprint. The addition of discretely placed rock bags may be required at approximately 50m intervals (worst case) for certain sections of the cable to provide stability. Concrete mattresses are only a potential requirement at cable crossings. As there are no cable crossings within the Cable Corridor 2.1 Yell to Unst, concrete mattresses are unlikely to be used for this cable corridor, within the Fetlar and Haroldswick NCMPA.

A summary of the qualifying features screened in for habitat pressures in Fetlar and Haroldswick NCMPA, and the approximate distance of the feature to the cable corridor is provided in Table 4-3.

Table 4-3 Feature condition and distances to cable corridors for the Fetlar and Haroldswick NCMPA qualifying habitat and geodiversity features

Qualifying feature	Feature Condition	Approximate distance from Cable Corridor 2.1
Circalittoral sand and coarse sediment communities	There are good examples of this habitat, which are widely distributed across the NCMPA (Hirst *et al*., 2013). It is not considered to be threatened and/or declining.	Within
Horse mussel beds	Abundance varies from 10-20% cover, up to 40-79% cover off the south coast of Unst (Hirst *et al*., 2013). Horse mussel beds within the NCMPA are collectively considered to represent seabed habitats of high biological diversity. This habitat is considered to be threatened and declining in Scottish waters.	1.1km

Qualifying feature	Feature Condition	Approximate distance from Cable Corridor 2.1
Kelp and seaweed communities on sublittoral sediment	This feature is naturally highly fragmented within shallow waters around Scotland. The examples of this feature within the NCMPA are of high quality.	1.1km
Maerl beds	The maerl beds consist of dense carpets of large live maerl fragments (40 - 79 % cover, Hirst et al., 2013). These beds have high biodiversity and appear to be in good condition. There is estimated to be 0.27km^2 of maerl within Bluemull Sound (Hirst *et al*., 2013). This habitat is considered to be threatened and declining in Scottish waters.	1.9km
Shallow tide-swept coarse sands with burrowing bivalves	There are a small number of discrete and widely dispersed locations of this habitat within the NCMPA. No indicators of damage to this feature were recorded during the most recent marine biological survey which was undertaken in 2012 (Hirst et al., 2013). The feature is therefore considered in good condition and to be in a natural state. This habitat is considered to be threatened and declining in Scottish waters.	Within
Marine geomorphology of the Scottish Shelf Seabed	The MPA lies fully within the Shetland Carbonate Production Area, which is a key geodiversity area in Scottish waters, and an internationally important example of a non-tropical shelf carbonate system (the biological production of marine sediments with high calcium carbonate content - derived from the shells of animals that live in on the seabed or from coralline algae such as maerl).	Within

This information has been collated from the 'Site Assessment against the MPA Guidelines' document (Hirst et al., 2013 in NatureScot, 2021a)

Physical change to another habitat will only occur within the footprint of the cable and any cable protection measures, if used. The following habitats are not found within Cable Corridor 2.1 Shetland to Yell and therefore, there is no pressure-receptor for this pressure to these habitats from the installation activities:

- Horse mussel beds
- Kelp and seaweed communities on sublittoral sediment
- Maerl beds

Circalittoral sand and coarse sediment communities

The NCMPA proposal document has not identified circalittoral sand and coarse sediment communities to be present within Cable Corridor 2.1 Yell to Unst (Figure 4-1, above; Brooks et al., 2012). However, drop-down video surveys undertaken for this project identified this habitat to be present in the centre of the cable corridor, and offshore of the Yell landing point (Appendix A, Cable Corridor 2.1 Yell – Unst Benthic Habitat Survey Report).

Circalittoral sand and coarse sediment communities encompasses a range of sub-habitat types and is widespread across the NCMPA and is found across Shetland. The sub-habitat *Mediomastus fragilis*, *Lumbrineris* spp. and venerid bivalves in circalittoral coarse sand or gravel is of the greatest conservation interest within the NCMPA (NatureScot, 2021a). This sub-habitat is comprised of predominantly circalittoral gravels, coarse to medium sands, and shell gravels in water generally

deeper than 15-20m. It is characterised by polychaetes, such as *Mediomastus fragilis*, *Lumbrineris* spp and also supports amphipods and bivalves (MarLIN, 2021).

This habitat has very low recoverability from habitat loss through physical change (to another seabed type) by placement of hard substrates such as rock bags and concrete mattressing (MarLIN, 2021). The cable is proposed to be buried to a target depth of 1m in sediment habitats. It is likely that the cable will achieve adequate burial depth, and cable protection measures will not need to be implemented within this habitat. The extent and distribution of circalittoral sand and coarse sediment communities will not be significantly impacted, and the extent, structure, functioning and integrity of the site will be maintained.

Shallow tide-swept coarse sands with burrowing bivalves

The NCMPA proposal document (NatureScot, 2021a) identified shallow tide-swept coarse sands with burrowing bivalves to be present within Cable Corridor 2.1 Yell to Unst in waters approaching the Unst landing point (Figure 4-1, above). Drop-down video surveys undertaken for this Project did not identify this habitat to be present anywhere within the cable corridor (Appendix A, Cable Corridor 2.2 Yell – Unst Benthic Habitat Survey Report). However, in case the habitat is present outside of the areas which were surveyed, it has been included in this assessment.

This habitat is comprised of coarse gravelly sand on exposed coasts extending down to around 20m water depth. It supports an abundance of burrowing bivalve molluscs, particularly *Tellina* spp. and surf clams, and polychaete worms, tanaids and sand hoppers. It has a very limited distribution, with most records from Shetland and a few from Orkney, the west coast of Scotland and Outer Hebrides.

This habitat has very low recoverability from habitat loss through physical change (to another seabed type) by placement of hard substrates such as rock bags and concrete mattressing (MarLIN, 2021). The cable is proposed to be buried to a target depth of 1m in sediment habitats. It is likely that the cable will achieve adequate burial depth, and cable protection measures will not need to be implemented within this habitat. The extent and distribution of shallow tide-swept coarse sands with burrowing bivalves will not be significantly impacted, and the extent, structure, functioning and integrity of the site will be maintained.

Marine geomorphology of the Scottish Shelf Seabed

The Marine Geomorphology of the Scottish Shelf Seabed geodiversity feature is generally sensitive to physical change to another habitat from activities such as concrete mattresses and rock dumping. However, the worst-case footprint of these activities will be up to 196m^2 (from 28 rock bags) and 54m^2 (3 mattresses), as described in the Project Description (Document Reference: P2308_R5367_ Rev0 MEA_Chap 2). The Fetlar to Haroldswick NCMPA lies fully within the Shetland Carbonate Production Area, which spans over 215.57km^2. Therefore, the installation activities will impact less than 0.00001% of the protected geodiversity feature and is likely to be even less should cable protection measure not be required. Therefore, the zone of influence is small in comparison to the wider extent of habitat present within the NCMPA and surrounding areas.

Additionally, the other protected habitats within the NCMPA, which are considered integral to the marine geomorphology, will not be affected by physical change to another habitat from the installation activities, as assessed above. Therefore, as only a small portion relative to the extent of the habitat will be impacted, and the biodiversity features which are integral to the NCMPA geomorphology will not be affected, there will be no significant impact to the Marine geomorphology of the Scottish Shelf Seabed within Fetlar and Haroldswick NCMPA.

4.2.3.2 Penetration and/or disturbance of the substrate below the surface of the seabed'

Activities considered by the assessment that cause the pressure 'penetration and/or disturbance of the substrate below the surface of the seabed, including abrasion' include cable route preparation

such as the pre-lay grapnel run, and cable burial. These activities lead to limited or no loss of substrate from the system.

Prior to installation, a PLGR will be undertaken along the proposed cable corridors. A typical PLGR can penetrate and/or disturb up to 40cm depth of the seabed in sediment habitats (depending on the sediment composition). As the PLGR is dragged through the surface sediments of the seabed it will pick up obstructions such as wires and derelict fishing gear and disturb the sediments. The sediments along the cable corridors are primarily sands and gravels, which although disturbed will be moved by natural sediment transport and naturally backfill any depressions caused by the PLGR. Ploughing and jetting ROV will be undertaken during cable burial in sediment habitats. These will penetrate up to 1m depth and will leave the trench backfilled.

Penetration and/or disturbance of the substrate below the surface of the seabed will only occur within the footprint of the PLGR, ploughing and jetting ROV activities, which will be 2.6m wide footprint along the length of the cable route. There will be no impact to habitats outside of the cable corridors. The following habitats are not found within Cable Corridor 2.1 Yell to Unst and therefore, there is no pressure-receptor for this pressure to these habitats from the installation activities:

- Horse mussel beds
- Kelp and seaweed communities on sublittoral sediment
- Maerl beds

Circalittoral sand and coarse sediment communities

Circalittoral sand and coarse sediment communities are mobile bedforms of high energy environments, meaning they typically have high resilience to sub-surface abrasion and penetration (Marine Scotland, 2021). This biotope is characterised by species which are relatively tolerant of penetration and sediment disturbance (Capasso et al., 2010). Whilst some individuals may be injured or killed by penetration of the subsurface, robust species are buried within the sediments, and other species are adapted to habitats with frequent disturbance and will quickly recover (MarLIN, 2021). Therefore, recoverability and low sensitivity to one-off disturbance events through penetration of the substratum subsurface is considered to be high (MarLIN, 2021).

The installation activities will be transient with the trench being backfilled by the action of the equipment. Pre-installation conditions will return quickly through natural sediment transport processes. Additionally, the area affected will also be highly localised, limited to only 2.6m width (worst case) along the cable corridors. Therefore, as the habitat circalittoral sand and coarse sediment communities is widely distributed and not threatened or declining (Hirst *et al.,* 2013; Table 4-3, above), the habitat is resilient to sub-surface penetration and abrasion, and the deterioration is temporary, there will be no significant impact to Circalittoral sand and coarse sediment communities.

Shallow tide-swept coarse sands with burrowing bivalves

Shallow tide-swept coarse sands with burrowing bivalves are mobile bedforms of high energy environments, meaning they typically have high resilience to sub-surface abrasion and penetration (Marine Scotland, 2021). Direct mortality may occur to bivalves and other organisms within the footprint of the cable corridor, however recoverability from a one-off disturbance event through penetration of the substratum subsurface is considered to be high (MarLIN, 2021).

The species that are present in the biotope can be broadly characterised as either opportunist species that rapidly colonise disturbed habitats and increase in abundance, or species that are larger and longer-lived and that may be more abundant in an established, mature assemblage. Species with opportunistic life strategies will recolonise habitat which has been disturbed first within 1-2 years. The

recovery of bivalves that recruit episodically and the establishment of a representative age-structured population for larger, longer lived organisms may require longer than two years.

The installation activities will be transient with the trench being backfilled by the action of the equipment. Pre-installation conditions will return quickly through natural sediment transport processes and species with opportunistic life strategies will recolonise a habitat which has been disturbed first, within 1-2 years. Additionally, the area affected will also be highly localised, limited to only 2.6m width (worst case) along the cable corridors. Therefore, as the habitat shallow tide-swept coarse sands with burrowing bivalves is in good condition (Hirst *et al.,* 2013; Table 4-3, above), the habitat is resilient to sub-surface penetration and abrasion, and the deterioration is temporary, there will be no significant impact to shallow tide-swept coarse sediments with burrowing bivalves.

Marine geomorphology of the Scottish Shelf Seabed

The sensitivity of the geomorphology to penetration and/or disturbance of the substrate below the surface of the seabed depends on the features and habitats present. For example, some Quaternary of Scotland landforms are large and robust, and will be more resistant to physical damage than sand waves or biogenic structures (NatureScot, 2021a). Penetration of the subsurface could occur from the PLGR, jetting ROV and plough activities, which occur within a 2.6m wide footprint along the cable length, as described in the Project Description (Document Reference: P2308_R5367_ Rev0 MEA_Chap 2). Therefore, the area affected will be up to 0.007km^2 (for the 2.5km cable length). The Fetlar to Haroldswick NCMPA lies fully within the Shetland Carbonate Production Area, which spans over 215.57km^2. Therefore, the installation activities will impact approximately 0.003% of the protected geodiversity feature. The zone of influence is small in comparison to the wider extent of habitat present within the NCMPA and surrounding areas.

Additionally, the other protected habitats within the NCMPA, which are considered integral to the marine geomorphology, will not be affected by penetration and/or disturbance of the substrate below the surface of the seabed from the installation activities, as assessed above. Therefore, as only a small portion relative to the extent of the habitat will be impacted, and the biodiversity features which are integral to the NCMPA geomorphology will not be affected, there will be no significant impact to the Marine geomorphology of the Scottish Shelf Seabed within Fetlar and Haroldswick NCMPA.

In-combination effects

The assessment has also considered the potential for in-combination effects with other projects on the NCMPA qualifying feature. One relevant project has been identified[2], the Nova Innovation Shetland Tidal Array, where there is a common receptor pathway that could lead to in-combination on habitat features. Details of the project are provided in Section 6.3.7.

There was no assessment made in the most recent Nova Innovation MEA for impact to the seabed however, the footprint of the devices is 13.5 x 12.2m and Nova Innovation have noted that after decommissioning the seabed will return to base level. Due to the distance of the tidal site from Cable Corridor 2.1 Yell to Unst it is not expected that an in-combination effect will occur on the designated features.

4.2.3.3 Abrasion/disturbance of the substrate on the surface of the seabed

Activities considered by the assessment that cause the pressure 'abrasion/disturbance at the surface of the substratum' include activities such as the pre-lay grapnel run, surface cable laying and cable burial. These activities lead to limited or no loss of substrate from the system.

Prior to installation a PLGR will remove any debris along the cable route. The PLGR will be used within the footprint of the plough. During installation, a plough will be towed along the cable corridors, which

[2] Method for identifying relevant projects is described in Section 6.3.7.

will simultaneously lay and bury the cable. The plough is towed across the seabed on skids and the plough share separates the sediment to bury the cable to the required burial depth. This action is in contact with the surface of the seabed and will cause a localised area of abrasion during the installation process. The footprint of the plough (skid and share) in contact with the seabed is less than 0.007km^2 along the length of Cable Route 2.1 Yell to Unst (worst case). In sections of hard seabed, such as reef habitats, where burial cannot be achieved, the cable may be surface laid and as such, only the seabed within the direct footprint of the cable (diameter up to 15cm – worst case) will be disturbed. The extent of the disturbance will be confined to a small and linear area.

Abrasion/disturbance of the substrate on the surface of the seabed will only occur within the footprint of the PLGR, ploughing and jetting ROV activities, which is 2.6m wide along the length of the cable route. There will be no impact to habitats outside of the cable corridors. The following habitats are not found within Cable Corridor 2.1 Yell to Unst, and therefore, there is no pressure-receptor for this pressure to these habitats from the installation activities:

- Horse mussel beds
- Kelp and seaweed communities on sublittoral sediment
- Maerl beds

Circalittoral sand and coarse sediment communities

Circalittoral sand and coarse sediment communities are mobile bedforms of high energy environments, meaning they typically have high resilience to abrasion and sediment disturbance (Marine Scotland, 2021). Opportunistic species are likely to recruit rapidly and recolonise the area (MarLIN, 2021). Direct mortality or damage to epifauna, including the characterising species, may occur within the footprint of the cable corridor, however recoverability is considered to be high and the habitat has low sensitivity to one-off disturbance event through penetration of the substratum subsurface (MarLIN, 2021).

In conclusion, as the habitat circalittoral sand and coarse sediment communities is widely distributed and not threatened or declining (Hirst *et al.,* 2013; Table 4-3, above), the habitat is resilient to abrasion/disturbance of the substrate on the surface of the seabed, and the deterioration is temporary, there will be no significant impact to circalittoral sand and coarse sediment communities.

Shallow tide-swept coarse sands with burrowing bivalves

Shallow tide-swept coarse sands with burrowing bivalves are considered to have low sensitivity to abrasion/disturbance of the substrate on the surface of the seabed (Marine Scotland, 2021). Damage may occur to shallower characterising infauna, with potential for some mortality (Marine Scotland, 2021), however recoverability from a one-off disturbance event through abrasion/disturbance of the substrate on the surface of the seabed is considered to be high (MarLIN, 2021).

The installation activities will a one-off event, and pre-installation conditions will return quickly through natural sediment transport processes. Species with opportunistic life strategies will recolonise a habitat which has been disturbed first, within 1-2 years. Additionally, the area affected will also be highly localised, limited to only 2.6m width (worst case) along the cable corridors. Therefore, as the habitat shallow tide-swept coarse sands with burrowing bivalves is in good condition (Hirst *et al.,* 2013; Table 4-3, above), the habitat is resilient to abrasion/disturbance of the substrate on the surface of the seabed, and the deterioration is temporary, there will be no significant impact to shallow tide-swept coarse sediments with burrowing bivalves.

Marine geomorphology of the Scottish Shelf Seabed

The sensitivity of the geomorphology to abrasion/disturbance of the substrate on the surface of the seabed depends on the features and habitats present. For example, some Quaternary of Scotland

landforms are large and robust, and will be more resistant to physical damage than sand waves or biogenic structures (NatureScot, 2021a). Surface substrate abrasion and disturbance could occur from the PLGR, jetting ROV and plough activities, which occur within a 2.6m wide footprint along the cable length. Therefore, the area affected will be up to 0.007km^2 (for the 2.5km cable length). The Fetlar to Haroldswick NCMPA lies fully within the Shetland Carbonate Production Area, which spans over 215.57km^2. Therefore, the installation activities will impact approximately 0.003% of the protected geodiversity feature. The zone of influence is small in comparison to the wider extent of habitat present within the NCMPA and surrounding areas.

Additionally, the other protected habitats within the NCMPA, which are considered integral to the marine geomorphology, will not be affected by abrasion/disturbance of the substrate on the surface of the seabed from the installation activities, as assessed above. In conclusion, as only a small portion relative to the extent of the habitat will be impacted, and the biodiversity features which are integral to the NCMPA geomorphology will not be affected, there will be no significant impact to the Marine geomorphology of the Scottish Shelf Seabed within Fetlar and Haroldswick NCMPA.

In-combination effects

The assessment has also considered the potential for in-combination effects with other projects on the NCMPA qualifying feature. One relevant project has been identified[3], the Nova Innovation Shetland Tidal Array, where there is a common receptor pathway that could lead to in-combination on habitat features. Details of the project are provided in Section 6.3.7.

There was no assessment made in the most recent Nova Innovation MEA for impact to the seabed however, the footprint of the devices is 13.5 x 12.2m and Nova Innovation have noted that after decommissioning the seabed will return to base level. Due to the distance of the tidal site from Cable Corridor 2.1 Yell to Unst it is not expected that an in-combination effect will not occur on the designated features.

4.2.3.4 Abrasion/disturbance of the substrate on the surface of the seabed

The marine cable installation will cause resuspension of sediments from the seabed into the water column. Jet trenching will cause a greater level of sediment suspension compared to the use of ploughing equipment. However, this is not proposed other than for small sections of the cables in the near shore area or sections of the cable that cannot be plough buried at the time of installation. The impact is a small, localised and temporary increase in turbidity.

The findings of a separate study on the Environmental Impact of Subsea Trenching Operations (Gooding et al., 2012) suggested that the impacts of subsea trenching operations on sediment disturbance are restricted to the immediate vicinity of the trench (less than 10m either side). Suspended solid concentrations, although elevated immediately after trenching, have been shown to fall to ambient levels within 66m of trenching activity in hard ground areas and 70m in sandy areas with fine deposition occurring out to a maximum of 2km from the trench (Gooding et al., 2012). The precautionary distance of 100m has been used in this assessment for the worst-case distance of the settling of suspended solids to ambient levels. Fine material will be rapidly diluted and dispersed in the water. Far-field deposition is predicted to be less than 1mm for both trenching by jetting and ploughing.

Siltation rate changes including smothering (depth of vertical sediment overburden) will only occur up to 100m from the installation activities. Therefore, there will be no significant impact to habitats over 100m from the cable corridors. The following habitats are not found within 100m of Cable Corridor

[3] Method for identifying relevant projects is described in Section 6.3.7.

2.1 Yell to Unst, and therefore, there is no pressure-receptor for this pressure to these habitats from the installation activities:

- Horse mussel beds
- Kelp and seaweed communities on sublittoral sediment
- Maerl beds

Circalittoral sand and coarse sediment communities

Circalittoral sand and coarse sediment communities has low sensitivity to low levels of siltation rate changes (MarLIN, 2021). Deposition of fine materials can alter the character of the habitat. However, organisms are likely to be able to survive short periods under sediments to reposition. The habitat has medium sensitivity to heavy sediment deposition, which could lead to smothering of buried organisms, depending on the depth of the overburden (MarLIN, 2021). The resistance and reliance of the habitat to heavy smothering is therefore assessed as medium (MarLIN, 2021).

The installation activities will be a one-off event, and the area affected will only impact up to 100m either side of the cable route. The footprint impacted by more than 50cm of sediment, which may cause mortality to sediment communities, will be much less than this. Therefore, as the habitat circalittoral sand and coarse sediment communities is widely distributed and not threatened or declining (Hirst *et al.,* 2013; Table 4-3, above), the habitat is resilient to siltation rate changes including smothering, and the deterioration is temporary, there will be no significant impact to circalittoral sand and coarse sediment communities.

Shallow tide-swept coarse sands with burrowing bivalves

Shallow tide-swept coarse sands with burrowing bivalves are not considered to be sensitive to low levels of siltation changes (Marine Scotland, 2021). Bivalves are a shallow, burrowing infauna which feed via suspension feeding and therefore require their siphons to remain above the sediment for feeding and respiration. Kranz (1972, cited in Maurer et al., 1986) reported that shallow burying siphon feeders are able to escape smothering with 10-50cm of their native sediment by burrowing upwards. Therefore, for one-off disturbance events the recoverability for the feature is considered to be high, and the sensitivity is low (Marine Scotland, 2021; MarLIN, 2021).

The installation activities will be a one-off event, and the area affected will only impact up to 100m either side of the cable route. The footprint impacted by more than 50cm of sediment, which may cause mortality to bivalves, will be much less than this. Therefore, as the habitat shallow tide-swept coarse sands with burrowing bivalves is in good condition (Hirst *et al.,* 2013; Table 4-3, above), the habitat is resilient to siltation rate changes including smothering, and the deterioration is temporary, there will be no significant impact to shallow tide-swept coarse sediments with burrowing bivalves.

Marine geomorphology of the Scottish Shelf Seabed

The sensitivity of the geomorphology to siltation rate changes including smothering depends on the features and habitats present. Siltation rate changes could occur from the jetting ROV and plough activities, which could lead to sediment deposition up to 100m either side of the cable route. Therefore, the area affected will be up to 0.5km^2 (200m total width of deposition for the 2.5km cable length). The Fetlar to Haroldswick NCMPA lies fully within the Shetland Carbonate Production Area, which spans over 215.57km^2. Therefore, the installation activities will impact approximately 0.02% of the protected geodiversity feature. Although significant smothering will only occur in the overburden immediately either side of the trench. The zone of influence is small in comparison to the wider extent of habitat present within the NCMPA and surrounding areas.

Additionally, the other protected habitats within the NCMPA, which are considered integral to the marine geomorphology, will not be affected by siltation rate changes including smothering from the

installation activities, as assessed above. In conclusion, as only a small portion relative to the extent of the habitat will be impacted, and the biodiversity features which are integral to the NCMPA geomorphology will not be affected, there will be no significant impact to the Marine geomorphology of the Scottish Shelf Seabed within Fetlar and Haroldswick NCMPA.

4.2.4 Project specific mitigation

None specified.

4.2.5 Conclusion

As the protected features horse mussel beds, kelp and seaweed communities on sublittoral sediment and maerl beds have not been identified within the zone of influence of the installation activities, there will be no significant impact to these features. Circalittoral sand and coarse sediment communities, shallow tide-swept coarse sands with burrowing bivalves and the Marine geomorphology of the Scottish Shelf Seabed will only be subject to temporary, localised disturbance so there will be no significant impact to these features. The project will not hinder the achievement of the management objectives for the NCMPA.

5. SSSI ASSESSMENT

5.1 Introduction

Chapter 1, Section 3 of the Nature Conservation (Scotland) Act 2004 provides for the notification and confirmation of SSSIs, by the country conservation body in Scotland (NatureScot). These sites are identified for their flora, fauna, geological or physiographical features. Only SSSI which are at the landing point have been assessed, unless there is a seal haul-out in close proximity.

The local planning authority, all landowners and occupiers, and the Secretary of State must be notified of any activities or works within a SSSI. This Act also contains measures for the protection and management of SSSIs, with attention to the integrity of the site and conservation objectives.

The notified bodies have a specified time-period within which representations and objections may be made. The country conservation body must consider these responses and may withdraw or confirm the notification. The assessment of potential effects to SSSIs in this report will inform the notification process as part of the Marine licence application submission to MS-LOT.

Table 5-1 below presents the results of the screening of the identified relevant SSSIs for further assessment. The distances have been measured from the closest point on the site to the edge of each cable corridor.

It should be noted that for East Sanday Coast SSSI, five of the notifying features are also protected under European designations and have therefore been considered under Sanday SAC (sandflats and harbour seal), and East Sanday Coast SPA and Ramsar (bar-tailed godwit, purple sandpiper, and turnstone).

