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Marine Environmental Appraisal

Jura to Islay Distribution Cable Replacement

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Marine Environmental Appraisal

Jura to Islay Distribution Cable Replacement

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GLOSSARY

AA
Appropriate Assessment

ABC
Argyll & Bute Council

ALARP
As Low as Reasonably Practicable

BGS
British Geological Society

BT
British Telecommunication

CEMP
Construction Environmental Monitoring Plan

CES
Crown Estate Scotland

CFA
Clyde Fishermen Association

CIRIA
Construction Industry Research and Information Association

CLV
Cable Lay Vessel

COLREGS
International Regulations for the Prevention of Collision at Sea 1972

DD
Decimal Degrees

DDM
Degrees and Decimal Minutes

DMS
Degrees, Minutes and Seconds

DWA
Double layer of armouring wires

ECoW
Ecological Clerk of Works

EIA
Environmental Impact Assessment

EM
Embedded Mitigation

ESRP
Emergency Spill Response Plan

EMODNet
European Marine Observation and Data Network

EPA
Environment Protection Agency

EPS
European protected Species

ERM
Environmental Resources Management

EU
European Union

EUNIS
European Nature Information System

FEAST
Feature Activity Sensitivity Tool

FLMAP
Fisheries Liaison Mitigation Action Plan

FLO
Fisheries Liaison Officer

GES
Good Ecological Status

GT
Giga tonne

Ha
Hectare

HDD
Horizontal Directional Drilling

HER
Historic Environment Records

HMPA's
Historic Marine Protected Areas

HRA
Habitats Regulations Appraisal

HSE
Health & Safety Executive

HSL
High Speed Link

HWDT
Hebridean Whale and Dolphin Trust

Hz
Hertz

ICES
International Council for Exploration of the Seas

INNS
Invasive Non-Native Species

SOLAS
International Regulations for the Safety of Life at Sea 1974

IUCN
International Union for Conservation of Nature

ICG-C
Intersessional Correspondence Group on Cumulative Effects

JNCC
Joint Nature Conservation Committee

kHz
Kilohertz

km
Kilometre

km^2
Kilometre squared

kV
Kilovolt

KIS-ORCA
Kingfisher Information Service - Offshore Renewable & Cable Awareness project

LAT
Lowest Astronomical Tide

LDP
Local Development Plan

LSE
Likely Significant Effect

m
Meter's

MarLIN
Marine Life Information Network

MARPOL
The International Convention for the Prevention of Pollution from Ships

MCA
Marine and Coastal Access Act

MCS
Marine Conservation Society

MD-LOT
Marine Directorate Licencing and Operations Team

MEA
Marine Environmental Appraisal

MHW
Mammal Hearing Weighted

MHWS
Mean High Water Springs

MLWS
Mean Low Water Springs

mm
Millimetres

MMO
Marine Management Organisation

MPA
Marine Protected Area

MPS
Marine Policy Statement

m/s
Meters per second

MSFD
Marine Strategy Framework Directive

MU
Management Unit

MCAA
Marine and Coastal Access Act (2009)

MEPC
Marine Environmental Protection Committee

M-Weighted
Weighted mean

N
Nursery

NAVTEX
Navigational Telex

NCMPA
Nature Conservation Marine Protected Area

nm
Nautical mile

NMP
National Marine Plan

NMPI
National Marine Plan Interactive

NRHE
National Record of the Historic Environment

NSA
National Scenic Area

NSTA
North Sea Transition Authority

NtM
Notice to Mariners

OIMD
Operation, Inspection, Maintenance and Decommissioning

OOS
Out of Service

OSIG
Offshore Site Investigation and Geotechnics Committee

OSPAR
Oslo and Paris convention

PAC
Pre-Application Consultation

PAD
Protocol for Archaeological Discoveries

PAD
Pressures and Activity Database

PEXA
Practice and Exercise Area

PILC
Paper-insulated lead-covered

PMF
Priority Marine Feature

RBMP
River Basin Management Plan

ROV
Remotely Operated Vehicle

RPL
Route Position List

RSPB
Royal Society for the Protection of Birds

RYA
Royal Yachting Association

SAC
Special Area of Conservation

SCANS
Small Cetaceans in European Atlantic waters and the North Sea

SSEN
Scottish & Southern Electricity Networks

SEPA
Scottish Environmental Protection Agency

SFF
Scottish Fishing Federation

SHEPD
Scottish Hydro Electric Power Distribution plc

SMWWC
Scottish Marine Wildlife Watching Code

SPR
Scottish Power Renewables

SWFPA
Scottish White Fish Producers Association Ltd

SEL
Sound Exposure Level

SOPEP
Shipboard Oil Pollution Emergency Plan

SSSI
Site of Special Scientific Interest

SN
Spawning and Nursing

SUT
Society for Underwater Technology

SPA
Special Protection Area

S
Spawning

T
Tonnes

TCE
The Crown Estate

TJP
Transition Joint pit

UK
United Kingdom

UK BAP
UK Biodiversity Action Plan

UKHO
UK hydrographic Office

USBL
Ultra Short Baseline

UXO
Unexploded Ordinance

WFD
Water Framework Directive

WCA
Wildlife and Countryside Act

WOSAS
West of Scotland Archaeology Service

WHS
World Heritage site

ZoI
Zone of Influence

1. INTRODUCTION

Scottish Hydro Electric Power Distribution plc (SHEPD), part of the Scottish and Southern Energy plc (SSE) group of companies, holds a licence under the Electricity Act 1989 for the distribution of electricity in the north of Scotland including the islands. This region covers a quarter of the total United Kingdom (UK) landmass, with electricity being delivered to 740,000 customers. In the marine environment SHEPD maintains connections to 60 Scottish islands with over 100 subsea cable links totalling approximately 454km. SHEPD has a statutory duty to provide an economic and efficient system for the distribution of electricity and to ensure that its assets are maintained to ensure a safe, secure and reliable supply to customers.

1.1 Purpose of this document

The purpose of this Marine Environmental Appraisal (MEA) is to support a Marine Licence application being made under the Marine (Scotland) Act 2010 and The Marine Licensing (Pre-application Consultation) (Scotland) Regulations 2013), by SHEPD, for the replacement of the Jura to Islay submarine electricity distribution cable. Following consultation with Marine Directorate Licensing Operations Team (MD-LOT) it was confirmed on 26 November 2022 that this project is exempt from the formal Pre-Application Consultation (PAC) process, however stakeholder consultation has been undertaken on an ongoing basis. MD-LOT granted an exemption to the PAC process, based on the proximity to the existing cable and description of the works provided. MD-LOT have informed SHEPD that they will treat this as an activity which has been previously carried out at the site, or a similar site, to which the application relates and for which a licence has been previously granted.

This MEA provides the baseline information and an assessment of the potential impacts on sensitive environmental receptors. Where potentially significant adverse effects have been identified, appropriate mitigation has been detailed in order to reduce the magnitude of effect to an acceptable level. The mitigation requirements identified by this MEA are also included in the supporting marine Construction Environmental Management Plan (CEMP), to ensure they are effectively disseminated to, and implemented by SHEPD and the cable installation contractor during the proposed works.

1.1.1 Objectives and scope of the Marine Environmental Appraisal

This MEA Report provides an overview of the baseline environment within the proposed Application Corridor (a 150m wide corridor within which the cable will be installed). The baseline environment includes physical and biological processes, and the human environment. The MEA Report identifies and assesses potential impacts from the proposed installation activities. A series of supporting documents are available for the Project which will be drawn upon or referenced throughout the MEA Report (listed in Table 1-1).

Table 1-1 Supporting documents for the Marine Licence application

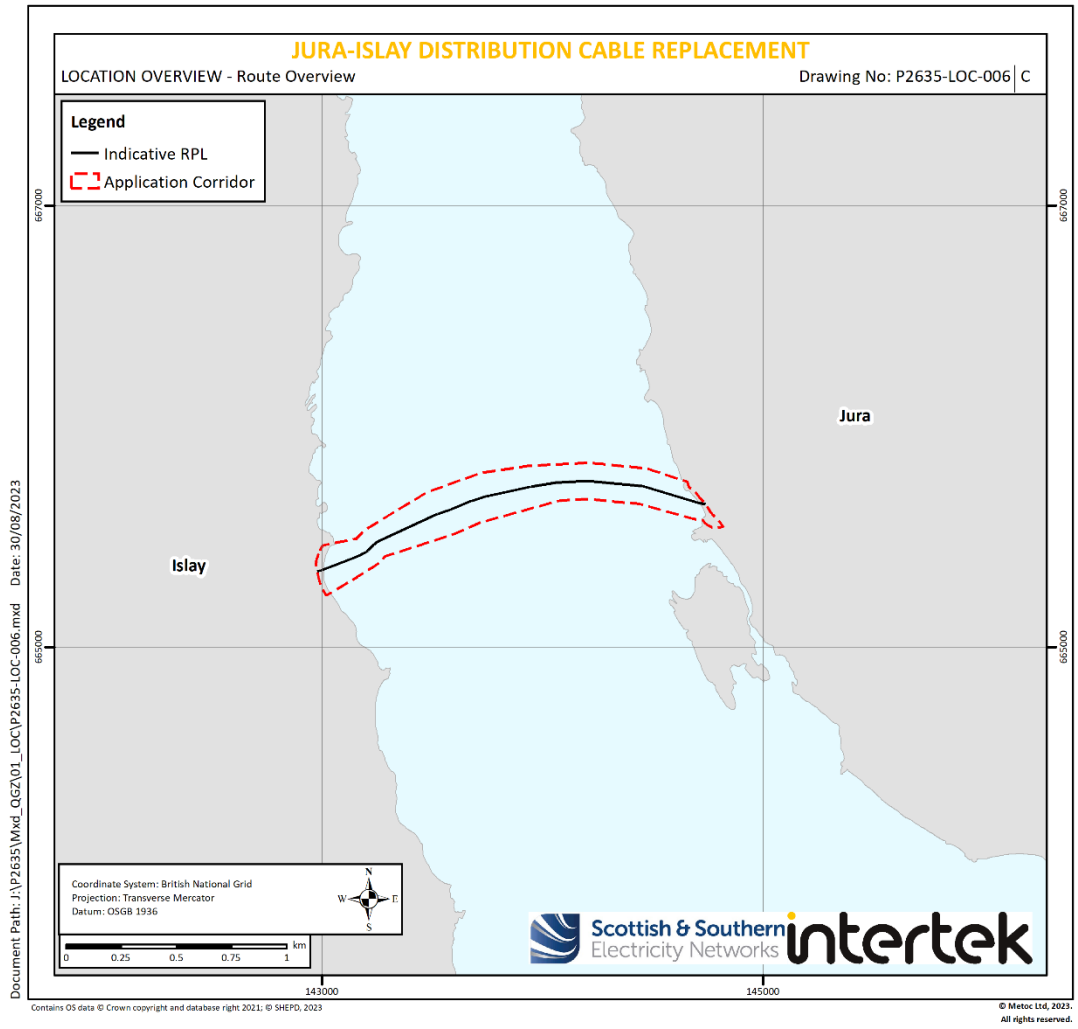
Appendix	Document
A	Jura – Islay Cable replacement Project description (P2635_R6193)
B	Argyll Fisheries Liaison Mitigation Action Plan (FLMAP) 2023
C	Jura to Islay EPS Risk and Protected Sites and Species Assessment
D	Jura to Islay (Offshore) Construction Environmental Management Plan (CEMP) (P2635_R6192)

1.2 Overview of the Project

The electricity networks of Jura are connected to Islay by approximately 2km of cable operating at 33kV, the landfalls of the cable are the beach north of Glas Eilean, Jura and Traigh Ban, Islay.

The present Jura - Islay 33 kiloVolt (kv) subsea cable is a 33kV 70mm^2 Paper-insulated lead-covered (PILC) 'High Speed Link'(HSL) Double wired Armour (DWA) cable and was installed in 2011. Routine inspections have determined this cable to be in critical condition with an urgent need for replacement. SHEPD, therefore, propose to replace the 33kv distribution submarine electricity cable across the Sound of Islay landing at Traigh Ban (herein referenced as the 'Project'). The existing cable to be left in situ as still currently operational. Sections of other, older cables may be removed but only where necessary to facilitate installation of the new cable. An overview of the proposed Jura to Islay cable replacement route is shown in Figure 1-1 (Drawing reference: P2635-LOC-006).

Figure 1-1 Overview of the proposed replacement cable Application Corridor



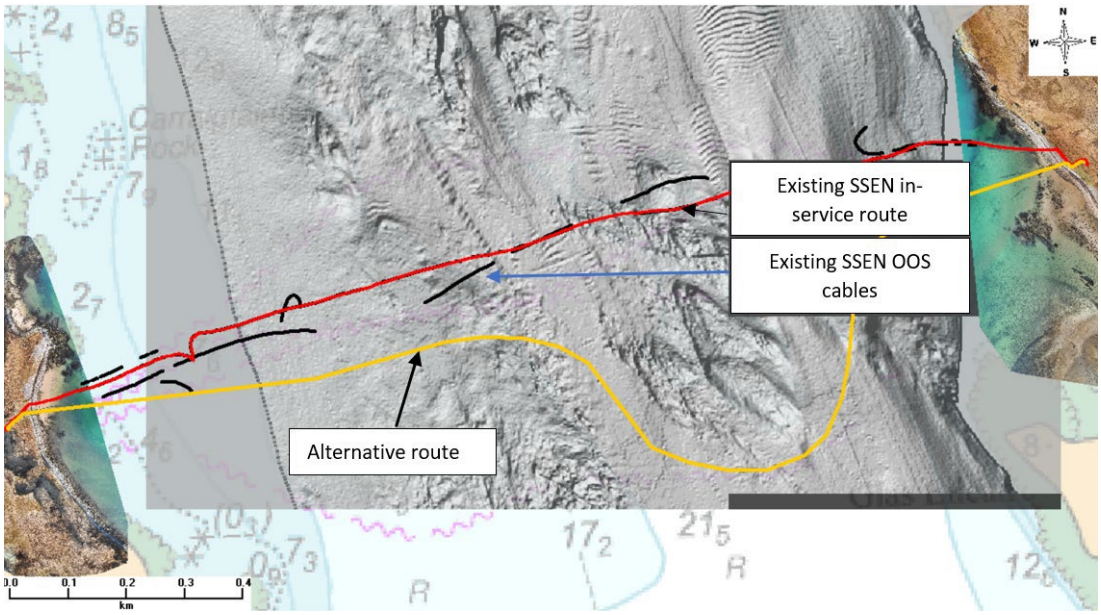
1.3 Considerations of alternatives

As the proposed activities will involve installing a new cable within the region of the Sound of Islay, the main considerations made were the route this cable would take from the beach north of Glas Eilean, Jura and Traigh Ban, Islay side. The following options were considered:

- Do Nothing: this option was rejected owing for the need to reinforce the connection between Jura and Islay.

- Alternative route 1: utilising the Tràigh Bhàn transition joint pit on Islay installing to the south of the existing cable between Jura and Islay. This option was rejected due to the risks associated with the strong current streams and increased risks of cable being laid on or near rocky outcrops.

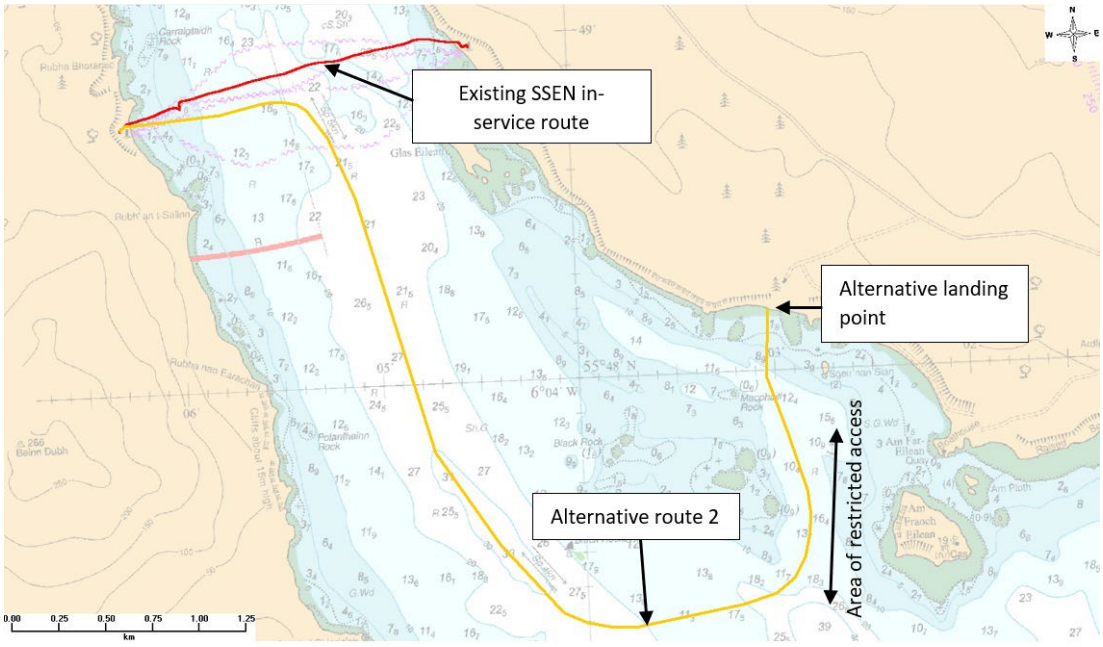
Figure 1-2 Alternative route 1, outlined by the yellow solid line



Source: Ocean IQ, 2022

- Alternative route 2: lay of the cable down the tidal stream and navigating around an area of rocky outcrops to land on the beach south of Glas Eilean, Jura. This was the longest route considered and was rejected due to risks associated with manoeuvrability of the vessel on approach to the Jura landfall.

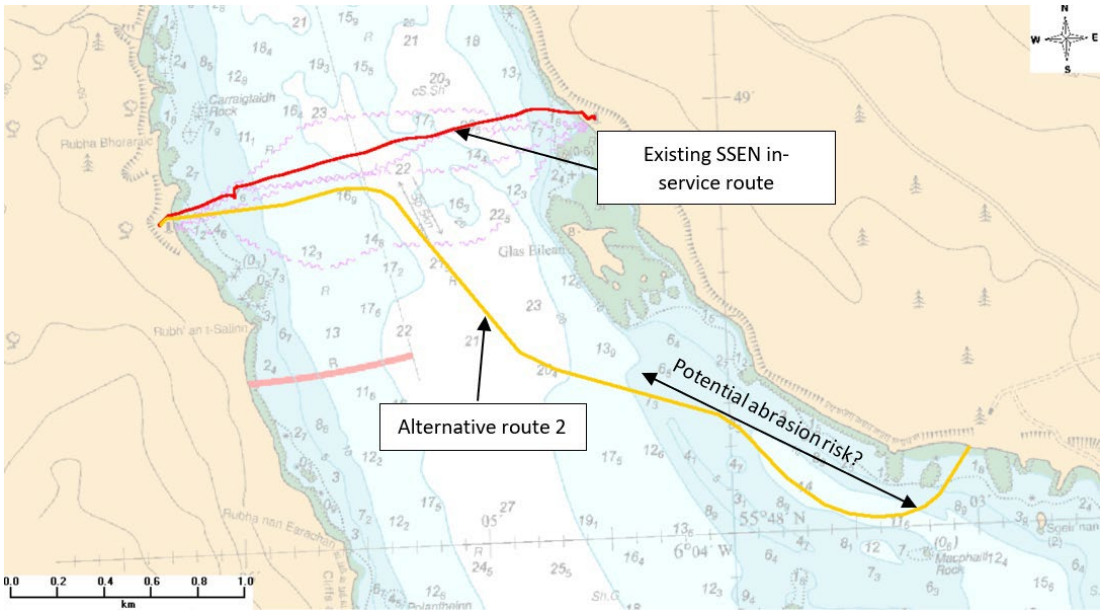
Figure 1-3 Alternative route 2, outlined by the solid yellow line



Source: Ocean IQ, 2022

- Alternative route 3: utilising a landing point at the beach to the south of Glas Eilean, Jura. This option was rejected due to shallow water depths on approach to shore and located within a potential area of shallow rock which presented risk of abrasion to cable and the need for an additional installation vessel to operate in shallower waters.

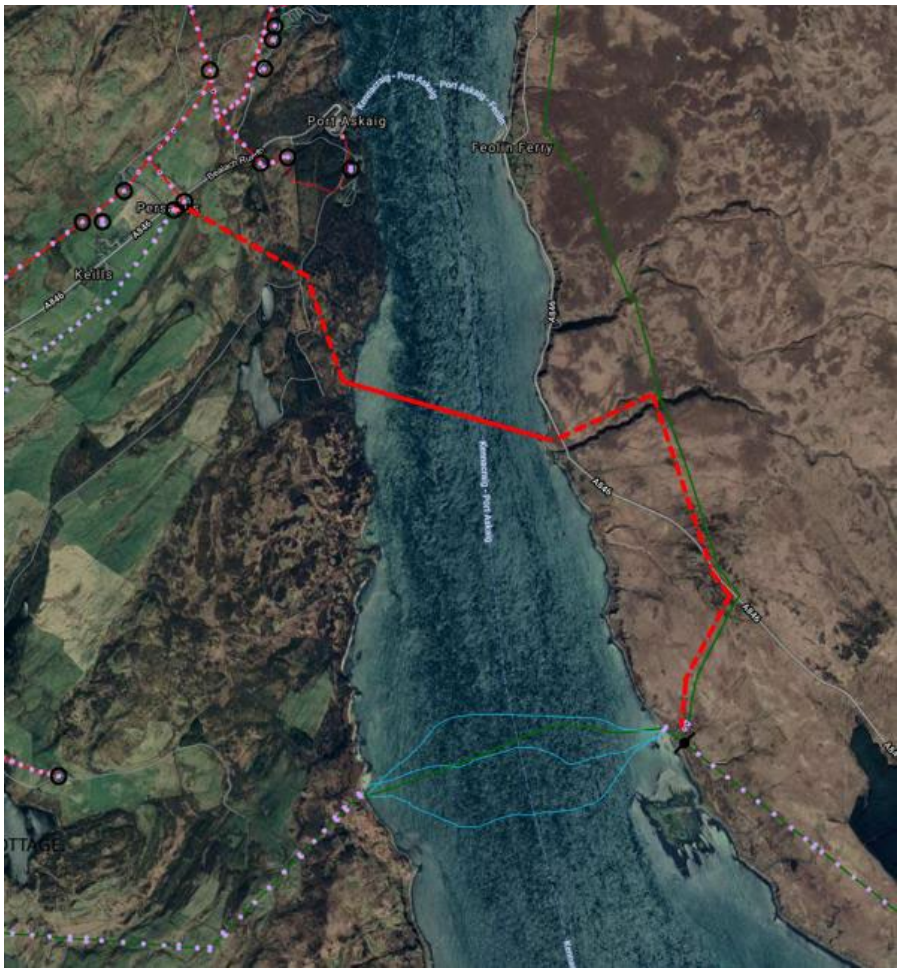
Figure 1-4 Alternative route 3, outlined by the yellow solid line



Source: Ocean IQ, 2022

HDD option 1: Install a new HDD bore (~1.3km) between suitable shore landings within a clearing in Dunlossit Estate, Islay, to an outcrop of flat land north of the Abhainn Daimh-sgeir burn, Jura.

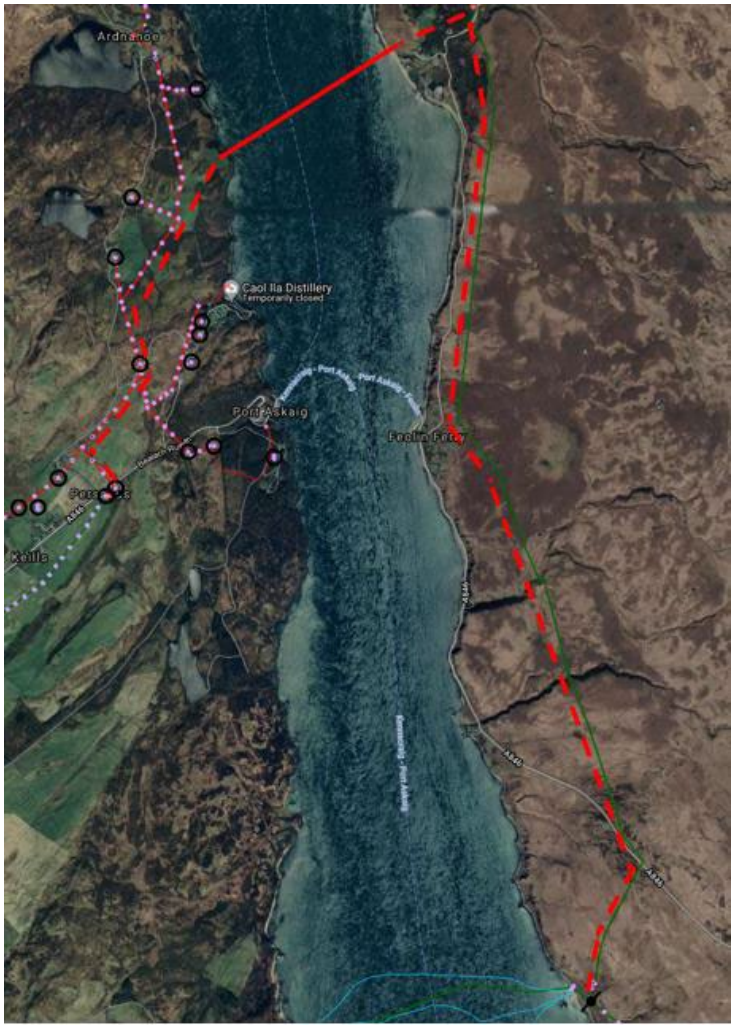
Figure 1-5 HDD Option 1 outlined by the red solid line and Grid Connection outlined by the dashed line



Source: Mott MacDonald, 2022

- HDD option 2: Install a new HDD bore (~1.3km) between suitable shore landings within farmland above Port nam Borrachaig, Islay to the northern section of Whitefarland Bay, Jura.

Figure 1-6 HDD option 2 outlined by the red solid line and Grid connection outlined by the dashed line



Source: Mott MacDonald, 2022

1.4 Exclusions from the assessment

This assessment covers the marine cable installation activities related to the replacement of the cable below Mean High Water Springs (MHWS). SHEPD realise that there is a need to consider options regarding potential future activities relating to maintenance and/or future decommissioning of the installed cable, specifically whether it shall be removed or left *in situ*. A separate OIMD plan will be developed, which will inform SHEPD's position on these activities.

Geophysical survey operations including, pre, during and post installation may be conducted as part of the proposed cable installation works. However, these survey operations are subject to existing consents held by SHEPD, specifically: an EPS Licence Reference – EPS-00010461; and a Basking Shark Derogation Licence Reference - BS-00010462. As such no geophysical survey operations are included within the scope of this MEA.

1.5 Stakeholder consultation

1.5.1 Fisheries

Stakeholder engagement with Scottish Fishermen Federation (SFF), Clyde Fisheries Association (CFA) and Scottish White Fish Producers Association Ltd (SWFPA) was held at various dates throughout 2022 and 2023 in relation to the replacement cable.

The FLMAP identifies potential impacts to commercial fisheries and other marine users. The FLMAP identifies measures to manage these impacts and presents measures on how these will be mitigated where required (see Appendix B).

1.5.2 NatureScot (Formerly Sottish Natural Heritage)

Consultation is undertaken on a bimonthly basis with NatureScot, meetings of note took place on 19 November 2022 with regard to the geotechnical surveys that are planned for the Project and provided an update on the progress being made in planning ED2 future projects including Jura to Islay, and Orkney to Shapinsay. Consultation was also undertaken on the 16 March and 18 May 2023 to update NatureScot on the progress of the project and the planned installation activities for Summer 2024. SHEPD also engaged with NatureScot to receive a disturbance licence with regards to a mitigation zone for the Golden Eagles nest covering both the land and marine elements of the Project.

1.5.3 Argyll and Bute Council (ABC)

Consultation meetings with ABC took place at various times throughout 2022 and 2023, at the most recent consultation meeting on the 28 March 2023, SHEPD provided a comprehensive update on Jura to Islay project.

1.5.4 Royal Society for the Protection of Birds (RSPB)

SHEPD held various consultation meetings throughout 2022 and 2023, providing updates on the Jura to Islay project and various other ED1 and ED2 projects.

1.5.5 European Protected Sites and Species Risk Assessment

A European Protected Species (EPS) Risk and Protected Sites and Species Assessment was prepared prior to commencement of surveys to support application for an EPS Licence and a Basking Shark Licence. This assessment has been subsequently updated to include cable replacement installation operations and forms the basis of this assessment (Appendix C).

2. LEGISLATION AND POLICY

2.1 Introduction

This Section describes the key relevant policy, legislation and guidance which relates to the proposed cable installation activities and explains how and where these have been considered in the production of this MEA. This Section outlines the statutory legislation which SHEPD must adhere to during the installation and operation of the replacement distribution cable.

2.2 UK Marine Policy Statement

Prepared and adopted for the purposes of Section 44 of the Marine and Coastal Access Act (MCAA) 2009, the UK Marine Policy Statement (MPS) was published to provide a framework for preparing marine plans and making effective decisions affecting the marine environment (HM Government, 2011). The MPS applies to all UK waters and has been adopted by the UK government and all devolved administrations, with all regional and national plans required to conform to the MPS. The MPS also states that in relation to energy infrastructure several factors must be considered when any decision makers are examining and determining applications. Of these factors, one is relevant to this Project:

The national level of need for energy infrastructure, as set out in the National Planning Framework which applies in Scotland.

2.3 Marine (Scotland) Act 2010

The Marine (Scotland) Act 2010 gained Royal Assent in 2010 and provides the legal mechanism to help protect Scotland's coastal and territorial waters through new and improved management systems (Scottish Government, 2020). The act comprises five key elements, which are:

1. A Strategic Marine Planning System;
2. A Streamlined Marine Licensing System;
3. Improved Marine Nature Conservation Measures;
4. Improved Measures for the Protection of Seals; and
5. Improved Enforcement Measures.

Installation and operation of submarine cables in Scottish waters requires a Marine Licence under Part 4 of the Marine (Scotland) Act (Scottish Parliament, 2010).

2.4 Marine Licence and supporting information requirements

Submarine cables do not require an Environmental Impact Assessment (EIA) to be conducted as they are not listed under Schedule A1 or A2 of The Marine Works (EIA) (Amendment) Regulations 2017 (HM Government, 2017).

Marine Scotland advise that a Marine Licence applicant should consider the scale and nature of the submarine cable project and consider the need for a proportionate environmental assessment. This should also include the extent to which an activity is in accordance with any marine plan for the area. Where there exists the potential for the environment, human health, legitimate uses of the sea or designated sites (i.e. Emerald Network (Natura) or Marine Protected Area (MPA)) to be impacted by the Project, Marine Scotland recommends that these impacts should be assessed (Marine Scotland 2015). The results of the assessment, along with other supporting information such as a cable-route study and cable-burial plan (if required), should be provided to Marine Scotland to support the Marine Licence Application. This MEA report presents an overview of the baseline environment and provides

the necessary environmental assessment to support the Marine Licence Application through consideration of the potential impacts of the project to the marine environment.

2.5 Conservation (Natural Habitats,&c.) Regulations 1994 (as amended in Scotland) (also known as 'The Habitats Regulations') and the revision to The Conservation (Natural Habitats) (EU Exit) (Scotland)(Amendment) Regulations 2019

The Conservation (Natural Habitats, &c) Regulations 1994 (also known as the 'Habitats Regulations') transposed the European Habitats Directive (92/43/EEC) and Birds Directive (79/409/EEC) into Scottish law. The Habitats Regulations enshrine the Habitats Regulations Appraisal (HRA) process in law, requiring that any proposal which has the potential to result in a negative Likely Significant Effect (LSE) to a European site or its designated features be subject to HRA, and if necessary Appropriate Assessment (AA). The regulations also make it an offence to deliberately or recklessly capture, kill, injure harass or disturb a European Protected Species (EPS). When European protected species are present, licences to permit works that will affect them can only be granted when:

- There is no satisfactory alternative; and
- The action authorised will not be detrimental to the maintenance of the population of the species concerned at a favourable conservation status in their natural range.

The regulations were amended further in 2019 following the UK leaving the European Union (EU), by the Conservation (Natural Habitats, &c.) (EU Exit) (Scotland) (Amendment) Regulations 2019 (Scottish Government, 2019).

2.6 Wildlife and countryside Act 1981 (as amended) and the Nature Conservation (Scotland) Act 2004

Basking sharks are protected under Schedule 5 of the Wildlife and Countryside Act (WCA) (1981 as amended) which prohibits the killing, injuring, or taking by any method of those wild animals listed on Schedule 5 of the Act. The Nature Conservation (Scotland) Act 2004, Part 3 and Schedule 6 make amendments to the WCA, strengthening the legal protection for threatened species to include 'reckless' acts, and specifically makes it an offence to intentionally or recklessly disturb or harass basking sharks. A derogation licence under the WCA will therefore be required for any activity which may result in disturbance or injury to basking sharks.

In addition, the primary legislation for the protection of birds in the UK is the WCA in combination with the Nature Conservation (Scotland) Act 2004. Under these acts, it is an offence to harm or disturb wild bird species, their eggs and nests. Additional protection is provided for certain bird species listed on Schedule 1 of the WCA, and it is an offence to disturb those species at their nest while it is in use. Licensing for wild birds does not cover development purposes, so any activity that could result in disturbance of a nesting Schedule 1 species should not proceed unless out-with the breeding season, unless a disturbance licence is in place. In addition, the Conservation (Natural Habitats) (European Union (EU) Exit) (Scotland) (Amendment) Regulations 2019 also instrument an amendment to Section 27 of the WCA 1981 to ensure that existing protections continue.

SHEPD discussions with NatureScot have indicated that due to overriding public interest a disturbance licence would be required to carry out these works within the bird breeding season.

2.7 Protection of Seals (Designated Sea Haul-out Sites) (Scotland) Order 2014

The Protection of Seals (Designated Sea Haul-out Sites) (Scotland) Order 2014 (made in exercise of the power conferred by section 117 of the Marine (Scotland) Act 2010) made it an offence to harass a seal (intentionally or recklessly) at a designated haul-out site, with the Order designating 194 such sites around the Scottish coastline. A haul-out site is defined as a location on land where seals come ashore at times to rest, to breed, have pups or moult. Section 117 of the Marine (Scotland) Act 2010, in conjunction with this Order, is designed to offer protection to seals on land, when they are at their most vulnerable.

2.8 Scottish National Marine Plan

Adopted by the Scottish Government in March 2015 (Marine Scotland, 2015), the Scottish National Marine Plan (NMP) establishes policies and objectives to enable the sustainable development and management of Scotland's marine resources, in both Scottish inshore (out to 12nm) and offshore waters (12 to 200nm). The NMP details 21 general policies that are applicable to all future developments and uses within Scottish waters. Relevant policies to this Project include, but are not limited to: GEN 1, GEN 2, GEN 4, GEN 13, GEN 15, GEN 18 and GEN 12.

These general policies are supplemented by sector-specific policies, enabling policies and objectives to be targeted at particular industries. With regards to this Project, the two most relevant sectoral policy sections are sea fisheries (due to the potential impacts to local fishermen) and submarine cables.

2.8.1 Sea fisheries

The Sea Fisheries chapter of the NMP details five marine planning policies that should be considered when developing within the vicinity of areas used for fishing purposes. Of these five, three are relevant to this Project. These are: Fisheries 1, Fisheries 2 and Fisheries 3.

2.8.2 Submarine Cables

Relevant objectives to this Project listed in the NMP regarding submarine cables include:

- Protect submarine cables whilst achieving successful seabed user co-existence;
- Achieve the highest possible quality and safety standards and reduce risks to all seabed users and the marine environment; and
- Support the generation, distribution, and optimisation of electricity from traditional and renewable sources to Scotland, UK and beyond.

In addition to these objectives, the NMP details four planning policies to be considered in the development of new submarine cable projects. These are: Cables 1, Cables 2, Cables 3 and Cables 4

2.8.3 Shipping, Ports harbours and Ferries

The Transport section of the NMP details Transport policies that should be considered when within the vicinity of areas used for shipping and transport. The relevant objectives to this Project listed in the NMP regarding submarine cables include Transport 1 and Transport 6.

2.9 Scottish Marine Regions

After multiple years of public consultation and specialist studies establishing the support for, and potential areas of marine regions in Scottish waters (Scottish Government, 2015), the Scottish Marine Regions Order 2015 came into force on 13 May 2015 and details the boundaries of the final 11 Scottish marine regions (Scottish Government, 2015). The Project is in the Argyll marine region. Regional Marine Plans will be developed by Marine Planning Partnerships, allowing more local ownership and decision making about specific issues within their area. Within these marine regions, Regional Marine Plans will be developed by Marine Planning Partnerships. These partnerships will comprise of groups of local marine stakeholders, allowing for more focused decision making by the local community to target the issues specific to each marine region.

Regional Marine Plans: The National Marine Plan sets the wider context for planning within Scotland, including what should be considered when creating local, regional marine plans. Eleven Scottish Marine Regions have been created which cover sea areas extending out to 12 nautical miles. Regional Marine Plans will be developed in turn by Marine Planning Partnerships, and this is an evolving process, being taken forward in phases. The Clyde and Shetland Isles are the first regions to take forward regional marine planning. This project will lie within the Argyll marine plan jurisdiction once the plan is implemented.

2.9.1 Argyll & Bute Council Local Development Plan

Plan provides the local planning framework for the surrounding Argyll & Bute Council (ABC) area. The Plan is divided into the written statement and proposals maps. The written statement provides a context for the policy against which planning applications for new development proposals should be assessed. This is supported by the proposals maps which show the range of development opportunities and constraints within the area. These maps include key development areas, potential area for development, areas requiring environmental improvement or regeneration and environmental designations.

2.9.2 Argyll and Bute Proposed Local Development Plan 2 (LDP2)

ABC is presently preparing a new Local Development Plan (LDP2) which will replace the current LDP in due course. ABC has submitted the proposed LDP2 and all unresolved representations to the Scottish Government. The Scottish Government appointed a Reporter to conduct the independent examination which started in May 2022, and which has now concluded. If it is adopted before the application submission, the Project will adhere to the policies involved in this LDP2.

2.10 Marine Wildlife Watching Code

NatureScot developed the Code as part of its duties under the Nature Conservation (Scotland) Act 2004. The Code was first published in 2006 and was revised in 2017 in light of recent legislation. The Code isn't a law or a regulation. Its main purpose is to raise awareness and offer practical guidance for responsible marine wildlife watching. The Code aims to:

- help minimise disturbance to marine wildlife;
- helps the public and organisations to enjoy watching marine wildlife;
- improve the chances of seeing wildlife;
- provide a standard for the wildlife watching industry; and
- help you to stay within the law.

Prior to operations taking place all vessel crew will be made aware of all protected species within the marine environment through the following guidance; the Marine Conservation Society (MCS) Basking

Shark Code of Conduct and good practice measures for boat control near basking sharks and the Scottish Marine Wildlife Watching Code and Guide to Best Practice for Watching Marine Wildlife. More information on this is provided in the Construction Environmental Management Plan (CEMP) (Appendix D).

3. PROJECT DESCRIPTION

This Section provides an overview of the activities associated with installation of the replacement cable and management of crossings of the in-service and out of service cables across the route. A detailed project description is provided in Appendix A to this Marine Environmental Appraisal (MEA).

The Jura to Islay cable is located within the Sound of Islay, Scotland. The replacement cable is approximately 2 kilometres (km) in length and routes from the beach north of Glas Eilean on the island of Jura and runs along the rocky foreshore and across the seabed in the Sound of Islay and onto the beach in Tràigh Bhàn on Islay. The proposed replacement cable will route in close proximity to the existing cable but will be micro-routed around any potential environmental and technical constraints as informed by pre-installation surveys.

The Application Corridor to be consented will be 150 meters (m) wide (+/- 75m either side of the Route Position List (RPL)) to allow for flexibility in route engineering. The Application Corridor is shown in Figure 1-1 of this MEA, with the co-ordinates of the corridor being provided in Table 3-1.

Table 3-1 Application Corridor co-ordinates

Point	Latitude	Longitude
WGS 84 Geographic		
1	55° 48.828' N	6° 6.219' W
2	55° 48.850' N	6° 6.076' W
3	55° 48.974' N	6° 5.774' W
4	55° 49.028' N	6° 5.546' W
5	55° 49.067' N	6° 5.099' W
6	55° 49.063' N	6° 4.846' W
7	55° 49.035' N	6° 4.658' W
8	55° 48.932' N	6° 4.491' W
9	55° 48.929' N	6° 4.539' W
10	55° 48.975' N	6° 4.862' W
11	55° 48.971' N	6° 5.207' W
12	55° 48.844' N	6° 5.793' W
13	55° 48.811' N	6° 5.944' W
14	55° 48.708' N	6° 6.193' W
15	55° 48.828' N	6° 6.219' W

A summary of the installation activities considered by this assessment is detailed below, with further detail provided in Appendix A of this MEA. It should be noted that the cable protection measures are still to be finalised, with the values representative of the maximum potential values to allow for a worst-case scenario to be assessed. The installation activities will comprise of:

- Surface laying of subsea cable using a cable lay vessel (CLV) with onshore trenching to the Transition Joint Pit (TJP);
- Use of a remotely operated vehicle (ROV) and associated Ultra-Short Baseline (USBL) positioning systems for pre- and post- lay survey works;

- Use of articulated pipe in the intertidal and nearshore zones for cable protection and stabilisation;
- Use of rock bags in the offshore zone for cable protection and stabilisation;
- Use of Uraduct and/or concrete mattresses for cable crossing management and/or cable stabilisation; and
- Associated vessel presence.

4. ASSESSMENT METHODOLOGY

4.1 Assessment criteria

4.1.1 Assessment criteria

The environmental assessment presented in this document reports on the impacts associated with the licensable activities of the cable installation process and presents its findings and conclusions. The key stages of the assessment process are listed as follows and align with the Institute of Environmental Management & Assessment (2004) guidelines which state, "*The assessment stage of the Environmental Impact Assessment (EIA) should follow a clear progression; from the characterisation of 'impact' to the assessment of the significance of the effects including the evaluation of the sensitivity and value of the receptors*." (p11/2) (IEMA, 2004):

- Characterisation of the baseline environment;
- Establish potential impacts from the Project and zone of influence (ZoI);
- Characterisation of the change in impact;
- Evaluation of significant of effects; and
- Establish mitigation.

ZOIs have been identified regarding the spatial extent over which the activities of the Project are predicted to have an impact on the receiving environment. These are referred to in topic chapters and identify the extent of assessment and include mobile species or mobile users of the sea with the potential to enter the ZoI.

4.1.2 Pressure identification

Pressures are the mechanism through which an activity has an effect on any part of the ecosystem. The nature of the pressure is determined by the activity type, intensity and distribution. A list of marine physical/chemical and biological pressures and their definitions has been formally agreed by the OSPAR (Oslo and Paris convention) Intersessional Correspondence Group on Cumulative Effects (ICG-C) (OSPAR 2016) and has been used in this assessment. The ICG pressure list does not include human pressures, and therefore, categories have been developed based on industry experience. In order to identify the appropriate pressures on biological features the following guidance has been considered:

- JNCC Marine Pressures and Activity database (PAD v1.5) (JNCC 2022); and
- Feature Activity Sensitivity Tool (FEAST) for identifying the sensitivity of marine habitats and features to the effects of cable installation (Marine Scotland 2023a).

Biological receptors which have protected status have been fully considered in Chapter 5 'Protected sites' and summarised in the biological Sections of this Marine Environmental Appraisal (MEA) report.

The interaction of the Project with other sea users has been considered within Appendix B – Fisheries Liaison Mitigation Action Plan (FLMAP) and referred to accordingly in the human environment Sections of this MEA Report.

4.1.3 Evaluation of significance

Effects only occur when an impact is present within an environment that is sensitive to it. An impact is the consequence of the pressure i.e. a predicted change in the baseline environment. The effect is the consequence of the impact and is usually measurable.

If appropriate, and typically based on the findings of supporting studies, pressures have been screened out for further assessment in the MEA. The screening decision and justification is provided in Section 4.4, Table 4-2.

In assessing the significance of the effect, the magnitude (the spatial extent of the impact, the duration and frequency) and sensitivity, recoverability and importance of the receptor are considered. The following definitions of significance, as adapted from the Environment Protection Agency (EPA) (2017) have been used in the assessment:

- Imperceptible – An effect capable of measurement but without significant consequences.
- Not Significant – An effect which causes noticeable changes in the character of the environment but without significant consequences.
- Slight – An effect which causes noticeable changes in the character of the environment without affecting its sensitivities.
- Moderate – An effect that alters the character of the environment in a manner that is consistent with existing and emerging baseline trends.
- Significant – An effect which, by its character, magnitude, duration or intensity alters a sensitive aspect of the environment.
- Very Significant – An effect which, by its character, magnitude, duration or intensity alters most of a sensitive aspect of the environment.
- Profound – An effect which obliterates sensitive characteristics.

Effects which are Imperceptible, Not Significant and Slight typically do not require mitigation measures other than compliance with environmental statute and best practice. Effects which are classified as Moderate or above would typically be unacceptable without the implementation of project specific mitigation designed to avoid, abate or reduce the significance of the effect.

4.2 Mitigation requirements

Certain measures are incorporated into the Project design as adherence to standard industry best practices or embedded mitigation which is fundamental to how the project will be executed. Details of the embedded mitigation which SHEPD are committed to implementing, and hence has been considered by this MEA are presented in Table 4-1. All embedded mitigation will be included within the Construction Environmental Management Plan (CEMP). Additional mitigation has been suggested on a receptor specific basis informed by the impact assessments. During the assessment of impacts in the receptor specific assessment chapters, all proposed mitigation is considered when assessing the significance of an impact.

Table 4-1 Table 4-1 Embedded mitigation and best practice measures relevant to the project

ID	Measure	Details
EM1	Environmental planning.	The final cable route will be optimised as part of the final engineering design to avoid impacts on sensitive environmental features, including Annex I habitats and wrecks insofar as possible. Cable protection methods and quantities as well as anchor chain deployment will be carefully selected and considered to minimise any potential impact on environmentally sensitive habitats.
EM2	Scottish Marine Wildlife Watching Code (SMWWC).	All vessels will adhere to the provisions of the SMWWC during installation works. NatureScot developed the Code as part of its duties under the Nature Conservation

ID	Measure	Details
		(Scotland) Act 2004. The Code was first published in 2006 and was revised in 2017. The code aims to minimise disturbance to marine wildlife
EM3	Marine Mammal Protection Plan.	All works will be undertaken in accordance with the Marine Mammal Protection Plan.
EM4	Vessels will be travelling at a slow speed during installation works.	The slow speed of installation vessels will minimise the risk of disturbance and injury impacts to seabird, marine mammal and basking shark receptors
EM5	All project personnel will be trained and informed of their responsibility to implement the environmental and ecological mitigation outlined in the CEMP.	Toolbox talks, inductions, and awareness notices will be used to disseminate this information among all relevant project personnel
EM6	Otter survey.	Otter surveys have indicated that there are no qualifying features within 200m of the works that would require a licence to be in place. A pre-construction survey will be carried out prior to the works. Mitigation measures will be detailed in the onshore CEMP, and SPP plans and adhered to.
EM7	Breeding and nesting birds.	For any nesting or protected breeding populations in close proximity to the Application Corridor or the landfall, further consultation will be undertaken with NatureScot on the requirement for any seasonal restriction to be implemented for cable installation in order to avoid disturbance to qualifying species.
EM8	Golden Eagles.	All vessels operating on the project (within and outwith the licence corridor) will have copies of the Golden Eagle disturbance licence will need to be present onboard the Project vessels as well as copies provided to the onshore contractors- with all conditions to be adhered to.
EM9	Lighting on board will be kept to a minimum.	Lighting on-board the cable installation vessel will be kept to the minimum level required to ensure safe operations. This will minimise disturbance to seabird species
EM10	Stakeholder engagement.	Continuing effective positive liaison with all interested parties through the pre-construction, construction and operational phases of the cable replacement.
EM11	Notice to Mariners (including local), Kingfisher bulletins, Radio Navigational Warnings, NAVTEX, and/or broadcast warnings will be promulgated in advance of any proposed works. The notices include the time and location of any work being carried out, and emergency event procedures.	Ensure navigational safety and minimise the risk and equipment snagging
EM12	Construction Phase Plan (CPP).	Construction Phase Plan (CPP) - Provision of details of the schedule for cable lay activities to local ports, ship operators, fishermen and recreational sailing organisations.
EM13	Automatic Identification Systems (AIS) Tracking.	The cable installation vessel has will have AIS as a legal requirement.
EM14	Safety zone.	Implementation of safety zones (of up to 500m) around the cable lay vessel will reduce the risk of collision between the cable laying vessel and other vessels transiting the area.

ID	Measure	Details
EM15	Fishing Industry Representatives (FIR) and Standard operating procedures (SOP).	Should a FIR not be present on a vessel, the Fishing Gear Interaction Standard Operating Procedure (SOP) will be followed as provided in Appendix A of the FLMAP.
EM16	Arrangement between the project and CalMac Ferries.	During the Marine Survey campaign for this project arrangements were made with CalMac Ferries to ensure survey vessel activities and ferry operations coexisted in harmony. The arrangement was very successful and is being continued into the installation phase of operations.
EM17	Consultation.	Early consultation with relevant contacts to notify of impending activity.
EM18	Compliance with International Regulations for the Prevention of Collision at Sea 1972 (COLREGs) and the International Regulations for the Safety of Life at Sea 1974 (SOLAS).	COLREGs are the international standards designed to ensure safe navigation of vessels at sea. All installation vessels will adhere to these rules, including displaying appropriate lights and shapes. SOLAS is an international maritime treaty which sets minimum safety standards in the construction, equipment and operation of merchant ships. The convention requires signatory flag states to ensure that ships flagged by them comply with at least these standards. In relation to the Project its compliance will ensure navigational safety.
EM19	As built survey data will be provided to the UK Hydrographic Office (UKHO) and Kingfisher for inclusion on Admiralty Charts and Kingfisher Information Service – Offshore Renewable & Cable Awareness project (KIS-ORCA) Awareness Charts.	Ensure navigational safety and minimise the risk and equipment snagging.
EM20	Guard vessel (if required).	A guard vessel may be contracted in the in the event of its presence being required for the safety of the vessel, its crew and the cable.
EM21	Cable protection.	Appropriate cable protection to be installed as applicable along the cable route.
EM22	A Fisheries Liaison Officer (FLO) will be employed to manage interactions between cable installation vessels, personnel, equipment and fishing activity. This will be managed through the Fisheries Liaison Mitigation Action Plan (Appendix B).	Employment of a FLO will ensure all commercial fisheries operators in the vicinity of the Project will be proactively and appropriately communicated with in terms of proposed Project operations including exclusions, dates and durations
EM23	Marine Safety Information broadcast.	The UKHO will be informed of installation activities in order to issue Maritime Safety Information (MSI) broadcasts as appropriate.
EM24	Avoidance over the cable.	Guidance provided by the UKHO and International Convention for the Safety of Life at Sea (SOLAS) recommend that fishing vessels should avoid trawling over installed seabed infrastructure (UKHO 2020). Vessels are advised in the Mariners Handbook not to anchor or fish (trawl) within 500 m of the cable.
EM25	Notification of buoys.	If cables are buoyed off whilst the vessel departs the area, buoy positions will be notified to the Notice to Mariners (NTM) distribution list including Kingfisher and 500 m clearance will be requested.
EM26	Potential Unexploded Ordnance (pUXO).	If pUXO items are discovered during any phase of the project, the location of the item will be recorded and immediate advice sought from relevant authorities.

ID	Measure	Details
		Munitions awareness briefings will be given to all relevant personnel.
EM27	Marine Archaeology Management Plan.	All works will be undertaken in accordance with the Marine Archaeology Management Plan.
EM28	Archaeological mitigation during installation.	If required by licence condition, a Protocol for Archaeological Discoveries (PAD) based on the Crown Estate's PAD reporting protocol (2014) may be implemented. The use of vessels with DP positioning systems rather than anchors will further prevent accidental impact.
EM29	Ballast water discharges from vessels will be managed under International Convention for the Control and Management of Ships' Ballast Water and Sediments, 2004 (BWM Convention).	The BWM Convention, adopted in 2004, aims to prevent the spread of harmful aquatic organisms from one region to another, by establishing standards and procedures for the management and control of ships' ballast water and sediments. Measures will be adopted to ensure that the risk of Invasive Non-Native Species (INNS) introduction during cable installation works is minimised
EM30	Vessels will be equipped with waste disposal facilities (sewage treatment or waste storage) to IMO MARPOL Annex IV Prevention of Pollution from Ship standards.	Measures will be adopted to ensure that the potential for release of pollutants from installation vessels is minimised
EM31	Control measures and shipboard oil pollution emergency plans (SOPEP) will be in place and adhered to under The International Convention for the Prevention of Pollution from Ships (MARPOL) Annex I requirements for all vessels. In the event of an accidental fuel release occurring appropriate standard practice management procedures will be implemented accordingly.	As per the MARPOL 73/78 requirement under Annex I, all ships with 400 Giga Tonne (GT) and above must carry an oil prevention plan as per the norms and guidelines laid down by International Maritime Organization under MEPC (Marine Environmental Protection Committee) act. Production of this plan will help to ensure that the potential for release of pollutants from construction, operation and decommissioning is minimised.
EM32	Monitoring and Reporting Plan.	To ensure works are carried out as per legislation, consent and licence conditions and in line with the *Employer* requirements monitoring and reporting of activities is to be undertaken in accordance with Monitoring and Reporting Plan, including completion of the Vessel Audit – Environmental Compliance Checklist.
EM33	Pre installation equipment checks.	All equipment will be checked and recorded prior to the commencement of installation activities to ensure that following completion of the cable installation all equipment has been recovered.
EM34	Post installation equipment checks.	Upon completion of the cable installation operation, post installation equipment checks will be completed to confirm that all equipment has been recovered in its entirety and no unlicenced deposits in the marine environment result from the project operations.
EM35	Production of a Construction Environmental Management Plan (CEMP).	Measures will be adopted to ensure environmental impacts are minimised, and to reduce the potential for release of pollutants from installation works. This will be informed by the results of this MEA.

EM = Embedded mitigation

4.3 Cumulative impact assessment

Information sources used to inform the potential cumulative effects that may be occurring in the region included the following:

- SEAFISH Kingfisher Bulletin;
- North Sea Transition Authority (NSTA): Oil and gas industry information;
- KIS-ORCA: Marine cables information;
- The Crown Estate Website: Offshore wind farm and marine aggregate digital data; and
- Marine Scotland: Marine licensing website.

The MEA will examine potential cumulative impacts of the replacement distribution cable between Jura and Islay and other plans and projects. It will also include the interactions with other environmental topics and inter-project interactions, for example the interaction of the offshore infrastructure with the onshore infrastructure which may share the same ZoI. However, considering the extremely localised nature of the effects likely to be associated with the proposed cable installation activities, no potential cumulative effects were identified, and no further assessment is required.

4.4 Pressure identification, zones of influence and screening

As detailed in Section 4.1.2 above, the pressures considered in this assessment have been identified from the ICG-C pressure list (OSPAR 2016) in addition to review of the JNCC Pressure Activity Database (JNCC 2022) and the FEAST tool for identifying the sensitivity of marine habitats and features to the effects of cable installation (Marine Scotland, 2023a). Several pressures have been identified for each topic area as outlined in Table 4-2. For each pressure identified, Table 4-2 presents any applicable embedded mitigation, the installation footprint and associated zone of influence and a screening decision as to whether assessment within the MEA is required.

Table 4-2 Pressures, zone of influence and screening decisions

Receptor	Sensitivity of receptor to pressure	Dimensions of pressure footprint	Applicable embedded mitigation and best practice measures	Further assessment required	Reference
Physical change (to another substratum)					
Sediment quality	Low – no sensitive features have been identified.	Cable[1] 2100m x 0.133m = 279.3m^2 Clump weights 8 x 1m^2 = 8m^2 Earthing clump weights 10 x 0.25m^2 = 2.5m^2 Sections of the above cable will have increased dimensions to their footprint: Cast iron split pipe (articulated pipe) 788m x 0.26m = 204.88m^2 along a route length of 788m Uraduct (up to 350m of route length), 350m x 0.35m (Uraduct diameter) = 122.5m^2 Concrete mattresses 3m x 6m (x10 mattresses) = 180m^2 along a route length of 2100m Rock bags (MWLS to 10m LAT) 2.2m diameter (130bags) across an area of 2100m Rock bags (below 10m LAT)* 2.8m diameter (164 bags) across an area of 2100m * some or all of these may be substituted with 3.6m diameter bags (58 bags)	The final cable route and positioning of rock, protective material or armouring will be optimised as part of the final engineering design to avoid impacts on sensitive environmental features so far as possible. The footprint of any placed cable protection will be limited to that required to ensure cable stability on the seabed and protection at crossings. Cable will be 100% surface laid	Yes	Section 6
Benthic and intertidal ecology	High – Priority Marine Feature (PMF) habitat 'Maerl beds' present in Application Corridor and highly sensitive.			Yes	Section 8
Commercial fisheries (fish and shellfish)	Medium – commercial fisheries in the area are of a low density; however 10 commercially sensitive species may use the area for nursery grounds.			Yes	Section 11
Abrasion / disturbance at the surface of the substratum					

Receptor	Sensitivity of receptor to pressure	Dimensions of pressure footprint	Applicable embedded mitigation and best practice measures	Further assessment required	Reference
Sediment quality	Low – works will not disturb submerged sediments or result in sediment suspension greater that that caused by natural wave action.	Cable[1] 2100m x 0.133m = 279.3m^2 Clump weights 8 x 1m^2 = 8m^2 Earthing clump weights 10 x 0.25m^2 = 2.5m^2 Spud leg π x 457mm^2 = 0.66m^2 Sections of the above cable will have increased dimensions to their footprint: Cast iron split pipe (articulated pipe) 788m x 0.26m = 204.88m^2 along a route length of 788m Uraduct (up to 350m of route length), 350m x 0.35m (Uraduct diameter) = 122.5m^2 Concrete mattresses 3m x 6m (x10 mattresses) = 180m^2 along a route length of 2100m Rock bags (MWLS to 10m LAT) 2.2m diameter (130bags) across an area of 2100m Rock bags (below 10m LAT)* 2.8m diameter (164 bags) across an area of 2100m * some or all of these may be substituted with 3.6m diameter bags (58 bags)	Deployment of anchor chains will be kept to a minimum. The cable will be stabilised to prevent movement and abrasion. All wrecks or features of archaeological significance will be avoided by a buffer of ≥50 m during detailed route design; The locations of wrecks and features of archaeological significance will be identified on electronic charts onboard the installation vessel and will be utilised to guide installation operations; and The locations of any wrecks or features of archaeological significance will be provided to Historic Environment Scotland and the UK Hydrographic Office (UKHO). If required by a condition of the Marine Licence, The Crown Estate's 'Protocol for Archaeological Discoveries' (The Crown Estate, 2014) will be implemented during installation works. No vessel/activity shall interact with the seabed within the specific exclusion radii surrounding a geophysical contact deemed as potential UXO ALARP certificate in place.	Yes	Section 6
Benthic and intertidal ecology	High – PMF habitat 'Maerl beds' present in Application Corridor and highly sensitive.			Yes	Section 8
Marine archaeology	Low – works will not disturb historic shipwrecks or artefacts			No	Section 10
Unexploded Ordnance (UXO) and existing utilities	Low – works will not disturb the UXO,			Yes	Section 12
Water flow (tidal current) changes – local					
Water quality	Low – No changes local currents within the Application Corridor will occur.	No change to water flow (tidal current) expected	N/A	No	N/A
Changes in suspended solids (water clarity)					

Receptor	Sensitivity of receptor to pressure	Dimensions of pressure footprint	Applicable embedded mitigation and best practice measures	Further assessment required	Reference
Water quality	Low – Works will not disturb submerged sediments or result in sediment suspension greater that that caused by natural wave action.	Sediment is expected to settle within 100m of the Application Corridor (Gooding *et al.*, 2012). 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.	N/A	No	N/A
Penetration and / or disturbance of the substrate below the surface of the seabed					
Sediment quality	Low - No penetration of the seabed or disturbance below the surface of the seabed will occur (with exception of intertidal sediments when the tide is out).	No penetration of the sub-tidal seabed planned during installation works.	Deployment of spud legs will be kept to a minimum.	No	Section 6
Benthic and intertidal ecology	Medium – Spud legs may be required to enable vessels to stay on location. PMF habitat 'Maerl beds' present in Application Corridor and highly sensitive.			Yes	Section 8
Marine archaeology	Low - No penetration of the seabed or disturbance below the surface of the seabed will occur.			No	Section 10
UXO and existing utilities	Low - No penetration of the seabed or disturbance below the surface of the seabed will occur.			No	Section 12
Smothering and siltation rate changes					
Benthic and intertidal ecology	High – PMF habitat 'Maerl beds' present in Application Corridor and highly sensitive.	Intertidal area of the Application Corridor.	Events to have a small impact area and will be restricted to short temporal events.	Yes	Section 8

Receptor	Sensitivity of receptor to pressure	Dimensions of pressure footprint	Applicable embedded mitigation and best practice measures	Further assessment required	Reference
Accidental hydrocarbon or chemical release from installation vessel					
Benthic and intertidal ecology	Medium - PMF habitats 'Maerl beds' and 'Kelp and seaweed communities on sublittoral sediment', as well as Annex 1 bedrock and stony reef, present in Application Corridor and sensitive.	Within the Application Corridor.	Best practice and compliance measures will be in place to minimise the likelihood of any accidental releases and provide an action plan if they do occur to minimise any effects.	Yes	Section 8
Introduction or spread of invasive / non-native species					
Benthic and intertidal ecology	Medium – PMF habitat 'Kelp and seaweed communities on sublittoral sediment' present in Application Corridor with medium sensitivity.	Immediately within the vicinity of the Application Corridor	Best practice and compliance measures will be in place to minimise the likelihood of any INNS from Project vessels or equipment.	Yes	Section 8
CEMP	High – due to the high density of existing vessels in the sound.	Within the Application Corridor	Ensure all vessels contracted to undertake works will be contractually obliged to adhere to relevant BWM measures as outlined above, where relevant and be surveyed and issued with an International Ballast Water Management Certificate. Ballast Water Management Plans (BWMP) will be provided by contracted vessels in accordance with Regulation B-1 of the Convention, alongside Ballast Water Record Books as described by BWM Regulation B-2. Biofouling / antifouling All vessels will be required to undertake pre use and post use checks, including the presence for marine growth. All equipment (ploughs, ROVs etc.) will be required to be free from marine growth prior to mobilisation.	No	CEMP
Underwater noise changes					
Protected sites	High - Due to the Application Corridor passing within/in the vicinity of protected sites.	Immediately within the vicinity of the Application Corridor.	All works will be undertaken in accordance with the Marine Mammal Protection Plan.	Yes	Section 5