Table 5-1 Screening relevant SSSIs for assessment

Site Name	Notifying features	Cable Corridor	Distance (km)	Potential pressure	Potential pressure-receptor pathway for adverse effect on site integrity	Screening decision
Gutcher SSSI	**Geological** Structural and metamorphic geology: Moine	Cable 2.1	0.0	Abrasion/disturbance of the substrate on the surface of the seabed Penetration and/or disturbance of the substrate below the surface of the seabed, including abrasion	Abrasion, penetration and disturbance of the seabed has potential to damage the geological feature moine, such as through trenching, ploughing, pre-lay grapnel run (PLGR), surface cable lay and rock cutting. As such, there is potential for the geological structures to be affected by installation activities. Potential for adverse effect on site integrity, further assessment required.	SCREENED IN
East Sanday Coast SSSI	Intertidal marine habitats: ▪ Rocky Shore	Cable 2.3	0.0	Abrasion/disturbance of the substrate on the surface of the seabed	Abrasion, penetration and disturbance of the seabed has potential to damage the intertidal habitat rocky shore through shore-end activities. As such, there is potential for the habitat to be affected by installation activities. Potential for adverse effect on site integrity, further assessment required.	SCREENED IN
	Birds (non-breeding) ▪ Ringed plover (*Charadrius hiaticula*) ▪ Sanderling (*Calidris alba*)	Cable 2.3	0.0	Visual (and above water noise) disturbance	Ringed plover and sanderling are wading birds which may utilise the intertidal area at the landing point. Potential for adverse effect on site integrity, further assessment required.	SCREENED IN
		Cable 2.3	0.0	Changes in supporting habitat and prey availability	Cable installation activities will disturb an area of approximately 0.0008km^2, which is less than 0.001% of the SSSI's marine area. Temporary disturbance to such a small area of the protected site will not result in any significant adverse effects to supporting habitat and prey availability. No potential for adverse effect on site integrity.	SCREENED OUT

Table 5-1 above concluded that there is the potential for likely significant effects on the following SSSIs and that further assessment is required:

- Gutcher SSSI
- East Sanday Coast SSSI

5.2 Gutcher SSSI

5.2.1 Features screened through for assessment

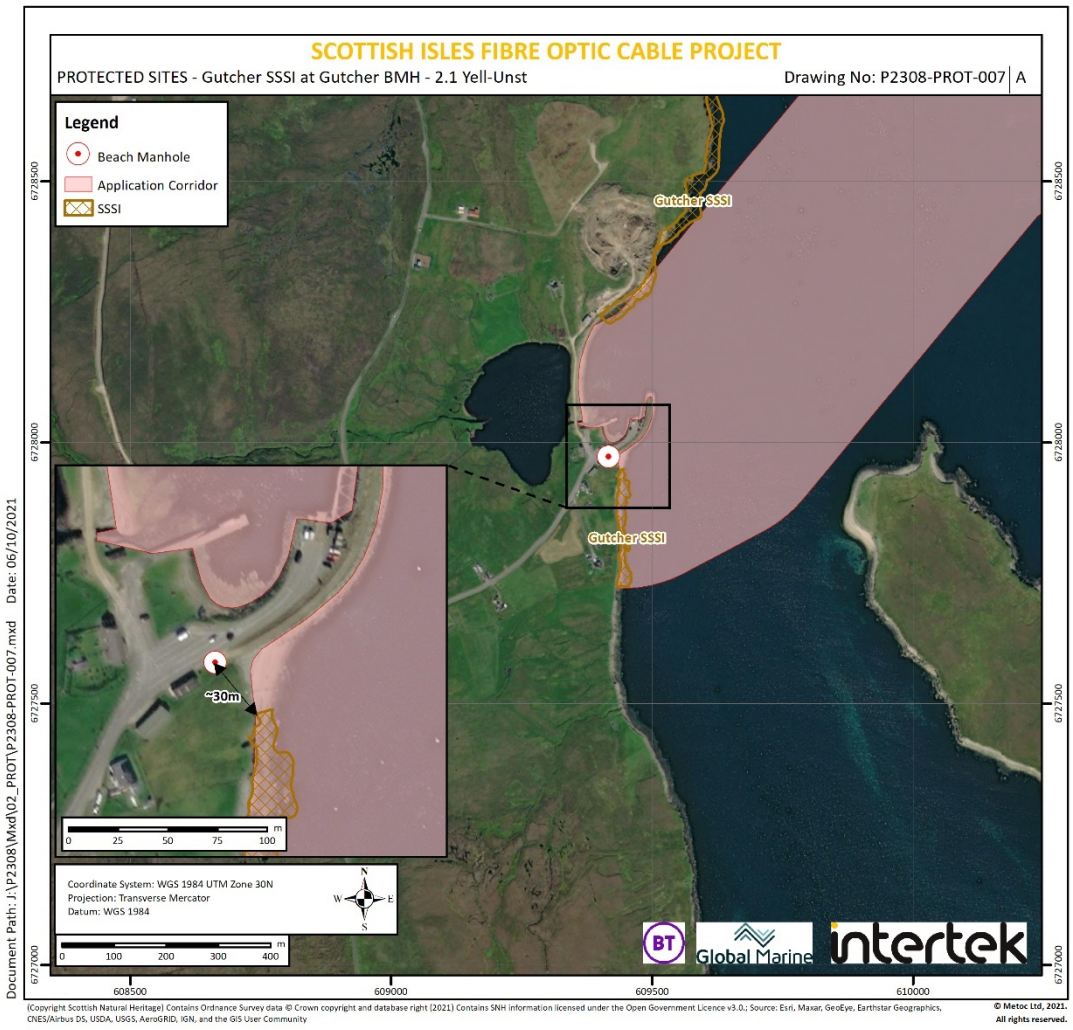
- Moine

5.2.2 Assessment

Gutcher SSSI is designated for its structural and metamorphic geology, with metamorphosed Moine rocks which contain a lot of information about the formation and closure of the Iapetus Ocean. The site is important for the study of geology in Shetland, but also in a wider Scottish context as the rocks present can be matched with those found on the Mainland to provide a picture of the events that shaped Scotland (NatureScot, 2011). The interests of the site are the rock exposures along the coast and foreshore. Whilst the cable corridor overlaps with a section of the SSSI (see Figure 5-1), the Project will route the cable in the sandy beach area outside the SSSI to the BMH which is also outside the SSSI boundary. This is to avoid the rocky outcrops within the SSSI which are unfavourable for cable placement. This means there is no risk of abrasion, penetration or disturbance to the designated feature of the SSSI by the installation activities or any cable protection measures which may be put in place.

As Cable Corridor 2.1 Yell to Unst will not route through the Moine feature or surrounding cliffs, there will be no adverse effects and the physical and visual integrity of the geological interest of the site will be maintained.

Figure 5-1 Gutcher SSSI and Gutcher BMH – Cable Corridor 2.1 Yell to Unst (Drawing Reference: P2308-PROT-007-A)



5.2.3 Project specific mitigation

None specified

5.2.4 Conclusion

The Project will route the cable in the sandy beach area to the landing point for Cable Corridor 2.1 Yell to Unst, outside the SSSI. There will be no adverse effects on the Moine exposures on the foreshore within Gutcher SSSI. Therefore, installation activities for Cable Corridor 2.1 Yell to Unst will not hinder the management objectives for the site.

5.3 Easy Sanday Coast SSSI

5.3.1 Features screened through for assessment

- Rocky shore
- Ringed plover (*Charadrius hiaticula*)

- Sanderling (*Calidris alba*)

5.3.2 Assessment

5.3.2.1 Rocky shore

Approximately 48% of the Scottish coast is comprised of rocky intertidal areas (Scottish Government, 2011b). This includes rocky shores at East Sanday Coast SSSI which are an important foraging habitats for waders such as turnstone (RSPB, 2021c). The SSSI is predominantly comprised of old red sandstone covered with sand, shingle and muddy sand. However, the areas of rocky shore contribute to an unusual combination of habitats which prove a rich habitat for a variety of plant and bird species (Scottish Government, 2011a).

As the Cable Corridor 2.3 Sanday landing point is within the SSSI, there is potential for shore-end installation activities to impact the rocky shores, by abrasion/disturbance of the substrate on the surface of the seabed during shore-end works. The sensitivity of rocky shore habitats to these pressures depends on the communities which are present. Generally, abrasion can damage or destroy algal and kelp species (e.g. *Fucus spp* and *Laminaria digitata*) and the related understory communities, whilst promoting the colonization of opportunistic species such as ephemeral green algae. Rocky shore habitats are therefore assessed to have low resistance and medium sensitivity to disturbance from surface abrasion (MarLIN, 2021). Communities may quickly begin to recolonize affected areas, however the equilibrium within the ecosystem may take longer to reach so they have been assessed to have medium resistance to abrasion pressures (MarLIN, 2021).

Intertidal surveys undertaken at the BMH and landing point found a range of sandy and rocky intertidal habitats within the cable corridor at the landing point (Figure 5-1; full details given in Appendix A, Cable Corridor 2.3 Sanday intertidal report). The fucoid habitats which have been identified qualify as rocky shore and reef habitats (European Commission, 2013). Sediment habitat types identified seaward of the BMH may be a veneer of sand across rock.

Figure 5-2 Intertidal Phase 1 habitat survey of Cable Corridor 2.3 Sanday landing point (Aquatera, 2021)

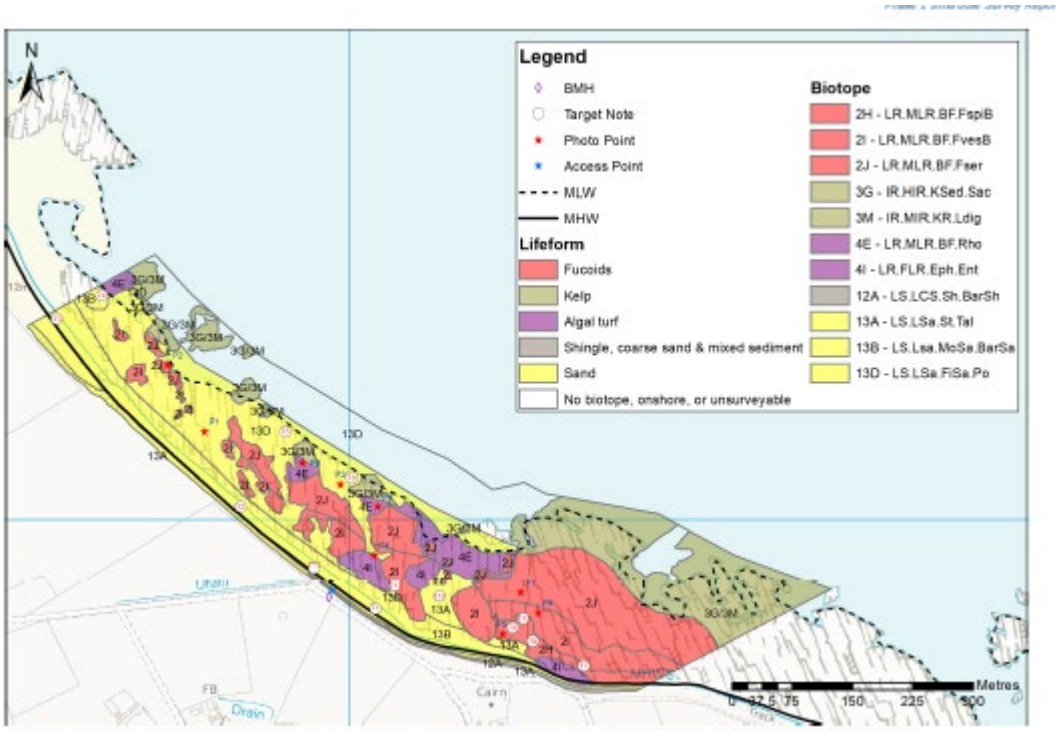


Figure 2.2 Lifeforms map of the Southvie Bay intertidal survey area (© Crown copyright and database rights 2021 OS 0100040827)

Due to the low resistance and medium sensitivity of rocky shores to surface abrasion, should the cable be routed through the rocky shore habitats, there is potential for significant disturbance to the protected feature and its associated communities. Therefore, to prevent habitat loss and damage, the cable will be micro-routed to avoid rocky shore habitats.

Due to the moderate sensitivity and low resistance of rocky shores to surface abrasion, there is potential for significant effects to the rocky shore habitat from abrasion and/or disturbance to the substratum within Cable Corridor 2.3 Sanday landing point and project specific mitigation is required to reduce the effect.

5.3.2.2 Ringed Plover and Sanderling

East Sanday Coast SSSI supports a range of wading bird species during their wintering period, including ringed plover and sanderling. As the Cable Corridor 2.3 Sanday landing point is within the SSSI, there is potential for birds to be disturbed within the site during shore-end installation activities and by vessels approaching the landing point.

A population count of ringed plover and sanderling for the East Sanday Coast SSSI (recorded in 2012) indicated that the SSSI supports:

- 89 individuals of ringed plover, which was equivalent to less than 1% of the Great Britain (GB) population at the time; and
- 286 individuals of sanderling, which was equivalent to approximately 1.5% of the GB population at the time (NatureScot, 2012).

Both ringed plover and sanderling have been assessed to have low sensitivity to general visual and above water noise disturbance, which is also predicted to apply to construction works due to their high tolerance (Cutts, Hemingway and Spencer, 2013).

The landfall works will be a one- off event over a short duration (7 days) within a relatively small area of the SSSI. Given the relative low sensitivity of the waders to human activities and their apparent tendency to find alternative feeding grounds either inland on farmland or on other beaches nearby, any disturbance to the qualifying species of the SSSI will be minimal. Therefore, due to the short-term and temporary nature of the installation activities, there will be no adverse effects to ringed plover and sanderling within the site, and the integrity of the protected features of the site will be maintained.

5.3.3 Project Specific Mitigation

- M1 - Micro-routeing will be undertaken to minimise effects to rocky shores identified within the Cable Corridor 2.3 Sanday landing point area.

5.3.4 Conclusion

The installation of Cable Corridor 2.3 Sanday to Shetland at the Sanday landing point has potential to impact the protected rocky shore habitat in the absence of mitigation. The following project-specific mitigation has been proposed to avoid significant impact to the rocky shore habitat:

- M1 - Micro-routeing will be undertaken to minimise effects to rocky shores identified within the Cable Corridor 2.3 Sanday landing point area.Sanday to Shetland

By applying project specific mitigation, there will be no impact to protected intertidal habitat features within the East Sanday Coast SSSI.

6. HRA STAGE 2 - INFORMATION TO INFORM APPROPRIATE ASSESSMENT

6.1 Introduction

The HRA Stage 1 Screening documented in Section 3, concluded that there is the potential for LSE on the following 12 European sites and that AA is required:

- Mousa SAC
- Sanday SAC
- Yell Sound Coast SAC
- Mousa SPA
- East Sanday Coast SPA and Ramsar
- Bluemull and Colgrave Sounds SPA
- East Mainland Coast, Shetland SPA
- Fair Isle SPA and SSSI
- Fetlar SPA
- Hermaness, Saxa Vord and Valla Field SPA
- Otterswick and Graveland SPA
- Sumburgh Head SPA

To inform the AA the Applicant must provide data and information on the project and on the European site. An analysis of potential effects on the site must be completed and presented as 'Information to Inform Appropriate Assessment'. This is a more detailed ecological assessment of the proposed activities, taking into consideration the conservation objectives for the European site and its overall integrity. It looks to answer two key questions:

- What are the likely effects of the proposed activity?
- How quickly could the Qualifying Feature recover from the effect, if at all?

The duty to undertake AA, having considered the 'Information to Inform AA', and to ensure that the stringent evaluation and decision-making procedure is applied correctly, lies with the competent authority, which for the Project is MS-LOT. The AA will be a focused and detailed impact assessment of the implications of the Project, alone and in combination with other plans and projects, on the integrity of a European site in view of its conservation objectives.

If the assessment concludes that the plan or project will adversely affect the integrity of a European site, then the process must proceed to Stage 3 of the HRA process, or the Project should be abandoned.

Any mitigation measures necessary to avoid, reduce or offset negative effects should be proposed at this stage (Stage 2).

6.2 Objectives and Structure of this Information to Inform AA

Screening identified 12 European sites where it could not be ruled out that the Project activities will not result in LSE and therefore required Stage 2 AA. This section provides information for the competent authority to undertake the AA.

The 12 European sites were screened in for the following pressure – receptor pathways:

- Visual (and above water noise) disturbance
- Underwater noise changes
- Physical change to another seabed type
- Abrasion / disturbance of the substrate on the surface of the seabed
- Penetration and/or disturbance of the substrate below the surface of the seabed
- Siltation rate changes (including smothering)

Section 6.3 provides details on each of the six pressure-receptor pathways and includes the assessment of in-combination effects.

Some common baseline information needed for each of the European site assessments has been provided first in Section 6.4 and then the assessment of each site has been presented in Sections 6.5 – 6.15.

6.3 Pressure-receptor Pathways for European Sites Requiring AA

6.3.1 Visual (and above water noise) disturbance

6.3.1.1 Seal

The HRA screening identifies that there is potential for LSE on the qualifying feature 'harbour seal' of the Sanday SAC and Yell Sound Coast SAC from the pressure 'Visual (and above water noise) disturbance'.

Seals can be disturbed when hauled out at a distance of up to 500m from the disturbance (pers comms – NatureScot, 2021). Visual disturbance induces a flight response, where seals will flush into the water. There is evidence that seals are less likely to flush during breeding and moulting periods, and will quickly return to land, which is likely attributed to a trade-off between fleeing and nursing during this period (Andersen *et al.*, 2012).

However, chronic flushing as a result of vessel disturbance reduces nursing time, increases energy use and disrupts energy balance, which can compromise growth and survival (Jansen *et al.*, 2010; Harding *et al.*, 2005). Repeated or prolonged disturbance can also influence the distribution of seals, where they may be more likely to utilise undisturbed areas even if they are less favourable for habitat suitability or prey availability (Jansen *et al.*, 2015). Therefore, prolonged or repeated visual and above water noise disturbance within 500m of hauled out seals could result in reduced growth and survival of seals, particularly young pups, which could affect the demographic characteristics of the population. There is also potential for impacts to the distribution of seals within a site.

The Project will typically involve the Main lay vessel and one ancillary support vessel. Given the distance of Cable Corridor 2.2 Shetland to Yell and Cable Corridor 2.3 Sanday to Shetland to the European Sites, screening could not rule out that temporary disturbance of hauled out seal will not occur.

6.3.1.2 Birds

The HRA screening identified that there is the potential for a LSE on bird qualifying features of nine SPAs from the pressure 'Visual (and above water noise) disturbance'.

The most vulnerable birds to disturbance are those within the zone of influence of the installation operations, as described in Table 2-1 (Section 2). Disturbance is predicted to be limited to that initiated by the movement of vessels or by noise e.g. flushing, typically into flight or by diving. The level of noise associated with cable installation activities is low with the presence of vessels the main cause of disturbance. Birds may take evasive action, but a single disturbance event does not have any immediate effect on the survival or productivity of an individual bird. Repeated disturbance, or disturbance over an extended period, can affect survival and productivity (Valente and Fischer, 2011).

The extent to which a seabird responds to disturbance is dependent upon factors including the period of breeding cycle during which disturbance occurs; duration, type and intensity of the disturbance; presence of opportunistic predators; and the degree of habituation with the disturbance (Showler *et al.*, 2010). Some seabirds are more resilient to disturbance than others. The breeding/summer season is typically defined as 1st April to 30th September.

Prolonged disturbance at the nest site could result in impaired breeding, disruption to incubation, increased nest failures due to predation and nest abandonment (Valente and Fischer, 2011). These factors could affect the demographic characteristics of the population. Repeated or prolonged disturbance within breeding bird foraging zones may result in reduced opportunities for catching prey items, nesting success and chick production.

The Project will typically involve one main installation lay vessel and one ancillary support vessel. Installation will take approximately 22 to 24 days per cable (except for Cable 2.3 and Cable 2.4 which due to longer cable route and crossing construction (Cable 2.3) and branching unit integration (Cable 2.4) will take 68 days each). This broadly reflects all activities associated with the cable corridor, vessel activity will be for a shorter duration within this period (approximately 6 days).

Therefore, during installation there is potential for temporary visual and above water noise disturbance from the presence of the vessels which may interrupt the feeding, breeding or nesting activities of birds from the screened in SPAs.

6.3.1.3 Otter

The HRA screening identified that there is the potential for LSE on otters at one SAC (Yell Sound Coast SAC) from the pressure 'Visual (and above water noise) disturbance'.

Otters have been known to forage 20km for females and 32km for males. In Shetland otters utlitsing the coast were recorded as ranging 5-14km for females and 19km for males with transient otters recorded moving 40km along the coast (SNH, 2019). They typically feed within 80m of the shoreline and regularly commute up to 500m over stretches of open water (NPWS, 2017). This may consist of transiting between the mainland and an island, between two islands or across an estuary.

Otters are most vulnerable to disturbance at their breeding stage. Females and cubs in natal dens are particularly sensitive to disturbance. There is no defined breeding season for otters and mothers will stay with their young for up to a year (NIEA, 2019).

There is also potential for European otter to be disturbed by the presence of vessels, should the proposed landing site occur in locations frequently used by the species for foraging holts or if the cable corridors overlap with areas of open water that otter's transit.

The Project will typically involve one main installation lay vessel and one ancillary support vessel. The shore end works will take approximately 7 days per landing site with the main lay vessel only being in the nearshore less than a day.

Therefore, during installation there is potential for temporary visual and above water noise disturbance from the presence of the vessels which may interrupt the feeding or breeding Otter within Yell Sound Coast SAC.

6.3.2 Underwater noise changes

6.3.2.1 Seals

The HRA screening identified that there is the potential for a LSE on the qualifying feature 'harbour seal' of the Sanday SAC, Mousa SAC and Yell Sound Coast SAC from the pressure 'Underwater noise changes' from the USBL device used to position the ROV to conduct touch down monitoring.

Underwater noise changes generated by the USBL may pose a risk to the seal population. Such noise can impact the species in two ways:

- Injury - physiological damage to an individuals' auditory or other internal organs; and
- Disturbance – either temporary or continuous. While this factor does not result in injury, disruptions to behavioural patterns such as migration, nursing, breeding, foraging, socialising and/or sheltering may occur.

Acute to significant long-term consequences to seal populations can occur, for example by avoidance of important habitats, interference with vocalisations and auditory damage (Southall *et al.*, 2019; Tyack, 2008). Male seals have been shown to utilise a repertoire of underwater vocalisations during mating season to attract a mate (Ruser *et al.*, 2014, Van Parijs and Kovacs, 2011), and to defend territories (Matthews *et al.*, 2017).

Harbour seals use low frequency rumblings from 250Hz to 1.4kHz (Van Parijs, Janik and Thompson, 2000), and are more sensitive to continuous noise than impulsive noise (Baltic Marine Environment Protection Commission, 2016). Therefore, there is potential for significant noise disturbance during mating to affect seal breeding success, as seals rely on these vocalisations (Baltic Marine Environment Protection Commission, 2016). Similar vocalisations have been recorded in harbour seal outside of breeding seasons, but the behavioural significance of these vocalisations in unknown (Andersson *et al.*, 2015). To determine the potential impact of noise generated by the USBL on seal, the sound levels that will be produced have been compared to the available estimated thresholds for injury and disturbance in seal. JNCC guidance (JNCC, 2020) recommends using the injury criteria proposed by Southall *et al.* (Southall *et al.*, 2019) based on a combination of linear (un-weighted) peak pressure levels and mammal hearing weighted (M-weighted) sound exposure levels (SEL).

If frequencies of the sound produced fall outside the predicted auditory bandwidth for a species, then disturbance is unlikely. Sufficiently high noise sources, however, can still cause damage to an individuals' auditory or other internal organs. Harbour seal are thought to possess a typical hearing range of 50 Hz to 86 kHz (NMFS, 2018). The highly precautionary assessment identifies that there is potential for disturbance to marine mammals (if sensitive) up to 1.1km from the sound source (NMFS, 2018).

Repeated or prolonged disturbance in the vicinity of seal haul out sites and foraging areas may result in reduced opportunities for catching prey items. Prolonged underwater noise disturbance could result in reduced mating and breeding success, which could affect the demographic characteristics of the population.

Noise will be temporarily generated by the USBL during the cable installation. The vessel mounted system to be used throughout cable installation activities is the HiPAP502. This transmits a directional beam, with a source level of SPL 190dB re 1µPa @1m (assumed to be 0-pk) in the frequency range 21-

31 kHz, with an effective range of 2000m[4]. This is within the audible range of seal. There will be no ongoing effect of noise from the cable once installed. Therefore, during installation there is potential for temporary underwater noise disturbance from the use of the USBL which may cause temporary disturbance to mating and other behavioural activities of seals up to 1.1km from the installation activities.

6.3.2.2 Otter

The HRA screening identified that there is the potential for LSE on otters at one SAC (Yell Sound Coast SAC) from the pressure 'Underwater noise changes'.

Noise will be temporarily generated by the USBL during the cable installation. The vessel mounted system to be used throughout cable installation activities is the HiPAP502. This transmits a directional beam, with a source level of SPL 190dB re 1µPa @1m (assumed to be 0-pk) in the frequency range 21-31 kHz, with an effective range of 2000m.

There are currently no studies which record the hearing range of Eurasian otters. Otter hearing is primarily adapted to air and is not underwater specialised, with lower sensitivity than in other amphibious marine carnivores such as seals and sea lions (Ghoul and Reichmuth 2016). A study observing hearing in sea otters (*Enhydra lutris*) reported the otters aerial hearing at >22 kHz and low frequency at <2 kHz with reduced under-water hearing at frequencies below 1 kHz (Ghoul and Reichmuth, 2013).

Therefore, during installation there is potential for temporary underwater noise disturbance from the presence of the vessels which may interrupt the feeding or breeding Otter within Yell Sound Coast SAC.

6.3.3 Physical change to another seabed type

The pressure 'physical change (to another seabed type)' can lead to a permanent change in substrate type which can make the habitat unsuitable for the pre-disturbance communities and, in turn, would lead to the habitat or biotope being re-classified (MarLIN 2021). Activities considered by the assessment that cause the pressure include surface laying of the cable (including integral protection) and any form of external cable protection that alters the seabed. For example, rock bags and concrete mattresses, included as contingency cable protection in this application.

The cable is proposed to be buried to 1m. However, for short section where it is not possible to bury the cable, such as in areas of hard ground or rock, the cable will be surface laid using heavier armoured cable as protection. Articulated pipe may also be used as additional integral protection to prevent abrasion to the cable. Any sections of the cable surface laid will be pinned or clamped to the seabed to avoid any movement of the cable while minimising the footprint. The addition of discretely placed rock bags may be required at approximately 50m intervals (worst case) for certain sections of the cable to provide stability. Concrete mattresses are only a potential requirement at cable crossings. However, no protected sites intersect these cable corridors at the crossings.

There is potential for physical change to another seabed type to cause disturbance to the following habitats which have been identified within European sites:

- Bedrock reef habitat
- Sandbanks which are slightly covered by sea water all the time

[4] It should be noted, the transmitter characteristics are within the range of echo sounders used on a variety of vessels (including pleasure craft, yachts, fishing vessels and other marine craft). Such echo sounders used by other vessels common across the area operate in the frequency range 12-400kHz, with signal strengths up to 230dB re 1µPa @1m (Risch et al. 2017).

- Mudflats and sandflats not covered by seawater at low tide

6.3.4 Abrasion / disturbance of the substrate on the surface of the seabed

Activities considered by the assessment that cause the pressure 'abrasion/disturbance at the surface of the substratum' include activities such as the pre-lay grapnel run, surface cable laying and cable burial. These activities lead to limited or no loss of substrate from the system. Abrasion and disturbance of the substrate can cause injury, damage and mortality to the organisms present beneath the surface of the substrate, such as bivalves, polychaetes and Fucoid spp. The recoverability and sensitivity of the habitat depends on the organisms' present.