Receptor	Sensitivity of receptor to pressure	Dimensions of pressure footprint	Applicable embedded mitigation and best practice measures	Further assessment required	Reference
Marine megafauna	High - Due to known presence of basking shark, pinniped and cetacean species within/in the vicinity of the Application Corridor.		All vessels will adhere to the provisions of the Scottish Marine Wildlife Watching Code (SNH, 2017), and the Basking Shark Code of Conduct (The Shark Trust, undated); All installation operations will be conducted at vessel speeds of ≤6 knots; If the SBP or LFE is deployed on an uncrewed surface vessel or other autonomous vehicle, the mitigation measures outlined below will be conducted from a support vessel or suitable vantage point on land; and Installation personnel will be made aware of all protected species within the marine environment, and their responsibility to implement the mitigation in this document.	Yes	Section 7
Visual (and above water noise) disturbance					
Protected sites and species	High – due to the presence of nesting/foraging birds protected within SPAs within/in the vicinity of the Application Corridor.	Within the Application Corridor	Disturbance licences will be obtained where required and all conditions adhered to.	Yes	Section 5
Ornithology	High – due to the presence of nesting golden eagles near the Islay landfall	Intertidal area of the Application Corridor	Disturbance licences will be obtained where required and all conditions adhered to.	Yes	Section 9
Vessel presence					
Protected sites and species	High - due to the Application Corridor passing within/in the vicinity of protected sites	Within the Application Corridor	All vessels will adhere to the SMWWC, slow installation vessel speed, disturbance licence(s) as required.	Yes	Section 5
Marine megafauna	Medium – due to the presence of protected basking shark, pinniped, cetacean and bird species within/in the vicinity of the Application Corridor.			Yes	Section 7

Receptor	Sensitivity of receptor to pressure	Dimensions of pressure footprint	Applicable embedded mitigation and best practice measures	Further assessment required	Reference
Ornithology	High – due to the presence of nesting golden eagles in proximity to the Application Corridor.	Within the Application Corridor	N/A	Yes	Section 9
Changes in supporting habitat and prey availability					
Marine megafauna	Low – Cetacean utilise sound and vision to locate prey items. There will be no significant loss of fish and benthic species during cable installation. Cetacean echolocation of prey items will mean that prey availability is not impaired during cable installation. Pinniped also use sight to locate prey items. The duration of sediment suspension will not be significant to pinniped species. The footprint of installation is not sufficient to reduce the available prey items within the region.	N/A	N/A	No	N/A
Temporary displacement / restricted access					
Shipping and Navigation	High – due to the high density of existing vessels in the sound.	Within the Application Corridor	Notice to Mariners (including local), Kingfisher bulletins, Radio Navigational Warnings, NAVTEX, and/or broadcast warnings will be promulgated in advance of any proposed works. The notices include the time and location of any work being carried out, and emergency event procedures. Compliance with IRPCS (IMO, 1972) and the International Regulations for the SOLAS. As built survey data will be provided to the UKHO and Kingfisher for inclusion on Admiralty Charts and KIS-ORCA Awareness Charts.	Yes	Section 13
Vessel collisions					

Receptor	Sensitivity of receptor to pressure	Dimensions of pressure footprint	Applicable embedded mitigation and best practice measures	Further assessment required	Reference
Shipping and navigation	High – due to the high density of existing vessels in the sound and potential requirement for existing vessels to have to re-route around project vessel thus creating pinch points.	Within the Application Corridor	Notice to Mariners (including local), Kingfisher bulletins, Radio Navigational Warnings, NAVTEX, and/or broadcast warnings will be promulgated in advance of any proposed works. The notices include the time and location of any work being carried out, and emergency event procedures. Compliance with IRPCS (IMO, 1972) and the International Regulations for the SOLAS.	Yes	Section 13
Increased snagging risk					
Commercial fisheries	Low – due to the low-density fisheries activity in the area.	Immediately within the Application Corridor	Notice to Mariners (including local), Kingfisher bulletins, Radio Navigational Warnings, NAVTEX, and/or broadcast warnings will be promulgated in advance of any proposed works. The notices include the time and location of any work being carried out, and emergency event procedures. Compliance with IRPCS (IMO, 1972) and the International Regulations for the SOLAS. As built survey data will be provided to the UKHO and Kingfisher for inclusion on Admiralty Charts and KIS-ORCA Awareness Charts.	Yes	Section 11
Shipping and navigation	Low – due to the low-density fisheries activity in the area.		As built survey data will be provided to the UKHO and Kingfisher for inclusion on Admiralty Charts and KIS-ORCA Awareness Charts.	Yes	Section 13
Damage to third party assets					
UXO and existing utilities	Low – no third party assets within the vicinity	Within the Application Corridor	ALARP certificate in place.	No	Section 12
Fisheries interaction with surface laid cable					
Commercial fisheries	Low - due to the low-density fisheries activity in the area.	Within the Application Corridor	▪ Project vessels will comply with the International Regulations for Preventing Collisions at Sea, 1972 (COLREGs) – as amended, particularly with respect to the display of lights, shapes and signals.	No	Section 11

Receptor	Sensitivity of receptor to pressure	Dimensions of pressure footprint	Applicable embedded mitigation and best practice measures	Further assessment required	Reference
			▪ The dropped object procedure will be followed, and any dropped objects must be reported to the relevant authority (MS LOT) using the dropped object procedure form, within 24 hours of the project becoming aware of an incident. ▪ 'As-laid' co-ordinates of the cable route will be recorded and circulated to the UK Hydrographic Office (UKHO), KIS-ORCA service and any other relevant authorities. Cables will be marked on Admiralty Charts and KIS-ORCA charts (paper and electronic format). An update will be distributed to stakeholders following the completion of installation.		

Source of information for [1] The length has been calculated based on the length of the centre line of the Application Corridor [2]Estimate based on sediment properties settling velocity of particles and currents; [3] Based on cables already in place and scientific judgement.

5. PROTECTED SITES ASSESSMENT

5.1 Introduction

This section provides details on the marine protected sites and species that may be present or have the potential to be present within or adjacent to the Application Corridor. Potential impacts on sites determined to be at risk of impact from the proposed installation activities have been assessed, along with the mitigation and management measures that will be utilised to remove or reduce these impacts. This Section should be read in conjunction with the separate European Protected Species (EPS) Risk and Protected Sites and Species Assessment (document reference: A-303128-S04-A-REPT-002) (Xodus, 2023) which assessed the impacts of survey activities to protected sites and species over the Argyll region.

Protected sites including Special Areas of Conservation (SACs), Nature Conservation Marine Protected Areas (NCMPAs), Special Protection Areas (SPAs), RAMSAR sites and Sites of Special Scientific Interest (SSSIs) in the immediate vicinity of the Application Corridor for physical features and within 50 kilometre (km) for sites designated for mobile species, have been considered within the baseline. The potential for likely significant effects have been identified and assessed.

5.2 Data sources

The preliminary baseline of protected sites in the region has been informed using the following sources:

- Jura to Islay Subsea Cable Replacement Environmental Desk Study Report, ERM 2022
- EPS and Protected Sites and Species Risk Assessment – Argyll (document reference: A-303128-S04-A-REPT-002, (Xodus 2023)(Appendix C)

In order to establish baseline conditions a desktop review of published information has been undertaken supported by consultation with relevant bodies. Any other data sources used are referenced throughout the document.

5.3 Protected sites description

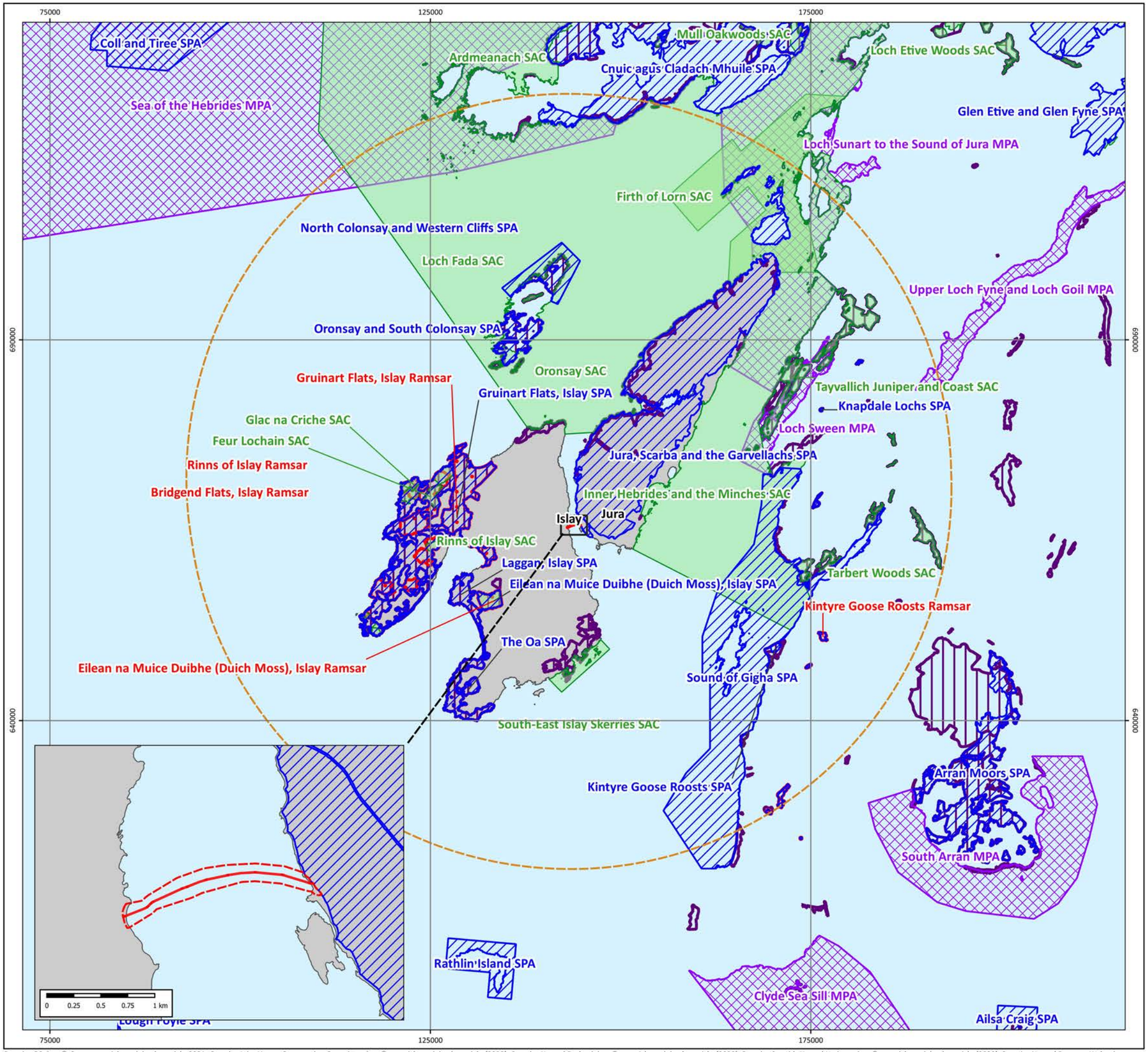
There is one marine protected site located within the Application Corridor and a further 20 sites within 50km designated for mobile species (see Figure 5-1 Location Overview, Drawing Reference: P2635-PROT-002).

JURA-ISLAY DISTRIBUTION CABLE REPLACEMENT

PROTECTED SITES

Wider Environmental Designations

Drawing No: P2635-PROT-002 | A



Legend

- Indicative RPL
- Installation Corridor
- 50km buffer

Environmental Designations

- SAC
- SPA
- MPA
- RAMSAR
- SSSI

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NOT TO BE USED FOR NAVIGATION

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5.3.2 Special Areas of Conservation (SAC)

SACs are sites classified under the Conservation (Natural Habitats, & c.) Regulations 2010 (as amended), the Conservation of Offshore Marine Habitats and Species Regulations 2017 (as amended by the Conservation (Natural Habitats, &c.) (EU Exit) (Scotland) (Amendment) Regulations 2019) and for the protection of Annex I and II habitats and species respectively (JNCC, 2019b).

There are no SACs located within the Application Corridor; two SACs are located within 50km of the corridor with primary or qualifying features with the potential to be present within the Application Corridor.

5.3.2.1 Inner Hebrides and the Minches SAC (7.38km, distance to closest part of Application Corridor)

The Inner Hebrides and the Minches SAC covers a large area of 1381391.4 hectares (Ha), stretching from the northern coast of Harris down to the waters south of Jura. The site is designated for the protection of the resident harbour porpoise (*Phocoena phocoena*) population. The site provides protection for approximately 32% of the harbour porpoise population found on the west coast of Scotland, and contains the highest density of harbour porpoise in the country (NatureScot, 2019). Given the mobile nature of harbour porpoise there is potential for their presence within the Application Corridor. **Therefore, this site has been taken forward for assessment in Section 5.4**.

5.3.2.2 South-East Islay Skerries SAC (15.11km, distance to closest part of Application Corridor)

Covering an area of 1500.41ha, the Southeast Islay Skerries SAC stretches from the eastern entrance of Lagavulin Bay to Ardmore Point encompassing numerous islands off the southeastern Islay coast. The site is designated for a nationally important population of common seal (*Phoca vitulina*) who use the rugged coastline of the area for pupping, moulting and haul-out activities. The population protected in the South-East Islay Skerries SAC represents between 1.5% and 2% of the entire UK population (JNCC 2020). Given the mobile nature of common seals and their high at-sea usage within the Sound of Islay (NMPI, 2023) there is potential for their presence within the Application Corridor. **Therefore, this site has been taken forward for assessment in Section 5.4**.

5.3.3 Special Protection Areas (SPAs)

SPA's are sites classified under the Conservation (Natural Habitats, & c.) Regulations 2010 (as amended), the Conservation of Offshore Marine Habitats and Species Regulations 2017 (as amended by the Conservation (Natural Habitats, &c.) (EU Exit) (Scotland) (Amendment) Regulations 2019), for the protection of Annex I or migratory breeding and non-breeding birds (JNCC, 2019c).

One SPA is located within the Application Corridor; 11 SPA's are located within 50km of the Application Corridor and two of these support species with the potential to enter the Application Corridor.

5.3.3.1 Jura, Scarba and the Garvellachs SPA (within)

The Jura, Scarba and the Garvellachs SPA covers an area of 34585.96ha and extends across a majority of Jura and the Slate Islands. The site is designated purely for breeding populations of the golden eagle (*Aquila chrysaetos*) and an assessment of impacts to this species in particular is provided in Section 9 "Ornithology". The site supports more than 2% of the Great Britian breeding population (NatureScot 2021b). **Therefore, this site has been taken forward for assessment in Section 5.4**.

5.3.3.2 Bridgend Flats, Islay SPA (9.98km, distance to closest part of Application Corridor)

The Bridgend Flats SPA, also designated as a SSSI and RAMSAR site, covers an area of important mudflats and saltmarshes on the eastern border of Loch Indaal, Islay. It is designated for wintering populations of barnacle goose (*Branta leucopsis*) and supports 24.9% of the Great Britain population (NatureScot 2021b). In winter, maximum foraging distances of 7km have been observed for barnacle

geese and as such the species is unlikely to be present within the Application Corridor (Doyle *et al*., 2022). **Therefore, this site has not been taken forward for further assessment.**

5.3.3.3 Eilean na Muice Duibhe (Duich Moss), Islay SPA (11.99km, distance to closest part of Application Corridor)

The Eilean na Muice Duibhe (Duich Moss), Islay SPA covers the terrestrial area between the Duich River and the River Laggan for a total of 577.27ha. The site is also designated as a SSSI and RAMSAR site and is designated for non-breeding populations of the Annex I species, the Greenland white-fronted goose (*Anser albifrons flavirostris*) (NatureScot 2021c). This species is known to forage in inland areas such as coastal marshes and estuaries approximately 10km from their roosting sites and as such are not expected to be present within the Application Corridor (Madsen *et al*., 2001). **Therefore, this site has not been taken forward for further assessment.**

5.3.3.4 Gruinart Flats, Islay SPA (12.18km, distance to closest part of Application Corridor)

Stretching from Lyrabus to Ardnave Point and extending to Nave Island, the Gruinart Flats, Islay SPA covers an area of 3262.13ha. The site is also designated as a SSSI and RAMSAR site and supports a variety of marine and terrestrial habitats, allowing for a wide diversity of plants and animal communities to thrive, providing food for the designated features of the site which are as follows (NatureScot, 2020a):

Passage

- Canadian light-bellied brent goose (*Branta bernicla hrota*)

Breeding

- Chough (*Pyrrhocorax pyrrhocorax*)

Non-breeding

- Chough (*Pyrrhocorax pyrrhocorax*)
- Greenland barnacle goose (*Branta leucopsis*)
- Greenland white-fronted goose (*Anser albifrons flavirostris*)

With maximum foraging ranges of 5.7km, 7km and 10km it is unlikely that populations of chough, barnacle geese or white-fronted geese will be present within the Application Corridor (Siriwardena *et al.,* 2000; Doyle *et al*., 2022; Madsen *et al.,* 2001). However, as Canadian light-bellied brent geese undertake their migrations from wintering grounds in the UK and Ireland to their breeding grounds in Canada there is possibility of their presence in the Gruinart Flats SPA and, with an observed mean foraging range of 53km ± 23.4km, the further possibility that they may transit within the Application Corridor (RSPB, 2023b; Clausen *et al*., 2013). **Therefore, this site has been taken forward for assessment in Section 5.4.**

5.3.3.5 Rinns of Islay SPA (13.36km, distance to closest part of Application Corridor)

Covering an area of 9416.83ha the Rinns of Islay SPA, also designated as a SSSI and RAMSAR site, protects numerous breeding, non-breeding and passing bird assemblages on the western portion of the island of Islay (NatureScot, 2021d). Protected species include:

Breeding

- Chough (*Pyrrhocorax pyrrhocorax*)
- Common scoter (*Melanitta nigra*)
- Corncrake (*Crex crex*)
- Hen harrier (*Circus cyaneus*)

Non-breeding

- Chough (*Pyrrhocorax pyrrhocorax*)
- Greenland white-fronted goose (*Anser albifrons flavirostris*)

Passage

- Whooper swan (*Cygnus cygnus*)

The foraging activities of the breeding and non-breeding species in the Rinns of Islay SPA mean that it is unlikely for members of these populations to be present within the Application Corridor. Chough have a mean foraging distance of 5.7km (Siriwardena *et al*., 2000), corncrake a foraging range of approximately 5.3 hectares (0.053 km^2) (Byrne *et al*., 2003) and Greenland white-fronted geese remain within approximately 10km of their roosting sites (Madsen *et al.*, 2001). Furthermore, common scoter are known to primarily forage in offshore areas and therefore are likely to travel west (away from the Application Corridor) for foraging activities (Carboneras 1992), and hen harrier are known to forage in the immediate locality of their nesting sites, usually within a few kilometres (Sim *et al*., 2017). Additionally, although populations of the whooper swan pass through the Rinns of Islay SPA during their yearly migrations, they are known to forage predominately in close proximity to their preferred wetland habitat and are therefore likely to remain close to these habitats within the protected site (BirdLife International, 2020). The protected species of this designated site are therefore unlikely to be present within the Application Corridor. **Therefore, this site has not been taken forward for further assessment.**

5.3.3.6 Laggan, Islay SPA (13.86km, distance to closest part of Application Corridor)

Stretching from Rubha Glas in Laggan Bay to Rubha an t-Saile in Loch Indaal, the Laggan, Islay SPA, also designated as a SSSI, covers an area 1225.62ha and is designated for non-breeding populations of the Greenland barnacle goose and the Greenland white-fronted goose (NatureScot, 2021e). The maximum foraging ranges for these species are 7km and 10km respectively and are therefore not likely to be present within the Application Corridor (Doyle *et al.*, 2022; Madsen *et al*., 2001). **Therefore, this site has not been taken forward for further assessment.**

5.3.3.7 The Oa SPA (19.40km, distance to closest part of Application Corridor)

Covering the southern point of Islay, the OA SPA, also designated as an SSSI, has an area of 1930.84ha and is designated only for breeding populations of chough. The designated population is currently in decline however new management measures implemented should, in time, improve the feature to favourable condition (NatureScot 2021f). Individuals protected as part of this population are unlikely to be within the Application Corridor due to the species limited forging range of 5.7km (Siriwardena *et al*., 2000). **Therefore, this site has not been taken forward for further assessment.**

5.3.3.8 Sound of Gigha SPA (19.79km, distance to closest part of Application Corridor)

The Sound of Gigha SPA covers a total area of 36326.83ha extending from Macrihanish Bay in the south to the entrance of Loch Caolisport off Knapdale to the north. It includes the sheltered waters of the Sound of Gigha between the island and the mainland and of West Loch Tarbert (NatureScot, 2020b).

The area included within the SPA supports a population of European importance of the following Annex I species:

- Great northern diver (*Gavia immer*) – Non-breeding

It also supports migratory populations of European importance of the following species:

- Common eider (*Somateria mollissima*) – Non-breeding

- Red-breasted merganser (*Mergus serrator*) – Non-breeding
- Slavonian grebe (*Podiceps autitus*) – Non-breeding

Of the protected species within the Sound of Gigha SPA, common eider, red-breasted merganser and Slavonian grebe have the potential to be present within the Application Corridor. These species utilise areas of rocky coastline, and sandy beaches and Islay has been identified as providing suitable habitat and feeding opportunities for these species in winter months. Given the close proximity of Islay to the Sound of Gigha SPA it has therefore been identified that these species have the potential to be present within the Application Corridor (RSPB, 2020). For the great northern diver a maximum foraging range of 10km offshore has been identified and as such the species is unlikely to be present within the Application Corridor (The Irish Government, 2020). **Therefore, this site has been forward for further assessment.**

5.3.3.9 Oronsay and South Colonsay SPA (22.59km, distance to closest part of Application Corridor)

Stretching 2016.85ha across the island of Oronsay and south Colonsay, this SPA is designated for breeding and non-breeding populations of chough and breeding populations of corncrake. However, with mean foraging distances of 5.7km and 5.3 hectares (0.053km^2) for the protected species of this site respectively, it is unlikely these populations will be present within the Application Corridor (Siriwardena *et al*., 2000; Byrne *et al*., 2003). **Therefore, this site has not been taken forward for further assessment.**

5.3.3.10 North Colonsay and Western Cliffs SPA (28.96km, distance to closest part of Application Corridor)

Extending across the northern portion of the Isle of Colonsay and covering 3297.3ha the North Colonsay and Western Cliffs SPA comprises of two SSSIs, namely the Western Colonsay Seabird Cliffs SSSI and the North Colonsay SSSI. The site is designated for the protection of numerous seabird assemblage species such as (NatureScot, 2020c):

Breeding

- Chough (*Pyrrhocorax pyrrhocorax*)
- Guillemot (*Uria aalge*)
- Kittiwake (*Risa tridactyla*)

Non-breeding

- Chough (*Pyrrhocorax pyrrhocorax*)

Considering the distance between the North Colonsay and Western Cliffs SPA and the Application Corridor, and the foraging distances of the protected species there is an unlikely possibility for interactions between the protected species of this site and the proposed activities. Chough are known to forage within a range of 5.7km of their nests, guillemot within 10-20km of their breeding sites, and kittiwake within 20km of their colony (Siriwardena *et al*., 2000; Wanless *et al*., 1991; Harris *et al*., 2010). **Therefore, this site has not been taken forward for further assessment.**

5.3.3.11 Kintyre Goose Roosts SPA (29.52km, distance to closest part of Application Corridor)

Covering an area of 409.2ha, the Kintyre Goose Roots SPA is designated to protect non-breeding populations of the Greenland white-fronted goose across the Kintyre peninsula (NatureScot 2021g). The site is also designated as a SSSI and RAMSAR site. With the Greenland white-fronted goose known to forage within 10km of their roosting sites (Madsen *et al*., 2001) it is unlikely these species will be present within the Application Corridor. **As such this site has not been taken forward for further assessment.**

5.3.3.12 Knapdale Lochs SPA (30.45km, distance to closest part of Application Corridor)

Covering 4 locations across Lochgilphead with a total area of 113.86ha, the Knapdale Lochs SPA, also designated as an SSSI, is designated only for breeding populations of the Black-throated diver (*Gavia arctica*) (NatureScot 2021h). This species has a generally localised foraging range with studies suggesting a distance of up to 5km from their breeding areas (Savard & Dupuis, 1999). It is therefore not expected for members of this protected population to be present within the Application Corridor. **As such the site has not been taken forward for further assessment.**

5.3.4 Nature Conservation Marine Protected Areas

Nature Conservation Marine Protected Areas (NCMPAs) are designated by Scottish Ministers under the Marine (Scotland) Act for the protection of biodiversity and geodiversity features within territorial waters (12 nautical miles (nm) (NatureScot, 2020d).

There are no NCMPAs located within the Application Corridor; two NCMPAs are located within 50km, both with protected features with the potential to enter the Application Corridor.

5.3.4.1 Loch Sunart to the Sound of Jura NCMPA (28.64km, distance to closest part of Application Corridor)

Covering 74100ha the Loch Sunart to the Sound of Jura NCMPA covers the waters of Loch Sunart, the Sound of Mull, the Firth of Lorne and the Sound of Jura (NatureScot 2020e). It is designated for the protection of the quaternary of Scotland and the Flapper skate (*Dipturus intermedius*) currently listed on the International Union for Conservation and Nature (IUCN) red list as critically endangered (IUCN., 2022). Flapper skate are transient in nature known to travel distances up to 100km (Thorburn *et al*., 2018). They are adapted to tidal channels with strong currents which they exploit as favourable foraging habitats (NatureScot, 2022e). It is therefore possible for flapper skate to be present within the Application Corridor. **Therefore, this site has been taken forward for assessment in Section 5.4**.

5.3.4.2 Sea of Hebrides NCMPA (48.62km, distance to closest part of Application Corridor)

Located off the west coast of Scotland, stretching from the Isle of Skye in the south to the butt of Lewis in the north, the Sea of Hebrides NCMPA covers an area of 1003900ha. The site protects fronts and regions of marine geomorphology of the Scottish Shelf Seabed but more notable is the sites designations for the protection of basking shark (*Cetorhinus maximus*) and minke whale (*Balaenoptera acutorostrata*) which, being highly mobile species, have the potential to be present within the project area (NatureScot 2022a). Given the mobile nature of the protected species of this site there is potential for their presence within the Application Corridor. **Therefore, this site has been taken forward for assessment in Section 5.4**.

5.3.5 Sites of Special Scientific Interest

SSSIs are statutory designations made by NatureScot under the Nature Conservation (Scotland) Act 2004. They are defined as areas of land and water that are considered to best represent natural heritage in terms of flora, fauna, geology and geomorphology (NatureScot, 2023a).

There are no SSSIs located within the Application Corridor; there are five SSSIs located within 50km of the Application Corridor. None of these sites are designated for features that may enter the Application Corridor.

5.3.5.1 Feur Lochain - Moine nam Faoileann SSSI (16.98km, distance to closest part of Application Corridor)

The Feur Lochain - Moine nam Faoileann SSSI is an extensive area of blanket peat, with numerous lochans and pools, located northwest of Bridgend on the island of Islay in western Scotland. The site is of international importance for the over-wintering population of Greenland white-fronted geese with the pools in the site being important roosting and night feeding areas. The site is known to

support an average of 5% of the British wintering population of this species (NatureScot 2022b). However, since the Greenland white-fronted is known to forage within 10km of their roosting sites it is unlikely for members of this protect population to be present within the Application Corridor (Madsen *et al*., 2001). **Therefore, this site has not been taken forward for further assessment.**

5.3.5.2 Rhunahaorine Point SSSI (29.05km, distance to closest part of Application Corridor)

The Rhunahaorine Point SSSI is notified for its nationally important coastal habitat and associated flora, as well as its breeding and wintering bird populations. The site comprises of a complex shingle spit covered in a mosaic of coastal heathland, wetland, raised bog and dune communities, interspersed with large areas of improved grassland. This provides important habitat for numerous bird populations and the site is designated for the protection of wintering Greenland white-fronted geese and breeding Little tern (*Sternula albifrons*) (Scottish Natural Heritage, 2011). Since Greenland white-fronted geese and little tern are known to restrict their foraging activities to within 10km and 15km of their resting sites respectively, it is unlikely for these species to be present within the Application Corridor (Madsen *et al*., 2001; Stenzel *et al*., 2014). **Therefore, this site has not been taken forward for further assessment.**

5.3.5.3 North Colonsay SSSI (30.33km, distance to closest part of Application Corridor)

Located across the northern part of the island of Colonsay, this SSSI includes a variety of habitats, including sand dune, machair, coastal grasslands, coastal oakwoods and dry and wet heathland. The site supports internationally important numbers of chough which breed and feed within the site, particularly on the coastal grassland and machair areas. It is noted that the site supports up to 10 breeding pairs of chough and during winter-feeding the dune areas are particularly important for large flocks of up to 20 choughs. These species are listed on Annex I of the EC Birds Directive and the size of the population found here qualifies the site as a Special Protection Area also (see Section 5.3.3.10) (Scottish Natural Heritage, 2012). Previous studies have defined the mean foraging distance for chough as approximately 5.7km (Siriwardena *et al*., 2000). It is therefore unlikely for members of this protected population to be present within the Application Corridor. **Therefore, this site has not been taken forward for further assessment.**

5.3.5.4 Tangy Loch SSSI (44.13km, distance to closest part of Application Corridor)

Tangy Loch, located in southern Kintyre, regularly supports an internationally important population of Greenland white-fronted goose (approximately 9% of Total World Population; 16% of Great Britain population). The geese roost on the loch included within this SSSI as well as on the surrounding grassland and heath (NatureScot, 2022c). Previous studies have found that Greenland white-fronted geese restrict their foraging activities to within 10km of their roosting sites and as such protected members of this population are unlikely to be present within the Application Corridor (Madsen *et al*., 2001). **Therefore, this site has not been taken forward for further assessment.**

5.3.5.5 Arran Northern Mountains SSSI (47.84km, distance to closest part of Application Corridor)

Covering an area of 12076.97ha, the Arran Northern Mountains SSSI supports a variety of habitats and species. The site supports the largest and most diverse upland habitat assemblage, composing of vascular plants, in west central Scotland. This plant assemblage supports a diverse upland breeding bird community including rock ptarmigan (*Lagopus muta*), hen harrier, red-throated diver (*Gavia stellata*), raven (*Corvus corax*) and golden eagle. The site is designated for the breeding populations of these bird assemblages (NatureScot, 2022d). Although this protected site is within 50km of the Application Corridor, it is unlikely that any members of the protected populations will be present within the Application Corridor. Rock ptarmigan, hen harrier, red diver and raven are all known to typically forage within the immediate locality of their nesting sites and breeding territories (Martin *et al*., 2000; Sim *et al*., 2017; Balcomb & Kirwan 2020; Hudson & Furness 1989). Furthermore, golden eagle primarily forage in established territories in mountainous and open habitats and are not known for their abilities to fly long distances over large bodies of water (Watson & Cross 2006). As such it is

unlikely for members of these populations to be present within the Application Corridor. **Therefore, this site has not been taken forward for further assessment.**

5.3.6 Other protected sites

There are no National Scenic Areas (NSA) or World Heritage Sites (WHS) which transect the Application Corridor. Therefore, these are not discussed further as part of this report.

5.4 Potential for likely significant effects

Table 5-1 below summarises the protected sites in the vicinity of the Application Corridor and identifies which sites have been assessed further to determine whether there is potential for likely significant effect (LSE). Those sites or impacts for which no LSE is expected have not been considered further in this assessment.

Table 5-1 Impact assessment of protected sites in the region

Designated site	Distance from Application Corridor (km)	Designating features	Potential pressures	Potential pressure-receptor pathway	Require further assessment?
Jura, Scarba and the Garvellachs SPA	0.00	Golden eagle (*Aquila chrysaetos*)	Visual (and above water noise) disturbance	Physical presence at the landfall site may potentially disturb breeding individuals at the Jura landfall site	Yes
Inner Hebrides and the Minches SAC	7.38	Harbour porpoise (*Phocoena phocoena*)	Underwater noise changes Vessel presence	The presence of vessels and the sound produced during installation activities could potentially disturb harbour porpoise from this site.	Yes
Bridgend Flats, Islay SPA	9.98	Barnacle goose (*Branta leucopsis*)	Visual (and above water noise) disturbance Vessel presence	Foraging activities are unlikely to extend to the Application Corridor, as discussed in Section 5.3.3.2. As such there is no potential for pressure-receptor pathway between this feature and the cable installation activities given the distance of this site from the Application Corridor.	No
Eilean na Muice Duibhe (Duich Moss), Islay SPA	11.99	Greenland white-fronted goose (*Anser albifrons flavirostris*)	Visual (and above water noise) disturbance Vessel presence	Foraging activities are unlikely to extend to the Application Corridor, as discussed in Section 5.3.3.3. As such there is no potential for pressure-receptor pathway between this feature and the cable installation activities given the distance of this site from the Application Corridor.	No
Gruinart Flats, Islay SPA	12.18	Barnacle goose (*Branta leucopsis*) Greenland White-fronted Goose (*Anser albifrons flavirostris*) Chough (*Pyrrhocorax pyrrhocorax*)	Visual (and above water noise) disturbance Vessel presence	The presence of the installation vessel can potentially cause disturbance and proves a collision risk for bird species	Yes

Designated site	Distance from Application Corridor (km)	Designating features	Potential pressures	Potential pressure-receptor pathway	Require further assessment?
		Canadian light-bellied brent goose (*Branta berniclahrota*)			
Rinns of Islay SPA	13.36	Breeding: ▪ Chough (*Pyrrhocorax pyrrhocorax*) ▪ Common scoter (*Melanitta nigra*) ▪ Corncrake (*Crex crex*) ▪ Hen harrier (*Circus cyaneus*) Non-breeding: ▪ Chough (*Pyrrhocorax pyrrhocorax*) ▪ Greenland white-fronted goose (*Anser albifrons flavirostris*) Passage: ▪ Whooper swan (*Cygnus cygnus*)	Visual (and above water noise) disturbance Vessel presence	Foraging activities are unlikely to extend to the Application Corridor, as discussed in Section 5.3.3.5. As such there is no potential for pressure-receptor pathway between this feature and the cable installation activities given the distance of this site from the Application Corridor.	No
Laggan, Islay SPA	13.86	Barnacle goose (*Branta leucopsis*) Greenland White-fronted Goose (*Anser albifrons flavirostris*)	Visual (and above water noise) disturbance Vessel presence	Foraging activities are unlikely to extend to the Application Corridor, as discussed in Section 5.3.3.6. As such there is no potential for pressure-receptor pathway between this feature and the cable installation activities given the distance of this site from the Application Corridor.	No
South-East Islay Skerries SAC	15.11	Common seal (*Phoca vitulina*)	Underwater noise changes Vessel presence	Underwater noise changes have the potential to disturb seals from the site. Vessels also pose a collision risk	Yes

Designated site	Distance from Application Corridor (km)	Designating features	Potential pressures	Potential pressure-receptor pathway	Require further assessment?
Feur Lochain – Mon nam Faoileann SSSI	16.98	Greenland White-fronted Goose (*Anser albifrons flavirostris*)	Visual (and above water noise) disturbance Vessel presence	There is no potential for pressure-receptor pathway between this feature (breeding cough) and the cable installation activities given the distance of this site from the Application Corridor.	No
The Oa	19.40	Chough (*Pyrrhocorax pyrrhocorax*)	Visual (and above water noise) disturbance Vessel presence	There is no potential for pressure-receptor pathway between this feature (breeding cough) and the cable installation activities given the distance of this site from the Application Corridor.	No
Sound of Gigha SPA	19.79	Common eider (*Somateria mollissima*) Great northern diver (*Gavia immer*) Red-breasted merganser (*Mergus serrator*) Slavonian grebe (*Podiceps autitus*)	Visual (and above water noise) disturbance Vessel presence	The presence of the installation vessel can potentially cause disturbance and proves a collision risk for common eider, red-breasted merganser and Slavonian grebe which may be present within the Application Corridor	Yes
Oronsay and South Colonsay SPA	22.59	Chough (*Pyrrhocorax pyrrhocorax*) Corncrake (*Crex crex)*	Visual (and above water noise) disturbance Vessel presence	There is no potential for pressure-receptor pathway between this feature (breeding and non-breeding cough and breeding corncrake) and the cable installation activities given the distance of this site from the Application Corridor (as described in Section 5.3.3.9).	No
North Colonsay and Western Cliffs SPA	28.96	Breeding: ▪ Chough (*Pyrrhocorax pyrrhocorax*)	Visual (and above water noise) disturbance Vessel presence	There is no potential for pressure-receptor pathway between both the breeding and non-breeding features of this site and the cable installation	No

Designated site	Distance from Application Corridor (km)	Designating features	Potential pressures	Potential pressure-receptor pathway	Require further assessment?
		▪ Guillemot (*Uria aalge*) ▪ Kittiwake (*Risa tridactyla*) Non-breeding: ▪ Chough (*Pyrrhocorax pyrrhocorax*)		activities given the distance of this site from the Application Corridor (as described in Section 5.3.3.10).	
Loch Sunart to the Sound of Jura NCMPA	28.64	Flapper skate (*Dipturus batis*) Quaternary of Scotland	Underwater noise changes Vessel presence	Underwater noise changes have the potential to disturb skate from the site. Vessels also pose a collision risk	Yes
Rhunahaorine Point SSSI	29.05	Greenland White-fronted Goose (*Anser albifrons flavirostris*) Little tern (*Sternula albifrons*)	Visual (and above water noise) disturbance Vessel presence	There is no potential for pressure-receptor pathway between the features of this site (wintering Greenland white-fronted goose and breeding little tern) (as discussed in Section 5.3.5.2) and the cable installation activities given the distance of this site from the Application Corridor.	No
Kintyre Goose Roots SPA	29.52	Greenland White-fronted Goose (*Anser albifrons flavirostris*)	Visual (and above water noise) disturbance Vessel presence	There is no potential for pressure-receptor pathway between this feature (non-breeding Greenland white-fronted goose) (as discussed in Section 5.3.3.11) and the cable installation activities given the distance of this site from the Application Corridor.	No
North Colonsay SSSI	30.33	Chough (*Pyrrhocorax pyrrhocorax*)	Visual (and above water noise) disturbance Vessel presence	There is no potential for pressure-receptor pathway between this feature (breeding and winter feeding chough) (as discussed in Section 5.3.5.3) and the cable installation activities given the distance of this site from the Application Corridor.	No
Knapdale Lochs SPA	30.45	Black-throated diver (*Gavia arctica*)	Visual (and above water noise) disturbance Vessel presence	There is no potential for pressure-receptor pathway between this feature (as discussed in Section 5.3.3.12) and	No

Designated site	Distance from Application Corridor (km)	Designating features	Potential pressures	Potential pressure-receptor pathway	Require further assessment?
				the cable instillation activities given the distance of this site from the Application Corridor.	
Tangy Loch SSSI	44.13	Greenland White-fronted Goose (*Anser albifrons flavirostris*)	Visual (and above water noise) disturbance Vessel presence	There is no potential for pressure-receptor pathway between this feature (non-breeding Greenland white-fronted goose) (as discussed in Section 5.3.5.4) and the cable installation activities given the distance of this site from the Application Corridor.	No
Arran Northern Mountains SSSI	47.84	Vascular plants Rock ptarmigan (*Lagopus muta*) Hen harrier (*Circus cyaneus*) Red-throated diver (*Gavia stellata*) Raven (*Corvus corax*) Golden eagle (*Aquila chrysaetos*)	Visual (and above water noise) disturbance Vessel presence	There is no potential for pressure-receptor pathway between these features of the site (as described and discussed in Section 5.3.5.5) and the cable installation activities given the distance of this site from the Application Corridor.	No
Sea of Hebrides NCMPA	48.62	Basking shark (*Cetorhinus maximus*) Minke whale (*Balaenoptera acutorostrata*)	Underwater noise changes Vessel presence	The presence of vessels and the sound produced during installation activities could potentially disturb basking shark and minke whale from this site.	Yes

5.5 Assessment of likely significant effects

5.5.1 Underwater noise changes

Underwater noise changes generated by Project vessels and installation equipment may pose a risk to cetaceans, pinnipeds and basking shark. Such noise has the ability to impact these species in two ways as follows:

- 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.

To determine the potential impact of noise generated by the Project on cetaceans, pinnipeds and basking shark, the sound levels that will be produced have been compared to the available estimated thresholds for injury and disturbance in cetaceans, pinnipeds and basking shark. JNCC guidance (JNCC, 2019a) recommends using the injury criteria proposed by *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. For details on the typical auditory bandwidths of cetaceans, see Table 5-2 below. The hearing range of basking sharks is not currently known. However, five other elasmobranchs have been found to have a hearing range between 20 hertz (Hz) to 1 kilohertz (kHz). This range may or may not be transferable to basking sharks (Macleod *et al*., 2011). Pinnipeds possess a typical hearing range of 50Hz to 86Hz (NMFS, 2018).

Table 5-2 Auditory bandwidths estimated for hearing groups of cetaceans

Hearing Group	Estimated Auditory Bandwidth
Low-frequency cetaceans (deep diving species e.g. minke whale, pilot whale, etc.)	7Hz to 35kHz, with peak sensitivity around 100- 200Hz
Mid-frequency cetaceans (small dolphins e.g. bottlenose dolphin, common dolphin, white-beaked dolphin, etc.)	150Hz to 160kHz, with peak sensitivity above 10 kHz (Except for killer whales: 50Hz to 100kHz)
High-frequency cetaceans (harbour porpoise)	180Hz to 200kHz, with peak sensitivity above 4kHz
Phocid pinnipeds (true seals, e.g. grey and common seal)	50Hz to 86kHz
Basking shark	20Hz to 1kHz

Source: NMFS, 2018; Southall *et al.*, 2019

The main sources of underwater noise that will be generated by the cable installation activities are:

- Noise from installation vessels utilised during the works; and
- Noise from cable laying activities.

However, the presence of installation vessels within the Sound of Islay will not result in a significant change in the number of vessels typically present in the area and as such will not result in a significant change to the soundscape of the area. Furthermore, previous modelling studies conducted to support EPS applications for cable replacement projects in Scotland have found that injury to other species would only occur if the animal was within the boat engine itself (Xodus Group, 2023). As such, this

source of noise will not result in an adverse effect on any protected species and has not been considered further.

As cable installation activities will be a continuous but temporary occurrence, nearby animals will not be subject to lasting or prolonged periods of noise. As such, noise and associated temporary disturbance from the cable laying activities themselves will not result in a significant adverse effect on nearby individuals.

5.5.1.2 Inner Hebrides and the Minches SAC

Conservation objectives

To ensure that the Inner Hebrides and the Minches SAC continues to make an appropriate contribution to harbour porpoise remaining at favourable conservation status. To ensure for harbour porpoise within the context of environmental changes, that the integrity of the Inner Hebrides and the Minches SAC is maintained through:

- Harbour porpoise within the Inner Hebrides and the Minches SAC are not at significant risk from injury or killing.
- The distribution of harbour porpoise throughout the site is maintained by avoiding significant disturbance.
- The condition of supporting habitats and the availability of prey for harbour porpoise are maintained.

Assessment against conservation objectives

Harbour porpoise are present within the Inner Hebrides and the Minches SAC year-round. With the development occurring in the Sound of Islay any porpoise seen is highly likely to be part of the Inner Hebrides and the Minches SAC protected population, with the sound providing a transit route between various parts of the SAC. Although there is no predicted density of harbour porpoise within the Application Corridor, Figure 5-2 (Drawing reference: P2635-MAMM-003) presents predicted areas of high density of harbour porpoise surrounding the islands of Jura and Islay.

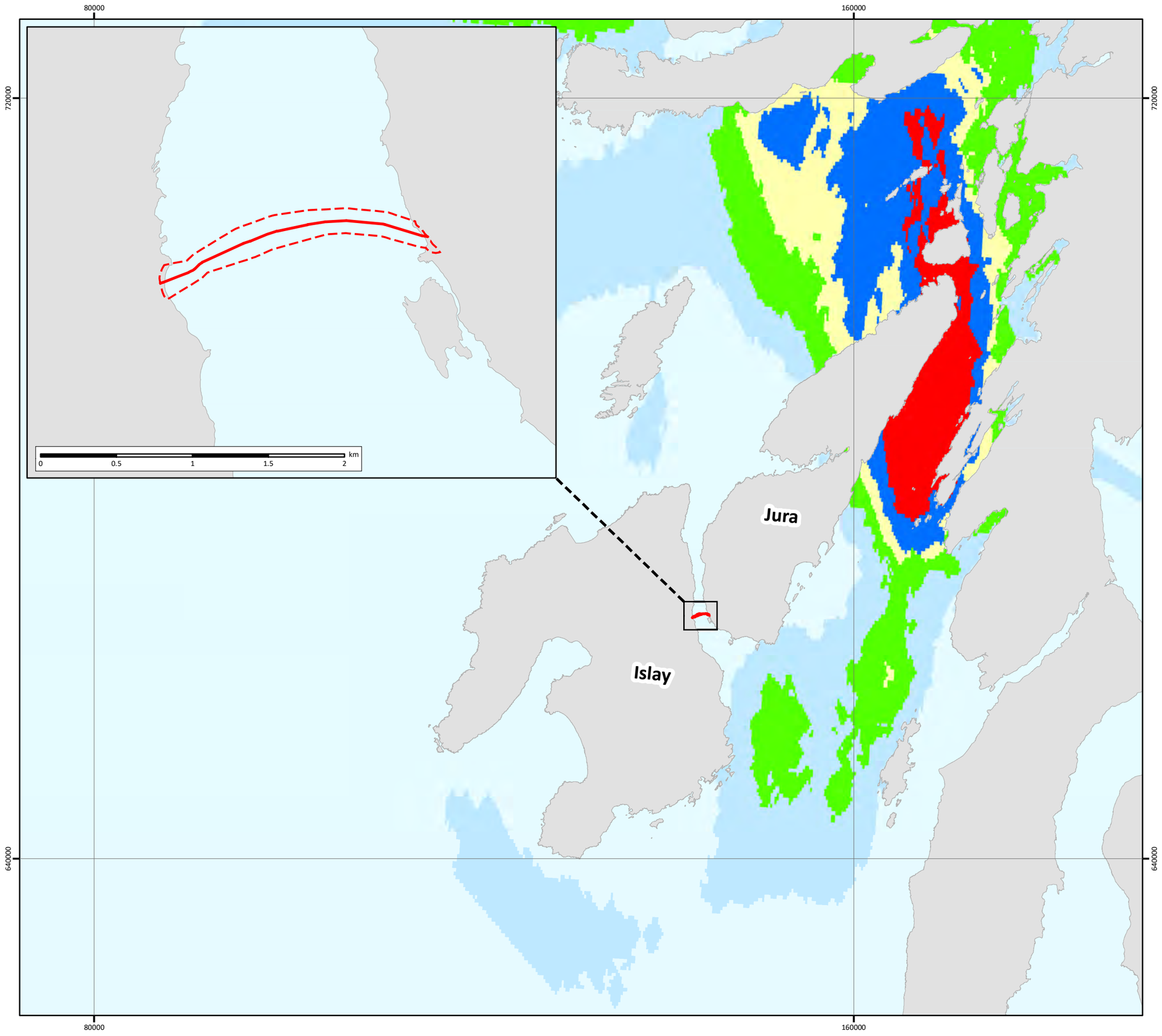
Although harbour porpoise are highly sensitive to noise disturbances (Dyndo *et al.,* 2015) it is likely they will move away from any noise sources during the operation, as such the likelihood of injury occurring is low. Furthermore, given the short-term, localised and transient nature of the installation activities, any disturbance caused will not be significant, ensuring the species distribution within the site is maintained. Underwater noise changes and associated cable installation activities will not affect the supporting habitat of harbour porpoise or the availability of prey species within the Sound of Islay, ensuring they are maintained for use by harbour porpoise into the future.

JURA-ISLAY DISTRIBUTION CABLE REPLACEMENT

MARINE MAMMALS

Areas of Predicted High Density of Harbour Porpoise (visual) (2003 - 2010)

Drawing No: P2635-MAMM-003 | **A**



Legend

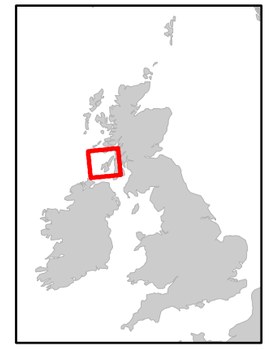
- Indicative RPL
- Installation Corridor

Areas of Predicted High Density

Predicted density

- Top 50%
- Top 20%
- Top 15%
- Top 10%
- Top 5%

N
W
E
S



NOTE: Not to be used for Navigation

Date	31 August 2023
Coordinate System	British National Grid
Projection	Transverse Mercator
Datum	OSGB 1936
Data Source	OS; NS; SHEPD; ESRI
File Reference	J:\P2635\Mxd_QGZ\04_MAMM\ P2635-MAMM-003.mxd
Created By	Lewis Castle
Reviewed By	Oliver Bula
Approved By	Aodhfin Coyle

Scottish & Southern Electricity Networks

intertek

0 5 10 15 20 km

5.5.1.3 South-East Islay Skerries SAC

Conservation objectives

The objective of the South-East Islay skerries SAC is to avoid deterioration of the habitats of common seal or significant disturbance to the species, 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 interest. The site ensures 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 processed of habitats supporting the species
- No significant disturbance of the species

Assessment against conservation objectives

Given the distance of the installation activities from the South-East Islay Skerries SAC and the short-term, localised and transient nature of such activities, there will be no disturbance to common seals hauled-out within the site from noise generated by the installation activities.

Common seals in the water however could be susceptible to disturbance from the installation activities. Recent studies have shown however 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).

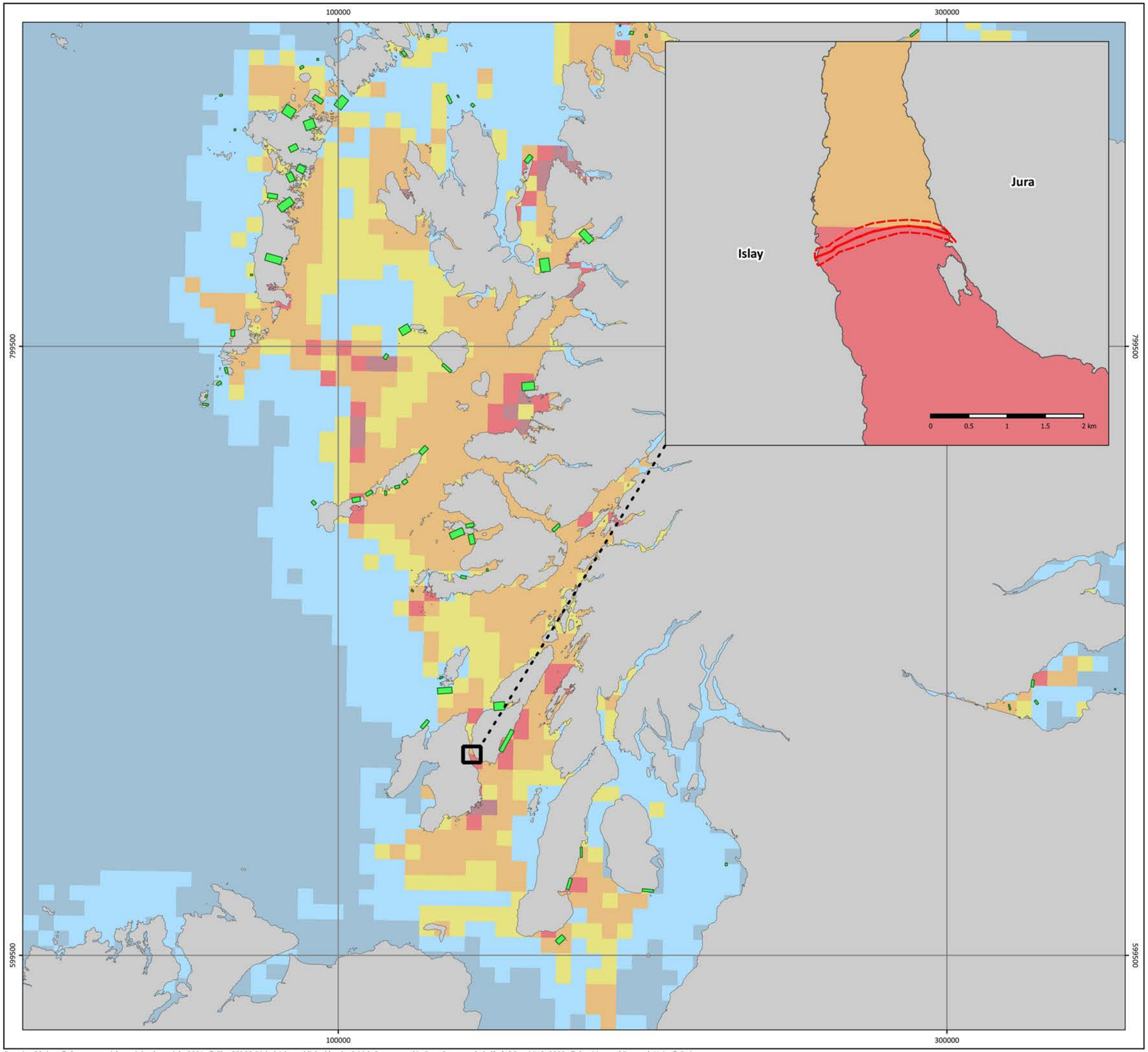
Although the density of common seal within the Application Corridor is moderate to high (Figure 5-2, drawing reference P2635-HAB-002), given the transient nature of the installation activities the distribution of common seal within this SAC will be maintained and no significant disturbance of the species is expected to occur. As such, the population of common seal within the South-East Islay skerries SAC will remain a viable component of the site. Underwater noise changes and associated cable installation activities will not affect the distribution, extent, structure, function and supporting processes of the supporting habitat for common seal, ensuring they are maintained for use by common seal into the future.

JURA-ISLAY DISTRIBUTION CABLE REPLACEMENT

PELAGIC HABITATS

Density of Common Seals Between 1991 and 2016

Drawing No: P2635-HAB-002 | A



Legend

- Indicative RPL
- Installation Corridor

Common Seal Density (5 km x 5 km)

- <= 1
- 1 - 5
- 5 - 10
- 10 - 50
- 50 - 100
- >= 100

Environmental Designation

- Protected Seal Haul-Out Site

NOT TO BE USED FOR NAVIGATION

Date	2023-08-30 15:07:34
Coordinate System	OSGB36 / British National Grid
WKID	EPSG:27700
Scale @A3	1:1,250,000
Data Sources	GEBCO; OS; SMRU; ESRI
File Reference	J:\P2635\Mxd_QGZ\01_LOC \P2635_LOC.qgz
Created By	Lewis Castle
Reviewed By	Emma Langley
Approved By	Aodhfin Coyle

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0 20 40 60 80 km

5.5.1.4 Loch Sunart to the Sound of Jura NCMPA

Conservation objectives

6. The conservation objective of the Loch Sunart to the Sound of Jura 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.
7. In paragraph (1) “favourable condition”, with respect to a mobile species of marine fauna, means that—
    a. The species is conserved or, where relevant, recovered to include the continued access by the species to resources provided by the Sea of the Hebrides NCMPA for, but not restricted to, feeding, courtship, spawning or use as nursery grounds;
    b. The extent and distribution of any supporting feature upon which the species is dependent is conserved or, where relevant, recovered; and
    c. The structure and function of any supporting feature, including any associated processes supporting the species within the Sea of the Hebrides NCMPA, is such as to ensure that the protected feature is in a condition which is healthy and not deteriorating.
8. In paragraph (1) “favourable condition”, with respect to a feature of geomorphological interest, means that –
    a. Its extent, component elements and integrity are maintained;
    b. Its structure and functioning are unimpaired; and
    c. Its surface remains sufficiently unobscured for the purposes of determining whether the criteria in paragraphs (a) and (b) are satisfied.
9. For the purpose of determining whether a feature of geomorphological interest is sufficiently unobscured under paragraph (3)(c), any obscuring of that feature entirely by natural processes is to be disregarded.
10. For the purpose of determining whether a protected feature is in favourable condition within the meaning of paragraph (2) or (3), any alteration to that feature brought about entirely by natural processes is to be disregarded.

Assessment against conservation objectives

Although the flapper skate designated within the Loch Sunart to the Sound of Jura NCMPA is a mobile species and therefore has the potential to transit into the operational area, there is evidence that a majority of populations are non-migratory and resident and as such it is unlikely for the species to be present within the Application Corridor (Neal & Pizzolla, 2006). Furthermore, the species is identified as being not sensitive to noise or visual presence and as such there is no potential for likely significant effects to the species in the Loch Sunart and the Sound of Jura NCMPA (Neal & Pizzolla, 2006).

5.5.1.5 Sea of Hebrides NCMPA

Conservation objectives

1. The conservation objective of the Loch Sunart to the Sound of Jura MPA 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.

2. In paragraph (1) "favourable condition", with respect to a mobile species of marine fauna, means that—

   a. The species is conserved or, where relevant, recovered to include the continued access by the species to resources provided by the Sea of the Hebrides MPA for, but not restricted to, feeding, courtship, spawning or use as nursery grounds;

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

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

3. In paragraph (1) "favourable condition", with respect to a large-scale feature, means that –

   a. The extent, distribution and structure of that feature is maintained;

   b. The function of that feature is maintained so as to ensure that it continues to support its characteristic biological communities and their use of the site including for, but not restricted to, feeding, courtship, spawning or use as nursery grounds; and

   c. The processes supporting that feature are maintained.

4. In paragraph (3)(b) the reference to the characteristic biological communities of a large-scale feature includes a reference to the diversity of any species associated with the large-scale feature.

5. In paragraph (1) "favourable condition", with respect to a feature of geomorphological interest, means that –

   a. Its extent, component elements and integrity are maintained;

   b. Its structure and functioning are unimpaired; and

   c. Its surface remains sufficiently unobscured for the purposes of determining whether the criteria in paragraphs (a) and (b) are satisfied.

6. For the purpose of determining whether a feature of geomorphological interest is sufficiently unobscured under paragraph (4)(c), any obscuring of that feature entirely by natural processes is to be disregarded.

7. For the purpose of determining whether a protected feature is in favourable condition within the meaning of paragraphs (2), (3) or (5) any alteration to that feature brought about entirely by natural processes is to be disregarded.

Assessment against conservation objectives

The Sea of the Hebrides NCMPA is designated for the populations of minke whale and basking shark which utilise the site for feeding in the summer months. As installation activities for the Project are located outside of the NCMPA, no individuals within the site itself will be affected. However, distribution data for both species within and outside of the NCMPA collected as part of the Data Confidence Assessment for the site (NatureScot, 2018) indicates that both minke whale and basking shark are found in higher number in the southern section of the Sea of Hebrides NCMPA, the section closest to the Application Corridor (Figures 5-4 and 5-5 (Drawing references P2635-MAMM-002 and FISH-005)). This is potentially due to the presence of fronts that create rich feeding grounds primarily located in the southern reaches of the site. Furthermore, since individuals of both species are known

to range outside of the NCMPA, it is possible they could be observed in the vicinity of the installation works.

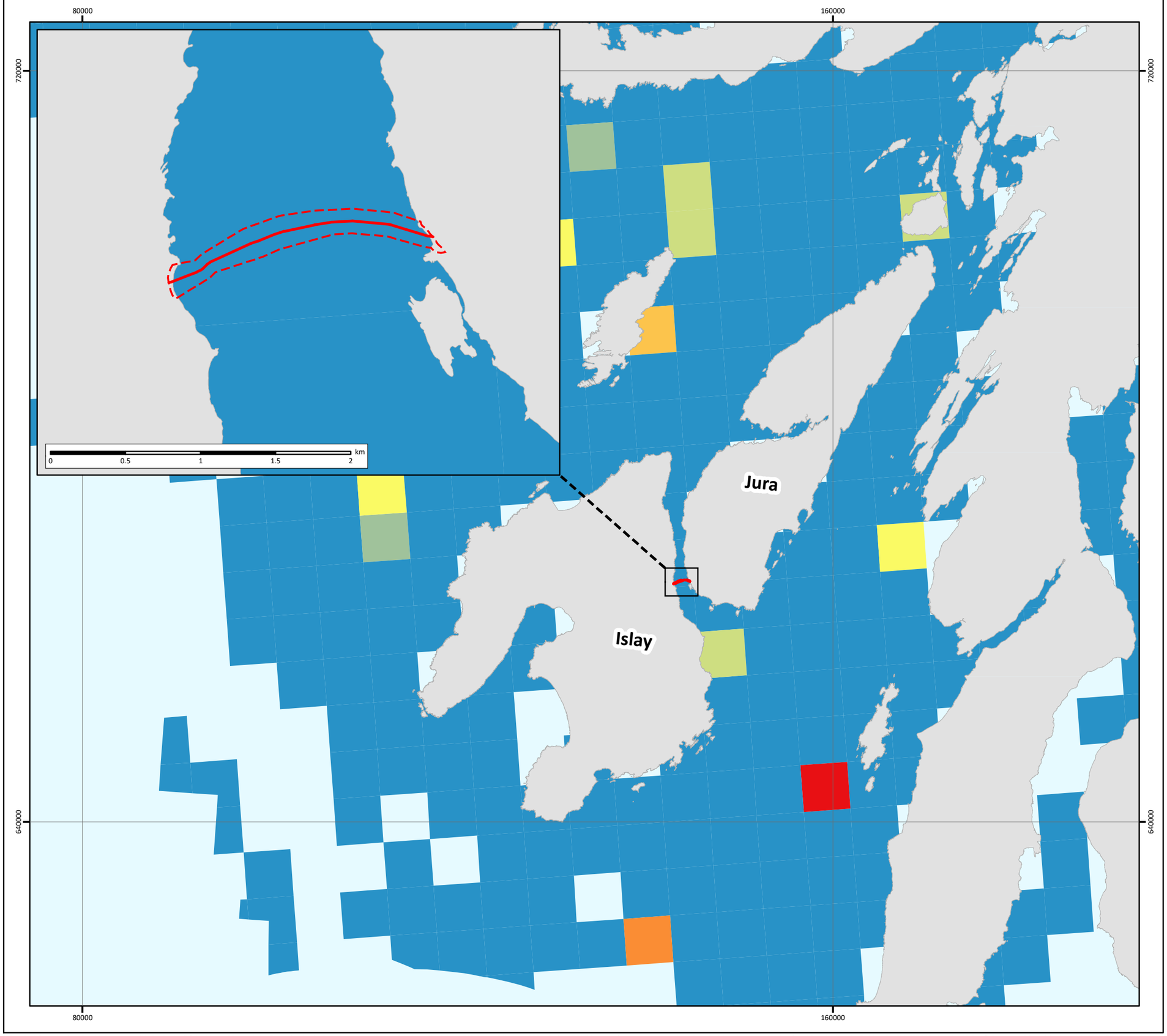
Underwater noise changes resulting from the installation activities primarily result from the noise associated with the installation vessel. Given the regular high levels of shipping in the area (see Section 11 'Commercial Fisheries and Other Sea Users'), the addition of vessels associated with installation activities will not substantially increase vessel numbers or the existing baseline soundscape in the vicinity of the Application Corridor. Therefore, underwater noise changes associated with cable installation activities will not affect the distribution, extent, structure, function and supporting processes of the supporting habitat for minke whale or basking shark, ensuring they are maintained for use by these species into the future.