Prior to installation a PLGR will remove any debris along the cable route. The PLGR will be used within the footprint of the plough. During installation, a plough will be towed along the cable corridors, which will simultaneously lay and bury the cable. The plough is towed across the seabed on skids and the plough share separates the sediment to bury the cable to the required burial depth. This action is in contact with the surface of the seabed and will cause a localised area of abrasion during the installation process. The footprint of the plough (skid and share) in contact with the seabed is approximately 2.6m wide along the length of the cable corridor. In sections of hard seabed, such as reef habitats, where burial cannot be achieved, the cable may be surface laid and as such, only the seabed within the direct footprint of the cable (diameter up to 15cm – worst case) will be disturbed. The extent of the disturbance will be confined to a small and linear area.

There is potential for abrasion / disturbance of the substrate on the surface of the seabed to cause disturbance to the following habitats which have been identified within European sites:

- Bedrock reef habitat
- Sandbanks which are slightly covered by sea water all the time
- Mudflats and sandflats not covered by seawater at low tide

6.3.5 Penetration and/or disturbance of the substrate below the surface of the seabed

Activities considered by the assessment that cause the pressure 'penetration and/or disturbance of the substrate below the surface of the seabed, including abrasion' include cable route preparation such as the pre-lay grapnel run, and cable burial. These activities lead to limited or no loss of substrate from the system. Penetration and disturbance of the substrate can cause injury, damage and mortality to the organisms present beneath the surface of the substrate, such as burrowing species. The recoverability and sensitivity of the habitat depends on the organisms' present.

Prior to installation, a PLGR will be undertaken along the proposed cable corridors. A typical PLGR can penetrate and/or disturb up to 40cm depth of the seabed in sediment habitats (depending on the sediment composition). As the PLGR is dragged through the surface sediments of the seabed it will pick up obstructions such as wires and derelict fishing gear and disturb the sediments. The sediments along the cable corridors are primarily sands and gravels, which although disturbed will be moved by natural sediment transport and naturally backfill any depressions caused by the PLGR. Ploughing and jetting ROV will be undertaken during cable burial in sediment habitats. These will penetrate up to 1m depth and will leave the trench backfilled.

Penetration and/or disturbance of the substrate below the surface of the seabed will only occur within the footprint of the PLGR, ploughing and jetting ROV activities, which will be maximum 2.6m wide footprint, noting that the actual trench will only be 0.5m wide, along the length of the cable corridor.

There is potential for penetration and/or disturbance of the substrate below the surface of the seabed to the following habitats which have been identified within European sites:

- Sandbanks which are slightly covered by sea water all the time
- Mudflats and sandflats not covered by seawater at low tide

6.3.6 Siltation rate changes (including smothering)

The marine cable installation will cause resuspension of sediments from the seabed into the water column. Jet trenching will cause a greater level of sediment suspension compared to the use of ploughing equipment. However, this is not proposed other than for small sections of the cables in the near shore area or sections of the cable that cannot be plough buried at the time of installation. The impact is a small, localised and temporary increase in turbidity. This pressure can smother organisms, preventing feeding and respiration. Mobile species are less sensitive to light siltation rate changes than sessile ones but can still be killed through heavy siltation rate changes. The recoverability and sensitivity of the habitat depends on the organisms' present.

The findings of a separate study on the Environmental Impact of Subsea Trenching Operations (Gooding et al., 2012) suggested that the impacts of subsea trenching operations on sediment disturbance are restricted to the immediate vicinity of the trench (less than 10m either side). Suspended solid concentrations, although elevated immediately after trenching, have been shown to fall to ambient levels within 66m of trenching activity in hard ground areas and 70m in sandy areas with fine deposition occurring out to a maximum of 2km from the trench (Gooding et al., 2012). The precautionary distance of 100m has been used in this assessment for the worst-case distance of the settling of suspended solids to ambient levels. Fine material will be rapidly diluted and dispersed in the water. Far-field deposition is predicted to be less than 1mm for both trenching by jetting and ploughing.

There is potential for siltation rate changes (including smothering) to cause disturbance to the following habitats which have been identified within European sites:

- Bedrock reef habitat
- Sandbanks which are slightly covered by sea water all the time
- Mudflats and sandflats not covered by seawater at low tide

6.3.7 In-combination effects

6.3.7.1 Method

The Habitats Directive requires that plans or projects are assessed alone and in-combination with other plans or projects to determine whether a likely significant effect to European sites could occur. Only plans or projects that would increase the likelihood of significant effects should be considered.

For there to be a potential cumulative impact between the proposed installation and another project, plan, or licensed activity there must be a common pressure-receptor pathway which overlaps spatially and to a certain degree temporally.

The nature of a linear telecommunications cable project means that many potential pressures result in temporary or short-term and localised effects restricted to an area smaller than the footprint of the Project cable corridors. The search area for other projects has been defined as anything within the 5km zone of influence from the Shetland cable corridors, herein referred to as the assessment search area. Although it is recognised that certain pressures may exceed this spatial extent these have been scoped out of the assessment as they will have a negligible effect.

To identify which projects and plans are likely to interact with the proposed Project cable corridors, it was established whether a common pressure-receptor pathway exists with the Project cable installation and other types of projects and plans identified. Based on professional judgement,

projects and plans were grouped into categories and then each category was assessed to determine whether it would have a pathway likely to induce similar pressures as the Project activities. Where project categories had a pressure-receptor pathway, these were considered in further detail to see whether they have:

- A common-pressure receptor pathway with the project;
- Activities, the effects of which overlap spatially with the project; and
- Activities, the effects of which overlap spatially and temporally with the project.

6.3.7.2 Method

To identify the potential for cumulative impacts of the R100 Project within the Shetland geographical area the following information sources have been reviewed and plotted on to GIS (Figure 6-1, Drawing Reference No: P2308_CUMU-002-SH-B):

- MS-LOT Public register
- National Marine Plan interactive (NMPi)
- SEAFISH Kingfisher Bulletin (Issues 27, 32, 35 dated 2021)
- UKDEAL: Oil and gas industry information;
- Oil and Gas Authority: Oil and gas industry information;
- KIS-ORCA: Marine cables information; and
- The Crown Estate Scotland Website: Offshore wind farm and marine aggregate digital data.

A review of the Marine Scotland Marine Licence Applications Public Register was undertaken in August 2021 to identify projects to be included in the assessment. Projects which had a license expiry date before January 2022 were not included as it is assumed that the licensable activity of these works will have taken place before the expiry date (any application variations with extended dates were included).

A review of the NMPi tool did not identify any other proposed projects or plans that would induce similar pressures and/or that were located within the assessment search area of the Shetland cable corridors (Marine Scotland 2021b).

In addition to the Marine Scotland public registers, GIS analysis of known infrastructure in the area was undertaken, using the data sources above. There were no additional proposed plans relating to this infrastructure identified as all infrastructure is already in place with no additional maintenance or repairs scheduled that the applicant is aware of.

Seven disposal sites and one oil rig were identified within the 5km assessment search area. All of the disposal sites are no longer in operation (five closed, two disused). The oil terminal is operational but with no installation/maintenance works being carried out and therefore no similar pressure receptor pathways occurring.

Table 6-1 presents known projects, plans and licences identified from the various sources as being within the assessment search area.

Fishing activity

Key fishing activities within the Shetland geographical area in relation to the proposed cable corridors are pelagic, demersal and aquaculture fishing, with some shellfish. Mackerel and herring are the key target species. Demersal fishing induces the pressures penetration and/or disturbance to the

substratum on the surface of the seabed including abrasion, and abrasion/disturbance of the substratum below the surface of the seabed. As a result, there is the potential that cable installation within the Shetland geographical area will have inter-project effects with demersal fishing activity. Despite this, the Shetland cable installation will be a temporary and one-off disturbance. Furthermore, the installation of the Shetland cables would only induce these pressures on a narrow footprint on the seabed, therefore potential cumulative impacts with demersal fishing activities will be highly limited and are therefore not considered further.

Table 6-1 Projects identified from MS-LOT public register and from MS communication

Project Category	Name	MS LOT Reference Number	Distance to cable corridor (km)					Does project category induce similar pressures to R100?	Projects to be taken forward to assessment?
			Cable 2.1	Cable 2.2	Cable 2.3	Cable 2.4	Cable 2.8		
Cable	BT Cable Removal – Between Fair Isle and Shetland	00009308			0			Yes	Yes – Further assessment is required
Cable	Marine Licence - HVDC Link Installation outside 12 Nautical Miles - Shetland to Caithness	07357			0			Yes	Yes – Further assessment is required
Cable	Marine Licence - HVDC Link Installation outside 12 Nautical Miles - Shetland to Caithness	07203			0			Yes	Yes – Further assessment is required
Chemotherapeutant	Marine Licence - Wellboat Discharge - North Voe, Shetland	07171					0	No	No, project category does not induce similar pressures to the Project, therefore there is no potential for inter-project effects
Chemotherapeutant	Marine Licence- Wellboat Discharge - Belmont, Shetland	06932	0					No	No, project category does not induce similar pressures to the Project, therefore there is no potential for inter-project effects
Chemotherapeutant	Wellboat Discharge – Swarta Skerry, Dury Voe, Shetland	07038					0	No	No, project category does not induce similar pressures to the Project, therefore there is no potential for inter-project effects
Chemotherapeutant	Marine Licence - Marine Farm - Bight of Bellister, Shetland	07346/00008827					0	No	No, project category does not induce similar pressures to the Project, therefore there is no potential for inter-project effects
Chemotherapeutant	Marine Licence - Wellboat Discharge - Bellister, Dury Voe	07301					0	No	No, project category does not induce similar pressures to the Project, therefore there is no potential for inter-project effects
Chemotherapeutant	Wellboat Discharge - Copister Salmon Farm, Yell Sound, Shetland	06835		1.2				No	No, project category does not induce similar pressures to the Project, therefore there is no potential for inter-project effects

Project Category	Name	MS LOT Reference Number	Distance to cable corridor (km)					Does project category induce similar pressures to R100?	Projects to be taken forward to assessment?
			Cable 2.1	Cable 2.2	Cable 2.3	Cable 2.4	Cable 2.8		
Chemotherapeutant	Marine Licence- Wellboat Discharge -Burkwell, Shetland	06937	2.5					No	No, project category does not induce similar pressures to the Project, therefore there is no potential for inter-project effects
Chemotherapeutant	Marine Licence- Wellboat Discharge - North Sandwick, Shetland	06934	2.9					No	No, project category does not induce similar pressures to the Project, therefore there is no potential for inter-project effects
Chemotherapeutant	Wellboat Discharge - Winna Ness, Uyeasound, Shetland	06945	3.2					No	No, project category does not induce similar pressures to the Project, therefore there is no potential for inter-project effects
Chemotherapeutant	Wellboat Discharge - Vee Taing, Uyeasound, Shetland	06941	3.5					No	No, project category does not induce similar pressures to the Project, therefore there is no potential for inter-project effects
Chemotherapeutant	Marine Licence - Wellboat Discharge - Vidlin Outer, Vidlin Voe	07303/07304					3.7	No	No, project category does not induce similar pressures to the Project, therefore there is no potential for inter-project effects
Chemotherapeutant	Marine Licence - Wellboat Discharge - Setterness South, Shetland	07283		3.9				No	No, project category does not induce similar pressures to the Project, therefore there is no potential for inter-project effects
Chemotherapeutant	Marine Licence- Wellboat Discharge- Kirkabaster, Shetland	06938	4					No	No, project category does not induce similar pressures to the Project, therefore there is no potential for inter-project effects
Construction, alteration or improvement of any works	Marine Licence - Construction of a New Marina - Cullivoe Pier, North Yell	Pre-application (No Ref Number.)	2					Yes	No, project has been deemed as a non EIA project with no significant effects and therefore will not have any potential for inter project effects.
Construction, alteration or improvement of any works	Marine Farm - Mula, Unst, Shetland	00009235	1					No	No, project is for an application to renew an existing licence and no changes or deposits are anticipated.

Project Category	Name	MS LOT Reference Number	Distance to cable corridor (km)					Does project category induce similar pressures to R100?	Projects to be taken forward to assessment?
			Cable 2.1	Cable 2.2	Cable 2.3	Cable 2.4	Cable 2.8		
Fish (including shellfish) farm	Marine Farm (and surrounding moorings)	5862					0	No	No, project category does not induce similar pressures to the Project, therefore there is no potential for inter-project effects
Fish (including shellfish) farm	Wellboat discharge (Active site)	6029					0	No	No, project category does not induce similar pressures to the Project, therefore there is no potential for inter-project effects
Fish (including shellfish) farm	Marine farm (Expired)	5050		1.5				No	No, project category does not induce similar pressures to the Project, therefore there is no potential for inter-project effects
Fish (including shellfish) farm	Marine Licence - Marine Farm - Wick of Belmont, Shetland	00009279	0					No	No, project category does not induce similar pressures to the Project, therefore there is no potential for inter-project effects
Fish (including shellfish) farm	New Finfish Farm - Dury Voe, Shetland Islands	06786					0	No	No, project category does not induce similar pressures to the Project, therefore there is no potential for inter-project effects
Fish (including shellfish) farm	Marine Licence - Marine Farm - Bellister, Shetland	07270					1	No	No, project category does not induce similar pressures to the Project, therefore there is no potential for inter-project effects
Fish (including shellfish) farm	Existing fish farm – Fish Holm, Yell Sound, Shetland	06977		1.1				No	No, project category does not induce similar pressures to the Project, therefore there is no potential for inter-project effects
Fish (including shellfish) farm	Marine Licence - Marine Farm - Loura Voe, Shetland	07347/00008828					1.2	No	No, project category does not induce similar pressures to the Project, therefore there is no potential for inter-project effects
Fish (including shellfish) farm	Marine Farm - Outer Grunna Voe, Dury Voe, Shetland	00008997					1.5	No	No, project category does not induce similar pressures to the Project, therefore there is no potential for inter-project effects

Project Category	Name	MS LOT Reference Number	Distance to cable corridor (km)					Does project category induce similar pressures to R100?	Projects to be taken forward to assessment?
			Cable 2.1	Cable 2.2	Cable 2.3	Cable 2.4	Cable 2.8		
Fish (including shellfish) farm	Marine Licence - Marine Farm - Vatsetter, Shetland	07257				1.5		No	No, project category does not induce similar pressures to the Project, therefore there is no potential for inter-project effects
Fish (including shellfish) farm	Marine Licence - Marine Farm - Copister, Yell Sound	07180		1.5				No	No, project category does not induce similar pressures to the Project, therefore there is no potential for inter-project effects
Fish (including shellfish) farm	Marine Licence - Marine Farm - South Holm, Unst	07114	2.3					No	No, project category does not induce similar pressures to the Project, therefore there is no potential for inter-project effects
Fish (including shellfish) farm	Marine Licence - Marine Farm - Copister, Yell -	07237		2.4				No	No, project category does not induce similar pressures to the Project, therefore there is no potential for inter-project effects
Fish (including shellfish) farm	Marine Farm - Vidlin Ness, Shetland	07348					3.0	No	No, project category does not induce similar pressures to the Project, therefore there is no potential for inter-project effects
Fish (including shellfish) farm	Marine Licence Variation - Marine Farm - Vidlin Voe, Shetland	00008902					3.4	No	No, project category does not induce similar pressures to the Project, therefore there is no potential for inter-project effects
Fish (including shellfish) farm	Marine Licence - Marine Farm - Bastavoe, Shetland	07305/00008805			4.2			No	No, project category does not induce similar pressures to the Project, therefore there is no potential for inter-project effects
Fish (including shellfish) farm	Marine Licence- Existing Marine Farm- Basta Voe South, Basta Voe	07185	4.7					No	No, project category does not induce similar pressures to the Project, therefore there is no potential for inter-project effects
Fish (including shellfish) farm	Marine Licence- Marine Farm - Turness, Skuda Sound	00009299	4.8					No	No, project category does not induce similar pressures to the Project, therefore there is no potential for inter-project effects

Project Category	Name	MS LOT Reference Number	Distance to cable corridor (km)					Does project category induce similar pressures to R100?	Projects to be taken forward to assessment?
			Cable 2.1	Cable 2.2	Cable 2.3	Cable 2.4	Cable 2.8		
Renewables - Tidal	Marine Licence – Shetland Tidal Array (as extended) – Bluemull Sound, Shetland	00009110	1.8					Yes	Yes – Further assessment is required
Renewables - Tidal	Marine Licence – Deposits Tidal Array – Bluemull Sound, Shetland	04859	1.8					Yes	Yes – Further assessment is required

6.3.7.3 Relevant projects

Of the projects listed in Table 6-1, there are five marine licences associated with three projects which have a common pressure-receptor pathway and therefore a potential for cumulative impact. The other projects either do not overlap temporally, spatially or do not have a common pressure receptor pathway. Table 6-2 provides a summary of the projects considered further by the assessment.

Table 6-2 Projects identified which require further assessment within search area of the Shetland region

Project Category	Project Name	Distance of Cable Corridor from project (km) or intersect (Int)				
		Cable Corridor				
		2.1	2.2	2.3	2.4	2.8
Cable	BT Cable Removal – Between Fair Isle and Shetland (Ref: 00009308)			Int		
Cable	SSE - Marine Licence - HVDC Link Installation outside 12 Nautical Miles - Shetland to Caithness (Ref: 07357)			Int		
Cable	SSE - Marine Licence - HVDC Link Installation outside 12 Nautical Miles - Shetland to Caithness (Ref: 07203)			Int		
Renewables - Tidal	Nova Innovation - Marine Licence – Shetland Tidal Array (as extended) – Bluemull Sound, Shetland (Ref: 00009110)	1.8				
Renewables - Tidal	Nova Innovation - Marine Licence – Deposits Tidal Array – Bluemull Sound, Shetland (Ref: 4859)	1.8				

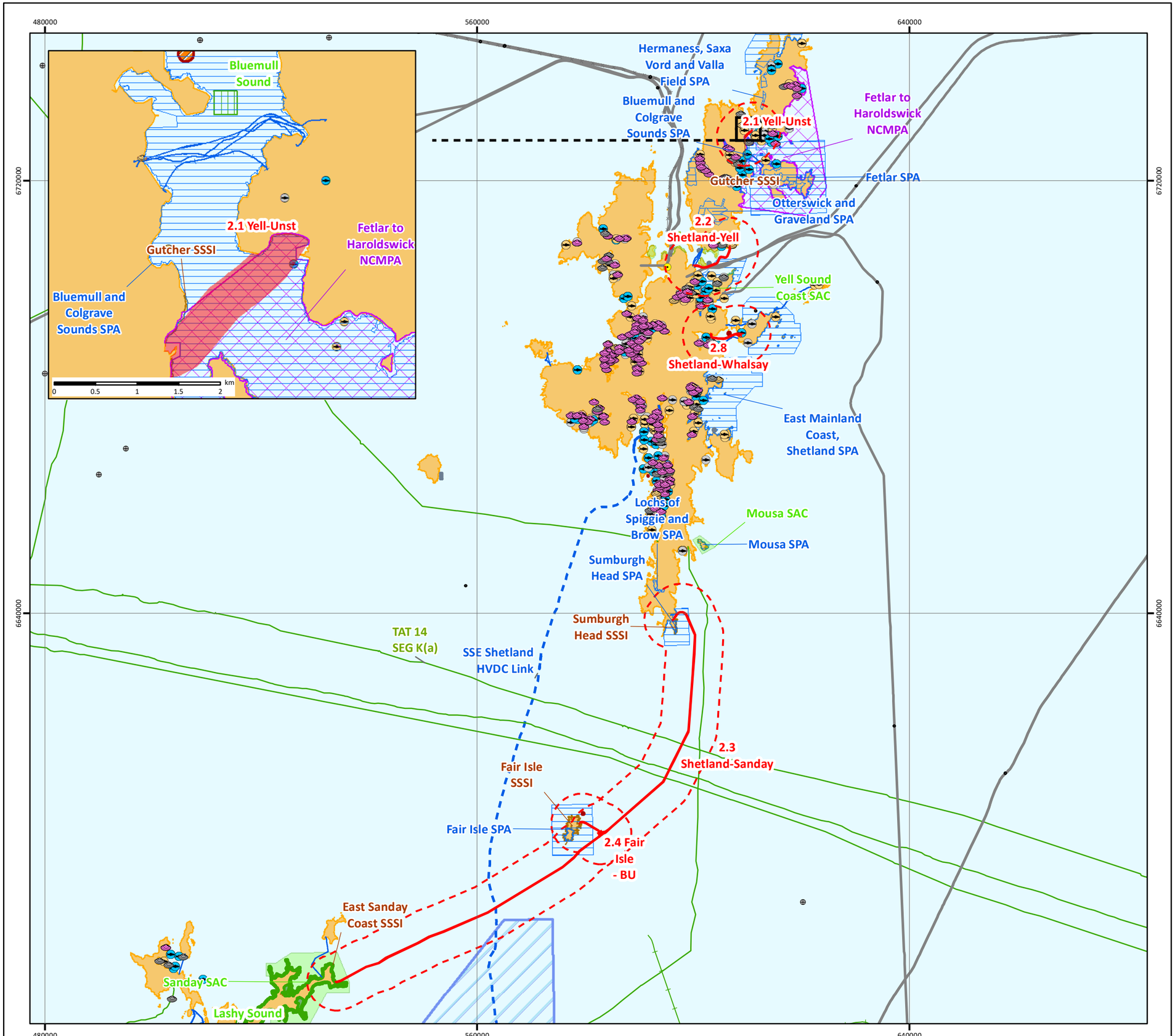
Of the three projects which have the potential for in-combination effect, only one project is within a protected site, namely the Nova Innovation Shetland Tidal Array (MLA references 4859 and 00009110).

The two cables project, BT Cable removal (00009308) and SSE HVDC cable installation (07203/07357), interact with the Shetland geographical region offshore. BT cable removal is located approximately 18km from Sumburgh Head SPA and 21km from Sumburgh SSSI to the North. To the South the project interaction is 20km from Fair Isle SPA and 24km from Fair Isle SSSI. SSEs HVDC cable installation also interacts with the Shetland geographical region offshore and is not within any protected sites. The closest sites to this area are Fair Isle SPA (13km) and Fair Isle SSSI (18km) to the north and Sanday SAC (31km) and East Sanday Coast SSSI (31km) to the south. Due to the distance of the project interaction from any protected sites these projects will not have an in-combination effect and do not require any further assessment.

SCOTTISH ISLES FIBRE OPTIC CABLE PROJECT

CUMULATIVE IMPACT
Other Marine Users
Shetland

Drawing No: P2308-CUMU-002_SH | **A**



Legend

Environmental Designation
- SAC
- SPA
- NCMPA
- SSSI

- Application Corridor
- 5km Zone of Influence
- Well
- Terminal
- Platform
- Subsurface Infrastructure

Aquaculture Site
- Fish, Active
- Fish, Inactive
- Fish, De-Registered
- Shellfish, Active
- Shellfish, Inactive
- Shellfish, De-Registered

Pipelines
- Proposed
- Active
- Removed

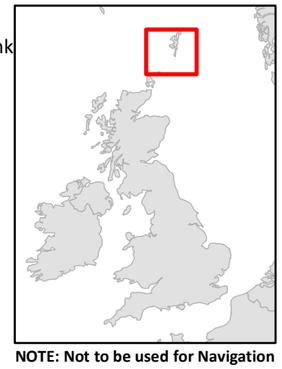
Cables
- Power
- Power (Disused)
- Telecom
- Telecom (Disused)
- Proposed SSE HVDC Link

Infrastructure Agreement
- Tidal Farm
- Seaweed Licence

Disposal Sites
- Closed
- Disused

Military Practice Area
- Air Force Department

N W E S



NOTE: Not to be used for Navigation

Date	13 October 2021
Coordinate System	WGS 1984 UTM Zone 30N
Projection	Transverse Mercator
Datum	WGS 1984
Data Source	ONS; MS; KISCA; OGA; CES; CEFAS; UKHO; ESRI; SNH;
File Reference	J:\P2308\Mxd\14_CUMU\ P2308-CUMU-002_SH.mxd
Created By	Emma Kilbane
Reviewed By	Chris Dawe
Approved By	Paula Daglish

BT Global Marine intertek

0 10 20 30 40 km

Nova Innovation - Marine Licence – Deposits Tidal Array – Bluemull Sound, Shetland (Ref: 04859) / Marine Licence – Shetland Tidal Array (as extended) – Bluemull Sound, Shetland (Ref: 00009110)
Nova Innovation Ltd. have been awarded a marine licence (04859) to operate five tidal turbines at the Shetland Tidal array until 2035 located in Bluemull Sound. The extended application (00009110) is to deploy a sixth turbine at the same site and extend the duration of operation to 2038 including tidal array reconfiguration of three turbines in this time (Nova Innovation Ltd., 2018). This site is located within the 5km zone of influence for Cable Corridor 2.1 Yell to Unst and is located approximately 1.5km distance from the cable corridor. Nova Innovation have five turbines consented under the existing licence which are T1 and T2 deployed in 2016; T3 deployed in 2017; and T4 and T5 which had been scheduled to be deployed in Q3 2019 and Q1 2020. Under the extended application form Nova Innovation requested to deploy a 6th turbine (T6) alongside T5 in Q1 of 2020. The array operation is scheduled to last from 2018 to 2038, with decommissioning commencing in 2038.

The project is located within Bluemull and Colgrave Sounds SPA and is approximately 2km from Gutcher SSSI and approximately 1.5km from Fetlar to Haroldswick NCMPA (Figure 6-1, Drawing Ref: P2308-CUMU-002-SH-B).

The common pressure-receptor pathway with Cable Corridor 2.1 Yell to Unst is noise effects on marine mammals and seabirds. None of the protected sites within the vicinity of the potential in-combination effects are designated for marine mammals, therefore seabirds are the only designated protected species at risk of in-combination effects. Bluemull and Colgrave Sounds SPA is designated for red throated diver and Fetlar to Haroldswick NCMPA is designated for black guillemot.

An assessment of the potential in-combination effects has been included in the Information to Inform AA for Bluemull and Colgrave Sounds SPA (Section 6.10) and Fetlar to Haroldswick NCMPA (Section 4.2).

6.4 Qualifying Interest Feature Summary

The HRA screening identified that 12 European sites require AA and that there was a potential for LSE on a total of 23 bird qualifying species, one seal species and otter from these sites. A summary of key information on these species including foraging ranges, sensitivity to disturbance and seasonal information (e.g. breeding and moulting) where available has been provided in Table 6-3 below.