JURA-ISLAY DISTRIBUTION CABLE REPLACEMENT

MARINE MAMMALS

Observed Adjusted Densities of Minke Whale (2000-2012)

Drawing No: P2635-MAMM-002 | **A**



Legend

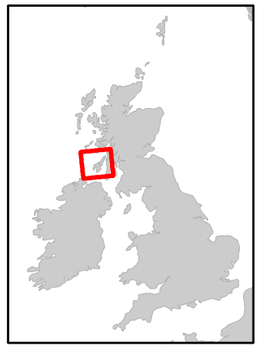
- Indicative RPL
- Installation Corridor

Observed Adjusted Densities

Encounter Rate

- 0.00 - 0.10
- 0.10 - 0.20
- 0.20 - 0.50
- 0.50 - 1.00
- 1.00 - 2.00
- 2.00 - 5.00
- 5.00 - 10.00
- > 10.00

N W E S



NOTE: Not to be used for Navigation

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Projection	Transverse Mercator
Datum	OSGB 1936
Data Source	OS; SMRU; SHEPD; ESRI
File Reference	J:\P2635\Mxd_QGZ\04_MAMM\ P2635-MAMM-002.mxd
Created By	Oliver Bula
Reviewed By	Lewis Castle
Approved By	Aodhfin Coyle

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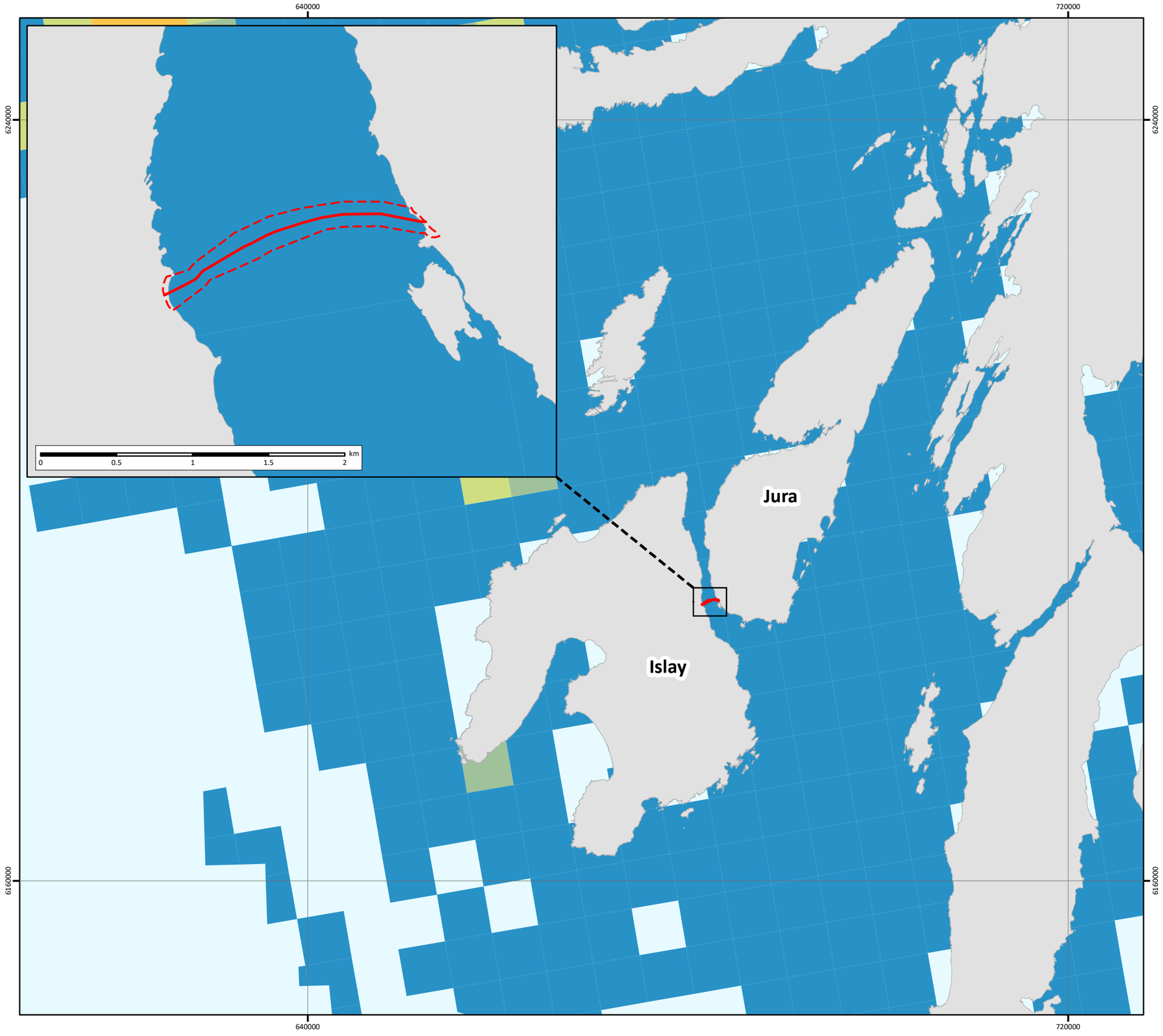
0 5 10 15 20 km

JURA-ISLAY DISTRIBUTION CABLE REPLACEMENT

FISH AND FISHING ACTIVITIES
Observed Adjusted Densities of Basking Shark (2000-2012)

Drawing No: P2635-FISH-005 | **A**



Legend

- Indicative RPL
- Installation Corridor

Observed Adjusted Densities

Encounter Rate

- 0.00 - 0.10
- 0.10 - 0.20
- 0.20 - 0.50
- 0.50 - 1.00
- 1.00 - 2.00
- 2.00 - 5.00
- 5.00 - 10.00
- > 10.00

N
W E
S

NOTE: Not to be used for Navigation

Date	31 August 2023
Coordinate System	WGS 1984 UTM Zone 29N
Projection	Transverse Mercator
Datum	WGS 1984
Data Source	OS; SMRU; SHEPD; ESRI
File Reference	J:\P2635\Mxd_QGZ\02_FISH\ P2635-FISH-005.mxd
Created By	Oliver Bula
Reviewed By	Lewis Castle
Approved By	Aodhfin Coyle

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0 5 10 15 20 km

5.5.2 Vessel presence

5.5.2.1 Inner Hebrides and the Minches SAC

Conservation objectives

To ensure that the Inner Hebrides and the Minches SAC continues to make an appropriate contribution to harbour porpoise remaining at favourable conservation status. To ensure for harbour porpoise within the context of environmental changes, that the integrity of the Inner Hebrides and the Minches SAC is maintained through:

- Harbour porpoise within the Inner Hebrides and the Minches SAC are not at significant risk from injury or killing;
- The distribution of harbour porpoise throughout the site is maintained by avoiding significant disturbance; and
- The condition of supporting habitats and the availability of prey for harbour porpoise are maintained.

Assessment against conservation objectives

Due to the mobile nature of harbour porpoise and the limited time that the installation activities will encompass, the risks will be minimal and will not have an adverse effect on the local population. As such, harbour porpoise will not be at a significant risk from being injured or killed and their distribution within the Inner Hebrides and the Minches SAC will remain unaffected.

5.5.2.2 Gruinart Flats, Islay SPA

Conservation objectives

To avoid the deterioration of the habitats of the qualifying species or significant disturbance to the qualifying species, thus ensuring the integrity of the site is maintained in the long term, the following is considered:

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

Assessment against conservation objectives

There is the possibility for individuals protected within this site to be present within the Application Corridor where they may be at risk of collision with installation vessels and disruptions to their foraging activities may occur. However, the slow movement of the installation vessel and the short-term, localised and transient nature of the installation activities will reduce the likelihood of such impacts occurring as such that the Gruinart Flats, Islay SPA will remain unaffected.

5.5.2.3 South-East Islay Skerries SAC

Conservation objectives

The objective of the South-East Islay skerries SAC is to avoid deterioration of the habitats of common seal or significant disturbance to the species, 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 interest. The site ensures 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 processed of habitats supporting the species
- No significant disturbance of the species

Assessment against conservation objectives

Seals located at haul-out sites have a typical disturbance range of 900m, where vessel or human presence at a distance lower than this may cause the seals to 'flush' from the site into the sea (Brassuer and Reijnders, 1994). As the Application Corridor is located outside of this distance, common seals hauled out within the South-East Islay Skerries SAC will not be disturbed by the installation activities. Furthermore, with harbours seals known to typically forage within 5 to 10km of their haul out sites (Lowry *et al.*, 2001) it is unlikely for any protected individuals of this site to be present within the Application Corridor. The risks of injury from vessel collisions is therefore minimal.

5.5.2.4 Sound of Gigha SPA

Conservation objectives

The conservation objectives of the Sound of Gigha SPA are as follows:

- To ensure that the qualifying features of Sound of Gigha SPA are in favourable condition and make an appropriate contribution to achieving Favourable Conservation Status
- To ensure that the integrity of Sound of Gigha SPA is maintained in the context of environmental changes
- The populations of the qualifying features remain a viable components of the site
- The distributions of the qualifying features throughout the site are maintained by avoiding significant disturbance of the species
- The supporting habitats and processes relevant to qualifying features and their prey/food resources are maintained

Assessment against conservation objectives

There is the possibility for individuals protected within this site to be present within the Application Corridor where they may be at risk of collision with installation vessels and disruptions to their foraging activities may occur. However, the slow movement of the installation vessel and the short-term, localised and transient nature of the installation activities will reduce the likelihood of such impacts occurring as such that the Sound of Gigha SPA will remain unaffected.

5.5.2.5 Loch Sunart to the Sound of Jura NCMPA

Conservation objectives

8. The conservation objective of the Loch Sunart to the Sound of Jura MPA 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.
9. In paragraph (1) "favourable condition", with respect to a mobile species of marine fauna, means that—

a. The species is conserved or, where relevant, recovered to include the continued access by the species to resources provided by the Sea of the Hebrides MPA for, but not restricted to, feeding, courtship, spawning or use as nursery grounds;

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

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

10. In paragraph (1) "favourable condition", with respect to a feature of geomorphological interest, means that –

    a. Its extent, component elements and integrity are maintained;

    b. Its structure and functioning are unimpaired; and

    c. Its surface remains sufficiently unobscured for the purposes of determining whether the criteria in paragraphs (a) and (b) are satisfied.

11. For the purpose of determining whether a feature of geomorphological interest is sufficiently unobscured under paragraph (3)(c), any obscuring of that feature entirely by natural processes is to be disregarded.

12. For the purpose of determining whether a protected feature is in favourable condition within the meaning of paragraph (2) or (3), any alteration to that feature brought about entirely by natural processes is to be disregarded.

Assessment against conservation objectives

Although the flapper skate designated within the Loch Sunart to the Sound of Jura NCMPA is a mobile species and therefore has the potential to transit into the operational area, there is evidence that a majority of populations are non-migratory and resident (Neal & Pizzolla, 2006). As such it is unlikely for members of this protected population to be present within the Application Corridor. If however, the species does transit the area, the installation vessel will be traveling at such a slow speed that significant risks from vessel presence are not expected and the Loch Sunart to the Sound of Jura NCMPA will remain unaffected.

5.5.2.6 Sea of Hebrides NCMPA

Conservation objectives

1. The conservation objective of the Loch Sunart to the Sound of Jura MPA 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

    c. In paragraph (1) "favourable condition", with respect to a mobile species of marine fauna, means that—

    d. The species is conserved or, where relevant, recovered to include the continued access by the species to resources provided by the Sea of the Hebrides MPA for, but not restricted to, feeding, courtship, spawning or use as nursery grounds;

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

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

2. In paragraph (1) "favourable condition", with respect to a large-scale feature, means that –
   a. The extent, distribution and structure of that feature is maintained;
   b. The function of that feature is maintained so as to ensure that it continues to support its characteristic biological communities and their use of the site including for, but not restricted to, feeding, courtship, spawning or use as nursery grounds; and
   c. The processes supporting that feature are maintained.
3. In paragraph (3)(b) the reference to the characteristic biological communities of a large-scale feature includes a reference to the diversity of any species associated with the large scale feature.
4. In paragraph (1) "favourable condition", with respect to a feature of geomorphological interest, means that –
   a. Its extent, component elements and integrity are maintained;
   b. Its structure and functioning are unimpaired; and
   c. Its surface remains sufficiently unobscured for the purposes of determining whether the criteria in paragraphs (a) and (b) are satisfied.
5. For the purpose of determining whether a feature of geomorphological interest is sufficiently unobscured under paragraph (4)(c), any obscuring of that feature entirely by natural processes is to be disregarded.
6. For the purpose of determining whether a protected feature is in favourable condition within the meaning of paragraphs (2), (3) or (5) any alteration to that feature brought about entirely by natural processes is to be disregarded.

Assessment against conservation objectives

Due to the mobile nature of minke whale and limited time that the installation activities will encompass, the risk will be minimal and will not have an adverse effect on the local population. As such, minke whale will not be at a significant risk from being injured or killed and their distribution within the site will remain unaffected.

As a slow-moving species, basking shark are more susceptible to the threat of vessel strikes, with the threat increasing as vessel speed increases. As the installation vessel will be moving at a slow speed, collision risk will be low.

5.5.3 Visual (and above water noise) disturbance

5.5.3.1 Jura, Scarba and the Garvellachs SPA

Conservation objectives

To avoid the deterioration of the habitats of golden eagle or significant disturbance to the species, thus ensuring the integrity of the site is maintained in the long term, the following is considered:

- Population of the species as a viable component of the site
- Distribution of the species within the site
- Distribution and extent of habitat supporting the species
- Structure, function and supporting processes of habitat supporting the species

- No significant disturbance of the species

Assessment against conservation objectives

The Jura, Scarba and the Garvellachs SPA is designated for breeding populations of the golden eagle, which have the potential to be disturbed by the installation activities occurring at the Jura landfall site. Visual disturbance can have significant impacts to foraging, nesting, and breeding behaviours.

Visual disturbance can influence the species choice of nesting site and their reproductive success. Golden eagles typically prefer nesting sites that provide good visibility, protection from predators, and access to prey. Human activity can disrupt these preferences, leading to nesting failure due to disturbances causing eagles to abandon nests, leaving them more susceptible to predation (Kochert *et al.,* 2002). For instance, a study by Kochert *et al*. (2002) observed that golden eagles avoided nesting or foraging near areas with high levels of human activity, such as roads and residential developments. This avoidance behaviour can result in habitat fragmentation and reduced access to suitable foraging areas as well as reduced prey availability, as the presence of humans and human structures can deter prey species from the area (Kochert *et al.,* 2002). The impacts of visual disturbance thus have the potential to lead to decreased reproductive success and population decline.

The Ecological Clerk of Works (ECoW) support and monitoring survey conducted during initial preparatory works for the cable installation monitored a golden eagle nest located on Jura as well as the behaviour of individuals whilst cable survey works commenced (ERM, 2023). During the arrival and departure of the cable surveyors to the Jura landfall and the undertaking of the preparatory cable survey works, observations by the ECoW suggested that non-incubating adult eagles actively avoided the area in which the cable survey works were being carried out. However, following completion of the survey works these individuals were observed to immediately return to utilising this area and amongst incubating adults no other signs of distress or behaviours indicating a serious disturbance were observed.

Therefore, given the short duration of the installation activities any potential visual and above water noise disturbance effects will be temporary in nature. Any disturbances to golden eagles will be minimal and if disturbed from the area the species are expected to return immediately following completion of the Project. As such, the Jura, Scarba and the Garvellachs SPA is expected to remain unaffected.

A further assessment of the potential impacts to golden eagles is discussed in Section 9 ‘Ornithology’.

5.5.3.2 Gruinart Flats, Islay SPA

Conservation objectives

To avoid the deterioration of the habitats of the qualifying species or significant disturbance to the qualifying species, thus ensuring the integrity of the site is maintained in the long term, the following is considered:

- Population of the species as a viable component of the site
- Distribution of the species within the site
- Distribution and extent of habitat supporting the species
- Structure, function and supporting processes of habitat supporting the species

No significant disturbance of the species

Assessment against conservation objectives

The Gruinart Flats, Islay SPA is designated for various bird species. One of which, the Canadian light-bellied brent goose has the potential for presence within the Application Corridor.

Visual disturbance and above water noise resulting from human presence and or machinery involved in the cable installation has the potential to disrupt the foraging behaviour of Canadian light-bellied brent geese. Disturbances can cause them to alter their feeding behaviour or abandon feeding areas thus impacting their energy intake and overall fitness. However, an assessment of threats as conducted by Robinson & Colhoun (2006) concluded that human disturbance is only of moderate importance in determining the loss of foraging opportunities for the species and that effects are constricted to the immediate area of the disturbance. Furthermore, since installation activities will be temporary and only transit through foraging areas for a short period of time, although individual birds may be temporarily disturbed, they will be able to quickly return to any utilised feeding areas. As such, no significant disturbance of the sites features will occur, and their populations will remain a viable component of the site.

5.5.3.3 Sound of Gigha SPA

Conservation objectives

The conservation objectives of the Sound of Gigha SPA are as follows:

- To ensure that the qualifying features of Sound of Gigha SPA are in favourable condition and make an appropriate contribution to achieving Favourable Conservation Status
- To ensure that the integrity of Sound of Gigha SPA is maintained in the context of environmental changes
- The populations of the qualifying features remain a viable components of the site
- The distributions of the qualifying features throughout the site are maintained by avoiding significant disturbance of the species
- The supporting habitats and processes relevant to qualifying features and their prey/food resources are maintained

Assessment against conservation objectives

The Sound of Gigha SPA is designated for a number of non-breeding bird populations. Of the protected species, common eider, red-breasted merganser and Slavonian grebe have the potential to be present within the Application Corridor during the installation works. These species forage along the beaches and rocky coastline of Islay, exploiting suitable habitat and feeding opportunities.

Visual and above water noise disturbances from boats and human presence has potential to disrupt feeding behaviours and reduce access to food resources. However in the example of Slavonian grebe, the species has been observed to comfortably overwinter in areas with very frequent ferry and fishing vessel traffic and the populations are known to be tolerant of these practises (Goodship & Furness, 2022). Given the cargo and fishing vessel traffic in the Application Corridor is of moderate to low density, as described in Section 11 “Commercial fisheries and other sea users”, it is suggested that individuals protected within the Sound of Gigha SPA that are present within the Application Corridor may possess a tolerance to impacts associated with visual and above water noise. Furthermore, given the short-term, localised and transient nature of the installation activities, the Sound of Gigha SPA is expected to remain unaffected.

5.6 Conclusion

The above assessment has demonstrated that installation activities associated with the cable replacement will not adversely affect the conservation objectives of any designated site within or in the vicinity of the Application Corridor. Any disturbance caused by the installation of the cable will be minor and temporary due to the short-term, localised and transient nature of the activities.

6. SEABED AND WATER QUALITY

6.1 Introduction

This Section characterises the seabed and water quality conditions influencing the baseline environment in the vicinity of the Application Corridor, outlines the potential impacts associated with the cable installation activities on the seabed and water quality and presents findings of the environmental assessment.

6.2 Data sources

OiQ has undertaken geophysical and environmental surveys to provide an overview of the seabed conditions along the Application Corridor. The following reports, which were developed from these surveys, was used to inform this Section:

- Cable Route Survey – SSEN Jura to Islay Replacement Cable – Integrated Geophysical Results Report (Aspect, 2023)
- Islay to Jura Cable Subtidal & Intertidal Benthic Survey 2023: Habitat Assessment (Ocean Ecology, 2023)

This information has been supplemented with bathing water and shellfish water quality data from the Scottish Environmental Protection Agency (SEPA); information from the Water Framework Directive (WFD) and artificial radionuclides (Marine Scotland, 2022); and previous works within the Sound of Islay such as the Scottish Power Renewables (SPR) Environmental Statement. All other data sources are referenced throughout this Section.

6.3 Seabed and water quality description

6.3.1 Seabed quality

The water depth in the Sound of Islay is 43 metres (m) at the deepest point, though a majority of the Sound is under 20m (ERM, 2022). The water depth within the Application Corridor ranges from 0 to 25.96m (EMODnet, 2023). The morphology of the Sound of Islay has a gradient 11° and 18° on the Jura side of the Sound and 6° and 10° on the Islay side of the Sound. There is also a fault rockhead which runs north – south of the Sound of Islay including through the centre of the Application Corridor (ERM, 2022).

The geology under the Sound of Islay comprises of a complex mixture of metamorphic Dalradian rocks, including schists and quartzites (SPR, 2010). Within the Application Corridor the main geological unit is Jura Quartzite, a metamorphic sedimentary rock of the Argyll Group, Precambrian in age (ERM, 2022).

Given the small size of the channel, information on sediment distribution within the Sound of Islay is relatively restricted (ERM, 2022). However, based on British Geological Survey (BGS) seabed sediment maps and United Kingdom Hydrographic Office (UKHO) navigation charts, it is implied that the rock seabed of the Sound consists of areas of coarse sediment with patches of gravel across the mouth of the Sound, a sediment distribution expected given the strong current regime in the area (ERM, 2022).

Natural and anthropogenic compounds can result in seabed contamination. Anthropogenic contamination is entirely dependent on the level of development at the nearshore areas of the Application Corridor. There are no known sources of contamination in the immediate vicinity of the Application Corridor. The closest potential source of contamination has been identified as the Port Ellen marine disposal site, 21.9 kilometres south of the Application Corridor. Historically, this site received dredged silt and sand with a last record of 9,922 tonnes (T) of material being disposed in 2005

(Metoc, 2006). The disposal licence for the site was not renewed for 2006 and the site has not been used since (Metoc, 2006). There are strong tidal current flows in the Sound, known to exceed 2.5 metre per second (m/s^{-} (Neill *et al.,* 2017). It is however not anticipated that material disposed at this site will have been transported to and settled in the Sound of Islay, and the deposition of fine material within the Application Corridor is unlikely.

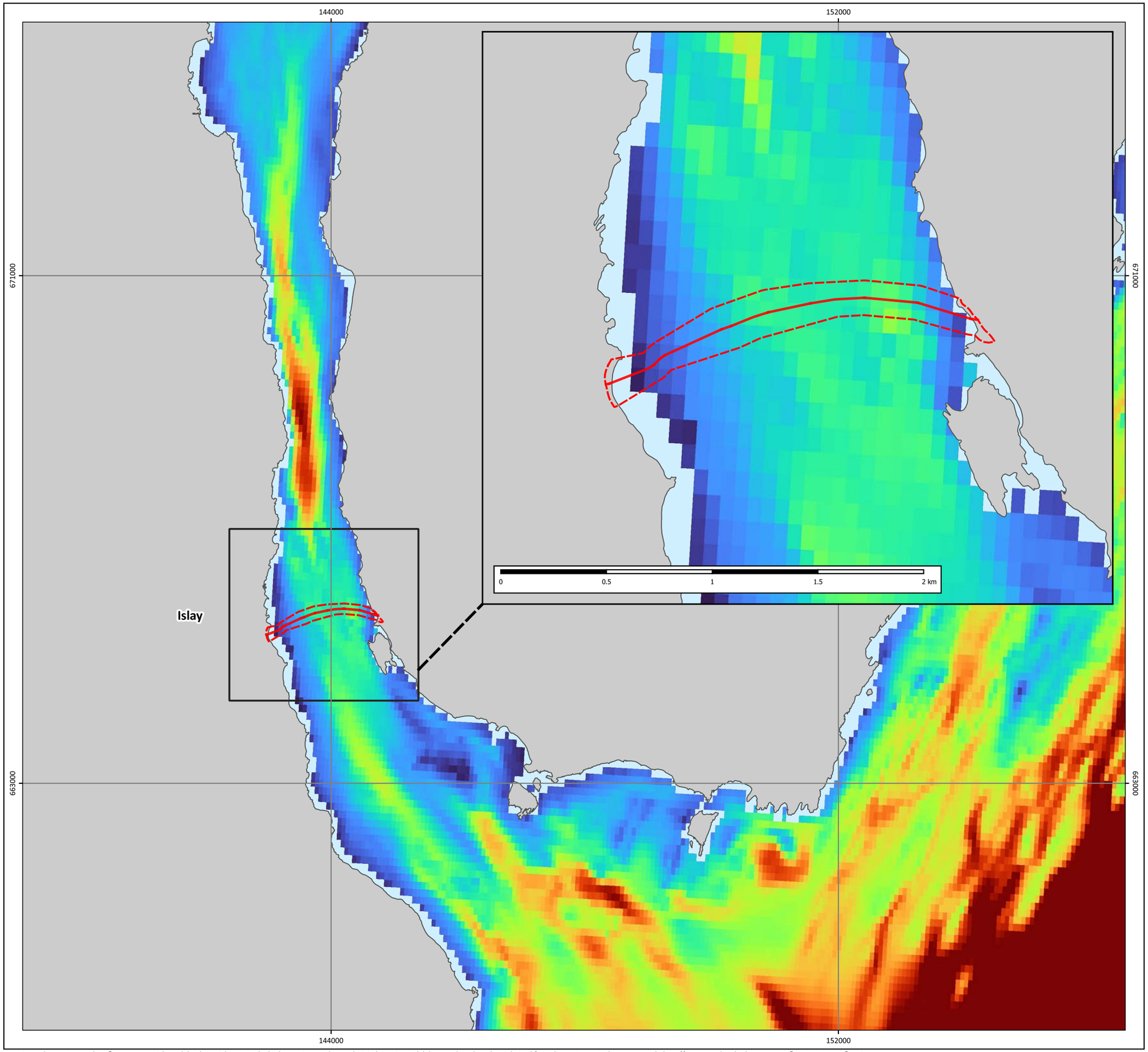
The bathymetry of the Application Corridor is displayed in Figure 6-1 (Drawing reference: P2635-BATH-001). The bathymetry data highlights ripples in several areas of the Application Corridor. Undulating seabed was detected to the east of the Application Corridor, which was identified as an area of larger ripples confined within a narrow channel that are 0.8m high (Aspect, 2023).

JURA-ISLAY DISTRIBUTION CABLE REPLACEMENT

BATHYMETRY

Bathymetry of the Sound of Islay

Drawing No: P2635-BATH-001 | A



Legend

Indicative RPL

Buffers

Installation Corridor

EMODnet Bathymetry (m Below LAT)

0

-60

N

NOT TO BE USED FOR NAVIGATION

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Scale @A3	1:60,000
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File Reference	J:\P2635\Mxd_QGZ \P2635.qgz
Created By	Oliver Bula
Reviewed By	Emma Kilbane
Approved By	Aodhfin Coyle

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0 1 2 3 4 km

6.3.2 Water quality

The European Union (EU) Marine Strategy Framework Directive (MSFD) adopted in 2008 requires that the UK takes "the necessary measures to achieve or maintain "Good Environmental Status" in the marine environment by the year 2020 at the latest" (Buckley *et al*,.2010). Within the Application Corridor, as well as the wider Sound of Islay, the Environmental Status is classified as good (Marine Scotland, 2023a).

The requirement for monitoring UK rivers and near-shore waters has increased as a result of the implementation of the EU Water Framework Directive (WFD), with more stringent criteria for water quality in rivers applied. River Basin Management Plans (RBMP) are being developed as a requirement of the WFD and report on the 'ecological status' of surface and ground water in coastal waters (out to 1 nautical mile (nm) from the baseline) and 'chemical status' of surface and ground waters in territorial waters (out to 12nm from the baseline). SEPA is responsible for producing RBMPs for the Scotland and the Solway Tweed River Basin Districts. The MSFD assessments are carried out at subregion level, i.e. the Greater North Sea and the Celtic Seas. The MSFD and WFD overlap in coastal waters as the WFD extends to three nm seaward from the Scottish territorial baseline. Any proposed development within these waters must have regards to the WFD and ensure that all surface water bodies achieve 'Good Ecological Status (GES)' and that there is no deterioration in status.

SEPA classifies the water quality within the Application Corridor to be 'good' (Marine Scotland, 2023a), as given the rock seabed and low volume of sediment within the area the resuspension of sediment is limited (ERM, 2022). There are no known bathing waters located within the vicinity of the Application Corridor, with the closest bathing water located 50km to the south-east.

There are no designated Shellfish Waters within the Application Corridor, the closest is located 24.6km to the south-east. Since 2017, this site has been classified as a mix of Class A and Class B Shellfish Waters depending on the time of year (SEPA, 2022). There is also an active shellfish water between Colonsay and Oransay (Colonsay: Pacific Oysters), approximately 25km north-west of the Application Corridor. Since 2017, this Shellfish Water has been classified as Class A (SEPA, 2022).

6.4 Impact Assessment

The proposed replacement cable will be surface laid along the entire route with the exception of the intertidal zone and as such no disturbance to underlying geological features in the area is expected and the activities will not result in significant sediment resuspension. The seabed footprint of the works will be minimal, and largely confined to the physical footprint of the cable itself, along with the potential for cable protection measures such as concrete mattresses, uraduct, split pipe and rock bags, as no seabed modification such as trenching and/or burial will be undertaken. No changes to water flow or levels of suspended solids are expected and as such potential effects on water quality have not been taken forward for further assessment.

Associated impacts on benthic and intertidal features are discussed in Section 8.

6.4.1 Physical change (to another substratum)

Physical change to the seabed within the proposed Application Corridor may arise from installation activities such as cable laying and potential placement of protective deposits on the seabed, which has the potential to lead to permanent seabed substrate (habitat) loss.

This could modify sediment supply and movement of presently occurring bedforms within the Application Corridor. Loss of substrate will result from the footprint of the cable on the seabed, while bedform alteration may occur from laying the cable towards the landfalls on Jura and Islay.

Given that the cable will be surface laid, disturbance from direct substratum loss is expected to be highly localised in extent, limited to the footprint of the cable, and any rock bags or concrete

mattresses if required. Furthermore, the cable route and use of cable protection deposits have been optimised to minimise their impact on sensitive benthic features, this includes use of cable stabilisation measures and micro-routing around medium resemblance stony reef.

Overall, given the small footprint of the cable installation activities (as defined in Section 4, Table 4-2), no significant loss of habitat or features will occur. The impact is therefore assessed as minor and not significant.

6.4.2 Abrasion / disturbance at the surface of the substratum

The seabed could be disturbed due to the installation activities, such as cable laying and trenching in the intertidal area, and operational activities, such as cable remedial works, which have the potential to result in damage to the seabed. Use of protective measures such as uraduct and articulated pipe could have an abrasive effect on hard substrate or in sensitive sites such as the maerl beds (if the protection and stabilisation measures are being used in the maerl bed area's along the cable route).

The intertidal works will be tide dependent (working at low water when the intertidal zone is exposed), using traditional terrestrial-based plant including excavators at low tide. As a result of conducting trenching activity in the intertidal area at low tide, it is expected that there will be temporary and localised disturbance.

Suspended sediment may be increased by incoming tide interacting with the cable trenching at the landfall sites. However, the impact of this suspended sediment is not expected to be significantly greater than suspended sediment resulting from wave action which causes low-level erosion of the shoreline sediments.

6.5 Mitigation

Mitigation measures that are embedded in the project design are listed in Table 4-1. Following assessment, there are no additional mitigation measures proposed.

6.6 Conclusion

The above assessment has concluded that the installation and operation of the Jura to Islay cable will not adversely affect the seabed and water quality within or in the vicinity of the Application Corridor. Any sediment dispersed as a result of the cable instillation activities will settle rapidly, becoming imperceptible in the water column to levels associated with tidal and wave action. Also, given that the cable will be surface laid with the exception of the intertidal area, disturbance from direct habitat loss is expected to be highly localised in extent, limited to the footprint of the cable, uraduct, and any rock bags, split pipe or concrete mattresses (if required), no significant loss of habitat or features will occur.

7. MARINE MEGAFAUNA

7.1 Introduction

This section characterises the marine megafauna (cetaceans, pinnipeds, otters and basking sharks) in the vicinity of the Application Corridor, outlines the potential pressures associated with the proposed cable installation activities on marine megafauna and presents findings of the environmental assessment. Given their mobile nature, marine megafauna recorded within a 50km radius of the Application Corridor are considered in this section (Figure 7-1, Drawing Reference: P2635-LOC-007).

7.2 Data sources

A separate European Protected Species (EPS) Protected Sites and Species Risk Assessment (document reference: A-303128-S04-A-REPT-002) which covers marine survey activities within the Argyle geographical area has previously been prepared by (Xodus Group, 2023), the region in which the Application Corridor is located. This detailed the baseline for protected sites and species located in the vicinity of the Application Corridor and assessed the impacts of survey activities on these sites and species. Relevant information has been used to inform the baseline description in this section, and where applicable assessment findings corroborated with this MEA to ensure consistency.

The preliminary baseline of megafauna in the region has therefore been informed using the following sources:

- Jura to Islay Subsea Cable Replacement Environmental Desk Study Report, ERM 2022
- EPS and Protected Sites and Species Risk Assessment – Argyll (document reference: A-303128-S04-A-REPT-002, Xodus Group (2023)(Appendix C)

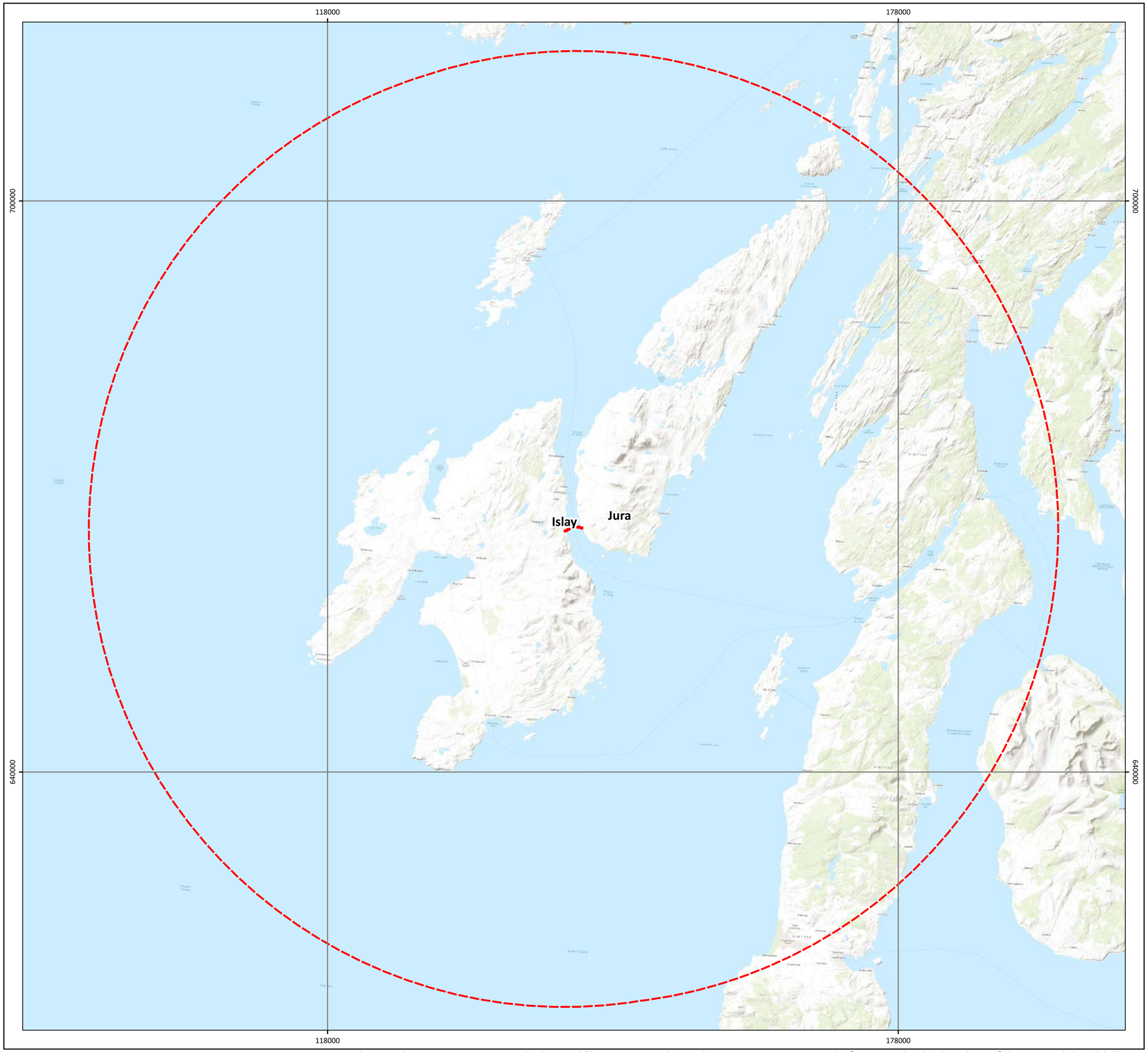
In order to establish baseline conditions a desktop review of published information has been undertaken supported by consultation with relevant bodies. Any other data sources used are referenced throughout the document.

JURA-ISLAY DISTRIBUTION CABLE REPLACEMENT

LOCATION OVERVIEW

Marine Megafauna Zone of Influence

Drawing No: P2635-LOC-007 | A



Legend

- Indicative RPL

Buffers

- Marine Megafauna Zone of Influence

N

NOT TO BE USED FOR NAVIGATION

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WKID	EPSG:27700
Scale @A3	1:400,000
Data Sources	OS; GEBCO; SHEPD; ESRI
File Reference	J:\P2635\Mxd_QGZ \P2635.qgz
Created By	Oliver Bula
Reviewed By	Lewis Castle
Approved By	Aodhfin Coyle

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0 5 10 15 20 km

7.3 Marine megafauna description

7.3.1 Cetaceans

All cetacean species found in the UK are listed under Annex IV of the Habitats Directive as EPS and are protected in Scottish territorial waters under Section 39 of the Conservation (Natural Habitats, &c.) Regulations 1994, with it being an offence to capture, kill or disturb any EPS. Harbour porpoise and bottlenose dolphins are also listed under Annex II of the Habitats Directive, therefore, under Schedule 2 of the Habitats Regulations, the designation of a Special Area of Conservation (SAC) is required to facilitate their conservation. Section 5 "Protected Sites Assessment" considers all protected species which are designated features of SACs. A total of 23 species of cetacean have been recorded off the west coast of Scotland, all of which can be found in Hebridean waters (HWDT, 2018). According to the SCANS-III survey undertaken in 2016, the Application Corridor is located within SCANS Block G. Three species of cetacean have been recorded in this Block: harbour porpoise (*Phocoena phocoena*), minke whale (*Balaenoptera acutorostrata*) and bottlenose dolphin (*Tursiops truncatus*) (Hammond *et al.*, 2017). These species, along with other species classed as infrequent visitors, are detailed in Table 7-1.

Table 7-1 Cetacean species recorded within the Application Corridor

Species	Description of species and occurrence	Density estimates in vicinity of Application Corridor (individuals/km²)	Management Unit (MU) population estimate
Commonly observed species			
Harbour porpoise (*Phocoena phocoena*)	Harbour porpoises are the most abundant cetacean species on the west coast of Scotland, constituting one of the highest densities of porpoise found in Europe. Harbour porpoises are resident year-round in Hebridean waters and tend to be observed in groups of one to three animals (Reid *et al.*, 2003). While the Application Corridor does not fall within any designated sights for harbour porpoises, the Inner Hebrides and Minches SAC is nearby and there may be connectivity between animals using the Application Corridor and this SAC.	0.336	28,936
Minke whale (*Balaenoptera acutorostrata*)	Minke whales are the smallest and most common baleen whale species in Scottish waters and are frequently sighted between April and October. Typically seen alone or in pairs, minke whales can be found in the vicinity of other cetaceans when feeding (Reid *et al.*, 2003). While the Application Corridor does not fall within any designated sights for minke whale, there may be connectivity between animals using the Application Corridor and the nearby Sea of the Hebrides Nature Conservation Marine Protected Area (NCMPA), for which minke whale are a designated feature.	0.027	20,118
Bottlenose dolphin (*Tursiops truncatus*)	Bottlenose dolphins found in Scottish waters are at the northernmost limit of their geographical range. There are two distinct communities of bottlenose dolphin found within Hebridean waters, with 12–15 individuals found around the Isle of Barra, and up to 45 individuals in the Inner Hebrides between Skye and Kintyre (Cheney *et al.* 2013); however, this species has also been sighted in coastal waters around Islay. Both	0.121	45

Species	Description of species and occurrence	Density estimates in vicinity of Application Corridor (individuals/km²)	Management Unit (MU) population estimate
	communities are resident year-round in Hebridean waters. The Application Corridor does not overlap with any features designated for bottlenose dolphins.		
Infrequent visitors			
Short-beaked common dolphin (*Delphinus delphis*)	Short-beaked common dolphins (*Delphinus delphis*) have a cosmopolitan distribution and are predominantly found in continental shelf waters. They are present throughout the year along the west coast of Scotland, with peak sightings between April and October. This species is mostly found east of the Outer Hebrides; however, there have been sightings off the west coast of Jura. The Application Corridor does not overlap with any features designated for short-beaked common dolphins.	Insufficient data	57,417
Risso's dolphin (*Grampus griseus*)	Risso's dolphin (*Grampus griseus*) occur primarily in continental shelf waters and can be observed year-round in Hebridean waters. Occurrences of Risso's dolphins in the Outer Hebrides are the highest in northwest Europe (Reid *et al.*, 2003). While sightings have occurred off the north coast of Islay, Risso's dolphins have not been sighted in the vicinity of the Application Corridor. The Application Corridor does not overlap with any features designated for Risso's dolphins.	Insufficient data	12,262

Sources: Hammond *et al.*,2017; IAMMWG, 2022; HWDT, 2018.

7.3.2 Pinnipeds

Two seal species inhabit UK waters: the common seal (*Phoca vitulina*) and the grey seal (*Halichoerus grypus*). Both species occur year-round along the west coast of Scotland and have been recorded within and around the Application Corridor (Paterson *et al*., 2015; SCOS, 2021). During the breeding and moulting season, seals are particularly vulnerable to disturbance. For common seals, breeding season occurs in June and July, and moulting season in August and September (Paterson *et al*., 2015). For grey seals, breeding occurs mid-September to December and moulting from December to April (Paterson *et al.,* 2015).

The latest population estimate for common seals in Scotland is around 37,300 individuals, with 78% of those occurring in west Scotland (Morris *et al*., 2021). The Application Corridor does not overlap with any SACs for common seal, however, it is within foraging range of the southeast Islay Skerries SAC, for which common seals are a designated feature. Section 5 (Protected Sites) considers all protected species which are designated features of SACs. The animals using this site constitute up to 14% of the west coast of Scotland's common seal population (Paterson *et al*., 2015; Morris *et al*., 2021).

The latest population estimate for grey seals in Scotland is around 106,300 individuals, with 41% of those occurring in west Scotland (Morris *et al*., 2021). The Application Corridor does not overlap with any SACs for grey seals; however, grey seals use the Sound between Islay and Jura to forage and haul-out (Paterson *et al*., 2015).

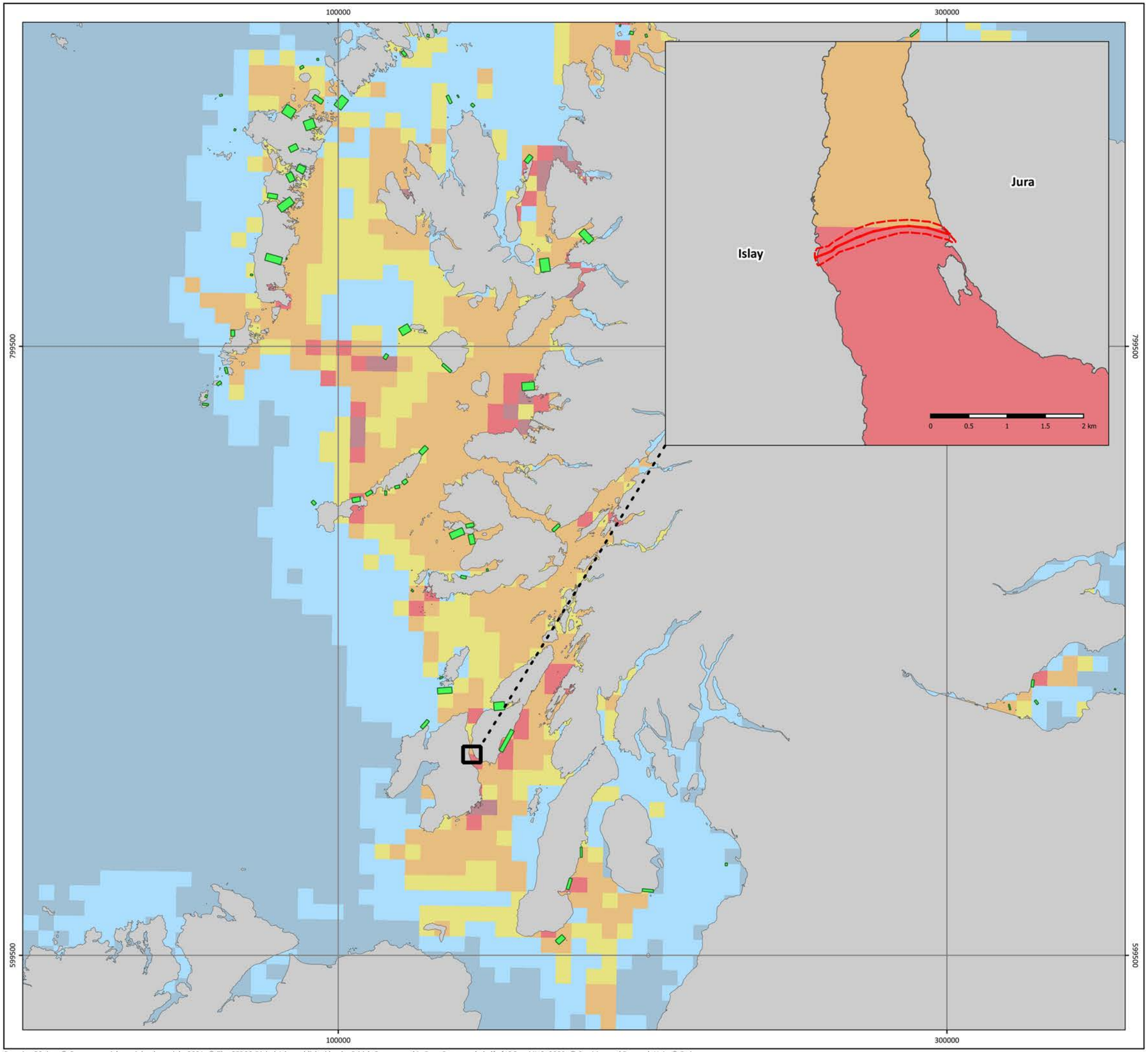
Within the Application Corridor, at-sea usage is higher for common seals compared to grey seals. Common seal usage is estimated between 10-100 individuals (Figure 7-2; (Drawing Reference: P2635-HAB-002), whereas grey seal usage is estimated between 10-50 individuals (Figure 7-3; (Drawing Reference: P2635-HAB-003; Russel *et al*., 2017; NMPi, 2023). Three seal haul-out locations are known around Jura and Islay, located 7.3km, 13.6km and 16.6km from the Jura landfall area and 9.7km, 13.9km and 14.1km from the Islay landfall (ERM, 2022).

JURA-ISLAY DISTRIBUTION CABLE REPLACEMENT

PELAGIC HABITATS

Density of Common Seals Between 1991 and 2016

Drawing No: P2635-HAB-002 | A



Legend

- Indicative RPL
- Installation Corridor

Common Seal Density (5 km x 5 km)

- <= 1
- 1 - 5
- 5 - 10
- 10 - 50
- 50 - 100
- >= 100

Environmental Designation

- Protected Seal Haul-Out Site

NOT TO BE USED FOR NAVIGATION

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Scale @A3	1:1,250,000
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Created By	Lewis Castle
Reviewed By	Emma Langley
Approved By	Aodhfin Coyle

Scottish & Southern Electricity Networks intertek

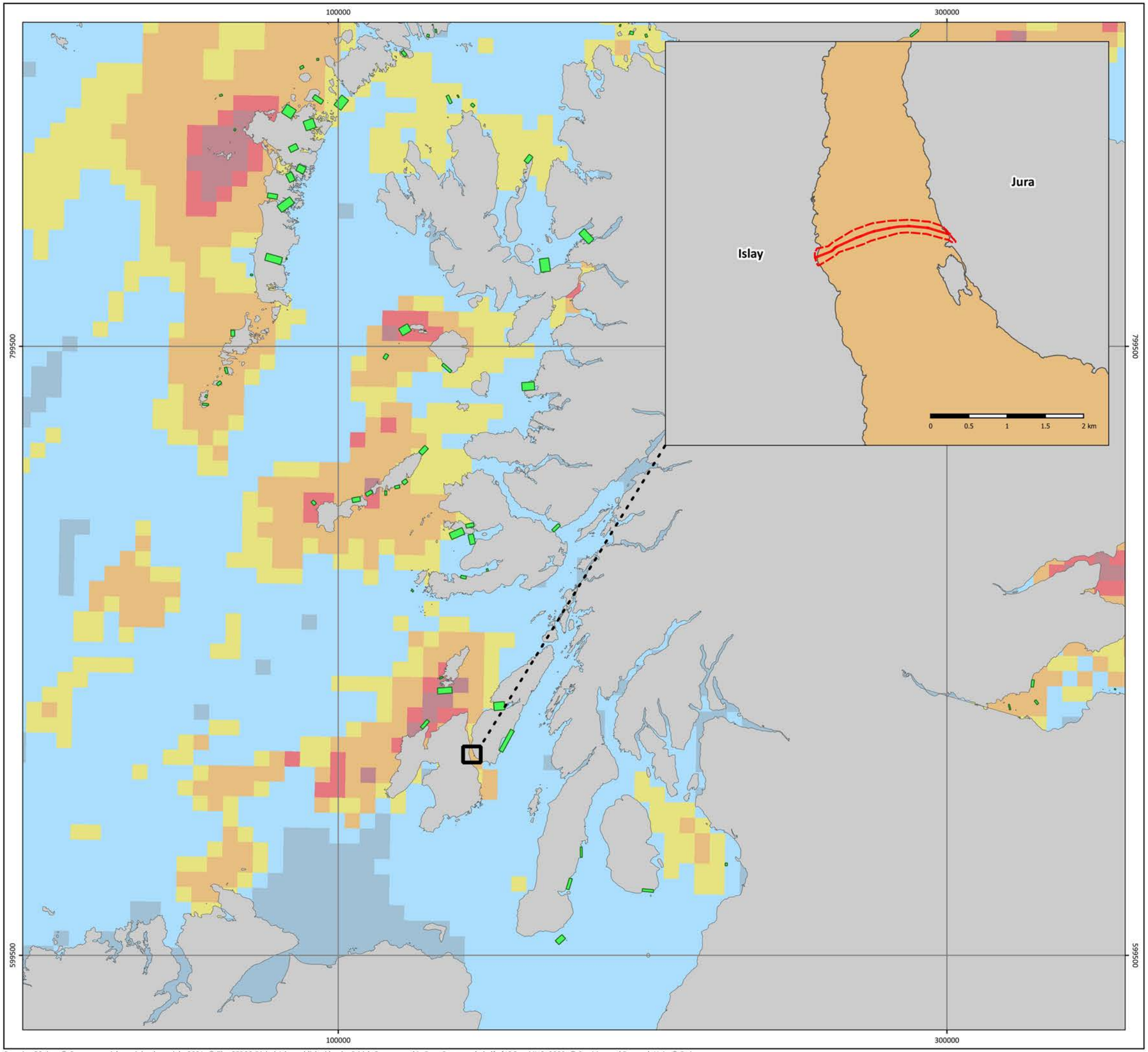
0 20 40 60 80 km

JURA-ISLAY DISTRIBUTION CABLE REPLACEMENT

PELAGIC HABITATS

Density of Grey Seals Between 1991 and 2016

Drawing No: P2635-HAB-003 | A



Legend

- Indicative RPL
- Installation Corridor

Grey Seal Density (5 km x 5 km)

- <= 1
- 1 - 5
- 5 - 10
- 10 - 50
- 50 - 100
- >= 100

Environmental Designation

- Protected Seal Haul-Out Site

NOT TO BE USED FOR NAVIGATION

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Created By	Lewis Castle
Reviewed By	Emma Langley
Approved By	Aodhfin Coyle

Scottish & Southern Electricity Networks | intertek

0 20 40 60 80 km

7.3.3 Elasmobranchs

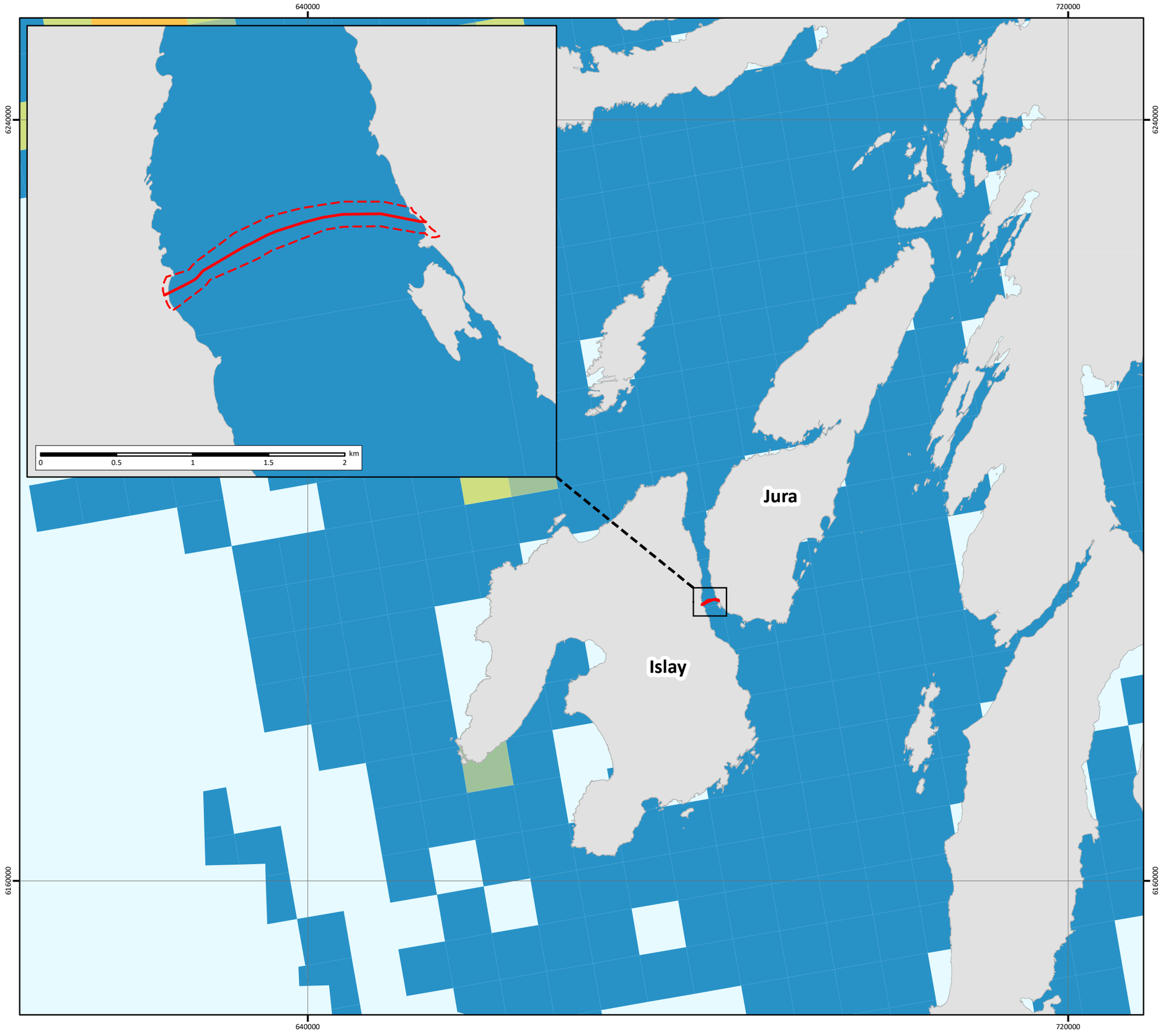
Basking shark are the second largest fish in the world and one of the few species of filter feeding shark (Sims, 2008). They are found in offshore waters of the UK continental shelf; however, western Scotland has been identified as a regional hotspot for basking sharks around the UK (Witt *et al*., 2012). They are frequently observed in Hebridean waters between May and October, with sightings peaking in July and August (HWDT, 2018; Witt *et al*., 2012). The Sea of Hebrides is an important feeding and breeding area for basking sharks, with some individuals known to return to the same location annually (HDTW, 2018). For this reason, the Sea of Hebrides NCMPA has been designated with basking sharks as a qualifying feature. Although the Application Corridor does not overlap the Sea of Hebrides NCMPA, given the mobile nature of basking shark there is potential for their presence within the Project area. The NMPi (2023) reports a basking shark density is low within the Application Corridor, with 0-0.1 animals/km^2 (Figure 7-4 drawing reference P2635-FISH-005).

25 species of skates and rays are known to inhabit Scotland's coastal water (The Scottish Government, 2011). One of these, the flapper skate (*Dipturus intermedius*) is designated within the nearby Loch Sunart to the Sound of Jura NCMPA located 28.64km (Section 5 assesses protected sites) from the Application Corridor at the closest part. Although there is evidence that this species are non-migratory and resident to the West coast of Scotland (Neal & Pizzolla, 2006) they are present across the Scottish west coast Within the Application Corridor, there were no occurrences of flapper skate encounters (Figure 7-5 drawing reference P2635-FISH-004). Flapper skate are transient in nature known to travel distances up to 100km (Thorburn *et al*., 2018). They are adapted to tidal channels with strong currents which they exploit as favourable foraging habitats (NatureScot, 2022e). It is therefore possible for flapper skate to be present within the Application Corridor. Section 5 (Protected Sites) considers all protected species which are designated features of SACs.