Table 6-3 Interest Feature Summary

Receptor	Woodward *et al.*, 2019	Joint SNCB, 2017		Suggested seasonal definitions for birds in the Scottish Marine Environment (NatureScot, 2020)											
	Mean-Max Foraging Range (km)	Disturbance Susceptibility	Habitat Specialisation	Winter			Summer						Winter		
				Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Auks															
Atlantic puffin (*Fratercula arctica*)	137.1	2	3												
Guillemot (*Uria aalge*)	73.2	3	3												
Razorbill (*Alca torda*)	88.7	3	3												
Shags															
European shag (*Phalacrocorax aristotelis*)	13.2	3	3												
Divers															
Great northern diver (*Gavia immer*)	Unknown	5	3												
Red-throated diver (*Gavia stellata*)	9.0	5	4												
Sea Ducks and Grebes															
Slavonian grebe (*Podiceps auratus*)	Unknown	3	4												
Gulls and Terns															
Arctic tern (*Sterna paradisaea*)	25.7	2	3												
Kittiwake (*Rissa tridactyla*)	156.1	2	2												
Petrels															
Northern fulmar (*Fulmarus glacialis*)	542.3	1	1												
Skuas															
Arctic skua (*Stercorarius parasiticus*)	62.5	1	2												
Great skua (*Stercorarius skua*)	443.3	1	2												
Gannets															
Northern gannet (*Morus bassanas*)	315.2	2	1												
Waders															
Bar-tailed godwit (*Limosa lapponica*)	Unknown	Unknown	Unknown												
Dunlin *(Calidris alpina schinzii)*	Unknown	Unknown	Unknown												
Purple sandpiper (*Calidris maritima*)	Unknown	Unknown	Unknown												
Red-necked phalarope (*Phalaropus lobatus*)	Unknown	1	2												
Ruddy Turnstone (*Arenaria interpres interpres*)	Unknown	Unknown	Unknown												
Whimbrel (*Numenius phaeopus*)	Unknown	Unknown	Unknown												
Terrestrial															
Fair Isle wren (*Troglodytes troglodytes fridariensis)*	Unknown	Unknown	Unknown												
Otter (*Lutra lutra*)	Up to 19 (SNH, 2019)	Unknown	Unknown												

Marine Mammals				
Harbour seal (*Phoca vitulina*)		21 (DECC, 2016).	N/A	N/A
Key		Bird breeding season / Seal pupping season		
		Present		
		Period of flightless moult for common eider		
		Unlikely to be present in significant numbers		

6.5 Sanday SAC

6.5.1 Screening conclusion

The HRA screening identified that there was a potential LSE on the qualifying feature 'harbour seal' from the following pressures:

- Visual (and above water noise) disturbance
- Underwater noise changes

The screening also identified that the pressures 'physical change to seabed type', 'penetration and/or disturbance of the substrate below the surface of the seabed', 'abrasion/disturbance of the substrate on the surface of the seabed' and 'siltation rate changes (including smothering)' could have a potential LSE on the protected features:

- Bedrock reef habitat
- Sandbanks which are slightly covered by sea water all the time
- Mudflats and sandflats not covered by seawater at low tide

6.5.2 Conservation objectives

To avoid deterioration of the habitats of harbour seal (the qualifying feature) or significant disturbance to harbour seal, thus ensuring that the integrity of the site is maintained, and the site makes an appropriate contribution to achieving favourable conservation status for the qualifying feature; and to ensure for harbour seal that the following are maintained in the long term:

- Population of the species as a viable component of the site;
- Distribution of the species within the site;
- Distribution and extent of habitats supporting the species;
- Structure, function and supporting processes of habitats supporting the species; and
- No significant disturbance of the species.

To avoid deterioration of the qualifying habitats 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 habitats that the following are maintained in the long term:

- Extent of the habitat on site
- Distribution of the habitat within site
- Structure and function of the habitat
- Processes supporting the habitat
- Distribution of typical species of the habitat
- Viability of typical species as components of the habitat
- No significant disturbance of typical species of the habitat

6.5.3 Assessment against conservation objectives (includes feature assessment)

6.5.3.1 Visual (and above water noise) disturbance

A summary of the qualifying features and cable corridors screened in for visual (and above water noise) disturbance in Sanday SAC is provided in Table 6-4.

Table 6-4 Summary of LSE for visual (and above water) disturbance for the qualifying feature of Sanday SAC

Feature	Cable 2.1	Cable 2.2	Cable 2.3	Cable 2.4	Cable 2.8
Harbour seal					

Note: Dark blue cells denote where cable corridors are within the European site

Sanday is situated in the north-east of the Orkney archipelago and supported the largest group of harbour seal at any discrete site in Scotland at the time of designation. At last summer count (surveyed in 2016), 83 harbour seal were counted, which was the lowest count to date and a 27% decline since 2013 (NatureScot, 2016c). Harbour seal are a primary reason for the site's designation. The breeding groups, found on intertidal haul-out sites that are unevenly distributed around the Sanday coast, represent over 4% of the UK population. Nearshore kelp beds that surround Sanday are important foraging areas for the seals, and the colony is linked to a very large surrounding population in the Orkney archipelago (JNCC, 2016). Harbour seals spend most time around haul out sites and foraging in offshore areas in the Moray Firth (Thompson et al., 2013). Cable Corridor 2.3 Sanday to Shetland comes into the northeast corner of the SAC, with the landing point located at Grutness, on the eastern side of the Shetland Mainland at Grutness Voe. Installation activities within 500m of hauled out seals have the potential to disturb individuals hauled out within the SAC (pers comm – NatureScot, 2021).

The Project will typically involve the Main lay vessel and one ancillary support vessel. It cannot be ruled out that even temporary disturbance during the breeding season will not affect pup production and lead to a change in the population dynamics for the year. Due to the sensitive nature of harbour seals when hauled-out, the close proximity of installation activities within the SAC and presence of higher numbers of individuals during the breeding season (typically occurring in June and July inclusive), significant disturbance to harbour seal could occur as a result of installation activities should they overlap with the breeding season. This has the potential to negatively affect their ability to remain a viable component of the site. It also has the potential to negatively affect their 'Favourable Maintained' status. Therefore, it is appropriate to implement mitigation measures to ensure that the Project will not hinder the conservation objectives for the site.

LSE cannot be ruled out for Cable Corridor 2.3 Sanday to Shetland for the qualifying feature harbour seal during their peak breeding season in June and July.

6.5.3.2 Underwater noise changes

A summary of the qualifying features and cable corridors screened in for underwater noise changes in Sanday SAC is provided in Table 6-5.

Table 6-5 Summary of LSE for underwater noise changes for the qualifying features of Sanday SAC

Feature	Cable 2.1	Cable 2.2	Cable 2.3	Cable 2.4	Cable 2.8
Harbour seal					

Note: Dark blue cells denote where cable corridors are within European site

Sound generated by USBL devices is used to determine the position of subsea equipment during cable installation. The system operates by emitting a low frequency acoustic pulse between the transponder

on the vessel and the transducer on the subsea unit. The vessel mounted system to be used throughout cable installation activities is the HiPAP502. This transmits a directional beam, with a source level of SPL 190dB re 1µPa @1m (assumed to be 0-pk) in the frequency range 21-31 kHz, with an effective range of 2000m. Such frequencies will be audible to nearby harbour seal, and thus could potentially disturb animals.

Calculations presented in the Shetland geographical area European Protected Species (EPS) Assessment (Document: P2308_R5283_Rev0) concluded auditory injury will not occur in seal from the use of the USBL. Calculations assumed 24 hours continuous exposure to impulsive sound and used the injury criteria as given in NMFS (2018), for a permanent threshold shift or temporary threshold shift in hearing. However, the highly precautionary calculations identified that disturbance may occur within 1.1km of the USBL.

The calculations presented in the Shetland EPS Assessment were highly precautionary. NMFS (2018) acknowledge that criteria for disturbance (termed effective silence in the case of NMFS 2018), are not representative of the effects on animals within their natural environment but are based on a limited number of studies of captive individuals and do not take into account habituation to ambient sound. Within Shetland waters, ambient sound is dominated by shipping noise (Richards et al 2007), which is of low frequency, in addition to fishing and military operations. These ambient sound sources are likely to reduce the effects of disturbance from the USBL.

The Project will typically involve the Main lay vessel and one ancillary support vessel. Up to approximately 40% of the SAC may be temporarily subject to underwater noise sufficient to cause disturbance. Cable installation activities will be a continuous, transient but temporary occurrence (approximately 6 days per cable corridor). As the installation activities will move at a maximum speed of 2 knots, the highly precautionary area of disturbance will move with the vessel and the effects will be brief in any one place and localised to the installation activity. Animals will not be subject to lasting or prolonged periods of disturbance. Recent studies have shown that individuals will quickly return to an area that was subjected to even high-intensity noise emissions within a short period of time (Russell et al., 2016). As such, noise and associated temporary disturbance from the cable laying activities themselves will not result in a significant adverse effect on nearby individuals.

As Cable Corridor 2.3 Sanday to Shetland routes directly into the north-eastern extent of the SAC to the landing point, there is the potential that the USBL noise could disturb individuals in the vicinity of the haul-out site itself. The remaining cable corridors in the Shetland region are a sufficient distance away from the SAC (minimum approximately 53km to Cable Corridor 2.4 Fair Isle to BU) that USBL activities for those cable corridors would not impact seals from Sanday SAC.

Although activities close to the landfall will be typically restricted to several days, it cannot be ruled out that even temporary disturbance during the breeding season will not affect pup production and lead to a change in the population dynamics for the year. As the population status is 'Unfavourable, declining', it is therefore appropriate to implement mitigation measures to ensure that the Project will not hinder the conservation objectives for the site and contribute to the local decline of the species.

LSE cannot be ruled out for Cable Corridor 2.3 Sanday to Shetland for the qualifying feature harbour seal during their peak breeding season in June and July.

6.5.3.3 Physical change to seabed type

The pressure 'physical change (to another seabed type)' can lead to a permanent change in substrate type which in turn would lead to the habitat or biotope being re-classified (MarLIN 2020). Activities considered by the assessment that cause the pressure include surface laying of the cable (including integral protection) and any form of external cable protection that alters the seabed. For example, rock bags and concrete mattresses, included as contingency cable protection in this application.

The cable is proposed to be buried to 1m. However, for short section where it is not possible to bury the cable, such as in areas of hard ground or rock, the cable will be surface laid using heavier armoured cable as protection. Articulated pipe may also be used as additional integral protection to prevent abrasion to the cable. Any sections of the cable surface laid will be pinned or clamped to the seabed to avoid any movement of the cable while minimising the footprint. The addition of discretely placed rock bags may be required at approximately 50m intervals (worst case) for certain sections of the cable to provide stability. Concrete mattresses are only a potential requirement at cable crossings. As there are no cable crossings within the Cable Corridor 2.3 Sanday to Shetland at Sanday SAC, concrete mattresses are unlikely to be used within the European site.

Table 6-6 Description of the Sanday SAC qualifying habitat features

Qualifying feature	Feature Description	Location within Cable Corridor 2.3 Sanday to Shetland
Bedrock reef habitat	Sanday is surrounded by extensive subtidal bedrock reefs which support dense kelp forests dominated by Laminaria spp. The kelp occurs to approximately 20m depth, and provides habitats for red algal turf communities, sponges and ascidians. The north coast is tide swept, and supports a richer fauna including bryzoan/hydroid turf and brittlestars, with horse mussel beds in mixed sediment below the kelp zone.	Bedrock reef with kelp communities were found across the cable corridor within the Sanday SAC during DDV surveys (Appendix A).
Sandbanks which are slightly covered by sea water all the time	Sandbanks which are slightly covered by sea water all the time consist of sandy sediments which are permanently covered by shallow sea water (typically less than 20m depth). Depending on the local conditions, these can support a range of communities, and are categorised into four sub-types: gravelly and clean sands, muddy sands, eelgrass *Zostera marina* beds, maerl beds. The latter two-subtypes are of particularly high conservation value due to their scarcity and the diverse species that they support.	Two areas of subtidal sand habitats were located within the DDV surveys (Appendix A). However, the communities that they support do not qualify them as a protected sandbank feature. Therefore, no sandbanks were identified within Cable Corridor 2.3 Sanday to Shetland.
Mudflats or sandflats not covered by water at low tide	Intertidal mudflats and sandflats are submerged at high tide, but exposed at low tide. They occur extensively along the open coast and lagoonal inlets, and can be categorised into three broad types: clean sands, muddy sands and muds, each supporting different communities. This habitat is also important to support invertebrates which provide food for waders and wildfowl.	DDV and intertidal surveys within the installation activities did not identify any mudflats or sandflats not covered by water at low tide (Appendix A).

Bedrock reef habitat

In areas where there is existing stony seabed or bedrock reef the surrounding epifaunal species may be able to colonise the rock bags. A number of studies have found evidence that cable rock protection has been colonised, for example, Sherwood *et al. (*2016), Lacey and Hayes (2019), Sheehan *et al. (*2018). Sheehan *et al.* (2018) made observations of the colonisation of rock protection installed for the Wave Hub subsea cable off the north coast of Cornwall, United Kingdom. The cable was installed predominantly over circalittoral rock and biogenic reef habitat. The study found the benthic fauna that colonised the rock protection was comparable to the surrounding rocky reef, and no significant difference in abundance was found in comparison to controls 5 years post-installation. This represents a similar habitat to areas within the Shetland geographical area, as such it would be reasonable to assume that any rock protection deposited will see similar results.

If the contingency deposits are used on this habitat type, the deposit is unlikely to cause a significant change to the receiving environment of the seabed, as it will be used in areas where the cable is surface laid due to hard ground. As the nature of the seabed in such areas is likely to consist of firm and coarse sediments, the change of the addition of small size and localised deposits of rock bags will cause a low magnitude of change in substrate type which can support recolonisation of local epifaunal species, therefore, this effect will be minor.

No LSE will occur on the qualifying features of the Sanday SAC.

Sandbanks which are slightly covered by sea water all the time and Mudflats or sandflats not covered by water at low tide

Sandbanks which are slightly covered by sea water all the time and mudflats or sandflats not covered by water at low tide were not found within Cable Corridor 2.3 Sanday to Shetland (Table 6-6). Therefore, there is no pressure-receptor pathway between these qualifying features and the pressure 'physical change (to another seabed type)' from the installation activities.

No LSE will occur on the qualifying features of the Sanday SAC.

6.5.3.4 Penetration and/or disturbance of the substrate below the surface of the seabed

Activities considered by the assessment that cause the pressure 'penetration and/or disturbance of the substrate below the surface of the seabed, including abrasion' include cable route preparation such as the pre-lay grapnel run, and cable burial. These activities lead to limited or no loss of substrate from the system.

Prior to installation, a PLGR will be undertaken along the proposed cable corridors. A typical PLGR can penetrate and/or disturb up to 40cm depth of the seabed in sediment habitats (depending on the sediment composition). As the PLGR is dragged through the surface sediments of the seabed it will pick up obstructions such as wires and derelict fishing gear and disturb the sediments. The sediments along the cable corridors are primarily sands and gravels, which although disturbed will be moved by natural sediment transport and naturally backfill any depressions caused by the PLGR. Ploughing and jetting ROV will be undertaken during cable burial in sediment habitats. These will penetrate up to 1m depth and will leave the trench backfilled.

Bedrock reef habitat

As bedrock reef habitat and sub features, including kelp bed, have a hard, rocky substrate, installation activities will not penetrate the surface. Therefore, there is no pressure-receptor pathway between the pressure 'penetration and/or disturbance of the substrate below the surface of the seabed' from the installation activities and the reef habitat.

No LSE will occur on the qualifying features of the Sanday SAC.

Sandbanks which are slightly covered by sea water all the time and mudflats or sandflats not covered by water at low tide

Sandbanks which are slightly covered by sea water all the time and mudflats or sandflats not covered by water at low tide were not found within Cable Corridor 2.3 Sanday to Shetland (Table 6-6). Therefore, there is no pressure-receptor pathway between these qualifying features and the pressure 'penetration and/or disturbance of the substrate below the surface of the seabed' from the installation activities.

No LSE will occur on the qualifying features of the Sanday SAC.

6.5.3.5 Abrasion/disturbance at the surface of the substratum

Activities considered by the assessment that cause the pressure 'abrasion/disturbance at the surface of the substratum' include activities such as the pre-lay grapnel run, cable laying and cable burial. These activities lead to limited or no loss of substrate from the system.

Prior to installation a PLGR will remove any debris along the cable route. The PLGR will be used within the footprint of the plough. During installation, a plough will be towed along the proposed Orkney cable corridors, which will simultaneously lay and bury the cable. The plough is towed across the seabed on skids and the plough share separates the sediment to bury the cable to the required burial depth. This action is in contact with the surface of the seabed and will cause a localised area of abrasion during the installation process. The footprint of the plough (skid and share) in contact with the seabed within Sanday SAC is less than 0.0065km^2 (worst case). In sections of hard seabed, such as reef habitats, where burial cannot be achieved, the cable may be surface laid and as such, only the seabed within the direct footprint of the cable (diameter up to 15cm – worst case) will be disturbed. The extent of the disturbance will be confined to a small and linear area.

Bedrock reef habitat

Bedrock reef habitats encompass a range of habitat types with varying sensitivity, resilience, and recoverability to abrasion, as determined by the benthic communities they support. The recoverability of rocky reef habitats from a one-off event of disturbance and abrasion are variable (up to 10 years) and are dependent on the algal regeneration and community species present. Kelp habitats have been assessed as having medium recoverability to abrasion/disturbance of the substratum or seabed and therefore are likely to be sensitive to repeated abrasion from movement of a surface laid cable, or from PLGR during route preparation (MarLIN, 2021). Ploughing and jetting ROV will only be used in sediment habitats, so there is no pressure-receptor pathway between this activity and the habitat.

As bedrock reef is widespread across Sanday SAC and the wider Orkney area, relative to the extent of this habitat, the area that will be impacted by the installation activities is negligible. Cable protection measures will be used to ensure the cable is stable and prevent persistent abrasion from the movement of the cable.

No LSE will occur on the qualifying features of the Sanday SAC.

Sandbanks which are slightly covered by sea water all the time and mudflats or sandflats not covered by water at low tide

Sandbanks which are slightly covered by sea water all the time and mudflats or sandflats not covered by water at low tide were not found within Cable Corridor 2.3 Sanday to Shetland (Table 6-6). Therefore, there is no pressure-receptor pathway between these qualifying features and the pressure 'abrasion/disturbance at the surface of the substratum' from the installation activities.

No LSE will occur on the qualifying features of the Sanday SAC.

6.5.3.6 Siltation rate changes including smothering (depth of vertical sediment overburden)

The marine cable installation will cause resuspension of sediments from the seabed into the water column. Jet trenching will cause a greater level of sediment suspension compared to the use of ploughing equipment. However, this is not proposed other than for small sections of the cables in the near shore area or sections of the cable that cannot be plough buried at the time of installation. The impact is a small, localised and temporary increase in turbidity.

The findings of a separate study on the Environmental Impact of Subsea Trenching Operations (Gooding et al., 2012) suggested that the impacts of subsea trenching operations on sediment disturbance are restricted to the immediate vicinity of the trench (less than 10m either side). Suspended solid concentrations, although elevated immediately after trenching, have been shown to

fall to ambient levels within 66m of trenching activity in hard ground areas and 70m in sandy areas with fine deposition occurring out to a maximum of 2km from the trench (Gooding et al., 2012). Fine material will, however, be rapidly diluted and dispersed in the water. Far-field deposition is predicted to be less than 1mm for both trenching by jetting and ploughing.

Bedrock reef habitat

The sensitivity of reef habitats and kelp beds is dependent on the volume of sediment that is displaced, and the communities which are present (MarLIN, 2021). Sediment rate changes may occur from the plough and jetting ROV during cable installation, where the greatest level of siltation range will occur within 10m of the trench on either side during these activities. However, as these activities will only occur in sediment habitats, and with deposition thicknesses in the far field of less than 1mm, there will be no significant impact to reef or kelp bed habitats.

No LSE will occur on the qualifying features of the Sanday SAC.

Sandbanks which are slightly covered by sea water all the time and mudflats or sandflats not covered by water at low tide

Sandbanks which are slightly covered by sea water all the time and mudflats or sandflats not covered by water at low tide were not found within Cable Corridor 2.3 Sanday to Shetland (Table 6-6). Therefore, there is no pressure-receptor pathway between these qualifying features and the pressure 'siltation rate changes including smothering (depth of vertical sediment overburden)' from the installation activities.

No LSE will occur on the qualifying features of the Sanday SAC.

6.5.4 Project specific mitigation

- M2 - Works at Cable Corridor 2.3 (Sanday landing point) will be scheduled to take place prior to the seal breeding season (June /July) to ensure works commence before seals arrive to breed and will target completion before the breeding period. An installation method statement to include timings will be agreed with Nature Scot prior to installation.

6.5.5 Conclusion

Project specific mitigation has been proposed to avoid installation during the peak harbour seal breeding season. Providing that the mitigation measures are implemented, the Project will not significantly disturb harbour seal within Cable Corridor 2.3 Sanday to Shetland and an LSE will not occur. No LSE has been identified on other qualifying features from cable installation activities. The in-combination assessment did not identify any relevant projects with the potential to act in-combination with the R100 project to cause a cumulative impact within the SAC.

In conclusion, the conservation objectives of the Sanday SAC will not be affected and there will be **no adverse effect on the integrity of the site either alone or in combination with other plans or projects**.

6.6 Yell Sound Coast SAC

6.6.1 Screening conclusion

The HRA screening identified that there was a potential LSE on the qualifying features harbour seal and otter from the following pressures:

- Visual (and above water noise) disturbance
- Underwater noise changes

6.6.2 Conservation objectives

To avoid deterioration of the habitats of harbour seal and otter (the qualifying features) or significant disturbance to harbour seal and otter, thus ensuring that the integrity of the site is maintained, and the site makes an appropriate contribution to achieving favourable conservation status for the qualifying feature; 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; and
- No significant disturbance of the species

6.6.3 Assessment against conservation objectives (includes feature assessment)

Yell Sound is one of the major channels in the Shetland Islands, dividing mainland Shetland from Yell. Yell Sound trends more or less north to southeast and is open to the Atlantic in the north-west and the North Sea in the south-east. It has a rocky coastline with numerous small islands and there are several voes on both shores of the sound. The SAC consists of 11 separate terrestrial regions of coastline and in addition extends up to approximately 500m seaward into the sound. The combined area of these regions across the SAC is 15.44km^2, with 53.2% of that in the marine environment (JNCC, 2021). Cable Corridor 2.2 Shetland to Yell passes through the Yell Sound, passing within the SAC boundary at Samphrey island.

6.6.3.1 Visual (and above water noise) disturbance

A summary of the qualifying features and cable corridors screened in for visual (and above water noise) disturbance in Yell Sound Coast SAC is provided in Table 6-7.

Table 6-7 Summary of LSE for visual (and above water noise) disturbance for the qualifying features of Yell Sound Coast SAC

Feature	Cable 2.1	Cable 2.2	Cable 2.3	Cable 2.4	Cable 2.8
Harbour Seal					
Otter					

Note: Dark blue cells denote where cable corridors are within protected site.

Harbour seal

The Yell Sound Coast supports over 200 harbour seals, which is one of the largest groups of harbour seals in Shetland and one of the most northerly groups in the UK. The seals use the offshore islands for hauling out, moulting and pupping. The undisturbed shores and adjacent areas of sea also facilitate adult social interactions, mating and act as a nursery area(NatureScot, 2021b). The landfalls at each end of Cable Corridor 2.2 Shetland to Yell do not overlap with the SAC. However, part of the cable corridor offshore overlaps with the SAC including Samphrey island and its surrounding waters. At this location, the cable corridor is approximately 70m south of Samphrey island where seals could be hauled out.

The Project will typically involve the Main lay vessel and one ancillary support vessel. Cable installation activities will be a continuous, transient but temporary occurrence (approximately 6 days per cable corridor). As the installation activities will move at a maximum speed of 2 knots, the highly

precautionary area of disturbance will move with the vessel and the effects will be brief in any one place and localised to the installation activity. Animals will not be subject to lasting or prolonged periods of disturbance. The installation vessels will only be within 500m of the land at Samphrey for 2.4km. Should ploughing be undertaken along this cable corridor, the vessel would only be laying within 500m of the SAC for approximately 4 hours (based on an installation speed of 0.6km/hour for up to 2km and 1km, respectively), worst case. The installation activity is a one-off occurrence and will not be repeated. Therefore, as seal hauled out within Yell Sound Coast SAC will only be subject to a one-off, temporary and localised disturbance, the installation activities will not result in a significant adverse effect on nearby individuals.

No LSE will occur on the qualifying features within Yell Sound Coast SAC.

Otter

Otter (*Lutra lutra*) are an EPS, and as such are fully protected in Scotland (not only in protected sites) under the Conservation (Natural Habitats, &c.) Regulations 1994 (as amended) (NatureScot, 2019). The Yell Sound Coast SAC supports approximately 180 otter which are genetically and morphologically distinct from their mainland counterparts (NatureScot, 2011b). Within Shetland, the Yell Sound area has the highest density of otter and is believed to support more than 2.5% of the entire GB otter population (JNCC, 2021b). The site supports otter holts and easy access to fresh water with the extensive availability of algal beds in the marine environment used for foraging. While there is no specific breeding season for otter a study found that in Shetland there was a birth peak in June (Kruuk, Conroy and Moorhouse, 1987). The most recent assessment (2012) of otter in the SAC has classed the condition as 'unfavourable no change' (NatureScot, 2021b).

Otters are typically sensitive to anthropogenic changes in habitat and disturbance as their coastal habitat use is highly dependent on the inclusion of freshwater features. As such, the location of their holts (or dens) is restricted, with any changes to their surrounding environment potentially causing disturbance/harm to the species (Roos et al., 2015).

Cable Corridor 2.2 Shetland to Yell overlaps with the SAC south of Samphrey island but the landfalls at each end of the cable corridor are not within the SAC. As the landfalls of Cable Corridor 2.2 Shetland to Yell are not located on the coast within the Yell Sound SAC there is no potential for the holts to be directly disturbed by the installation activities.

No LSE will occur on the qualifying features within Yell Sound Coast SAC.

6.6.3.2 Underwater noise changes

A summary of the qualifying features and cable corridors screened in for underwater noise changes in Yell Sound Coast SAC is provided in Table 6-8.

Table 6-8 Summary of LSE for underwater noise changes for the qualifying features of Yell Sound Coast SAC

Feature	Cable 2.1	Cable 2.2	Cable 2.3	Cable 2.4	Cable 2.8
Harbour Seal					

Note: Dark blue cells denote where cable corridors are within protected site.

The only potential source of noise capable of having a significant effect on harbour seal is the use of USBL devices. Seals present in the vicinity of installation activities could be susceptible to disturbance from USBL devices given the overlap in their hearing ranges and frequencies generated by USBL devices. As stated previously however, recent studies have shown that individuals will quickly return to an area that was subjected to even high-intensity noise emissions within a short period of time (Russell et al., 2016).