JURA-ISLAY DISTRIBUTION CABLE REPLACEMENT

FISH AND FISHING ACTIVITIES
Observed Adjusted Densities of Basking Shark (2000-2012)

Drawing No: P2635-FISH-005 | **A**



Legend

- Indicative RPL
- Installation Corridor

Observed Adjusted Densities

Encounter Rate

- 0.00 - 0.10
- 0.10 - 0.20
- 0.20 - 0.50
- 0.50 - 1.00
- 1.00 - 2.00
- 2.00 - 5.00
- 5.00 - 10.00
- > 10.00

N
W E
S

NOTE: Not to be used for Navigation

Date	31 August 2023
Coordinate System	WGS 1984 UTM Zone 29N
Projection	Transverse Mercator
Datum	WGS 1984
Data Source	OS; SMRU; SHEPD; ESRI
File Reference	J:\P2635\Mxd_QGZ\02_FISH\ P2635-FISH-005.mxd
Created By	Oliver Bula
Reviewed By	Lewis Castle
Approved By	Aodhfin Coyle

Scottish & Southern Electricity Networks intertek

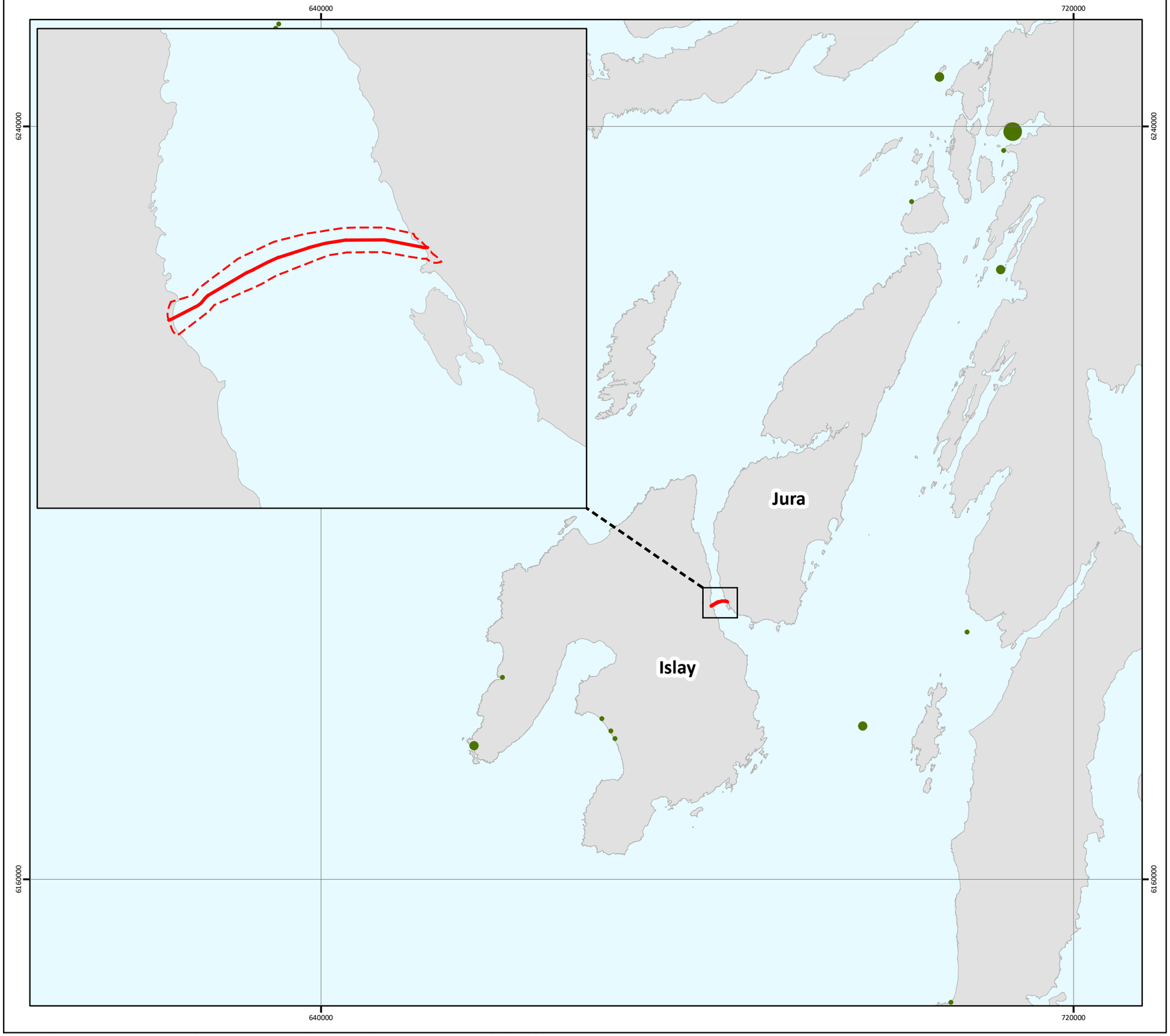
0 5 10 15 20 km

JURA-ISLAY DISTRIBUTION CABLE REPLACEMENT

FISH AND FISHING ACTIVITIES

Flapper Skate and Blue Skate distribution in Scotland's Seas

Drawing No: P2635-FISH-004 | **A**



Legend

- Indicative RPL
- Installation Corridor

Flapper Skate and Blue Skate Encounter (Surveys from 1995 Onwards)

Count

- 1 - 2
- 3 - 5
- 6 - 10
- 11 - 50
- > 50

N
W E
S

NOTE: Not to be used for Navigation

Date	31 August 2023
Coordinate System	WGS 1984 UTM Zone 29N
Projection	Transverse Mercator
Datum	WGS 1984
Data Source	OS; SNH; SHEPD; ESRI
File Reference	J:\P2635\Mxd_QGZ\02_FISH\ P2635-FISH-004.mxd
Created By	Oliver Bula
Reviewed By	Lewis Castle
Approved By	Aodhfin Coyle

Scottish & Southern Electricity Networks intertek

0 5 10 15 20 km

7.4 Impact assessment

7.4.1 Underwater noise changes

As described in Section 5 - Protected Sites Assessment, the main sources of underwater noise generated during replacement cable installation will be from the installation vessel and the cable laying activities. The effects of underwater noise changes on harbour porpoise, common seal, flapper skate, minke whale and basking shark have been assessed in Section 5 and concluded that no significant effects to these species would occur. Underwater noise changes resulting from the installation activities primarily result from the noise associated with the installation vessel and Ultra-short baseline (USBL). The assessment below therefore focuses on other cetacean and pinniped species, and the effects USBL devices may have on these species.

If frequencies of the sound produced fall outside the predicted auditory bandwidth for a species, then disturbance is unlikely. Sufficiently loud noise sources, however, can still cause damage to an individuals' auditory or other internal organs. For details on the typical auditory bandwidths of cetaceans, see Table 7-2.

Table 7-2 Auditory bandwidths estimated for hearing groups

Hearing Group	Estimated Auditory Bandwidth
Low-frequency cetaceans (deep diving species e.g. minke whale, pilot whale, etc.)	7Hz to 35kHz, with peak sensitivity around 100- 200Hz
Mid-frequency cetaceans (small dolphins e.g. bottlenose dolphin, common dolphin, white-beaked dolphin, etc.)	150Hz to 160kHz, with peak sensitivity above 10kHz (Except for killer whales: 50Hz to 100kHz)
High-frequency cetaceans (harbour porpoise)	180Hz to 200kHz, with peak sensitivity above 4kHz
Phocid pinnipeds (true seals, e.g. grey and common seal)	50Hz to 86kHz
Basking shark	20Hz to 1kHz

Source: NMFS, 2018; Southall *et al.*, 2019

7.4.1.2 Cetaceans

Cetaceans present within the Application Corridor may experience impacts from the installation activities such as injury to auditory and internal organs and disturbance to behavioural patterns. USBL in a worst-case scenario would disturb less than 0.1 individuals of any cetacean species per 0.13km² (Xodus, 2023). As such, potential disturbance impacts from USBL on short-beaked common dolphin, Risso's dolphin and bottlenose dolphin would be negligible. Given the regular levels of shipping in the area, a ferry crossing between Jura and Islay (see Section 13 – Shipping and Navigation), the addition of vessels associated with installation activities will not substantially increase vessel numbers or the existing baseline soundscape in the vicinity of the Application Corridor. Given that the presence of the installation vessels will not result in a significant change to the number of vessels in the area and that cable installation activities will be a temporary occurrence, no adverse effects to cetaceans from the installation activities are expected. There will therefore be no significant disturbance to cetacean species as a result of installation activities.

7.4.1.3 Pinnipeds

While less sensitive to underwater noise emissions than cetaceans, noise from vessels has been shown to elicit behavioural responses in seals (Mikkelsen *et al.*, 2019). For details on the typical auditory bandwidths of pinnipeds, see Table 7-2. Noise emissions from vessels associated with the Project will

be localised, temporary and transient, such that any disturbance to seals will be short-term. Seals in the water could also be susceptible to disturbance form USBL devices however, given the overlap in their hearing ranges and sound generated by USBL devices (NMFS, 2018). 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, given the low usage of seals at sea within the Application Corridor and transient nature of the installation activities, no significant disturbance of seals will occur as a result of installation/decommissioning activities.

7.4.1.4 Elasmobranchs

Elasmobranchs (sharks and rays) in general are considered to have a low sensitivity to noise given that they do not possess a swim bladder. The hearing capabilities of basking sharks is unknown; however, five species of elasmobranch are known to hear in the range of 20Hz to 1KHz (Macleod *et al*., 2011). The low frequency noise emissions produced by vessels overlaps with this range, therefore, could be a potential risk to basking sharks should they have similar hearing sensitivity. However, the addition of vessels associated with installation activities will not substantially increase vessel numbers or the existing baseline soundscape in the vicinity of the Application Corridor. Furthermore, flapper skate are identified as not being sensitive to noise (Neal & Pizzolla, 2006) and as such no significant disturbance of basking shark or flapper skate are expected.

7.4.2 Vessel presence

The Application Corridor is in close proximity to an active ferry route, therefore, the addition of those associated with the cable installation will not substantially increase vessel numbers.

The effects of vessel presence on harbour porpoise, common seal, flapper skate, minke whale and basking shark have been assessed in Section 5 - Protected Sites if they fall within a protected site or are likely to enter the Application Corridor due to proximity of their protected site. The assessment concluding that no significant effects to these species would occur, due to their mobile nature and the temporary, transient and localised nature of the installation activities.

7.4.2.1 Cetaceans

Although cetaceans may transit the Application Corridor their mobile nature and the slow movement of instillation vessels means that individuals will have sufficient time to move out of the path of any vessel. Thus, minimising risks of collision and reducing significant risks of injury or death to unlikely. As such no significant disturbance to cetaceans is expected.

7.4.2.2 Pinnipeds

When hauled out seals have a typical disturbance range of 900m (Brassuer and Reijnders, 1994). Given that the closest seal haul out site is located 7.3km from the Jura landfall site no disturbance to hauled out seals is expected (ERM, 2022). However, given that seals typically forage within 5-10km of their haul out sites their presence within the Application Corridor is possible. The slow speed of the instillation vessel however provides individuals with sufficient time to move out of the path of the vessel thus reducing the risk of vessel strike. As such no significant disturbance to pinnipeds is expected.

7.4.2.3 Elasmobranchs

Basking shark are slow to mature and have long gestational periods (HDTW, 2018). As a large, slow-moving species, basking sharks are at risk of collision with vessels, particularly those at higher speeds. Given the slow speed of the installation vessel however no significant risks of injury to basking shark from vessel presence are expected and as such no significant disturbance to basking shark is expected.

Flapper skate, given their mobility are unlikely to be disturbed as a result of vessel presence.

7.5 Mitigation

Mitigation measures that are embedded in the project design are listed in Table 4-1. Following assessment, there are no additional mitigation measures proposed.

7.6 Conclusion

The above assessment has determined that the short-term, localised and transient nature of installation activities in combination with low densities of marine megafauna in the area (common seal usage is estimated between 10-100 individuals, grey seal usage is estimated between 10-50 individuals, no encounters of flapper skate), there are unlikely to be any adverse effects to cetacean, pinniped and elasmobranchs as a consequence of planned installation activities.

8. BENTHIC AND INTERTIDAL ECOLOGY

8.1 Introduction

This section characterises the intertidal and subtidal benthic ecology within the Application Corridor, outlines the impacts associated with the cable installation activities on intertidal and subtidal benthic communities and presents the findings of the environmental assessment.

8.2 Data sources

Baseline conditions have been established by undertaking a desktop review of published data and through interpretation of data provided in a site specific subtidal and intertidal habitat assessment report produced by Ocean Ecology for the marine surveys undertaken between April and July 2023. The Marine Scotland Feature Activity Sensitivity Tool (FeAST) tool and the Marine Life Information Network (MarLIN) sensitivity descriptions have been used to inform the impact assessment.

The baseline description and assessment has been informed using the following primary sources:

- Islay to Jura Cable Subtidal & Intertidal Benthic Survey 2023: Habitat Assessment (Ocean Ecology, 2023)
- Multibeam, geophysical, side-scan sonar & magnetometer survey Jura to Islay Cable Route, Argyll & Bute (Aspect Land & Hydrographic Surveys, 2023)
- Marine Scotland FeAST tool (Marine Scotland, 2023a)
- MarLIN – The Marine Life Information Network (MarLIN, 2023)

8.3 Benthic and intertidal ecology description

8.3.1 Intertidal ecology

8.3.1.1 Jura landfall site

The intertidal zone at Jura ranged from 20m towards the centre of the Application Corridor to 70m in the southeastern extent of this boundary, between mean high-water springs (MHWS) and mean low water springs (MLWS). A clear linear zonation of habitats was observed throughout most of the Jura landfall site, with a patchier habitat distribution observed in the northern and southern extents of the survey area. The intertidal area was characterised by a seaward gradient, with barren littoral shingle (A2.111) dominating the upper shore. Two narrow strandlines (A2.21) were observed along the high water marks. The middle shore graded into low energy littoral rock (A1.3) which was dominated by fucoids (A1.31).

The southern section of the area consisted of a mosaic of sandier sediment and areas of polychaetes in fine sand (A2.231). A rocky outcrop was observed to the north of the landfall site and was dominated by patches of the biotope *Fucus spiralis* on upper eulittoral rock (A1.312). To the south of the landfall site, patches of the biotope *Fucus serratus* on full salinity lower eulittoral mixed substrata (A1.3152) were observed. The northern section consisted of larger rocks/cliffs covered in lichen and angiosperms (B3.3) as well as rock with yellow and grey lichen (B3.111). The boundary of the upper shore in the northern and southern extents was characterised by mixed shingle beaches with herbaceous vegetation (B2.4).

Figure 8-1 below displays the broadscale habitats (BSHs) and biotopes observed across the Jura intertidal survey area.

Potentially sensitive habitats

No PMFs or Annex I features were identified within the intertidal survey areas.

8.3.1.2 Islay landfall site

The intertidal zone at Islay ranged from around 30m towards the south of the Application Corridor to around 40m to in the northern extent of this boundary, between mean high-water springs (MHWS) and mean low water springs (MHWS). No distinct zonation was observed at the Islay landfall site, however there was a clear seaward gradient. The upper shore was dominated by barren littoral shingle (A2.111), which graded into areas of low energy littoral rock (A1.3) with biota including Fucoids (A1.31), *Pelvetia canaliculata* (A1.311), *Fucus vesiculosus* (A1.3132, A1.323) and *Ascophyllum nodosum* (A1.3141). Towards the centre of this band, a variation consisting of *Fucus spiralis* (A1.312, A1.3121, A1.315, A1.3151) was identified extending into the lower shore.

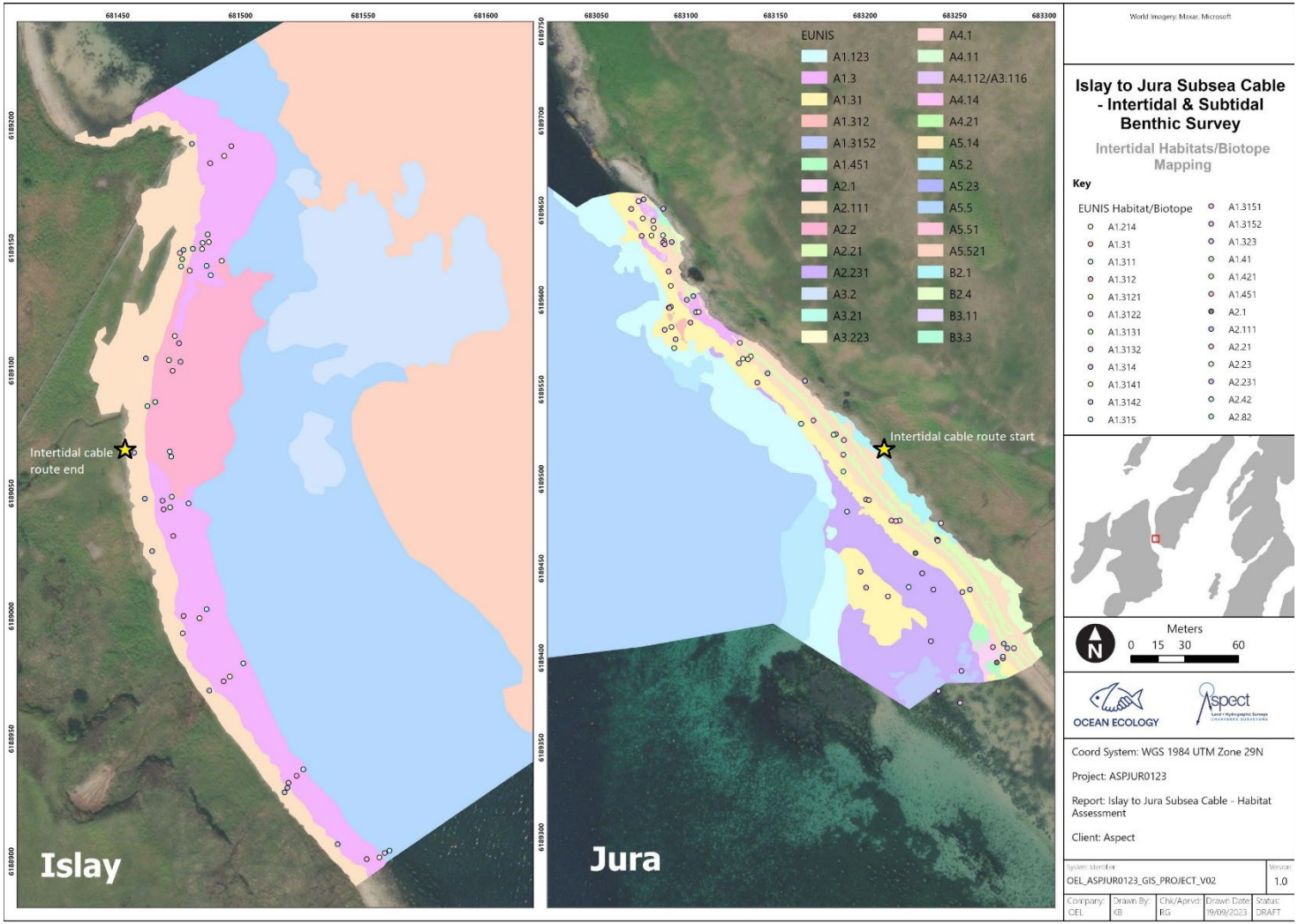
Areas of sand and muddy sand supporting polychaetes (A2.231) were observed within the centre of the survey area. To the north of the landfall site, littoral rock habitats (A1.4) were observed including communities of littoral rock pools (A1.41) and *Fucus serratus* on lower eulittoral rock (A1.3151).

Figure 8-1 below displays the BSH's and biotopes observed across the Jura intertidal survey area.

Potentially sensitive habitats

No PMFs or Annex I features were identified within the intertidal survey areas.

Figure 8-1 Map of habitats recorded at the Jura and Islay landfall sites



8.3.2 Subtidal ecology

A survey of the subtidal area found it to be generally dominated by rock habitats and mixed kelp and seaweed communities. The mid-section of the Sound was characterised by very tide-swept faunal communities on circalittoral rock (A4.11). Areas of tide-swept circalittoral coarse sediment (A5.14) were also observed towards the central eastern quarter of the Sound, mainly identified in the form of megaripples.

Further eastward sediments were dominated by echinoderms and crustose communities on circalittoral rock (A4.21), deepening into infralittoral fine sand (A5.23) and mobile circalittoral coarse sediment (A5.14) to the north and south of the eastern Application Corridor. Sublittoral macrophyte-dominated sediment (A5.5) dominated areas close to the shore in both the west and east extent of the corridor surveyed.

The western extent was characterised by a narrow band of mobile maerl bed (A5.51) and maerl gravel/sediment. This deepened eastward into mixed kelp and red seaweeds on infralittoral boulders, cobbles, and gravel in tidal rapids (A3.223) and further deepened moderate energy infralittoral rock (A3.21) and *Tubularia indivisa* on tide-swept circalittoral rock (A4.112).

Figure 8-2 below displays the locations of these habitats across the Application Corridor with ground-truthing stations and Figure 8-3 illustrates the final habitat interpretation.

Figure 8-2 Map of subtidal habitats and ground-truthing stations for the Jura to Islay cable route

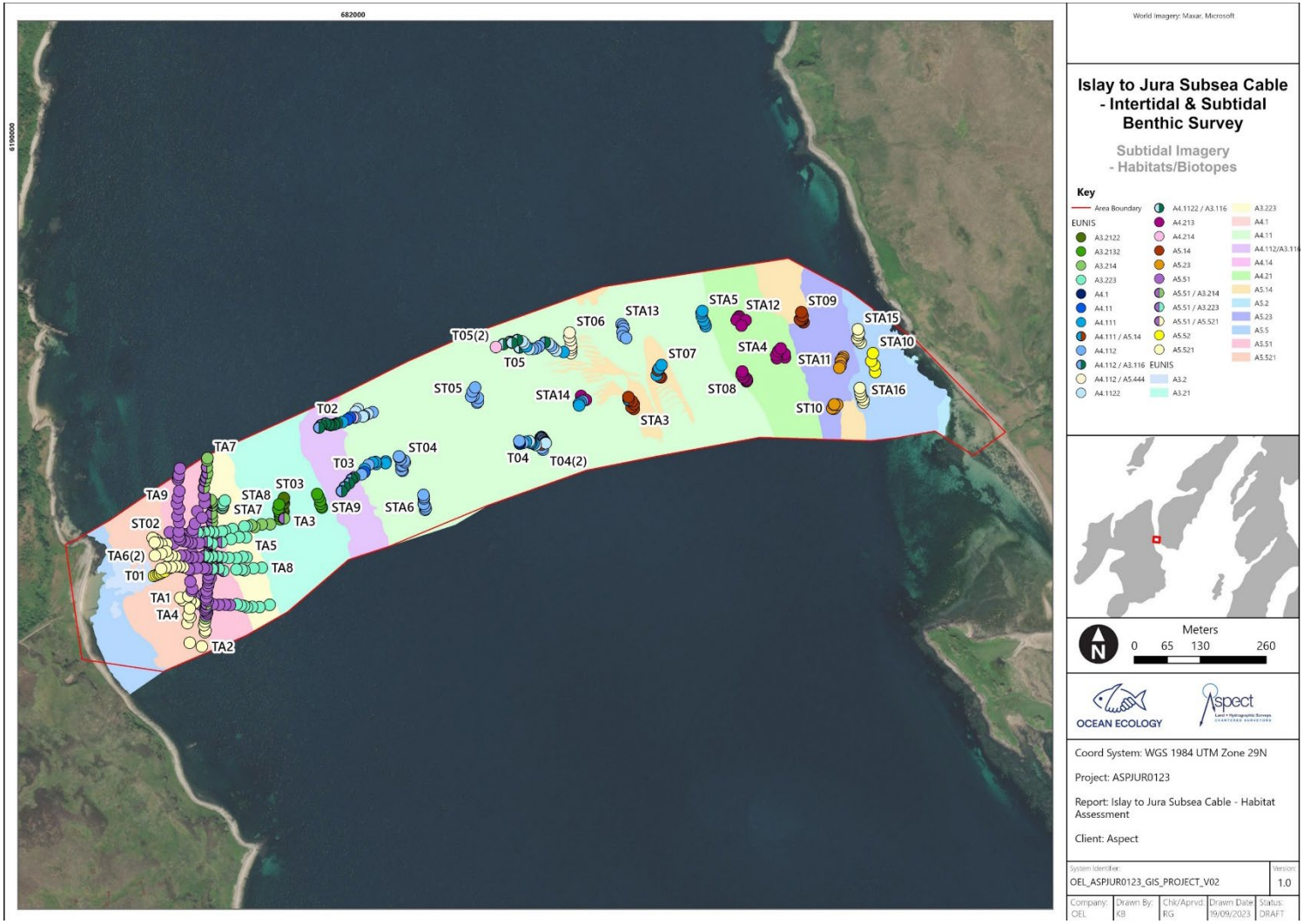
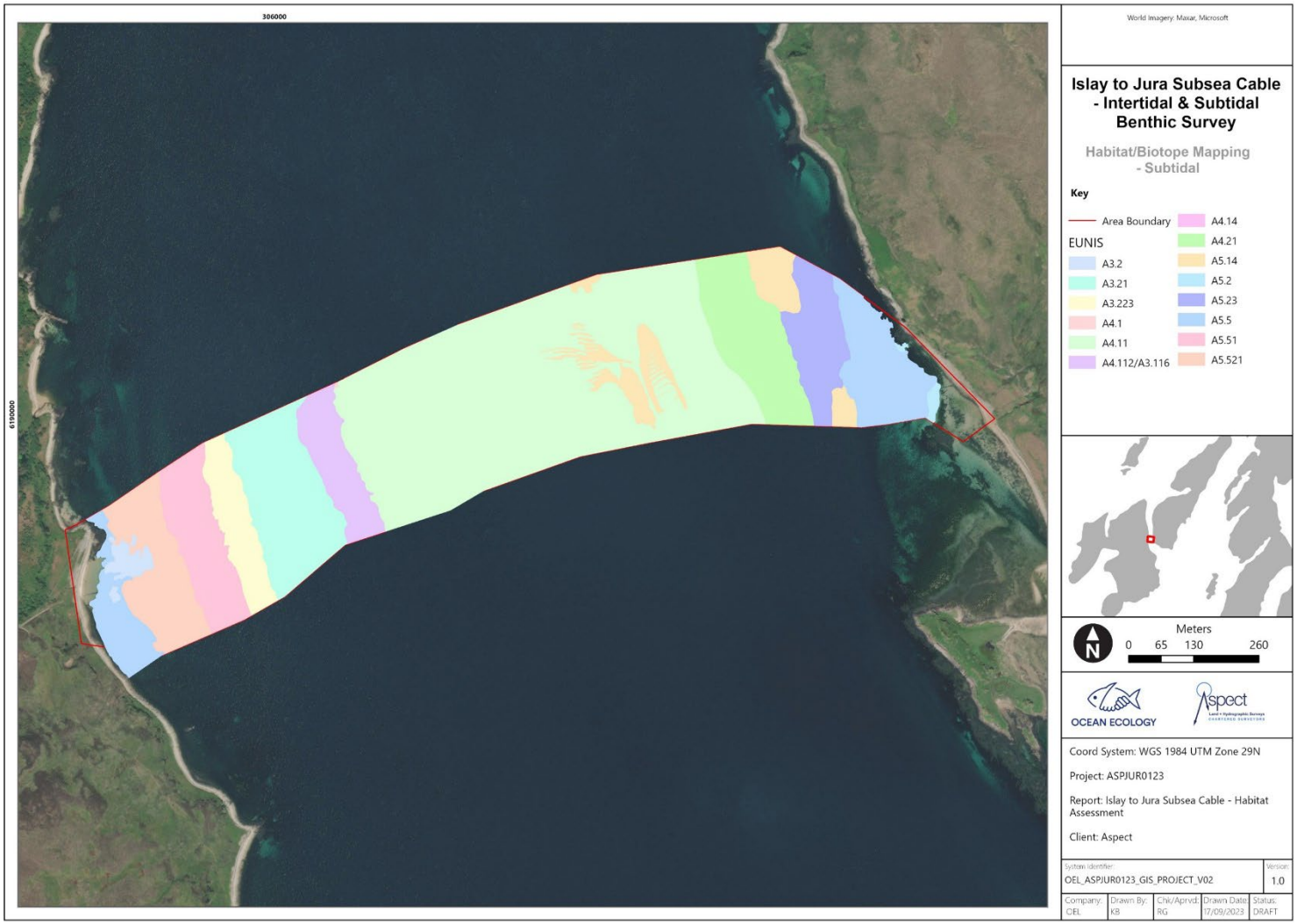


Figure 8-3 Map of subtidal habitats recorded at the Jura to Islay cable route



8.3.2.2 Potentially sensitive habitats and / or species

Several potentially sensitive habitats or species were identified within the Application Corridor. These habitats and species are detailed below:

- **Kelp beds** – Common kelps found within Scottish waters include cuvie kelp (*Laminaria hyperborea*), sugar kelp (*Saccharina latissima*) and furbelows kelp (*Saccorhiza polyschides*) (NatureScot, 2023b). When these species form beds or 'forests', they create habitats for many other species including sea anemones, sponges, and other seaweeds. 'Kelp beds' are a PMF and an OSPAR (2008) threatened and/or declining habitat. Kelp beds were observed to the southwest of the Application Corridor and were dominated by cuvie kelp (*Laminaria hyperborea*). This PMF was occasionally mosaiced with 'Tide-swept algal communities' and 'Maerl beds'.
- **Tide-swept algal communities** –Tide-swept algal communities are a priority feature for both intertidal and subtidal rock around the west coast of Scotland. They are associated with strong tidal currents in tidal rapids, sea lochs and sounds which may be occur down to 30m and in environments where fine, muddy particles are carried away, leaving a seabed of coarse materials – gravel, pebbles, boulders and bedrock. They are species rich, structurally complex habitats. Where substrates are stable the strong tidal currents support a wide variety of sessile epifauna including foliose seaweeds, sponges, anemones and sea squirts. The PMF 'Tide-swept algal communities' were observed to the southwest of the area and were occasionally mosaiced with 'Kelp beds' and 'Maerl beds'.
- **Kelp and seaweed communities on sublittoral sediment** – This biotope classification (A5.52) is only found in shallow water (up to 20m) and can cover a wide variety of substrates (muddy sands and gravels through to cobbles and boulders). It is widespread on the west coast of Scotland and typically includes the sugar kelp (*Saccharina latissimi*), the bootlace weed (*Chorda filum*) and various filamentous red and brown seaweeds (Marine Scotland, 2023b). They host a wide variety of fauna including burrowing polychaetes, crustaceans and echinoderms. 'Kelp and seaweed communities on sublittoral sediment' is a PMF and was observed towards the northeastern and southwestern extents of the area and was occasionally mosaiced with 'Maerl beds'.
- **Maerl beds** – Maerl is a calcareous free-living coralline red algae which can remain transient within the marine environment, becoming stable where attached in aggregations forming 'beds' where they are classified as a PMF habitat. Such beds can provide an important habitat for marine fauna and flora as well as an important nursery ground for commercially important fish and shellfish including scallops (*Pecten maximus*). Two main species of maerl are expected in the Sound of Islay, *Phymatolithon calcareum* and the less frequent *Lithothamnion glaciale*. Maerl beds are also a UK Post-2010 Biodiversity Framework (formally UK BAP) Priority Habitat and an OSPAR (2008) threatened and/or declining habitat. They can also be a component habitat of Annex I sandbank features. 'Maerl beds' were observed to the southwest of the area and were occasionally mosaiced with 'Kelp beds', 'Kelp and seaweed communities on sublittoral sediment' and 'Tide-swept algal communities'.
- **Annex I geogenic reef (bedrock) habitats** – Within the Application Corridor, areas of rock were assessed to meet the criteria of a bedrock reef (Irving, 2009) thus qualifying as Annex I (1170) – Reef, as described within the Habitats Directive (EUR 28, 2013). Bedrock reef can be defined as encompassing hard compact substrata, specifically, rocks (including soft rock, e.g. chalk) of geogenic origin. Annex I bedrock reef habitat occurs where soft (e.g., clay) or hard bedrock arises from the surrounding seabed, providing a stable habitat for attachment for a diverse range of epibiota. Bedrock reef was observed in the central area of the Application Corridor, with patches of both low and high confidence.
- **Annex I geogenic reef (stony) habitats** – Within the Application Corridor, areas of cobbles and boulders were assessed to meet the criteria of "Low resemblance" and "Medium resemblance" to

a stony reef (Irving, 2009) thus qualifying as Annex I (1170) – Reef, as described within the Habitats Directive (EUR 28, 2013). Stony reef can be defined as encompassing hard compact substrata, specifically, boulders and cobbles (generally >64mm in diameter of geogenic origin. Stony reef habitats occur when stable hard substrata, namely cobbles and boulders > 64mm in diameter arise from the surrounding habitat, creating a habitat colonised by a variety of fauna and flora species. Most of the survey area was composed of stony reef, except for the northeastern and southwestern extents of the area. Low stony reef dominated, with three patches of medium stony reef identified. The majority of stony reef was assessed as high confidence, with some areas of low confidence.

- **Annex I sandbanks slightly covered by seawater all the time** – Sandbanks can be defined as elevated, elongated, rounded or irregular topographic features, permanently submerged and predominantly surrounded by deeper water. They consist mainly of sandy sediments, but larger grain sizes, including boulders and cobbles, or smaller grain sizes including mud may also be present to some degree on a sandbank (CEC, 2013). Annex 1 sandbanks can be composed of sediment as well as free-living maerl beds. Sandbanks were observed across the southwest extent of the area, in one section split into low and high confidence and were comprised of the component habitat 'Maerl beds'.