The Project will typically involve the Main lay vessel and one ancillary support vessel. Cable installation activities will be a continuous, transient but temporary occurrence (approximately 6 days per cable corridor). As the installation activities will move at a maximum speed of 2 knots, the highly precautionary area of disturbance will move with the vessel and the effects will be brief in any one place and localised to the installation activity. Animals will not be subject to lasting or prolonged periods of disturbance. Recent studies have shown that individuals will quickly return to an area that was subjected to even high-intensity noise emissions within a short period of time (Russell et al., 2016). As such, noise and associated temporary disturbance from the cable laying activities themselves will not result in a significant adverse effect on nearby individuals. Cable Corridor 2.2 Shetland to Yell will pass between the northern and southern areas of the SAC, as the SAC is comprised of multiple areas. This could cause a temporary restriction to seal moving between the areas. However, as the vessel will be moving continuously through the area, and seals will be able to move faster than the typical vessel speed (2km/h), there will be no barrier to seals moving between the SAC areas.

As Cable Corridor 2.2 Shetland to Yell overlaps directly with the eastern extent of the SAC, there is the potential that the USBL noise could disturb individuals in the vicinity of the SAC.

The installation vessels will only be within 1.1km of the land at Samphrey for approximately 3.8km. Should ploughing be undertaken along this cable corridor, the vessel would only be laying within 1.1km of the SAC for approximately 6.3 hours (based on an installation speed of 0.6km/hour for up to 2km and 1km, respectively), worst case. The installation activity is a one-off occurrence and will not be repeated. Therefore, as seal within Yell Sound SAC will only be subject to a one-off, temporary and localised disturbance, the installation activities will not result in a significant adverse effect on nearby individuals.

No LSE will occur on the qualifying features within Yell Sound SAC.

Otter

Otter are an EPS, and as such are fully protected in Scotland (not only in protected sites) under the Conservation (Natural Habitats, &c.) Regulations 1994 (as amended) (NatureScot, 2019). Otter populations in coastal areas utilise shallow, inshore marine areas for feeding but also require fresh water for bathing and terrestrial areas for resting and breeding holts (JNCC, 2021b). There are currently no studies which record the hearing range of Eurasian otters. Otter hearing is primarily adapted to air and is not underwater specialised, with lower sensitivity than in other amphibious marine carnivores such as seals and sea lions (Ghoul and Reichmuth 2016). A study observing hearing in sea otters (*Enhydra lutris*) reported the otters aerial hearing at >22 kHz and low frequency at <2 kHz with reduced under-water hearing at frequencies below 1 kHz (Ghoul and Reichmuth, 2013). USBL devices typically operate at a frequency of 24 - 33.5 kHz (Xodus Group, 2019a). As such, there is no overlap between the hearing frequency of otters and the USBL devices, so there will be no significant adverse effect on nearby otter.

No LSE will occur on the qualifying features within Yell Sound SAC.

6.6.4 Project specific mitigation

None specified.

6.6.5 Conclusion

As there are no landing points within Yell Sound SAC, there will be no disturbance to otter or their holts. As such, the otter population will not be significantly disturbed by the Project.

The installation activities will be a transient, temporary occurrence that will not affect harbour seal in the long-term. There is also no overlap between the hearing frequency of otters and the USBL device

frequency. As such, the harbour seal and otter populations will not be significantly disturbed by the Project.

The in-combination assessment did not identify any relevant projects with the potential to act in-combination with the R100 project to cause a cumulative impact within the SAC.

The conservation objectives of the Yell Sound SAC will not be affected and therefore there will be **no adverse effect on the integrity of the site either alone or in combination with other plans or projects.**

6.7 Mousa SAC

6.7.1 Screening conclusion

The HRA screening identified that there was a potential LSE on the qualifying feature 'harbour seal' from the following pressures:

- Underwater noise changes

6.7.2 Conservation objectives

To avoid deterioration of the habitats of the qualifying species or significant disturbance to the qualifying species, thus ensuring that the integrity of the site is maintained; and to ensure for the qualifying species that the following are maintained in the long term:

- Population of the species as a viable component of the site
- Distribution of the species within 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

6.7.3 Assessment against conservation objectives (includes feature assessment)

6.7.3.1 Underwater noise changes

A summary of the qualifying features and cable corridors screened in for underwater noise changes in Yell Sound Coast SAC is provided in Table 6-9.

Table 6-9 Summary of LSE for underwater noise changes for the qualifying features of Mousa SAC

Feature	Cable 2.1	Cable 2.2	Cable 2.3	Cable 2.4	Cable 2.8
Harbour Seal					

Note: Blue cells denote cable corridors where screening has identified a potential for LSE.

Harbour Seal

The exposed rocky island of Mousa, off the east coast of Shetland Mainland, supports one of the largest groups of harbour seal in Shetland and is one of the most northerly groups in the UK. The large rocky tidal pools on the island are of particular importance, as they are frequently used by the seals for pupping, breeding and moulting, and provide shelter from the exposed conditions on the open coast. The site supports between 251 and 500 seals, which is equivalent to just over 1% of the UK population (JNCC, 2021a). Cable Corridor 2.3 Sanday to Shetland is 11.2km south of the SAC; within the foraging range of seals from Mousa SAC.

The only potential source of noise capable of having a significant effect on harbour seal is the use of USBL devices. Seals present in the vicinity of installation activities could be susceptible to disturbance from USBL devices given the overlap in their hearing ranges and frequencies generated by USBL devices. As stated previously however, recent studies have shown that individuals will quickly return to an area that was subjected to even high-intensity noise emissions within a short period of time (Russell et al., 2016). Also, the highly precautionary calculations identified that disturbance may occur within 1.1km of the USBL, so the zone of influence from the installation activities does not overlap with the SAC. None of the cable corridors are located close enough to the SAC to disturb seals at their haul-out sites within the SAC.

Additionally, the cable installation activities will be a continuous, transient but temporary occurrence (approximately 6 days per cable corridor). As the installation activities will move at a maximum speed of 2 knots, the highly precautionary area of disturbance will move with the vessel and the effects will be brief in any one place and localised to the installation activity. Animals will not be subject to lasting or prolonged periods of disturbance. As such, noise and associated temporary disturbance from the cable laying activities themselves will not result in a significant adverse effect on nearby individuals.

No LSE will occur on the qualifying features within the Mousa SAC.

6.7.4 Project specific mitigation

None specified.

6.7.5 Conclusion

As there is no overlap in the zone of influence and the SAC there will be no significant disturbance to seals within the site. Additionally, the installation activities will be a transient, temporary occurrence that will not affect harbour seal in the long-term. As such, the harbour seal population will not be significantly disturbed by the Project.

The in-combination assessment did not identify any relevant projects with the potential to act in-combination with the R100 project to cause a cumulative impact within the SAC.

In conclusion, the conservation objectives of the Mousa SAC will not be affected and therefore there will be **no adverse effect on the integrity of the site either alone or in combination with other plans or projects.**

6.8 Mousa SPA

6.8.1 Screening conclusion

The HRA screening identified that there was a potential LSE from the pressure 'visual (and above water noise) disturbance' on the qualifying features:

- Arctic tern (breeding)

6.8.2 Conservation objectives

To avoid deterioration of the habitats of the qualifying species or significant disturbance to the qualifying species, thus ensuring that the integrity of the site is maintained; and

To ensure for the qualifying species that the following are maintained in the long term:

- Population of the species as a viable component of the site
- Distribution of the species within 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

6.8.3 Assessment against conservation objectives (includes feature assessment)

6.8.3.1 Visual (and above water noise) disturbance

A summary of the qualifying features and cable corridors screened in for visual (and above water noise) disturbance in Mousa SPA is provided in Table 6-10.

Table 6-10 Summary of LSE for visual (and above water noise) disturbance for the qualifying features of Mousa SPA

Feature	Cable 2.1	Cable 2.2	Cable 2.3	Cable 2.4	Cable 2.8
Arctic tern					

Note: Blue cells denote cable corridors where screening has identified a potential for LSE.

Arctic tern (Breeding)

The last population estimate of Arctic tern for Mousa SPA (recorded in 1994) indicated that the SPA supports 1000 breeding pairs, which was equivalent to 2% of the GB population at the time (NatureScot, 1994). Arctic tern are present in Shetland year-round. They are most sensitive to disturbance during their breeding season, which is May to September (NatureScot, 2020). However, as the closest cable corridor (Cable Corridor 2.3 Sanday to Shetland) is 11.9km from the SPA, nesting birds within the SPA will not be disturbed by the installation activities. Therefore, there is only potential for installation activities associated with Cable Corridor 2.3 Sanday to Shetland to disturb Arctic tern foraging from the SPA.

In the Joint SNCB Interim Displacement Advice Note (JNCC, 2017b), Arctic tern are classed as having a moderate habitat specialisation (score of 3 out of 5) and a low susceptibility to disturbance (score of 2 out 5). This finding is in line with other studies which indicate that Arctic tern have a low sensitivity to vessel disturbance (NatureScot, 2017b). Vessel activity through areas where these species are present on the surface may result in temporary displacement from optimal areas for feeding/loafing. A report conducted by JNCC in 2014, on the usage of marine environment by Arctic terns predicted abundances at the cable corridor to be low at 0.00-0.08 individuals/km^2 (Wilson et al., 2014).

Installation vessels will be slow moving (typically 1 knot (2km/hr)) which is slower than walking speed (generally assumed to be 5km/hr), and at times stationary. At such slow speeds, the vessels are effectively stationary in terms of bird displacement. Studies have shown that slow moving vessels cause little disturbance to birds and birds may habituate to frequent and relatively benign events and noises (Natural England and Suffolk Coast and Heaths, 2012). Additionally, Arctic tern show little escape or avoidance behaviour in response to disturbance from vessels (Garthe and Hüppop, 2004).

As no nesting Arctic tern will be disturbed, and individuals foraging at sea will only be subject to temporary and localised disturbance, there will be no significant disturbance. Therefore, distribution of the species within the site and their population as a viable component of the SPA will be maintained.

No LSE will occur on the qualifying features within Mousa SPA.

6.8.4 Project specific mitigation

None specified.

6.8.5 Conclusion

Visual (and above water noise) disturbance caused by the installation works will not disturb nesting Arctic tern within Mousa SPA. Any temporary disturbance to Arctic tern from the SPA foraging at sea will be minimal and localised. The distribution of the species within the site and their population as a viable component of the SPA will be maintained.

The in-combination assessment did not identify any relevant projects with the potential to act in-combination with the R100 project to cause a cumulative impact within the SPA.

In conclusion, there will be **no adverse effect on the integrity of the site either alone or in combination with other plans or projects.**

6.9 East Sanday Coast SPA and Ramsar

6.9.1 Screening conclusion

The HRA screening identified that there was a potential LSE from the pressure 'visual (and above water noise) disturbance' on the qualifying features:

Wintering

- Bar-tailed godwit
- Purple sandpiper
- Turnstone

6.9.2 Conservation objectives

To avoid deterioration of the habitats of the qualifying species or significant disturbance to the qualifying species, thus ensuring that the integrity of the site is maintained; and

To ensure for the qualifying species that the following are maintained in the long term:

- Population of the species as a viable component of the site,
- Distribution of the species within 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.

6.9.3 Assessment against conservation objectives (includes feature assessment)

6.9.3.1 Visual (and above water noise) disturbance

A summary of the qualifying features and cable corridors screened in for visual (and above water noise) disturbance in East Sanday Coast SPA is provided in Table 6-11.

Table 6-11 Summary of LSE for visual (and above water noise) disturbance habitat for the qualifying features of East Sanday Coast SPA

Feature	Cable 2.1	Cable 2.2	Cable 2.3	Cable 2.4	Cable 2.8
Bar-tailed godwit					
Purple sandpiper					
Turnstone					

Note: Dark blue cells denote where cable corridors are within protected site.

Bar-tailed godwit, purple sandpiper, turnstone (Non-breeding)

Table 6-12 provides the last population estimate (recorded in 1997; NatureScot, 1994) and condition status (2015) for the three species.

Table 6-12 Population estimates and condition status

	Bar-tailed godwit	Purple sandpiper	Turnstone
Population estimate	600 individuals	830 individuals	1,400 individuals
% of the GB population	1.2%	2%	2%
Condition status	Favourable maintained	Favourable maintained	Favourable maintained
Present	October to March	October to March	October to March

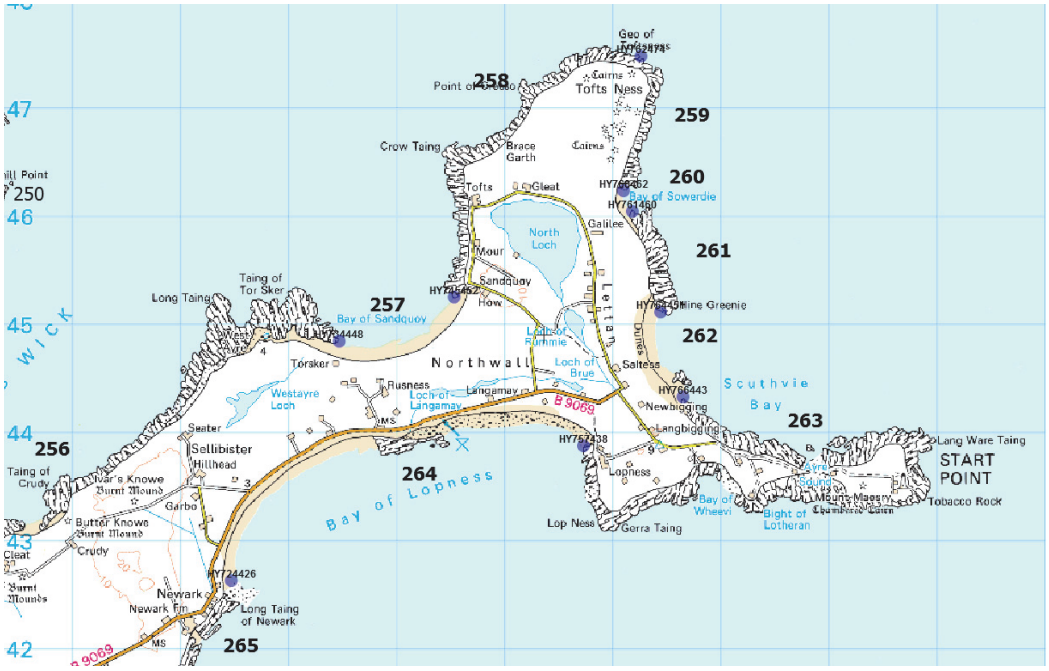
Cable Corridor 2.3 Sanday to Shetland crosses through the marine area of East Sanday Coast SPA. The Sanday landing point is within the SPA at Scuthvie Bay. There is therefore the potential for cable installation activities associated with the landfall operations to disturb the qualifying features non-breeding bar-tailed godwit, purple sandpiper, turnstone should works occur over the winter months between October and March.

Collop (2016) states that disturbance from human activity can "impact birds' energy budgets by reducing the time and area available for feeding, as well as through the additional energetic costs of fleeing the source of disturbance. Survival will only be affected, however, if birds are unable to compensate by moving elsewhere and/or increasing the amount of time spent feeding or their foraging efficiency".

A waterbird disturbance mitigation toolkit informing estuarine panning and construction projects (Heminway et al., 2013), indicates the sensitivity of two of the three qualifying species to works disturbance. Bar-tailed godwit has moderate sensitivity i.e., it is a relatively disturbance tolerant species that habituates to works rapidly. They are also tolerant of people, allowing an approach range as close as 40-400m before flushing when confronted with a lone walker on a mudflat. However, they rapidly abandon highly disturbed areas in favour of quieter areas to forage and roost. Turnstone has low sensitivity and are thought to be an extremely tolerant species that habituates rapidly. They are tolerant of people, allowing approach as close as 30-50m before flushing when confronted with a lone walker on the mudflat (and will feed closely around people on harbours).

In 2012 the waders of the East Sanday Coast SPA were re-surveyed (Foster et al., 2012). The surveys were undertaken in November 2012 and the general observations were that waders were observed actively flying from the shore to fields. Most often the movements were noted during high tide as birds left feeding areas on the shore to either roost or feed in neighbouring fields or to travel to an alternative shore. Turnstone was recorded to frequently use farmland when the shoreline was inaccessible and bar-tailed godwit was frequently observed flying inland, generally at height and not settling in fields. Observers also noted that some birds crossed the island, particularly at narrower areas such as Start Point close to the landing point for Cable Corridor 2.3 Sanday to Shetland, and between roosting/feeding areas such as the Bay of Lopness and Scuthvie Bay (see Figure 6-2).

Figure 6-2 Eastern tip of Sanday, an area which observations revealed interchange between coastal feeding/roosting sites. Source Foster et al (2012)



Note: Black numbers on the map refer to the survey count sections

The landfall works will be a one-off event over a short duration (approximately 7 days) within a relatively small area of the SPA; the SPA covers approximately half the coastline of Sanday. Given the relative low sensitivity of the waders to human activities and their apparent tendency to find alternative feeding grounds either inland on farmland or on other beaches nearby, any disturbance to the qualifying species of the SPA will be minimal.

It is therefore concluded that any disturbance will be temporary and localised and will not result in any likely significant effects on bar-tailed godwit, purple sandpiper, turnstone. Therefore, distribution of the species within the site and their population as a viable component of the SPA, will be maintained.

No LSE for Cable Corridors 2.3 Sanday to Shetland will occur on the qualifying features within the East Sanday Coast SPA.

6.9.4 Project Specific Mitigation

None specified

6.9.5 Conclusion

Visual (and above water noise) disturbance caused by the installation works within Cable Corridor 2.3 Sanday to Shetland will not result in LSE on bar-tailed godwit, purple sandpiper and turnstone within the East Sanday Coast SPA. Any temporary disturbance to these species will be minimal and localised. The distribution of the species within the site and their population as a viable component of the SPA will be maintained.

The in-combination assessment did not identify any relevant projects with the potential to act in-combination with the R100 project to cause a cumulative impact within the SPA.

In conclusion, there will be **no adverse effect on the integrity of the site either alone or in combination with other plans or projects.**

6.10 Bluemull and Colgrave Sounds SPA

6.10.1 Screening conclusion

The HRA screening identified that there was a potential LSE from the pressure 'visual (and above water noise) disturbance' on the qualifying features:

- Red-throated diver (breeding)

6.10.2 Conservation objectives

To avoid deterioration of the habitats of the qualifying species or significant disturbance to the qualifying species, subject to natural change, thus ensuring that the integrity of the site is maintained in the long-term and it continues to make an appropriate contribution to achieving the aims of the Birds Directive for each of the qualifying species. This contribution will be achieved through delivering the following objectives for each of the site's qualifying features:

- Avoid significant mortality, injury and disturbance of the qualifying features, so that the distribution of the species and ability to use the site are maintained in the long-term
- To maintain the habitats and food resources of the qualifying features in favourable condition

6.10.3 Assessment against conservation objectives (includes feature assessment)

6.10.3.1 Visual (and above water noise) disturbance

A summary of the qualifying features and cable corridors screened in for visual (and above water noise) disturbance in Bluemull and Colgrave Sounds SPA is provided in Table 6-13.

Table 6-13 Summary of LSE for visual (and above water noise) disturbance for the qualifying features of Bluemull and Colgrave Sounds SPA

Feature	Cable 2.1	Cable 2.2	Cable 2.3	Cable 2.4	Cable 2.8
Red throated diver					

Note: Dark blue cells denote where cable corridors are within protected site.

Red-throated diver (breeding)

Bluemull and Colgrave Sounds SPA was designated to protect the important feeding grounds for red-throated diver between the islands of Unst, Yell and Fetlar. The SPA falls within the foraging ranges of a high concentration of nesting birds on Yell and South Unst. The SPA has an area of 46.65km^2 (NatureScot, 2016a). The marine waters encompass the north coast of Yell east to Winna Ness on Unst and down through Colgrave Sound as far as White Hill of Vatsetter. The sounds between the islands are quite shallow with sea depth increasing rapidly east and south of Fetlar. The coastline of the SPA is mostly cliff with some sand beaches and bays in between. Cable Corridor 2.1 Yell to Unst passes through the northwest of the SPA, with the marine areas for both landing points within the site boundary.

Bluemull and Colgrave Sounds SPA hosts the second largest concentration of foraging red-throated diver during the breeding season in the UK (Dillon et al., 2009). The last adult population estimate of red-throated diver within the SPA (recorded in 2006) was 194 breeding pairs, which was equivalent to 15.4% of the UK population at the time (NatureScot, 2016a). In Shetland red-throated diver breed

inland on freshwater locks on blanket bog and moorland. As the Bluemull and Colgrave Sounds SPA is an exclusively marine site, there will be no disturbance to nesting individuals. Only individuals foraging within the cable corridor have the potential to be disturbed by the Project.

Red-throated diver have a mean-max foraging range of 9km (Woodward et al., 2019). In the Joint SNCB Interim Displacement Advice Note (Joint SNCB, 2017), red-throated diver is classed as having a high habitat specialisation (score of 4 out of 5) and very high susceptibility to disturbance (score of 5 out 5). This finding is in line with other studies which indicate that red-throated divers are highly sensitive to anthropogenic activity and move away from ships in the marine environment (Schwemmer et al., 2011). One third of the UK's red-throated divers breed in Shetland during summer (Dillon et al 2009), though most disperse from Shetland waters during winter months.

Previous research data gathered for the Bluemull and Colgrave Sounds SPA show that there are predicted to be high densities (40 or greater) of red-throated diver across the SPA (see Figure 6-3, Drawing P2308-BIRD-008_SH). Cable Corridor 2.1 Yell to Unst is predominantly outside of the red-throated diver distribution, likely due to the high current speeds in this area. However, in the waters at the Unst landing point there is estimated to be densities of 40 or more red-throated diver (Figure 6-3 Drawing Reference: P2308-BIRD-008_SH).

Installation vessels will be slow moving (approximately 2km/hr), slower than walking speed (generally assumed to be 5km/hr), and at times stationary. At such slow speeds, the vessels are effectively stationary in terms of bird displacement. Studies have shown that slow moving vessels cause little disturbance to birds and birds may habituate to frequent and relatively benign events and noises (Natural England and Suffolk Coast and Heaths, 2012). In addition, whilst red-throated diver are sensitive to visual disturbance, negligible disturbance has been shown to occur by vessels moving at less than 2km/h (Burger et al., 2019). Additionally, any such disturbance will take place in the context of existing sources of disturbance such as commercial shipping, recreational boating etc. For example, Belmont ferry terminal, which is approximately 200m southeast of the BMH, has approximately 50 sailings a day, connecting Unst to Fetlar and Yell islands (Appendix A, Cable 2.1 Unst landing point intertidal report). The duration of operations along Cable Corridor 2.1 Yell to Unst are approximately 6 days. Given the wider area available, birds are likely to be able to find alternative feeding / loafing grounds in the short term. As red-throated diver have highest abundances in the site during the breeding season, should any works overlap with the winter months abundances will be lower and, disturbance to red-throated diver will be minimal.

Due to the temporary and localised nature of installation activities, there will be no significant disturbance of red-throated diver and their population as a viable component of (and distribution within) Bluemull and Colgrave Sounds SPA will be maintained.

6.10.3.2 In combination effects

The assessment has also considered the potential for in-combination effects with other projects on the SPA qualifying feature. One relevant project has been identified[5], the Nova Innovation Shetland Tidal Array, where there is a common receptor pathway that could lead to in-combination visual disturbance on red-throated diver. The Nova Innovation project is described in Section 6.3.7. Nova Innovation applied to install five turbines during the first stage of development and an assessment of the impacts to the Bluemull and Colgrave Sound SPA was deemed insignificant. This assessment remains valid for the current project which involves installing a sixth turbine at the site.

It is possible that visual disturbance could occur from the increased vessel traffic from both projects. A study carried out at another tidal array site, the EMEC at Fall of Warness Shetland, identified that there was some disturbance and redistribution of birds, including red-throated diver, during

[5] Method for identifying relevant projects is described in Section 6.3.7.

construction however, numbers returned to previous levels once the turbines were operational (Long, 2017). The analysis suggested the temporary effects of disturbance were likely to be due to increased vessel movements (Long, 2017; Xodus Group, 2019b). However, Nova Innovation has specified that the multicat vessels being used for installation at the Shetland Tidal Array are considerably smaller and less intrusive than those used at the EMEC site. Additionally, Cullivoe Pier is a busy fishing port located 1km from the SPA and has traffic year-round indicating a base level of traffic noise and visual disturbance.

While there will be an increase in the area of vessel activity due to the Cable Corridor 2.1 Yell to Unst cable installation, as previously described installation vessels will be effectively stationary in terms of bird displacement. It is therefore concluded that any temporary cumulative disturbance within the SPA will be brief, minimal and localised and will not result in any likely significant effects on red-throated diver. The extent and distribution of red-throated diver will not be significantly impacted, and the structure, functioning and integrity of the protected sites will be maintained. No significant in-combination effects will occur.

No LSE will occur on the qualifying features within the Bluemull and Colgrave Sounds SPA.

6.10.4 Project specific mitigation

Without prejudice to the conclusion of no LSE as best practice the Applicant proposes that the following mitigation be implemented:

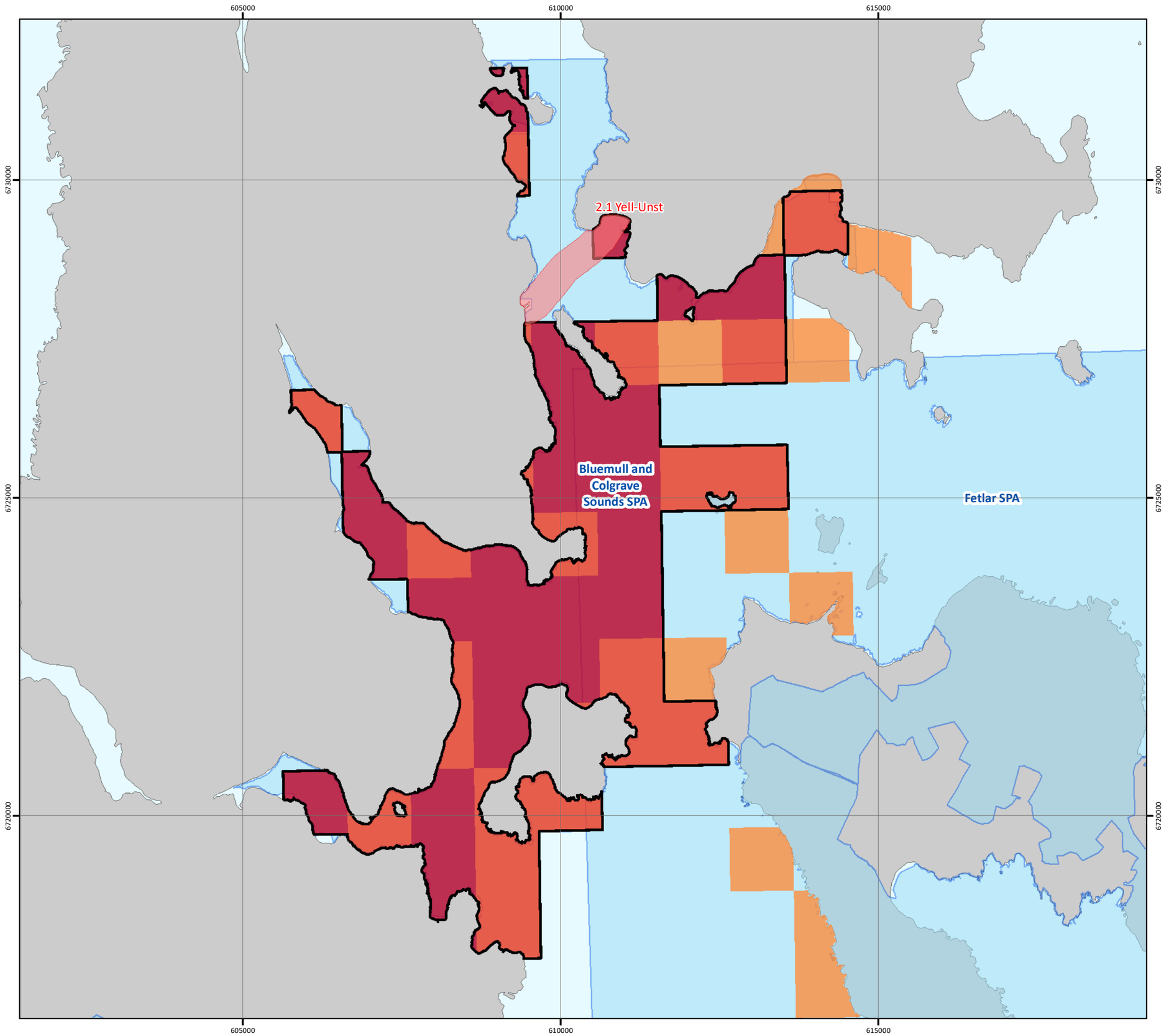
- M4 - All vessels associated with the cable installation operations within Cable Corridor 2.1 Yell to Unst will follow the "Guide to Best Practice for Watching Marine Wildlife' guidance on birds where practicable and reduce their speed on approach to the cable corridor to below 6knots should rafting birds be observed ahead.

6.10.5 Conclusion

The Bluemull and Colgrave Sounds SPA is a marine site designated to protect foraging red-throated diver. There will therefore be no LSE on nesting birds. Any visual (and above water noise) disturbance of foraging red-throated diver, caused by the installation works, will be temporary and localised. Without prejudice to the conclusion of no LSE, the Applicant is proposing to implement best practice in the form of following the wildlife watching code. The distribution of the species within the site and their population as a viable component of the SPA, will be maintained.

The in-combination assessment identified one relevant project with the potential to act in-combination with the R100 project to cause a cumulative impact within the SPA. Assessment concluded that no significant in-combination effects will occur.

In conclusion, there will be **no adverse effect on the integrity of the site either alone or in combination with other plans or projects.**



SCOTTISH ISLES FIBRE OPTIC CABLE PROJECT

BIRD ACTIVITY
Red-Throated Diver Distribution in Bluemull and Colgrave Sounds SPA

Drawing No: P2308-BIRD-008_SH | **B**

Legend

- Cable Route Applicaton Corridor

Red-Throated Diver Predictive Bird Distribution (per km^2)

- 4 or less
- 4 - 12
- 12 - 24
- 24 - 40
- 40 or greater

- Maximum Curvature

Protected Site

- SPA

N W E S

NOTE: Not to be used for Navigation

Date	12 October 2021
Coordinate System	WGS 1984 UTM Zone 30N
Projection	Transverse Mercator
Datum	WGS 1984
Data Source	ESRI; JNCC; OSOD; SNH
File Reference	J:\P2308\Mxd\11_BIRD\ P2308-BIRD-008_SH.mxd
Created By	Jessica Harvey
Reviewed By	Chris Dawe
Approved By	Jill Hobbs

BT Global Marine intertek

0 1 2 3 4 km

6.11 East Mainland Coast, Shetland SPA

6.11.1 Screening conclusion

The HRA screening identified that the pressure 'visual (and above water noise) disturbance' could have a potential LSE on the qualifying features:

- Great northern diver (non-breeding)
- Red throated diver (breeding)
- Slavonian grebe (non-breeding)

6.11.2 Conservation objectives

To avoid deterioration of the habitats of the qualifying species or significant disturbance to the qualifying species, subject to natural change, thus ensuring that the integrity of the site is maintained in the long-term and it continues to make an appropriate contribution to achieving the aims of the Birds Directive for each of the qualifying species. This contribution will be achieved through delivering the following objectives for each of the site's qualifying features:

- Avoid significant mortality, injury and disturbance of the qualifying features, so that the distribution of the species and ability to use the site are maintained in the long-term
- To maintain the habitats and food resources of the qualifying features in favourable condition

6.11.3 Assessment against conservation objectives (includes feature assessment)

6.11.3.1 Visual (and above water noise) disturbance

A summary of the qualifying features and cable corridors screened in for visual (and above water noise) disturbance in East Mainland Coast SPA is provided in Table 6-14.

Table 6-14 Summary of LSE for Visual (and above water noise) disturbance habitat for the qualifying features of East Mainland Coast SPA

Feature	Cable 2.1	Cable 2.2	Cable 2.3	Cable 2.4	Cable 2.8
Great northern diver					
Red throated diver					
Slavonian grebe					

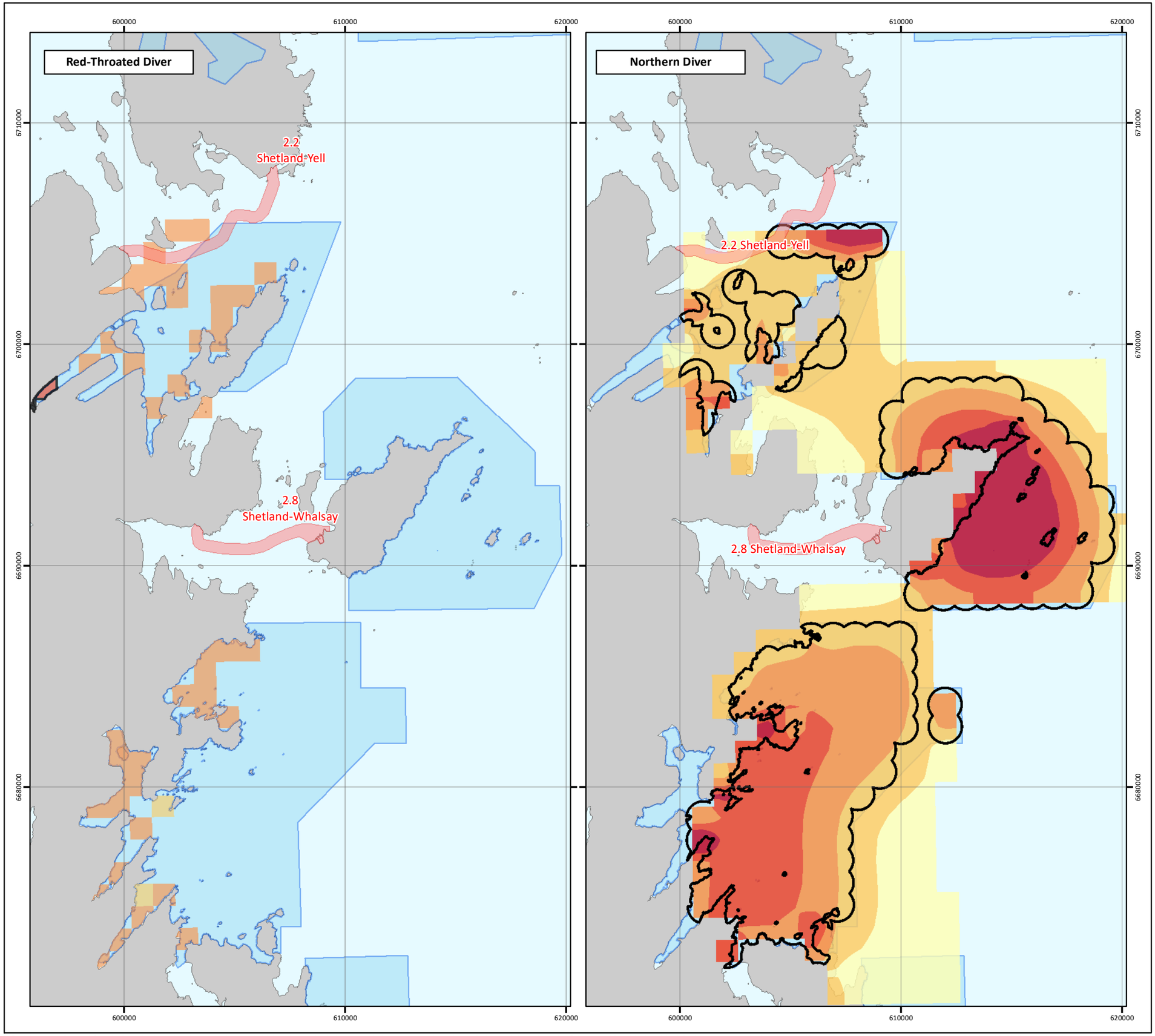
Note: Blue cells denote cable corridors where screening has identified a potential for LSE. Dark blue cells denote where cable corridors are within protected site.

The East Mainland Coast SPA covers an area of 256.47km^2 over three separate areas along the east coast of Shetland Mainland. These areas were selected to protect wintering grounds used for feeding, moulting and roosting by diving species who migrate to Mainland to overwinter. The SPA also protects important foraging areas for breeding red-throated diver; falling within the foraging range of high concentrations of nesting territories. The site generally has water depths of less than 40m, with seaweed cover common throughout but variable in extent and composition. The east coast is relatively sheltered, and much of the shore is cliff interspersed with sandy beaches and gravelly to sandy bays. The distribution of the qualifying interests within the site are displayed in Figures 6-4 and 6-5 (Drawings: P2308-BIRD-009_SH and P2308-BIRD-010_SH).

Cable Corridors 2.2 Shetland to Yell is partly located within the SPA, with the remaining Cable Corridors all located within the foraging ranges of one or more of the qualifying species. The landing points for Cable Corridor 2.2 Shetland to Yell are outside of the SPA.

SCOTTISH ISLES FIBRE OPTIC CABLE PROJECT

BIRD ACTIVITY
Bird Distribution in East Mainland Coast SPA
Sheet 1 of 2



Drawing No: P2308-BIRD-009_SH	B

Legend

- Cable Route Applicaton Corridor

Red-Throated Diver Predictive Bird Distribution (per km²)

- 4 or less
- 1 - 12
- 12 - 24
- 24 - 40
- 40 or greater
- Maximum Curvature

Northern Diver Predictive Bird Distribution (per km²)

- 0.25 or less
- 0.25 - 0.5
- 0.5 - 0.75
- 0.75 - 1
- 1 or greater

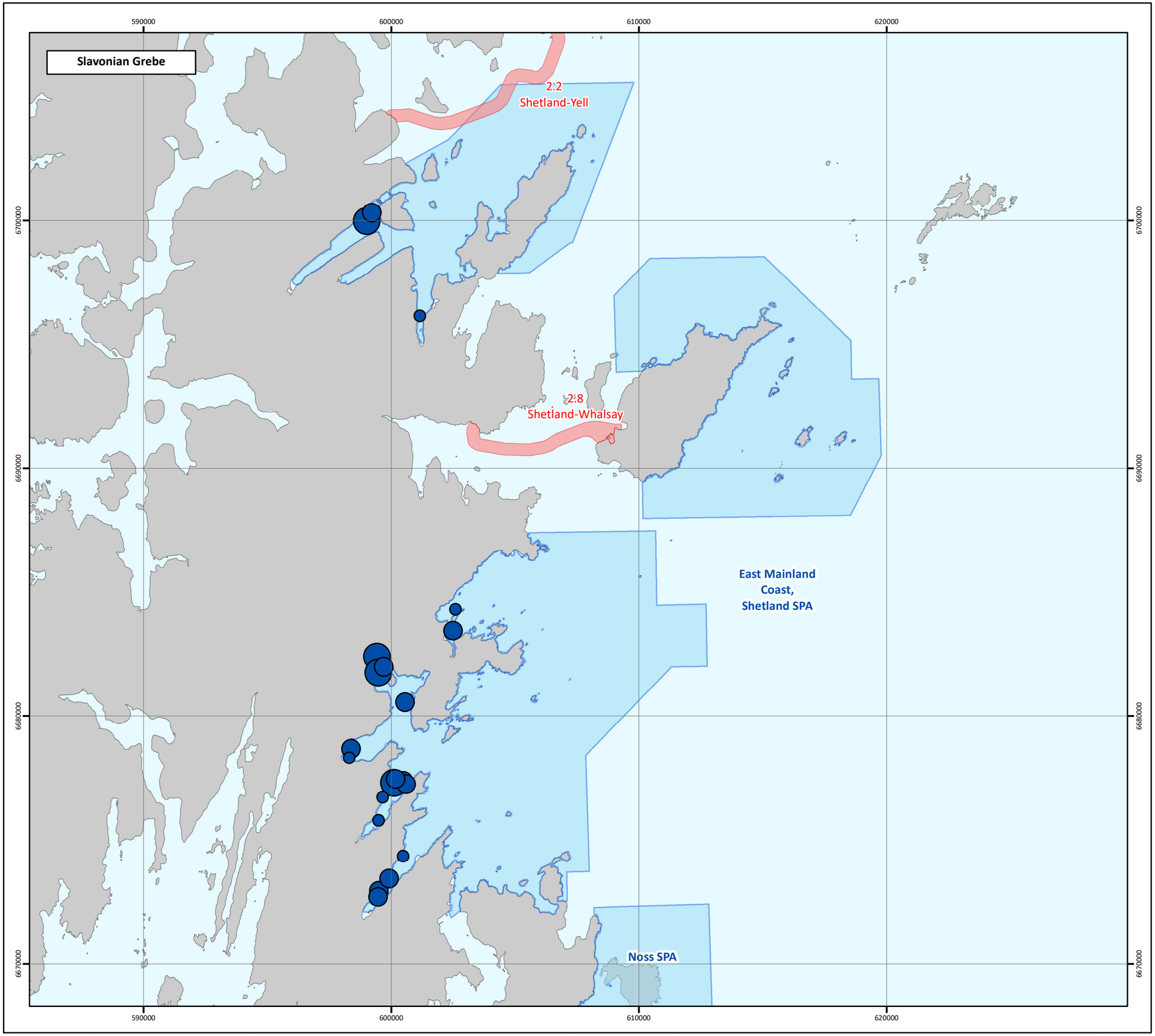
Protected Site

- SPA

NOTE: Not to be used for Navigation

Date	12 October 2021
Coordinate System	WGS 1984 UTM Zone 30N
Projection	Transverse Mercator
Datum	WGS 1984
Data Source	ESRI; JNCC; OSOD; SNH
File Reference	J:\P2308\Mxd\11_BIRD\ P2308-BIRD-009_SH.mxd
Created By	Jessica Harvey
Reviewed By	Chris Dawe
Approved By	Jill Hobbs

0 2.5 5 7.5 10 km



SCOTTISH ISLES FIBRE OPTIC CABLE PROJECT

BIRD ACTIVITY
Bird Distribution in East Mainland Coast SPA Sheet 2 of 2

Drawing No: P2308-BIRD-010_SH	B

Legend

Cable Route Applicaton Corridor

Distribution of Slavonian grebe

- 0
- 1 or less
- 2 - 3
- 4 - 5

Protected Site

SPA

N W E S

NOTE: Not to be used for Navigation

Date	14 October 2021
Coordinate System	WGS 1984 UTM Zone 30N
Projection	Transverse Mercator
Datum	WGS 1984
Data Source	ESRI; JNCC; OSOD; SNH
File Reference	J:\P2308\Mxd\11_BIRD\ P2308-BIRD-010_SH.mxd
Created By	Jessica Harvey
Reviewed By	Chris Dawe
Approved By	Jill Hobbs

BT Global Marine intertek

0 2 4 6 8 km

Great northern diver and Slavonian Grebe (Non-Breeding)

Table 6-15 provides the last population estimate (recorded in 2009; NatureScot, 2016b) and condition status for the two species.

Table 6-15 Population estimates and condition status

	Great northern diver	Slavonian grebe
Population estimate	182 individuals	54 individuals
% of the GB population	7.3%	4.9%
Months present	Winter – October to mid-May	Winter – mid-September to April
Distribution within the SPA (Figure 6-4, Drawing: P2308-BIRD-009_SH; Figure 6-5, Drawing: P2308-BIRD-010_SH)	Largest area of high density (>1 per km^2) is in the central section of the SPA. The centre of Cable Corridor 2.2 Shetland to Yell overlaps with an area of moderate density (0.5-0.75 per km^2).	Predominantly distributed in the central section of the SPA. Cable Corridor 2.2 Shetland to Yell is outside of the main distribution of Slavonian grebe within the SPA.

Great northern diver and Slavonian grebe migrate long distances from their northern breeding grounds to overwinter in Shetland. The concentration of Slavonian grebes is the largest in Scotland and GB. The foraging range of these species is unknown. In the Joint SNCB Interim Displacement Advice Note (Joint SNCB, 2017), Slavonian grebe is classified as having a moderate susceptibility to vessel disturbance (score of 3 out of 5), and great northern diver are classified as having a high susceptibility to disturbance (Joint SNCB, 2017; score of 5 out of 5). Within East Mainland Coast, Shetland SPA they are considered to have medium sensitivity to vessels, showing some avoidance behaviour from vessels (NatureScot, 2016b). Vessel activity through areas where birds are present on the surface may result in temporary displacement from optimal areas for feeding/loafing. These species are only present during their wintering periods; Great Northern Diver are present from October to mid-May and Slavonian grebe are present from mid-September to April (Table 6-15). Therefore, installation activities occurring outside of these months will not have an effect on these species. Should installation activities take place between May and September, there would therefore be no impact on Slavonian grebe and Northern diver.

Cable Corridor 2.2 Shetland to Yell is outside of the main distribution of Slavonian grebe but overlaps with an area of moderate great northern diver density (Table 6-15; Figure 6-4, Drawing: P2308-BIRD-009-SH, Figure 6-5 Drawing: P2308-BIRD-010-SH). Installation vessels will be slow moving (approximately 2km/hr), slower than walking speed (generally assumed to be 5km/hr), and at times stationary. At such slow speeds, the vessels are effectively stationary in terms of bird displacement. Studies have shown that slow moving vessels cause little disturbance to birds and birds may habituate to frequent and relatively benign events and noises (Natural England and Suffolk Coast and Heaths, 2012). Additionally, any such disturbance will take place in the context of existing sources of disturbance such as commercial shipping, recreational boating etc. The duration of operations along the cable corridors in the region are approximately 6 days. Given the wider area available, birds are likely to be able to find alternative feeding / loafing grounds in the short term.

If installation activities were to occur when great northern diver and Slavonian grebe are present, due to the temporary and localised nature of installation activities, there will be no significant disturbance and their population as a viable component of (and distribution within) East Mainland Coast, Shetland SPA will be maintained.

No LSE will occur on the qualifying features great northern diver and Slavonian grebe within the East Mainland Coast, Shetland SPA.

Red-throated diver (Breeding)

The last population estimate of red-throated diver for East Mainland Coast, Shetland SPA (recorded in 2015) indicated that the SPA supports 210 pairs, which was equivalent to 17% of the UK population (NatureScot, 2016b). The East Mainland Coast, Shetland SPA is entirely marine, designated to protect the foraging grounds of the red-throated diver. The birds nest on small lochans on the surrounding land outside of the SPA. The assessment for LSE therefore focuses only on individuals foraging within the cable corridors which have the potential to be disturbed by installation activities.

Red-throated diver have a mean-max foraging range of 9km (Woodward et al., 2019). Individuals from the East Mainland Coast, Shetland SPA could therefore be found feeding in the vicinity of installation activities of Cable Corridor 2.2 Shetland to Yell and Cable Corridor 2.8 Shetland to Whalsay.

In the Joint SNCB Interim Displacement Advice Note (Joint SNCB, 2017), red-throated diver is classed as having a high habitat specialisation (score of 4 out of 5) and very high susceptibility to disturbance (score of 5 out 5). This finding is in line with other studies which indicate that red-throated diver is highly sensitive to anthropogenic activity and move away from ships in the marine environment (Schwemmer et al., 2011). Breeding red-throated diver show a clear avoidance of areas with high shipping intensity and can take flight of small vessels approaching within 1km of them foraging (NatureScot, 2016b). The peak breeding and chick rearing period is from June to August (Hulka, 2010).

Cable Corridor 2.2 Shetland to Yell partly overlaps the East Mainland Coast, Shetland SPA and passes between areas of low red-throated diver density (Figure 6-4, Drawing: P2308-BIRD-009_SH). Cable Corridor 2.8 Shetland to Whalsay is outside of the SPA and therefore outside the main distribution of red-throated diver.

Installation vessels will be slow moving (approximately 2km/hr), slower than walking speed (generally assumed to be 5km/hr), and at times stationary. At such slow speeds, the vessels are effectively stationary in terms of bird displacement. Studies have shown that slow moving vessels cause little disturbance to birds and birds may habituate to frequent and relatively benign events and noises (Natural England and Suffolk Coast and Heaths, 2012). In addition, whilst red-throated diver is sensitive to visual disturbance, negligible disturbance has been shown to occur by vessels moving at less than 2km/h (Burger et al., 2019). Additionally, any such disturbance will take place in the context of existing sources of disturbance such as commercial shipping, recreational boating etc. The duration of operations along each cable corridor is approximately 6 days. Given the wider area available, birds are likely to be able to find alternative feeding / loafing grounds in the short term.

Due to the temporary and localised nature of installation activities, there will be no significant disturbance of red-throated diver and their population as a viable component of (and distribution within) East Mainland Coast, Shetland SPA will be maintained.

No LSE will occur on the qualifying feature breeding red-throated diver within East Mainland Coast, Shetland SPA.

6.11.4 Project specific mitigation

Without prejudice to the conclusion of no LSE as best practice the Applicant proposes that the following mitigation be implemented:

- M4 - All vessels associated with the cable installation operations within Cable Corridor 2.1 Yell to Unst will follow the “Guide to Best Practice for Watching Marine Wildlife’ guidance on birds where practicable and reduce their speed on approach to the cable corridor to below 6knots should rafting birds be observed ahead.

6.11.5 Conclusion

The East Mainland Coast, Shetland SPA is a marine site designated to protect foraging red-throated diver and wintering great northern diver and Slavonian grebe. There will therefore be no LSE on nesting birds. Any visual (and above water noise) disturbance of foraging qualifying interest species, caused by the installation works, will be brief, temporary and localised. The distribution of the species within the site and their population as a viable component of the SPA will be maintained.

The in-combination assessment did not identify any relevant projects with the potential to act in-combination with the R100 project to cause a cumulative impact within the SPA.

In conclusion, there will be **no adverse effect on the integrity of the site either alone or in combination with other plans or projects.**

6.12 Fair Isle SPA

6.12.1 Screening conclusion

The HRA screening identified that there was a potential LSE from the pressure 'visual (and above water noise) disturbance' on the qualifying features:

Breeding

- Fair Isle wren
- Arctic tern
- Guillemot

Breeding seabird assemblage species

- Arctic skua, fulmar, gannet, great skua, kittiwake, shag, puffin and razorbill

6.12.2 Conservation objectives

To avoid deterioration of the habitats of the qualifying species or significant disturbance to the qualifying species, thus ensuring that the integrity of the site is maintained; and

To ensure for the qualifying species that the following are maintained in the long term:

- Population of the species as a viable component of the site;
- Distribution of the species within site;
- Distribution and extent of habitats supporting the species;
- Structure, function and supporting processes of habitats supporting the species; and
- No significant disturbance of the species

6.12.3 Assessment against conservation objectives (includes feature assessment)

Fair Isle is an old red sandstone island, the most southerly of the Shetland group, lying halfway between Mainland and Orkney. It has a rocky, cliff coastline with adjacent coastal waters, heather moorland, acidic grassland, maritime grassland and crofting in-bye. The SSSI extends across the north of the island and the southern coastlines island, with the SPA spanning across the same area in addition to extending approximately 2km seaward, covering 68.24km^2. It has been designated as an SPA for supporting two Annex 1 species (Fair Isle wren and Arctic tern), one migratory species (common guillemot) and in excess of 20,000 individual seabirds including nationally important populations of

Atlantic puffin, razorbill, black-legged kittiwake, great skua, Arctic skua, European shag, northern gannet and northern fulmar.

The seabirds nest both on the cliffs and crags around the island as well as on moorland and maritime grassland areas, and feed in the waters around the island, outside the SPA. As both Cable Corridor 2.3 Sanday to Shetland and Cable Corridor 2.4 Fair Isle to BU pass within the Fair Isle SPA, there is potential for Visual (and above water noise) disturbance of seabirds nesting and foraging within the SPA.

6.12.3.1 Visual (and above water noise) disturbance

A summary of the qualifying features and cable corridors screened in for visual (and above water noise) disturbance in Fair Isle SPA is provided in Table 6-16.

Table 6-16 Summary of LSE for Visual (and above water noise) disturbance of the qualifying features of Fair Isle SPA/SSSI

Feature	Cable 2.1	Cable 2.2	Cable 2.3	Cable 2.4	Cable 2.8
Arctic skua					
Arctic tern					
Fair Isle wren					
Fulmar					
Gannet					
Great skua					
Guillemot					
Kittiwake					
Puffin					
Razorbill					
Shag					

Note: Blue cells denote cable corridors where screening has identified a potential for LSE. Dark blue cells denote where cable corridors are within protected site.

Fair Isle Wren (Breeding)

The Fair Isle wren is a sub-species of wren endemic to Fair Isle (NatureScot, 2009a) the population of which is surveyed by counts of territorial males. From 2015 to 2021, between 30 and 45 territories were occupied annually, that is, the total breeding population of this endemic subspecies ranged from 30 – 45 pairs. (Fair Isle Bird Observatory 2021). The breeding territories of wrens on Fair Isle are almost entirely confined to the island's cliffs and very few inland. However, one breeding pair of Fair Isle wren has been reported to have been sighted most years in the shrubs adjacent to the landing point of Cable Corridor 2.4 Fair Isle to BU (Fair Isle Bird Observatory 2021). Additionally, in 2015 a pair bred in a territory not occupied previously (on the West side of the Buness peninsula, in the region of the North Haven harbour/pier and a Fair Isle wren has also been reported to nest behind the wire mesh at the back of the pier (Fair Isle Bird Observatory 2021).

As wrens are a terrestrial species, only Fair Isle wrens foraging and nesting in the vicinity of the landing point of Cable Corridor 2.4 Fair Isle to BU have the potential to be disturbed by the installation activities. Whilst Cable Corridor 2.3 Sanday to Shetland crosses the south-east corner of the marine area of the Fair Isle SPA, it is a sufficient distance away from the island that installation activities within the cable corridor would not have any adverse effects on the species.

The landing point of Cable Corridor 2.4 Fair Isle to BU on Fair Isle is at North Haven located in a sheltered inlet backed by a sandy beach (see Figure 6-6). There is also a pier on the eastern side of the inlet where the ferry from Grutness on the Shetland Mainland arrives and a jetty has berths for visiting yachts and local boats during the summer (NatureScot, 2009a). Although Fair Isle wren typically nest on the island's cliffs, since a nesting pair has been recorded close to the landing point, should installation activities occur within the breeding season of Fair Isle wren (April to August) there is potential for visual (and above water noise) disturbance.

However, a Fair Isle wren has been reported to nest behind the wire mesh at the back of the pier, an unusually accessible nest site (Fair Isle Bird Observatory 2021) close to human activity. It has also been reported that the wren species is indifferent to people and their activities (BTO 2008). This suggests that should any Fair Isle wren be nesting in close proximity to the landfall works, they are unlikely to be disturbed by the activities.

Given the landfall installation activities will be limited to approximately 7 days and will take place in the context of existing sources of disturbance such as the ferry operations and boating during the summer and wrens appear to have a low sensitivity to anthropogenic activity, any Fair Isle wrens nesting in the vicinity of the landing point within Cable Corridor 2.4 Fair Isle to BU will not be disturbed. Therefore, distribution of the species within the site and their population as a viable component of the SPA, will be maintained.

No LSE for Cable Corridor 2.4 Fair Isle to BU or Cable Corridor 2.3 Sanday to Shetland will occur on the qualifying feature breeding Fair Isle wren within the Fair Isle SPA

Figure 6-6 North Haven inlet, Fair Isle (Source Aquatera, 2021)

Arctic Tern and Guillemot (Breeding)

Table 6-17 provides the last population estimate (recorded in 2009;(NatureScot, 2009a)) and condition status (Arctic tern and guillemot 2016) for the two species.

Table 6-17 Population estimates and condition status

	Arctic tern	Guillemot
Population estimate	1,100 pairs	32,300 individuals
% of the GB population	1%	1.4%
Condition status	Unfavourable declining	Unfavourable declining
Breeding season	May to August	April to August

More than half of Cable Corridor 2.4 Fair Isle to BU crosses through Fair Isle SPA marine area to the landing point on Fair Isle at North Haven. As the landing point for this cable corridor is within the SPA there is potential for installation activities associated with Cable Corridor 2.4 Fair Isle to BU to disturb nesting birds as well as breeding foraging birds. Cable Corridor 2.3 Sanday to Shetland crosses through the south-east corner of the marine area of the SPA, therefore installation activities within this cable corridor only have the potential to disturb breeding foraging seabirds from the SPA.

Table 6-18 Fair Isle bird count data (2017-2021) for Arctic tern and common guillemot

Species	Count unit	Count by Year										Percentage of 2021 whole island count at North Haven
		Whole Island Count					North Haven Count					
		2017	2018	2019	2020	2021	2017	2018	2019	2020	2021	
Arctic tern	AON/AIA*	322	190	286	248	268	269	188	273	247	267	99.6
Common guillemot	Attendant adults	-	-	-	-	18295	-	-	-	-	602	3.3

*AON - Apparently occupied nests; AIA – Apparently incubating adults, '-' – No Count

Arctic Tern - Ground nesting species

The Arctic Tern was first recorded breeding on Fair Isle in the 1980s. Numbers have fluctuated considerably since then, with 2,836 pairs nesting in 2001, but only 115 the following year and none in 2008 (Fair Isle Bird Observatory 2021). Data from the Fair Isle Bird Observatory has been presented in Table 6-18. This includes whole island counts and counts extracted relevant to the Project for the North Haven area where Cable Corridor 2.4 Fair Isle to BU lands. It should be noted that birds that were recorded as nesting on the Buness peninsula, a core Arctic tern nesting colony on Fair Isle (JNCC 2002), are considered to nest within the 'North Haven' area. The North Haven inlet to which Cable Corridor 2.4 Fair Isle to BU will be routed through, is flanked on the east side by the Buness peninsula. Table 6-18 indicates that over the last five years (2017 – 2021) whole island counts of Arctic tern have ranged from 190 – 322 apparently occupied nests (AON) or apparently incubating adults (AIA). Counts for the same period in the North Haven area range between 188 – 273 AON/AIA and the percentage of 2021 whole island counts of Arctic tern at North Haven is 99.6% indicating North Haven (or more accurately Buness peninsula) is the most important area on the island for nesting Arctic tern.

Arctic Terns place their nests on the ground generally near water in areas with rocky or sandy ground. Sometimes they place their nests on top of short grasses or mosses (All About Birds, 2019). Productivity varies wildly, with no chicks produced at all in some years, usually due to a lack of food causing youngsters to starve. The food required is small fish, such as sandeels, which are usually caught close to shore (All About Birds, 2019).

Should Arctic tern be nesting up on the Buness peninsula above the cliffs that flank the east side of North Haven, they are unlikely to be disturbed by installation activities at the landfall. However, since

Arctic tern favour areas close to the water and sandy or rocky shores it cannot be ruled out that they will not utilise the beach at North Haven during the breeding season from May to August inclusive.

LSE cannot be ruled out for Cable Corridor 2.4 Fair Isle to BU on the qualifying feature breeding Arctic tern within Fair Isle SPA.

No LSE for Cable Corridor 2.3 Sanday to Shetland will occur on the qualifying feature breeding Arctic tern within the Fair Isle SPA

Common guillemot (Breeding) - Cliff nesting species

Table 6.18 indicates that there were no counts for common guillemot from 2017 – 2020. In 2021 there were 18,295 attendant adults counted of which 602 were in the North Haven area (representing 3.3% of whole island count. The numbers presented are the totals nesting within the two coastal count sectors that include North Haven but also includes the northeast coastline from Biskam, close to the top of Fair Isle down to North Haven. As guillemot are cliff nesting birds the small percentage of the islands breeding population will be away from the installation activities.

Based on guillemots mean max foraging range (73.2km), there is potential for installation activities associated with Cable Corridor 2.4 Fair Isle to BU and Cable Corridor 2.3 Sanday to Shetland to disturb foraging guillemot during the breeding season. In the Joint SNCB Interim Displacement Advice Note (JNCC, 2017b), guillemot are classed as having both a moderate habitat specialisation and susceptibility to disturbance (score of 3 out of 5). Vessel activity through areas where these species are present on the surface may result in temporary displacement from optimal areas for feeding/loafing. However, the area disturbed due to vessel movements along the cable corridor is very small in the context of the distribution of guillemot (i.e. limited to the immediate vicinity of where works are being carried out) and installation of telecommunication cables represents a single discrete event.

Installation vessels will be slow moving (approximately 2km/hr), slower than walking speed (generally assumed to be 5km/hr), and at times stationary. At such slow speeds, the vessels are effectively stationary in terms of bird displacement. Studies have shown that slow moving vessels cause little disturbance to birds and birds may habituate to frequent and relatively benign events and noises (Natural England and Suffolk Coast and Heaths, 2012). It is therefore concluded that any disturbance will be temporary and localised and will not result in any likely significant effects on guillemot.

As no nesting guillemot will be disturbed, and individuals foraging at sea will only be subject to temporary and localised disturbance, there will be no significant disturbance. Therefore, distribution of the species within the site and their population as a viable component of the SPA, will be maintained.

No LSE for any cables listed in Table 6-16 will occur on the breeding qualifying features common guillemot within Fair Isle SPA.

Seabird assemblage – Cliff nesting species

Arctic skua, fulmar, gannet, great skua, kittiwake (Breeding)

Table 6-19 provides the last population estimate (recorded in 2009; (NatureScot, 2009a)) and condition status (Arctic skua, fulmar, great skua, kittiwake 2016 and gannet 2014) for the five species.

Table 6-19 Population estimates and condition status

	Artic skua	Fulmar	Gannet	Great skua	Kittiwake
Population estimate	110 pairs	35,210 pairs	1,166 pairs	110 pairs	18,160

	Artic skua	Fulmar	Gannet	Great skua	Kittiwake
% of the GB population	3%	7%	0.6%	1%	4%
Condition status	Unfavourable declining	Favourable maintained	Favourable maintained	Favourable maintained	Unfavourable declining
Breeding season	May to August	April to September	March to September	April to September	April to August

As Cable Corridor 2.4 Fair Isle to BU and the landing point at North Haven are within the SPA, there is potential for disturbance to individuals nesting and foraging within the SPA. As Cable Corridor 2.3 Sanday to Shetland crosses the south-east corner of the marine area of the SPA only foraging individuals from the SPA have the potential to be disturbed by installation activities associated with this cable corridor. Additionally, Cable Corridor 2.8 Shetland to Whalsay is within the foraging range of gannet. All five species are cliff nesting seabirds which may be nesting high on the cliffs and crags of the island such as those along the east and west sides of the North Haven inlet.

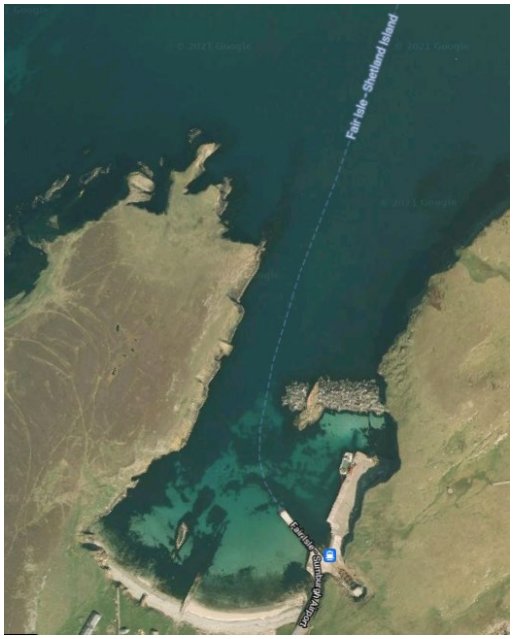
However, given the installation vessels are likely to follow a similar route through the inlet as the ferry and yachts that arrive in North Haven harbour (see Figure 6-7), nesting birds are likely to be habituated to some vessel disturbance. There is potential for breeding birds to forage in the waters within Cable Corridor 2.4 Fair Isle to BU during installation operations.

In the Joint SNCB Interim Displacement Advice Note (JNCC, 2017b), the five cliff nesting seabird species have very low to low habitat specialisation and susceptibility to disturbance (score of 1-2 out of 5). Installation vessels will be slow moving (approximately 2km/hr), slower than walking speed (generally assumed to be 5km/hr), and at times stationary. At such slow speeds, the vessels are effectively stationary in terms of bird displacement. Studies have shown that slow moving vessels cause little disturbance to birds and birds may habituate to frequent and relatively benign events and noises (Natural England and Suffolk Coast and Heaths, 2012).

Additionally, any such disturbance will take place in the context of existing sources of disturbance such as ferry operations and recreational boating. The duration of operations along the cable corridors in the region are approximately 6 days. Given the wider area available, birds are likely to be able to find alternative feeding / loafing grounds in the short term. Should any works overlap with the breeding season of the qualifying species any disturbance will be minimal.

No LSE for any cables listed in Table 6-16 will occur on the qualifying feature Seabird Assemblage (Breeding) for Arctic skua, fulmar, gannet, great skua and kittiwake within Fair Isle SPA.

Figure 6-7 North Haven inlet and Fair Isle – Shetland Island ferry route



Google Imagery ©2021 Getmapping plc

In the Joint SNCB Interim Displacement Advice Note (JNCC, 2017b), all five species are classed as having habitat specialisation and susceptibility to disturbance scores of low to very low (scores of 1 and 2).

The installation vessels will be slow moving (approximately 2km/hr), slower than walking speed (generally assumed to be 5km/hr), and at times stationary. At such slow speeds, the vessels are effectively stationary in terms of bird displacement. Studies have shown that slow moving vessels cause little disturbance to birds and birds may habituate to frequent and relatively benign events and noises (Natural England and Suffolk Coast and Heaths, 2012). Additionally, any such disturbance will take place in the context of existing sources of disturbance such as ferry operations and recreational boating to North Haven harbour. The duration of operations along the cable corridors in the region are approximately 6 days. Given the wider area available, foraging birds are likely to be able to find alternative feeding / loafing grounds in the short term. Should any works overlap with the breeding season of these species, any disturbance will be minimal.

Due to the temporary and localised nature of installation activities, there will be no significant disturbance to the five cliff nesting species, and their population as a viable component of (and distribution within) Fair Isle SPA will be maintained.

No LSE for activities associated with Cable Corridor 2.3 Sanday to Shetland and Cable Corridor 2.4 Fair Isle to BU will occur on the qualifying features breeding Arctic skua, fulmar, gannet, great skua, kittiwake within Fair Isle SPA.

Seabird Assemblage – Cliff nesting species

European shag, Atlantic puffin and razorbill (Breeding)

Table 6-20 provides the last population estimate (recorded in 2009; (NatureScot, 2009a)) and condition status (European shag 2013, Atlantic puffin and razorbill 2015) for the three species.

Table 6-20 Population estimates and condition status

	European shag	Atlantic puffin	Razorbill
Population estimate	1,100 pairs	23,000 individuals	3,400 individuals
% of the GB population	3%	2%	2%
Condition status	Unfavourable declining	Unfavourable declining	Unfavourable declining
Breeding season	March to September	April to August	April to August

As Cable Corridor 2.4 Fair Isle to BU and the landing point at North Haven are within the SPA, there is potential for disturbance to individuals nesting and foraging within the SPA. As Cable Corridor 2.3 Sanday to Shetland crosses the south-east corner of the marine area of the SPA installation activities within this cable corridor have the potential to disturb breeding foraging individuals from the SPA. Additionally, all the cable corridors in the Shetland geographical area are within the foraging range of puffin and Cable Corridor 2.8 Shetland to Whalsay is within the foraging range of razorbill and European shag. All three species are cliff nesting seabirds which may be nesting high on the cliffs and crags of the island such as those along the east and west sides of the North Haven inlet.

However, given the installation vessels are likely to follow a similar route through the inlet as the ferry and yachts that arrive in North Haven harbour, nesting birds are likely to be habituated to some vessel disturbance. There is potential for breeding birds to forage in the waters within Cable Corridor 2.4 Fair Isle to BU during installation operations.

In the Joint SNCB Interim Displacement Advice Note (JNCC, 2017b), European shag and razorbill are classed as having both a moderate habitat specialisation and susceptibility to disturbance (score of 3 out of 5). Atlantic puffin is classed as having a low habitat specialisation (score 2 out of 5) and a moderate susceptibility to disturbance (score 3 out of 5).

Installation vessels will be slow moving (approximately 2km/hr), slower than walking speed (generally assumed to be 5km/hr), and at times stationary. At such slow speeds, the vessels are effectively stationary in terms of bird displacement. Studies have shown that slow moving vessels cause little disturbance to birds and birds may habituate to frequent and relatively benign events and noises (Natural England and Suffolk Coast and Heaths, 2012).

Additionally, any such disturbance will take place in the context of existing sources of disturbance such as ferry operations and recreational boating. The duration of operations along the cable corridors in the region are approximately 6 days. Given the wider area available, birds are likely to be able to find alternative feeding / loafing grounds in the short term. Should any works overlap with the breeding season of the qualifying species any disturbance will be minimal.

Due to the temporary and localised nature of installation activities, there will be no significant disturbance to the five cliff nesting species, and their population as a viable component of (and distribution within) Fair Isle SPA will be maintained.

No LSE for any Cable Corridors listed in Table 6-16 will occur on the qualifying features breeding Atlantic puffin, razorbill and European shag within Fair Isle SPA.

6.12.4 Project specific mitigation

- M3 – Following licence submission and confirmation by NatureScot Ornithology expert on the use of Cable Corridor 2.4 Fair Isle to BU (North Haven landing point) and Cable Corridor 2.3 Sanday to Shetland (Sumburgh landing point) by nesting Arctic Tern, appropriate local mitigation will be agreed.

6.12.5 Conclusion

Due to the uncertainty surrounding the presence of breeding Arctic tern at the North Haven landing point for Cable Corridor 2.4 Fair Isle to BU, further advice and information is being sought from Nature Scot. This was not available at the time of Marine Licence application submission. The applicant recognises that additional mitigation may be required at the North Haven landing point if it is confirmed that Artic tern breed at the landing site. The Applicant is confident that if necessary, appropriate mitigation can be agreed with Nature Scot to ensure that there is no LSE.

The in-combination assessment did not identify any relevant projects with the potential to act in-combination with the R100 project to cause a cumulative impact within the SPA.

In conclusion, through the implementation of appropriate mitigation, the conservation objectives of the Fair Isle SPA will not be affected and therefore there will be **no adverse effect on the integrity of the site either alone or in combination with other plans or projects.**

6.13 Sumburgh Head SPA

6.13.1 Screening conclusion

The HRA screening identified that there was a potential LSE from the pressure 'visual (and above water noise) disturbance' on the qualifying features:

Breeding

- Arctic tern

Breeding seabird assemblage species

- Common guillemot
- Kittiwake

6.13.2 Northern fulmarConservation objectives

To avoid deterioration of the habitats of the qualifying species or significant disturbance to the qualifying species, thus ensuring that the integrity of the site is maintained; and

To ensure for the qualifying species that the following are maintained in the long term:

- Population of the species as a viable component of the site,
- Distribution of the species within 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.

6.13.3 Assessment against conservation objectives (includes feature assessment)

Sumburgh Head SPA covers an area of cliffs and boulder beaches at the southern tip of Mainland, Shetland. The site consists of high cliffs of Old Red Sandstone, of up to 100 metres, and outlying stacks which provide an important breeding site for various seabirds (NatureScot, 2009d). The boundary of the SPA is coincident with that of Sumburgh Head SSSI along the eastern and southern parts of the head and the seaward extension extends approximately 2 km into the marine environment to include the seabed, water column and surface, covering a total area of 24.8km^2.

It has been designated as an SPA for supporting Annex 1 species Arctic tern, in addition to supporting in excess of 20,000 individual seabirds including nationally important populations of guillemot, black-legged kittiwake and Northern fulmar (NatureScot, 2009d). Cable Corridor 2.3 Sanday to Shetland passes through the northern area of the site to the landing point within the SPA at Grutness Voe.

As Cable Corridor 2.3 Sanday to Shetland and its associated landing point on Shetland Mainland are within the SPA, there is potential for visual (and above water noise) disturbance of seabirds nesting and foraging within Sumburgh SPA.

6.13.3.1 Visual (and above water noise) disturbance

A summary of the qualifying features and cable corridors screened in for visual (and above water noise) disturbance in Sumburgh Head SPA is provided in Table 6-21.

Table 6-21 Summary of LSE for Visual (and above water noise) disturbance habitat for the qualifying features of Sumburgh Head SPA

Feature	Cable 2.1	Cable 2.2	Cable 2.3	Cable 2.4	Cable 2.8
Arctic tern					
Fulmar					
Guillemot					
Kittiwake					

Note: Blue cells denote cable corridors where screening has identified a potential for LSE. Dark blue cells denote where cable corridors are within protected site.

Arctic Tern (Breeding)

The last population estimate for Arctic tern in Sumburgh Head SPA (recorded in 2009) indicated that the SPA supports 700 pairs, which was equivalent to 2% of the Great Britain population. Condition status for this species was recorded as 'unfavourable no change' in 2018 (NatureScot, 2009d). As there are installation activities within the SPA, there is potential for disturbance of individuals nesting and foraging within the SPA.

Arctic tern build their nests on the ground, generally near water in areas with rocky or sandy ground. Sometimes they place their nests on top of short grasses or mosses (All About Birds, 2019). Productivity varies wildly, with no chicks produced at all in some years, usually due to a lack of food causing youngsters to starve. The food required is small fish, such as sandeel, which are usually caught close to shore (All About Birds 2019).

Should cable installation activities overlap with the Arctic tern breeding season (May to August) there is therefore potential to disturb nesting birds. It is possible that Arctic tern could nest on the shore at the Grutness landing point of Cable Corridor 2.3 Sanday to Shetland. No information is publicly available on their use of the beach area. Therefore, due to lack of evidence, LSE cannot be ruled out.

LSE cannot be ruled out for Cable Corridor 2.3 Sanday to Shetland on the qualifying feature breeding Arctic tern within Sumburgh Head SPA.

Seabird Assemblage – Cliff nesting species - Common guillemot, kittiwake and fulmar (Breeding)

Table 6-22 provides the last population estimate (recorded in 2009; (NatureScot, 2009d)) and condition status (2017) for the three species.

Table 6-22 Population estimates and condition status

	Common guillemot	Kittiwake	Fulmar
Population estimate	16,000 individuals	1,366 pairs	2,542 pairs
% of the GB population	1%	0.3%	0.5%
Condition status	Unfavourable declining	Unfavourable declining	Favourable maintained
Breeding season	March to September	April to August	April to August

Cable Corridor 2.3 Sanday to Shetland crosses through the marine area of Sumburgh SPA. The Shetland landing point is within the SPA at Grutness, an inlet at the northern end of Sumburgh Head. As kittiwake and fulmar have low sensitivity to disturbance, there is no potential for LSE to foraging individuals. However, thereis potential for cable installation activities associated with this cable corridor to disturb breeding guillemot, kittiwake and fulmar. These are cliff nesting species and are likely to site their nests in the cliffs around the Sumburgh Head peninsula away from the landing point. Nesting individuals will therefore not be disturbed by the operations at the Grutness landing point. Although Cable Corridor 2.3 Sanday to Shetland passes some cliffs on the way into the inlet at Grutness, the installation vessels are likely to follow a similar route through the inlet as the ferry from Fair Isle (see Figure 6-8, therefore any nesting birds are likely to be habituated to some vessel disturbance and sufficient distance to not be disturbed by the installation vessel.

Figure 6-8 Sumburgh Head and inlet at Grutness Landing Point

Google Imagery ©2021 Getmapping plc

There is also potential for these species to be disturbed during the breeding season whilst foraging in the waters within and surrounding cable installation activities. In the Joint SNCB Interim Displacement Advice Note (JNCC, 2017b), guillemot is classed as having both a moderate habitat specialisation and susceptibility to disturbance (score of 3 out of 5). Kittiwake is classed as having a low habitat specialisation and susceptibility to disturbance (score of 2 out of 5) and fulmar is classed as having a very low habitat specialisation and susceptibility to disturbance (score of 1 out of 5).

Based on guillemots mean max foraging range (73.2km) and their moderate sensitivity to disturbance they were screened in for Appropriate Assessment. There is potential for installation activities associated with Cable Corridor 2.2 Shetland to Yell, Cable Corridor 2.3 Sanday to Shetland, Cable Corridor 2.4 Fair Isle to BU and Cable Corridor 2.8 Shetland to Whalsay to disturb foraging guillemot during the breeding season.

Vessel activity through areas where these species are present on the surface may result in temporary displacement from optimal areas for feeding/loafing. However, the area disturbed due to vessel movements along the cable corridor is very small in the context of the distribution of guillemot (i.e. limited to the immediate vicinity of where works are being carried out) and installation of telecommunication cables represents a single discrete event.

Installation vessels will be slow moving (approximately 2km/hr), slower than walking speed (generally assumed to be 5km/hr), and at times stationary. At such slow speeds, the vessels are effectively stationary in terms of bird displacement. Studies have shown that slow moving vessels cause little disturbance to birds and birds may habituate to frequent and relatively benign events and noises (Natural England and Suffolk Coast and Heaths, 2012).

Additionally, any such disturbance will take place in the context of existing sources of disturbance such as ferry operations and recreational boating and the nearby Sumburgh Airport. The duration of operations along the cable corridors in the region are approximately 6 days per corridor. Given the wider area available, birds are likely to be able to find alternative feeding / loafing grounds in the short term. Should any works overlap with the breeding season of the qualifying species any disturbance will be minimal.

It is therefore concluded that any disturbance will be temporary and localised and will not result in any likely significant effects on guillemot, kittiwake and fulmar.

As no nesting guillemot, kittiwake and fulmar will be disturbed, and individuals foraging at sea will only be subject to temporary and localised disturbance, there will be no significant disturbance. Therefore, distribution of the species within the site and their population as a viable component of the SPA, will be maintained.

No LSE will occur on the qualifying features guillemot, kittiwake and fulmar within the Sumburgh Head SPA.

6.13.4 Project specific mitigation

- M3 – Following licence submission and confirmation by NatureScot Ornithology expert on the use of Cable Corridor 2.4 Fair Isle to BU (North Haven landing point) and Cable Corridor 2.3 Sanday to Shetland (Sumburgh landing point) by nesting Artic Tern, appropriate local mitigation will be agreed.

6.13.5 Conclusion

Due to the uncertainty surrounding the presence of breeding Arctic tern at the Grutness landing point for Cable Corridor 2.3 Sanday to Shetland, further advice and information is being sought from Nature Scot. This was not available at the time of Marine Licence application submission. The applicant

recognises that additional mitigation may be required at the Grutness landing point if it is confirmed that Artic tern breed at the landing site. The Applicant is confident that if necessary, appropriate mitigation can be agreed with Nature Scot to ensure that there is no LSE.

The in-combination assessment did not identify any relevant projects with the potential to act in-combination with the R100 project to cause a cumulative impact within the SPA.

In conclusion, through the implementation of appropriate mitigation, the conservation objectives of the Sumburgh Head SPA will not be affected and therefore there will be **no adverse effect on the integrity of the site either alone or in combination with other plans or projects**.

6.14 Fetlar SPA

6.14.1 Screening conclusion

The HRA screening identified that there was a potential LSE from the pressure 'visual (and above water noise) disturbance' on the qualifying features:

- Arctic skua (breeding and migratory)
- Arctic tern (breeding)
- Dunlin (migratory)
- Fulmar (breeding)
- Great skua (migratory)
- Red-necked phalarope (breeding)
- Whimbrel (migratory)

6.14.2 Conservation objectives

To avoid deterioration of the habitats of the qualifying species or significant disturbance to the qualifying species, thus ensuring that the integrity of the site is maintained; and

To ensure for the qualifying species that the following are maintained in the long term:

- Population of the species as a viable component of the site,
- Distribution of the species within 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.

6.14.3 Assessment against conservation objectives

6.14.3.1 Visual (and above water noise) disturbance

A summary of the qualifying features and cable corridors screened in for visual (and above water noise) disturbance in Fetlar SPA is provided in Table 6-23.

Table 6-23 Summary of LSE for visual (and above water noise) disturbance of the qualifying features of Fetlar SPA

Feature	Cable 2.1	Cable 2.2	Cable 2.3	Cable 2.4	Cable 2.8
Arctic skua					
Arctic tern					
Dunlin					
Fulmar					
Great skua					
Red-necked phalarope					
Whimbrel					

Note: Blue cells denote cable corridors where screening has identified a potential for LSE.

Fetlar is an island in the Shetland group, lying to the east and south respectively of the larger islands of Yell and Unst. The species-rich heath, bog and mire communities on the island support an important and characteristic breeding bird community, with the cliffs, rocky shores, and adjacent coastal waters important for breeding seabirds. Fetlar SPA covers a total area of 169.65km^2 and overlaps North Fetlar SSSI, Lamb Hoga SSSI and Trona Mires SSSI. The seaward extension extends approximately 2 to 5km into the marine environment to include the seabed, water column and surface, with 85% of the protected site in marine areas. Cable Corridor 2.1 Yell to Unst is the closest cable, located 0.9km from the north-west corner of the site, followed by Cable Corridor 2.2 Shetland to Yell, Cable Corridor 2.8 Shetland to Whalsay, Cable Corridor 2.3 Sanday to Shetland and Cable Corridor 2.4 Fair Isle to BU. As the closest protected land area for nesting birds is approximately 3.8km from the closest cable corridor, there is no potential for disturbance of nesting birds within the SPA.

Arctic tern (breeding)

The last population estimate of Arctic tern within Fetlar SPA (recorded in 2009) indicated that the SPA supports 1,065 pairs, which was equivalent to 1% of the GB population (NatureScot, 2009b). The condition status of Arctic tern at last assessment (2017) categorised the population within the SPA as 'Unfavourable, declining' (NatureScot, 2017a). In Scotland, Arctic tern are present during the breeding season (May to August), before migrating to Antarctica for winter (Scottish Wildlife Trust, 2021a).

As the closest protected land within the SPA is approximately 3.8km from the closest cable corridor (Cable Corridor 2.1 Yell to Unst), there is no potential for installation activities to cause disturbance of nesting birds within the SPA. However, there is potential for installation activities to cause disturbance to Arctic tern foraging outside the SPA and within Cable Corridor 2.1 Yell to Unst, Cable Corridor 2.2 Shetland to Yell and Cable Corridor 2.8 Shetland to Whalsay.

In the Joint SNCB Interim Displacement Advice Note (Joint SNCB, 2017), Arctic tern is classed as having a moderate habitat specialisation (score of 3 out of 5) and a low susceptibility to disturbance (score of 2 out 5). This finding is in line with other studies which indicate that Arctic tern have a low sensitivity to vessel disturbance (NatureScot, 2017b). Vessel activity through areas where these species are present on the surface may result in temporary displacement from optimal areas for feeding/loafing. The area disturbed due to vessel movements along the cable corridors is considered to be very small in the context of the distribution of Arctic tern (i.e. limited to the immediate vicinity of where works are being carried out).

Installation vessels will be slow moving (approximately 2km/hr) which is slower than walking speed (generally assumed to be 5km/hr), and at times stationary. At such slow speeds, the vessels are effectively stationary in terms of bird displacement. Studies have shown that slow moving vessels

cause little disturbance to birds and birds may habituate to frequent and relatively benign events and noises (Natural England and Suffolk Coast and Heaths, 2012). It is therefore concluded that any temporary disturbance will be brief, minimal and localised and will not result in any likely significant effects on foraging Arctic tern. Their population will be maintained as a viable component of the SPA.

No LSE will occur on Arctic tern within the Fetlar SPA.

Arctic skua and fulmar (Breeding)

Table 6-24 provides the last population estimate (recorded in 2009) and condition status for the two species (NatureScot, 2009b).

Table 6-24 Population estimates and condition status

	Arctic Skua	Fulmar
Population estimate	130 pairs	9,500 pairs
% of the population	4% of the GB population	2% of the GB population
Condition status (year assessed)	Unfavourable Declining (2017)	Unfavourable Declining (2016)
Breeding season	May to August	April to mid-September

Arctic skua and fulmar nest on coastal moorland and cliffs, respectively. As the closest protected land within the SPA is approximately 3.8km from the closest cable corridor (Cable Corridor 2.1 Yell to Unst), there is no potential for installation activities to cause disturbance of nesting birds within the SPA. Whilst foraging birds could be found outside of the SPA within the majority of the cable corridors, according to the SNCB Joint displacement note (Joint SNCB, 2017), Arctic skua and Fulmar have low sensitivity to vessel disturbance (score of 1 out of 5). As such, the species will not be significantly disturbed by installation activities associated with these cable corridors.

No LSE will occur on the qualifying features breeding Arctic skua and fulmar within the Fetlar SPA.

Great skua (migratory)

The last population estimate of great skua within Fetlar SPA (recorded in 2009) indicated that the SPA supports 508 pairs, which was equivalent to 3.7% of the world biogeographic population (NatureScot, 2009b). The condition status of Arctic tern at last assessment (2016) categorised the population within the SPA as 'Favourable Maintained' (NatureScot, 2017a).

Great skua nest on moorlands of the Scottish Islands from mid-April to mid-September, including Shetland, before migrating to the Spanish and African Atlantic coasts for winter (Scottish Wildlife Trust, 2021c). As the closest protected land within the SPA is approximately 3.8km from the closest cable corridor (Cable Corridor 2.1 Yell to Unst), there is no potential for installation activities to cause disturbance of nesting birds within the SPA. Whilst foraging birds could be found outside of the SPA, within the majority of the cable corridors, according to the SNCB Joint displacement note (Joint SNCB, 2017), great skua have low sensitivity to vessel disturbance (score of 1 out of 5). As such, the species will not be significantly disturbed by installation activities associated with these cable corridors.

No LSE will occur on the qualifying features migratory great skua within the Fetlar SPA.

Dunlin, Red-necked phalarope and Whimbrel

Table 6-25 provides the last population estimate (recorded in 2009), condition status and the article that the species qualifies under for the three species (NatureScot, 2009b).

Table 6-25 Population estimates and condition status

	Dunlin	Red-necked phalarope	Whimbrel
Population estimate	90 pairs	23 pairs	65 pairs
% of the population	0.8% of the temperate European biogeographic population	80% of the world's biogeographic population	<0.1% of the Europe/West Africa biogeographic population
Condition status (year assessed)	Favourable, Maintained (2003)	Favourable, Recovered (2014)	Favourable, Maintained (2002)
Qualifies under:	Article 4.2 Migratory	Article 4.1 Annex 1	Article 4.2 Migratory

Dunlin, red-necked phalarope and whimbrel are wading species which nest / breed on the northern Scottish Isles, including Shetland (The Wildlife Trusts, 2021a) (Scottish Wildlife Trust, 2021b), (The Wildlife Trusts, 2021b). These species are predominantly associated with the mires found on the island of Fetlar (Ellis, 2004); (RSPB, 2021a). The closest protected island within the SPA is approximately 3.8km from the closest cable corridor (Cable Corridor 2.1 Yell to Unst), and over 4km to the island of Fetlar. Therefore, due to the distance to the protected areas which may be used by the wading birds, there is no potential for installation activities to cause disturbance of nesting or foraging birds within the SPA.

No LSE will occur on the qualifying features dunlin, red-necked phalarope and whimbrel within the Fetlar SPA.

6.14.4 Project specific mitigation

None specified.

6.14.5 Conclusion

Visual (and above water noise) disturbance caused by the installation works within any of the cable corridors listed above in Table 6-23 will not disturb the qualifying species within the Fetlar SPA. The distribution of the species within the site and their population as a viable component of the SPA, will be maintained.

The in-combination assessment did not identify any relevant projects with the potential to act in-combination with the R100 project to cause a cumulative impact within the SPA.

In conclusion, there will be **no adverse effect on the integrity of the site either alone or in combination with other plans or projects.**

6.15 Otterswick and Graveland SPA

6.15.1 Screening conclusion

The HRA screening identified that there was a potential LSE from the pressure 'visual (and above water noise) disturbance' on the qualifying features:

- Red-throated diver (breeding)

Conservation objectives

To avoid deterioration of the habitats of red-throated diver (the qualifying feature) or significant disturbance to the qualifying feature, thus ensuring that the integrity of the site is maintained and the site makes an appropriate contribution to achieving favourable conservation status for the qualifying feature; 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; and
- No significant disturbance of the species

6.15.2 Assessment against conservation objectives (includes feature assessment)

6.15.2.1 Visual (and above water noise) disturbance

A summary of the qualifying feature and cable corridors screened in for visual (and above water noise) disturbance in Otterswick and Graveland SPA is provided in Table 6-26.

Table 6-26 Summary of LSE for visual (and above water noise) disturbance of the qualifying features of Otterswick and Graveland SPA

Feature	Cable 2.1	Cable 2.2	Cable 2.3	Cable 2.4	Cable 2.8
Red-throated diver					

Note: Blue cells denote cable corridors where screening has identified a potential for LSE.

Otterswick and Graveland SPA comprises two areas of open moorland with numerous pools and lochans on Yell, Shetland. Otterswick is located in the south of Yell, while Graveland is a peninsula on the west of Yell. The site rises from sea-level on Graveland, to 205m at Ward of Otterswick. The site was designated as an SPA for its significant red-throated diver population. Cable Corridor 2.2 Shetland to Yell landing point is situated on the south of Yell, 3.19km away from the Otterswick half of the protected area. The landing point for Cable Corridor 2.1 Yell to Unst is north-east of the island, 8.62km away from the Otterswick and Graveland SPA.

Red-throated diver

The Shetland Islands support the largest populations of red-throated diver, making it an important stronghold for the species (RSPB, 2021b). The last known adult population estimate of red-throated diver at Otterswick and Graveland SPA (recorded in 1999) was 26 pairs, which is equivalent to 3% of the British population (NatureScot, 2001). The latest assessed condition by Nature Scot for red-throated diver in 2018 classed the SPA population condition as “Unfavourable Declining”. As the installation activities will occur outside 2km of the SPA itself, there will be no disturbance to individuals nesting or foraging within the SPA.

Red-throated diver have a mean-max foraging range of 9km (Woodward et al., 2019). As such, individuals from Otterswick and Graveland SPA could be found foraging within the cable corridors of Cable Corridor 2.2 Shetland to Yell and Cable Corridor 2.1 Yell to Unst. These cable corridors are located within the East Mainland Coast, Shetland SPA and Bluemull and Colgrave Sounds SPA, respectively, which have both been designated to protect breeding red-throated diver foraging areas. Therefore, red-throated diver from Otterswick and Graveland SPA foraging within Cable Corridors 2.2 Shetland to Yell and Cable Corridor 2.1 Yell to Unst have been assessed under East Mainland Coast, Shetland SPA (Section 6.11) and Bluemull and Colgrave Sound SPA (Section 6-10).

The assessments concluded that due to the low utilisation by red-throated diver of the cable corridors, slow vessel speeds and the temporary and localised nature of installation activities, there will be no significant disturbance of red-throated diver and their population as a viable component of (and distribution within) the site will be maintained.

6.15.3 Project specific mitigation

None specified.

6.15.4 Conclusion

The cable installation will not cause visual (and above water noise) disturbance of nesting birds within the Otterswick and Graveland SPA. Any disturbance of breeding red-throated diver foraging outside of the SPA within the cable corridors will be temporary and localised. The distribution of the species within the site and their population as a viable component of the SPA, will be maintained.

The in-combination assessment did not identify any relevant projects with the potential to act in-combination with the R100 project to cause a cumulative impact within the SPA.

In conclusion, there will be **no adverse effect on the integrity of the site either alone or in combination with other plans or projects.**

6.16 Hermaness, Saxa Vord and Valla Field SPA

6.16.1 Screening conclusion

The HRA screening identified that there was a potential LSE from the pressure 'Visual (and above water noise) disturbance' on the qualifying features:

- Guillemot (breeding)
- Puffin (breeding)
- Red throated diver (breeding)
- Shag (breeding)

6.16.2 Conservation objectives

To avoid deterioration of the habitats of the qualifying species or significant disturbance to the qualifying species, thus ensuring that the integrity of the site is maintained; and

To ensure for the qualifying species that the following are maintained in the long term:

- Population of the species as a viable component of the site,
- Distribution of the species within 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.

6.16.3 Assessment against conservation objectives (includes feature assessment)

6.16.3.1 Visual (and above water noise) disturbance

A summary of the qualifying features and cable corridors screened in for visual (and above water noise) disturbance in Hermaness, Saxa Vord and Valla Field SPA is provided in Table 6-27.

Table 6-27 Summary of LSE for visual (and above water noise) disturbance habitat for the qualifying features of Hermaness, Saxa Vord and Valla Field SPA

Feature	Cable 2.1	Cable 2.2	Cable 2.3	Cable 2.4	Cable 2.8
Guillemot					
Puffin					
Red throated diver					
Shag					

Note: Blue cells denote cable corridors where screening has identified a potential for LSE.

Hermaness, Saxa Vord and Valla Field SPA lies in the north-west corner of the island of Unst. It consists of 100-200m high sea cliffs and adjoining areas of grassland, heath and blanket bog. The seaward extension extends approximately 2km into the marine environment to include the seabed, water column and surface. The site is designated for supporting seabird species of European significance, in addition to regularly supporting 157,500 seabirds including nationally important species. The site covers an area of 68.32km^2, with 75.9% of the protected site in marine areas (NatureScot, 2015).

The closest cable corridor is Cable Corridor 2.1 Yell to Unst, located 4.13km south of the SPA, followed by Cable Corridor 2.2 Shetland to Yell, Cable Corridor 2.8 Shetland to Whalsay, Cable Corridor 2.3 Sanday to Shetland and Cable Corridor 2.4 Fair Isle to BU. No nesting qualifying interests will be disturbed by the installation due to the distance of all the cable corridors from the SPA. The potential for LSE therefore arises from the presence of installation vessels within the foraging ranges of the species. As these cable corridors are not located within the SPA, there will also be no effects from installation activities on the distribution of the species within site, the distribution and extent of habitats supporting the species or the structure, function and supporting processes of habitats supporting the species.

Guillemot, Puffin and Shag (Breeding)

Table 6-28 provides the last population estimate (recorded in 1999), condition status and the article that the species qualifies under for the three species (NatureScot, 2009c).

Table 6-28 Population estimates and condition status

	Guillemot	Puffin	Shag
Population estimate	25,000 individuals over two surveys	55,000 individuals	450 pairs
% of the GB population	2%	6%	1%
Condition status (year assessed)	Unfavourable, Declining (2017)	Unfavourable Declining (2017)	Unfavourable, No Change (2017)
Qualifies under:	Article 4.2 Breeding Seabird Colony	Article 4.2 Migratory	Article 4.2 Breeding Seabird Colony
Breeding Season	April to August	April to August	March to September

These species are most vulnerable to disturbance during the breeding season, when disturbance could impact nesting success and chick survival. Shag and puffin are found in high densities in Shetland during the breeding season and guillemot are present year-round in Shetland waters (Scottish Wildlife Trust, 2021e; RSPB, 2021b; Scottish Wildlife Trust, 2021d).

Guillemot, shag and puffin are considered to have a moderate sensitivity to vessel disturbance (Joint SNCB, 2017). Vessel activity through areas where these species are present on the surface may result in temporary displacement from optimal areas for feeding/loafing. The area disturbed due to vessel movements along the cable corridors is considered to be very small in the context of the distribution of these species (i.e. limited to the immediate vicinity of where works are being carried out). Additionally, the marine extension of the SPA northwest of the breeding grounds and away from the cable corridors is likely to be the area predominantly used by nesting seabirds.

Installation vessels will be slow moving (typically 2km/hr) slower than walking speed (generally assumed to be 5km/hr), and at times stationary. At such slow speeds, the vessels are effectively stationary in terms of bird displacement. Studies have shown that slow moving vessels cause little disturbance to birds and birds may habituate to frequent and relatively benign events and noises (Natural England and Suffolk Coast and Heaths, 2012). It is therefore concluded that any disturbance will be temporary and localised and will not result in any likely significant effects on guillemot, puffin and shag.

As no nesting guillemot, puffin or shag will be disturbed and birds foraging at sea will only be subject to temporary and localised disturbance, there will be no significant disturbance. Therefore, distribution of the species within the site and their population as a viable component of the SPA will be maintained.

No LSE will occur on the qualifying features guillemot, puffin and shag within Hermaness, Saxa Ford and Valla Field SPA.

Red throated diver (Breeding)

The Shetland Islands support the largest populations of red-throated diver, making it an important stronghold for the species (RSPB, 2021b). The last known adult population estimate of red-throated diver at Hermaness, Saxa Vord and Valla Field SPA (recorded in 1999) was 26 pairs, which is equivalent to 3% of the British population (NatureScot, 2009c). The latest assessed condition by Nature Scot for red-throated diver in 2013 classed the SPA population condition as “Unfavourable Declining” (NatureScot, 2015). As the installation activities will occur outside 2km of the SPA itself, there will be no disturbance to individuals nesting or foraging within the SPA.

Red-throated diver have a mean-max foraging range of 9km (Woodward et al., 2019). As such, individuals from Hermaness, Saxa Vord and Valla Field SPA could forage within Cable Corridor 2.1 Yell to Unst, which is approximately 4.1km south of the SPA. Cable Corridor 2.1 Yell to Unst lies within Bluemull and Colgrave Sounds SPA, which has been designated to protect breeding red-throated diver foraging areas. Therefore, red-throated diver from Hermaness, Saxa Vord and Valla Field SPA foraging within the Cable Corridor 2.1 Yell to Unst has been assessed under Bluemull and Colgrave Sound SPA (Section 6.10).

Any disturbance to red-throated diver will be brief and localised. Due to the slow vessel speeds and the temporary and localised nature of installation activities, there will be no significant disturbance of red-throated diver and their population as a viable component of (and distribution within) the site will be maintained.

No LSE will occur on the qualifying feature breeding red-throated diver within Hermaness, Saxa Ford and Valla Field SPA.

6.16.4 Project specific mitigation

None specified.

6.16.5 Conclusion

The cable installation will not cause visual (and above water noise) disturbance of nesting birds within the Hermaness, Saxa Ford and Valla Field SPA. Any disturbance of birds foraging outside of the SPA will be temporary and localised. The distribution of the species within the site and their population as a viable component of the SPA, will be maintained.

The in-combination assessment did not identify any relevant projects with the potential to act in-combination with the R100 project to cause a cumulative impact within the SPA.

In conclusion, there will be **no adverse effect on the integrity of the site either alone or in combination with other plans or projects.**

7. CONCLUSIONS

The Protected Sites Assessment identified 14 European Sites, one NCMPA and two SSSI's where there was a possible pressure-receptor pathway between the protected site and the proposed installation activities.

The NCMPA assessment concluded that as the protected features horse mussel beds, kelp and seaweed communities on sublittoral sediment and maerl beds have not been identified within the zone of influence of the installation activities, there will be no significant impact to these features. Circalittoral sand and coarse sediment communities, shallow tide-swept coarse sands with burrowing bivalves and the Marine geomorphology of the Scottish Shelf Seabed will only be subject to temporary, localised disturbance so there will be no significant impact to these features. Therefore, the project will not hinder the achievement of the management objectives for the NCMPA.

The SSSI assessment concluded for Gutcher SSSI that since the Project will route the cable in the sandy beach area to the landing point for Cable Corridor 2.1 Yell to Unst, outside the SSSI, there will be no adverse effects on the Moine exposures on the foreshore within Gutcher SSSI. Therefore, installation activities for Cable Corridor 2.1 Yell to Unst will not hinder the management objectives for the site.

For East Sanday Coast SSSI, the installation of Cable Corridor 2.3 Sanday to Shetland at the Sanday landing point has potential to impact the protected rocky shore habitat in the absence of mitigation. The following project-specific mitigation has been proposed to avoid significant impact to the rocky shore habitat:

- M1 - Micro-routeing will be undertaken to minimise effects to rocky shores identified within the Cable Corridor 2.3 Sanday landing point area.

By applying project specific mitigation, there will be no impact to protected intertidal habitat features within the East Sanday Coast SSSI.

With respect to the European Sites, many of which are also designated as SSSIs, the Habitats Regulation Appraisal process was followed. Stage 1 Screening of the 14 European sites concluded that for 12 of these sites a potential likely significant effect (LSE) could not be ruled out and therefore Stage 2 Appropriate Assessment (AA) is required.

Information to Inform AA has been provided (Section 5) and where appropriate mitigation measures have been proposed. The assessment concluded that of the 12 sites, in the absence of mitigation LSE could occur to the qualifying interests of Sanday SAC, Fair Isle SPA, Sumburgh Head SPA. As a result, the following project specific mitigation measures have been proposed to prevent LSE from occurring:

- M1 - Micro-routeing will be undertaken to minimise effects to rocky shores identified within the Cable Corridor 2.3 Sanday landing point area.
- M2 - Works at Cable Corridor 2.3 (Sanday landing point) will be scheduled to take place prior to the seal breeding season (June /July) to ensure works commence before seals arrive to breed and will target completion before the breeding period. An installation method statement to include timings will be agreed with Nature Scot prior to installation.
- M3 - Following licence submission and confirmation by NatureScot Ornithology expert on the use of Cable Corridor 2.4 Fair Isle to BU (North Haven landing point) and Cable Corridor 2.3 Sanday to Shetland (Sumburgh landing point) by nesting Arctic Tern, appropriate mitigation will be agreed.

Without prejudice to the conclusion of no LSE on red-throated diver for the East Mainland Coast, Shetland SPA and Bluemull and Colgrave Sounds SPA, as best practice the Applicant proposes that the following mitigation be implemented:

- M4 - All vessels associated with the cable installation operations within Cable Corridor 2.1 Yell to Unst will follow the “Guide to Best Practice for Watching Marine Wildlife’ guidance on birds where practicable and reduce their speed on approach to the cable corridor to below 6knots should rafting birds be observed ahead.

It is concluded that with the implementation of the mitigation measures prescribed above, the proposed installation activities will not have an adverse effect on the integrity of any Protected Sites.

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APPENDIX A

HRA and SSSI Assessment Processes

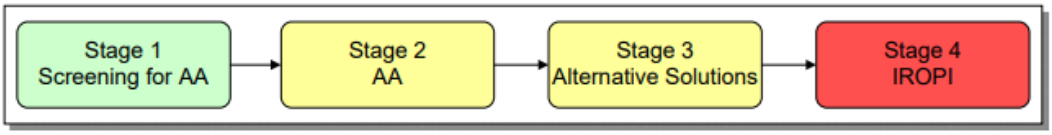
A.1 HABITATS REGULATIONS APPRAISAL (HRA) PROCESS

The Conservation (Natural Habitats, &c.) Regulations 1994 (CHSR) (as amended) in Scotland requires that any plan or project which has the potential to adversely affect a European site, no matter how far away from that site, be subject to the Habitats Regulations Appraisal (HRA) process in order to determine whether Appropriate Assessment (AA) is required.

Whilst the obligation to undertake the AA is derived from Articles 6(3) and 6(4) of EC Council Directive 92/43/EC on the conservation of natural habitats and of wild fauna and flora (the Habitats Directive), it is regulation 48 of the CHSR that sets out procedural requirements. It is the role of the designated competent authority (in this case Marine Scotland) to undertake the HRA process. However, the applicant is required to provide necessary information to inform the process or to enable them to determine whether an AA is required. The competent authority can only agree to the plan or project if, based on the findings of the AA, it has ascertained that it will not have an adverse effect on the integrity of the site concerned. It is important to note that the onus is on demonstrating the absence (rather than the presence) of negative effects.

The HRA process involves four stages (as outlined in EC 2002 and shown in Figure A-1) that need to be applied in sequential order. The outcome at each successive stage determines whether a further stage in the process is required. The results at each stage must be documented so there is transparency of the decisions made.

Figure A-1 Stages of HRA process



There is no statutory method for undertaking the HRA process, but The Planning Inspectorate (2017) guidance outlines the steps to be taken by the applicant at each Stage.

Stage 1 - Screening for Appropriate Assessment is the process that addresses and records the reasoning and conclusions in relation to the first two tests of regulation 48 of the CHSR:

- Whether a plan or project is directly connected to or necessary for the management of the site, and
- Whether a plan or project, alone or in combination with other plans and projects, is likely to have significant effects on a European site in view of its conservation objectives.

Where significant effects are likely, uncertain, or unknown at screening stage, the process must proceed to Stage 2 (AA). Screening should be undertaken without the inclusion of mitigation, unless potential effects clearly can be avoided through the modification or redesign of the plan or project, in which case the screening process is repeated on the altered plan. The greatest level of evidence and justification will be needed in circumstances when the process ends at screening stage on grounds of no effect. Where a potential for significant effect has been identified the assessment must progress to Stage 2.

A.2 NCMPA ASSESSMENT PROCESS

Under Section 126 of the Marine and Coastal Access Act (MCAA) 2009 an applicant must satisfy the public authority with the function of determining applications (in this case Marine Scotland) that there is no significant risk of the proposed act hindering the achievement of the conservation objectives stated for the NCMPA. It is therefore related to the published or draft conservation objectives and designated features of any NCMPA screened for likely significant effect (LSE).

The process for assessing the effects of a plan/project on a NCMPA follows a three-stepped assessment process. Like the HRA process, the outcome at each successive stage determines whether a further stage in the process is required. The stages of the process are Screening, Stage 1 Assessment and Stage 2 Assessment.

All marine licence applications are screened to determine whether Section 126 of the MCAA should apply. It will apply if it is determined that:

- the licensable activity is taking place within or near an area being put forward or already designated as an MPA; and
- the activity is capable of affecting (other than insignificantly) either (i) the protected features of an MPA; or (ii) any ecological or geomorphological process on which the conservation of any protected feature of an MPA is (wholly or in part) dependant.

If during the screening stage it has been determined that Section 126 should apply, it is necessary for the public authority to assess, by proceeding to Stage 1 Assessment, which elements of Section 126 should apply to a marine licence application.

This Protected Sites Screening Report presents the findings of the applicants Screening of Marine Protected Areas.

A.3 SSSI ASSESSMENT PROCESS

SSSIs represent the best of Scotland's natural heritage. They are 'special' for their plants, animals or habitats, their rocks or landforms, or a combination of these. They can include freshwater, and sea water down to the mean low water mark of spring tides, as well as land.

Operations requiring consent, or ORCs, are those activities that NatureScot believe could damage the natural features of an SSSI and for which NatureScot is responsible for giving consent. Developers can apply for consent under the Nature Conservation (Scotland) Act 2004 to carry out, cause or permit to be carried out, operations likely to damage the natural feature(s) of a Site of Special Scientific Interest (SSSI).

When applying for consent, the applicant should provide NatureScot with information about the proposed activities such as the nature and location of the proposed activities. Written consent for operations that can be do