No other Annex I habitats, OSPAR threatened and/or declining species and habitats or Post-2010 Biodiversity Framework (formally UK BAP) priority habitats and species were observed within the survey area. The potential extent of the sensitive habitat features described above is presented in Figure 8-4, 8-5 and 8-6 below.

Figure 8-4 Map of PMFs identified throughout the Jura to Islay cable route

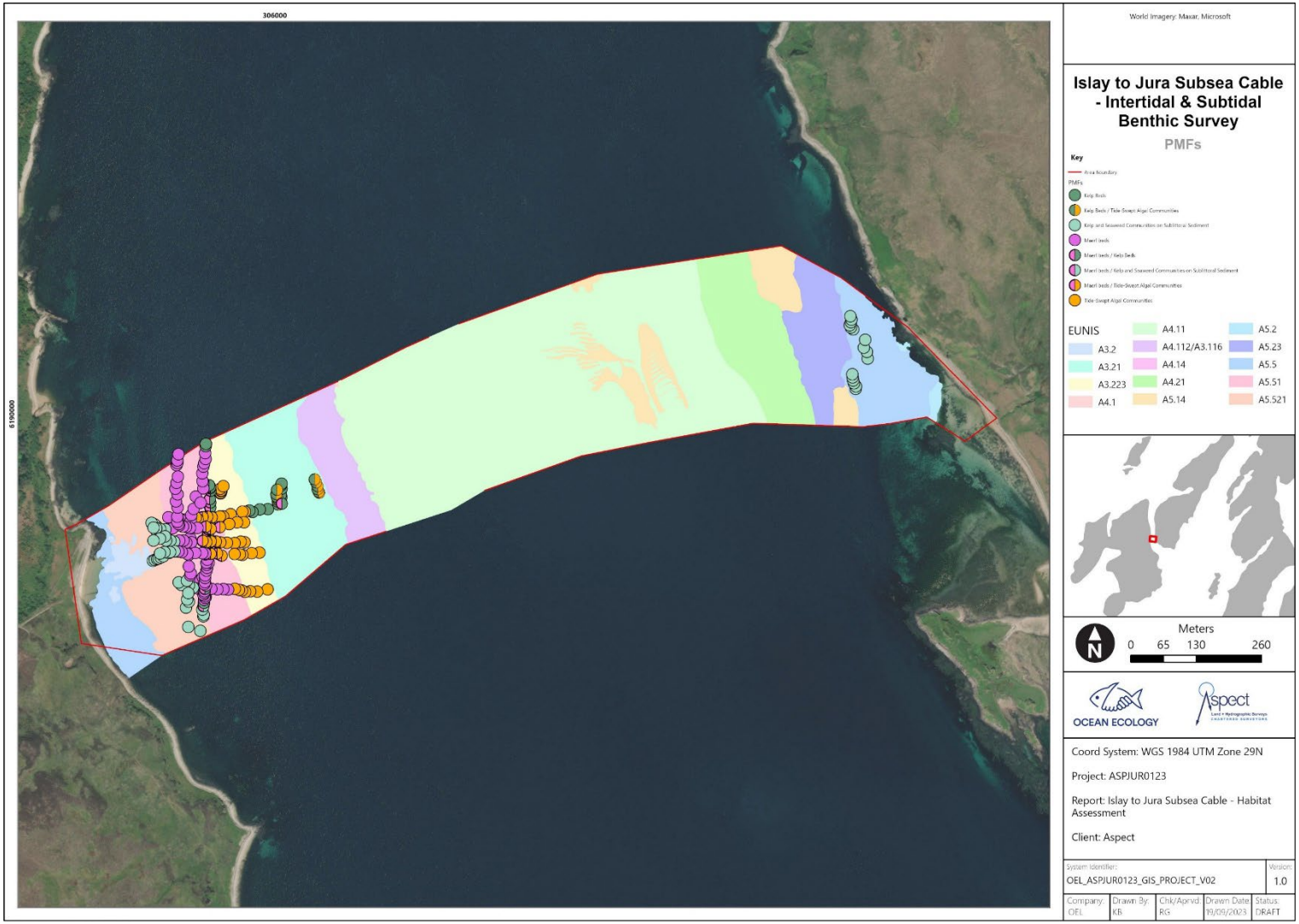


Figure 8-5 Map of maerl habitats and maerl bed density identified in the Jura to Islay cable route

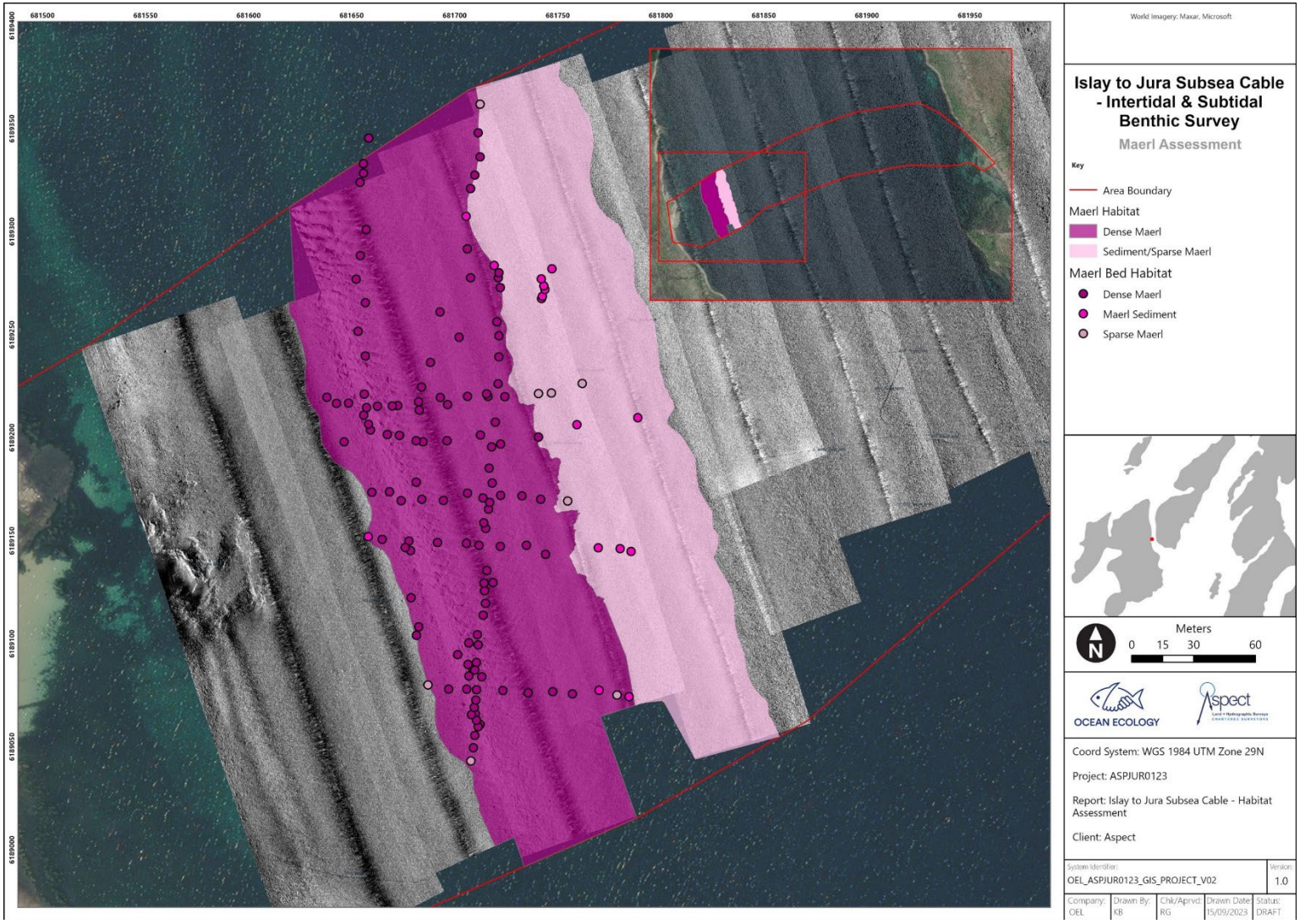


Figure 8-6 Annex I reef and sandbanks identified throughout the Jura to Islay cable route

8.4 Impact Assessment

8.4.1 Cable Installation Summary

At both landfall sites, an excavator will be used to construct a trench between MHWS and MLWS in the intertidal zone where the cable will be buried with an armour earth. The length of the trench will be 40m at the Jura landfall and 30m at the Islay landfall, with both trenches having a width of 1m. Additionally, a second trench will be required for a fibre optic earth. Both the armour earth and fibre optic earth will extend to 50m below MLWS. The trenches will be backfilled with the excavated material such that the intertidal area will be restored to pre-work conditions. The excavator will work within an approximate 20m corridor, during these trenching operations.

Approximately 2km of the 2.1km cable will be surface laid within the subtidal Application Corridor and will cover up to 433m^2 (0.133m cable diameter, 0.26m cast iron split pipe diameter, 0.35m Uraduct diameter) over the entire cable route. Additional cable protection will be required along certain points of the cable route. Where applicable, impacts on sensitive habitats have been assessed to account for the potential presence of cable protection including cast iron and Uraduct articulated pipe, rock bags, concrete mattresses and clump weights.

In a worst-case scenario, two tonne rock bag pairs will be used for stabilisation between KP0.266 – 0.376 (0.110km) and KP1.433 – 1.559 (0.126km), with 10m spacing. In addition, four tonne rock bag pairs will be used for stabilisation between KP0.376 – 1.433 (1.057km), with 25m spacing. For contingency, up to 10 concrete mattresses (18m^2 each) have been included for the Marine License application. Therefore, given the design dimensions this represents a total worst-case cable protection coverage area of 0.0001825km^2 for two tonne rock bag pairs, 0.000855km^2 for four tonne rock bag pairs and 180m^2 for concrete mattresses, if required.

Best practice for cable installation includes micro-routing to avoid sensitive habitats such as Annex I reef and PMFs such as 'Maerl beds'. Due to the broad scale sensitive habitats identified within the Application Corridor, routeing around these features has not been possible and therefore micro-routing and the installation techniques proposed have been carefully considered to minimise the impact of operations on these environmentally sensitive receptors. Embedded mitigation is discussed further in sections 4.2 and 4.3.

8.4.2 Physical change (to another substratum)

8.4.2.1 Intertidal

Cast iron split shell protection will be used and placed on both shore ends of the cable. This is an articulated cast iron shell design that interlocks around the cable and is fixed with bolted end clamps. The total (worst case) length of cable protected with cast iron split shell will be up to 788m for both landfalls (planned 366m at Islay, 352m at Jura). This will be buried in a trench in the intertidal zone and be surface laid in the initial subtidal sections of the cable route. Trenching activities will lead to a temporary loss of habitat within the direct trenching footprint. This habitat loss will be localised due to the relatively small footprint of the sections of burial proposed at each landfall, the seabed is expected to begin re-colonisation after several tidal cycles. As such, while trenching and burial may lead to localised loss in habitat, such loss will not be significant in proportion to the scale of the habitats present. None of the habitats present in this area were listed as PMF or Annex I habitats.

8.4.2.2 Subtidal

The cable will be surface laid throughout the subtidal section of the route. Split pipe will be used to stabilise and protect the cable and will be surface laid below MLWS to 10m below lowest astronomical tide (LAT). Cast iron split pipe shells will change the substrate type where they are used, however it is expected that they will be colonised by sessile encrusting organisms, similar to the surrounding hard

substratum and can also attract mobile macrofauna (Taormina *et al.,* 2018). Up to 350m of Uraduct will also be used to protect the cable, this will change the substrate type where used. Given the relatively small diameter of the cable and its protection systems, the impact on habitats and biological communities in the cable / Uraduct footprint will be localised and short term (Tillin *et al*., 2010).

The removal of small sections of the existing cable may be required in the subtidal zone and will result in a change to the existing conditions, with a loss of habitat occurring when the cable sections are removed. This habitat loss will be temporary and localised due to the small footprint of the existing cable and will allow for the seabed occupied by the existing cable to be re-colonised. As such, while decommissioning of the existing cable may lead to localised loss in habitat associated with the cable itself, such loss will not be significant in extent. Where existing cables are cut, clump weights may be required to secure the cable ends. These can be concrete, steel or iron. A maximum of eight clump weights will be used with a footprint of 1m^2 each. Therefore, any loss or change of habitat associated with the use of clump weights will not be significant in proportion to the scale of the habitats present.

Rock bag placement is expected to be required along sections of the Application Corridor, to protect and stabilise the cable. Although cable protection will only be used where necessary, where it is used the seabed habitat within the footprint of the protection will be lost and replaced with, in places, a harder substrate, changing the seabed type. In addition, concrete mattresses may also be used to stabilise the cable and/or for protection at cable crossings. Given the design dimensions, rock bag placement represents a worst-case coverage area of 0.0001825km^2 for two tonne rock bag pairs, 0.000855km^2 for four tonne rock bag pairs and 180m^2 for concrete mattresses, if required. Environmentally sensitive habitats recorded in the Application Corridor including Annex I habitats, bedrock and stony reef habitat, sandbanks as well as the PMFs 'Kelp beds', 'Tide-swept algal communities', 'Kelp and seaweed communities on sublittoral sediment' and 'Maerl beds', could be present where cable protection may be required.

Up to ten concrete earthing clump weights will also be used for the surface laid section of earthing wires, 50m seaward of MLWS, with a footprint each of 0.25m^2. Any loss or change of habitat associated with the use of clump weights will affect 'Kelp and seaweed communities on sublittoral sediment' and bedrock reef habitat.

The Annex I bedrock reef and stony reef habitats are present throughout the majority of the Application Corridor (Figure 8-6) and are comprised of cobbles, boulders and other hard substrate dominated by epifaunal species which are often rapid colonisers, capable of early reproduction and rapid growth (Sebens, 1986). It is therefore expected that epifauna will be able to colonise introduced hard substrates following cable installation and impacts will not be significant. While low resemblance stony reef is unavoidable, the cable route and rock bag placement will avoid areas identified as medium resemblance stony reef through ground truthing.

Sandbanks slightly covered by seawater all the time is an Annex I habitat and spans the southwestern extent of the Application Corridor (Figure 8-6). Rock bag and concrete mattress placement is not planned in the area identified as sandbank. The presence of the cable in this habitat will give a localised change from a mobile sand feature to an immobile hard substratum and will therefore lead to the very localised physical loss of the sand habitat. Sandbank features can be highly sensitive to physical obstruction and changes in habitat; however, they can be the result of relatively high energy conditions and may be flexible to changes (Pidduck *et al*., 2017). To minimise the potential for Annex 1 'sandbanks slightly covered by seawater all the time' habitat loss, rock bag and concrete mattress protection measures are not planned, nor will the cable be trenched in this habitat. The use of cast iron articulated pipe will be used in part of this feature however the effect of physical change on Annex I sandbank would be not significant.

The PMF 'Kelp beds' was found to be prevalent in the southwestern and northeastern extents of the Application Corridor (Figure 8-4). Rock bags are required in biotopes that constitute this feature. Any

species found in the direct footprint of rock bag placement would likely be lost, however the rock bags may provide additional substrate for re-colonisation of kelp, in time. The 'Kelp beds' identified consist of mainly of *Laminaria hyperborea*, which can recover within two to six years (Kain, 1979; Birkett *et al*., 1998; Christie *et al*., 1998). As such, while rock bag and concrete mattress placement would lead to a loss of PMF 'Kelp beds' habitat, this would not be a permanent change. Therefore, the effect of physical change on this habitat would be temporary and not significant.

The PMF 'Tide-swept algal communities' were also found to be prevalent in the southwestern extent of the Application Corridor (Figure 8-4). This PMF consists of mixed kelp and foliose red seaweeds, rock bags are required in biotopes that constitute this feature. As discussed, species found in the direct footprint of rock bag or concrete mattress placement would likely be lost however, the placement may potentially provide additional substrate for re-colonisation. Although the new hard substratum may differ in character, red foliose algae can recolonise an area from adjacent populations within a short period of time in ideal conditions (Green *et al*., 2012; MarLIN, 2023). With regards to kelp *Saccharina latissima* can rapidly colonise substratum, with evidence of recovery within 6 months (Kain, 1975). As such, while rock bag and concrete mattress placement would lead to a loss of habitat, this would not be a permanent change and the impact not significant.

'Kelp and seaweed communities on sublittoral sediment' was also observed towards the northeast and southwest extents of the area the Application Corridor (Figure 8-4). No rock bags or concrete mattresses are planned to be deployed in this habitat, however concrete earthing clump weights may be used here, and the cable with cast iron articulate pipe protection will cross the extent of this habitat. Any fauna in the direct footprint of clump weights or the cable in this PMF would likely be lost. All the characterising species within this biotope can successfully grow on rock / hard substrates and *Saccharina latissimi* is a fast-growing kelp that can recover relatively quickly after disturbance, however the species present may change and the biotope could be lost (Birkett *et al*., 1998). To minimise this potential PMF habitat loss, the use of earthing clump weights will only be utilised where necessary, and rock bags or concrete mattresses will not be used within this biotope. The effect of physical change on the habitat extent would be not significant.

The PMF 'Maerl beds' spans the southwestern extent of the Application Corridor, (Figure 8-5). No rock or concrete mattresses are planned to be used within the extent of this feature. To protect and stabilise the cable, cast iron split pipe will we used as the cable crosses the extent of this feature. The footprint of this cable and articulate pipe across the identified maerl bed will be approximately 26m^2, the cast iron articulated pipe will replace the normal substratum within this biotope and the biotope itself would also be lost (Perry & Tyler-Walters, 2023). However, maerl beds surrounding the cable may not be negatively impacted. As maerl species within the biotopes recorded are free-living, they are therefore not attached to the substratum. This mobility will ensure some maerl can move with hydrodynamic transport regimes, albeit less so when recorded in dense maerl beds. To minimise this potential PMF habitat loss, the use of rock protection will only be utilised outside of this habitat extent, required to ensure cable stability which will reduce cable movement within areas of maerl bed. The impact of physical change on this habitat extent is therefore assessed as not significant.

Best practice for cable installation can include micro-routing around sensitive habitats (Table 4-1). This will be practiced where possible, however where these features are unavoidable, rock protection measures will be used conservatively to have a minimal environmental impact.

8.4.3 Abrasion / disturbance at the surface of the substratum

8.4.3.1 Intertidal

Where the cable will be buried within the intertidal zone, installation activities will take place over a short-time period and any abrasion events will be temporary and will not occur once installation is complete. In addition, no sensitive habitats were identified in the intertidal area therefore the potential impact is expected to not be significant.

8.4.3.2 Subtidal

The pressure 'abrasion/disturbance at the surface of the substratum' will occur in areas where the cable is surface laid, throughout the subtidal route. The use of cast iron split shell protection, Uraduct articulated pipe, rock bags and concrete mattress placement will protect and stabilise the cable to reduce cable movement and abrasion. A Pre-Lay Grapnel Run (PLGR) may be required prior to operations commencing. The removal of any boulders or debris may cause abrasion/disturbance.

Decommissioning of sections of the existing cable could result in abrasion of the underlying substrate. Loose ends of the decommissioned cable will be secured with clump weights which will minimise future abrasion. This should ensure that abrasion pressures should be confined to one decommissioning event and therefore impacts will be localised and temporary.

Of the sensitive habitats identified along the Application Corridor, Annex I bedrock and stony reef habitat, sandbanks and PMFs 'Kelp beds', 'Tide-swept algal communities', 'Kelp and seaweed communities on sublittoral sediment', 'Maerl beds' could be affected.

The sensitivity of bedrock reef biotopes to abrasion is considered to be low due to the habitats high resilience enabling recovery estimated within two years (Jasper & Hill, 2015). Therefore, with consideration to the extent of this feature (Figure 8-6), the pressure will not have a significant impact on subtidal bedrock/stony reef within the Application Corridor.

The stony reef biotopes observed in the Application Corridor are considered to have low to medium sensitivity to abrasion, with macroalgae dominated biotopes expected to recover within a few years. The sedentary species associated with stony reefs in this area, such as *Tubularia indivisa*, would likely suffer from the effects of abrasion however faunal turf communities do not show large signs of damage from abrasion and are mostly sensitive to repeated abrasion (Boulcott & Howell, 2011). Abrasion events will be temporary and localised in nature, ensuring that a minimal number of individuals would be affected and the impact would not be significant. In addition, the proposed cable route will avoid areas identified as medium stony reef through ground truthing.

There is little direct evidence available regarding the impact of abrasion on sandbanks. Research into similar habitats and pressures has highlighted that, although abrasion may cause physical disturbance, sandbanks may have some ability to recover since it is formed and actively maintained by the action of tidal currents. Sandbanks have been defined as having high resilience, medium resistance, and low sensitivity to this pressure (Marine Scotland, 2023a). As such, due to the temporary and localised nature of any abrasion events resulting from cable laying activities, the potential impact is expected to not be significant.

The PMF 'Kelp beds' has been assessed to have medium sensitivity to abrasion. Abrasion has the potential to remove the canopy forming kelp *Laminaria hyperborea*, of which dominated the 'Kelp beds' observed in the Application Corridor. However, there is evidence that recruits are largely unaffected and a new canopy can form within two to six years (Christie *et al*., 1998). In addition, other kelp species commonly observed in 'Kelp beds' habitats, such *as Saccharina latissimi*, are fast-growing with potential to rapidly form a new canopy (Birkett *et al*., 1998). Abrasion events will be temporary and localised in nature, the narrow cable diameter and careful placement of cable protection measures should ensure that a minimal density of kelp would be affected and the impact would not be significant.

Abrasion of the PMF 'Tide-swept algal communities' has the potential to remove a large proportion of kelp and red foliose algae, however red foliose algae can recolonise an area from adjacent populations within a short period of time in ideal conditions (Green *et al*., 2012; MarLIN, 2023). The epibenthic community observed includes sea mats, sea squirts, anemones and sponges, of which may also be removed by abrasion (Marine Scotland, 2023c). However, encrusting organisms can be well adapted to frictional stress (Vogel, 1994). In addition, *Saccharina latissimi*, can recover within six months to six

years (Kain, 1975). The sensitivity of this PMF is medium. As such, while abrasion would lead to damage, this would not be permanent or significant.

The PMF 'Kelp and seaweed communities on sublittoral sediment' is also present within the Application Corridor and abrasion can potentially remove algae and cause localised mobility of the substrata. Sensitivity of this PMF is medium and as abrasion events will be temporary and localised in nature, the potential impact will therefore not be significant.

The impact of abrasion on the PMF 'Maerl beds' has been studied, finding that the pressure can break up maerl into smaller pieces leading to subsequent death (Kamenos *et al*., 2003). However, maerl beds have been observed to remain productive after repeated abrasion events (Hall-Spencer *et al*., 2003). Many species living in this PMF are buried within the maerl bed and will receive some protection from abrasion. 'Maerl beds' are assessed to have high sensitivity to abrasion and low recoverability and the abrasion of the PMF 'Maerl beds' may negatively impact the habitat in the immediate vicinity of installation activities. The installation activities, however, will include stabilisation of the cable through such biotopes, to minimise the cable movement and therefore the zone that abrasion can occur. Therefore, the impacts to these biotopes are expected to represent only a small proportion of the habitat extent in this area, and impacts should be mostly limited to installation and decommissioning activity and should be slight.

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

8.4.4.1 Intertidal

Where the cable will be buried, a single over-turning event is likely to lead to the loss of species present in the intertidal area of the Application Corridor, with damage and mortality of epifauna potentially occurring. However, after the trench material is re-instated it will be re-colonised. Mobile species will be able to relocate back to the area. As such, the effects of trenching on the intertidal biotopes will be temporary and not result in the permanent loss of habitat, ensuring any impact is not significant.

In areas where the sub-surface is rocky, a rock pecker will be utilised to achieve burial depth. This will penetrate rock and cause disturbance of the substrate below the surface of the seabed and any species present may be lost. Only substrate in the direct vicinity of the rock pecker will be impacted and so habitat and species loss will be restricted to a spatially small area relative to the extent of the surrounding environment. To minimise this potential habitat loss, the use of rock peckers will only be utilised where necessary.

8.4.4.2 Subtidal

The marine cable will be surface laid in the subtidal area, and no trenching will be required for the installation.

Depending on vessel use, spud legs may be required to enable vessels to stay on location. Spud feet stay in place by penetrating the seafloor. The number of spud legs expected to be used will be two, with a maximum diameter of 914mm and depth limit of 15m. The sensitive benthic habitats in the Application Corridor are Annex I stony reef habitat, sandbanks and PMFs 'Kelp beds', 'Tide-swept algal communities', 'Kelp and seaweed communities on sublittoral sediment', 'Maerl beds'. These habitats could all be impacted but due to the relatively small area damaged, this is not likely to be significant to the biotopes encountered.

No novel penetration of the seabed will occur as a result of the decommissioning activities. A such penetration and/or disturbance of the substrate below the surface of the seabed, including abrasion, will not have a significant effect on the subtidal habitats.

8.4.5 Smothering and siltation rate changes

8.4.5.1 Intertidal

Any sediment disturbance from installation activities will not be significant in extent due to the relatively low level of sediment disturbed by trenching activities. This pressure will be most evident during a flood tide. Typically, the tidal waters of the intertidal zone will have a high sediment load due to high energy hydrodynamic regime and close interaction with shore sediments. Therefore, species which inhabit these areas are well adapted to such pressures, including increased sediment load.

8.4.5.2 Subtidal

Any decommissioning of the existing cable will not result in significant sediment dispersion in areas with underlying rocky substrate and only very minor resuspension in areas with underlying sedimentary substrate. This pressure will therefore not result in any significant effect to the surrounding benthic features, with impacts expected to be temporary and species present resilient to smothering and siltation. The impact of smothering and siltation rate changes will be restricted as no trenching activities will be undertaken in the subtidal environment. However as there will be sediments from the intertidal zone, which are transported into the subtidal zone as well as potential changes in local hydrodynamics resuspending soft sediments, this pressure has been considered.

Cable laying activities will not result in significant sediment resuspension, as discussed in Section 6. The seabed footprint of the works will be minimal, and largely confined to the physical footprint of the cable itself, along with cable protection measures. Disturbed sediment from cable installation and placement of cable protection measures is expected to settle rapidly and will be very localised as no trenching is required for the cable installation.

The Annex I bedrock reef observed in the Application Corridor consists of anthozoan, hydroid, bryozoan, barnacle, and sponge communities. Smothering and siltation rate changes can negatively impact anthozoans as they are largely sessile and unable to avoid deposition. Other small organisms are also vulnerable to hindered respiration and barnacles can experience hindered feeding and cease filtration. Larger taxa, such as dead man's fingers (*Alcyonium digitatum*) and oaten piped hydroid (*Tubularia indivisa*), recorded in this area, are still able to filter feed and can use mucus to slough off deposited material. Sponge communities can be resilient to this pressure, for a relatively short duration of exposure. Bedrock reef habitats, particularly in this area, experience very strong to moderately strong tidal streams, meaning sediment is likely to be removed quickly. In addition, many species are tolerant of periodic smothering as this can be a common occurrence in bedrock habitats (Holme & Wilson, 1985). Bedrock reef habitats are assessed as not sensitive or low sensitivity, with high resilience (MarLIN, 2023). As smothering events are likely to have a small impact area and will be restricted in duration, this has been assessed and not significantly impacted.

The Annex I stony reef biotopes have no or low sensitivity to smothering. This is dependent on the level of smothering and siltation rate changes. In this case, smothering is likely to be light and is unlikely to damage epifauna, however it could negatively impact recruitment processes (Moy & Christie, 2012). Smothering is only likely to impact the upper faces of reef. In addition, stony reef habitats are often exposed to moderately strong tidal streams and so deposited sediment is unlikely to remain for more than a few tidal cycles (MarLIN, 2023). The impact of smothering and siltation rate changes is therefore not significant.

Smothering in Annex I sandbank habitats can result in a loss of habitat and a possible shift in community organisation (Hartnoll, 1998; Marine Scotland, 2023a). Sensitivity of sandbanks is assessed as low due to the dynamic nature of this habitat. Species are likely to be well adapted to fluctuations in suspended sediment and the impact will not be significant.

Kelp species found in the PMF 'Kelp beds' are unlikely to be damaged by smothering and siltation rate changes. This pressure, however, can impact gametophyte survival, zoospore settlement and holdfast

fauna associated with these biotopes. If smothering occurs as a discrete event, kelp gametophytes can normally resume growth within a month (Dieck, 1993). In addition, if the deposited sediment is cleared rapidly, associated faunal communities can recover. Habitats that are classed as 'Kelp beds' are often high to moderate energy habitats, so sediment is unlikely to remain for more than a few tidal cycles. 'Kelp beds' habitats are assessed as not sensitive with high resilience to this pressure (MarLIN, 2023). As smothering events are likely to have a small impact area and will be restricted in duration, the impact will not be significant.

The PMF 'Tide-swept algal communities' consists of a variety of macroalgae species. Large macroalgae are unlikely to be smothered however erect turf forming algae and smaller or low-lying algae may be less tolerant (Dixon, 1977). Sediment smothering can lead to light exclusion and reduced propagation as well as a reduction of the attachment of spores (Vadas *et al.*, 1992). Adult forms are likely to be resilient to this pressure however smaller macroalgae and overall recruitment could be adversely affected. 'Tide-swept algal communities' are assessed to have low sensitivity and high recoverability to smothering and siltation rate changes. As smothering events are likely to have a small impact area and will be restricted to short temporal events, the impact is expected to be not significant.

The PMF 'Kelp and seaweed communities on sublittoral sediment' is assessed as having no to low sensitivity to smothering and siltation rate changes, depending on the level. If smothering is light, mature kelp and other macroalgae is unlikely to be damaged. This said, recruitment could be negatively impacted (Moy & Christie, 2012). If the habitat is exposed to moderately strong tidal streams deposited sediment is unlikely to remain for more than a few tidal cycles, however sediment deposited in more sheltered areas can remain for up to a year (MarLIN, 2023). As smothering events are likely to have a small impact area and will be restricted to short temporal events, this habitat will not be significantly impacted.

'Maerl beds' can be intolerant of smothering due to the inability to escape from any elevated sediments (Marine Scotland, 2023a). The sediment is likely to penetrate the open matrix of the maerl bed rather than sit on top of it. The loose and complex consistency of this biotope provides considerable structural diversity utilized by a wide range of species. While any smothering of maerl will potentially result in a major decline in species richness for the area, smothering events, however, are not expected due to the very limited disturbance of sediment from the surface lay of the cable and rock bag placement, and the strong prevailing currents preventing a significant settlement of sediment particles. Therefore, the impact on this habitat by siltation will only be slight and localised to the vicinity of the cable.

8.4.6 Accidental hydrocarbon or chemical release from installation vessel

8.4.6.1 Intertidal

At both landfall sites, an excavator will be used to construct a trench between MHWS and MLWS in the intertidal zone within area where the cable can be buried. The length of the trench will be 40m at the Jura landfall and 30m at the Islay landfall, with both trenches having a width of 1m. The excavator will work within an approximate 20m corridor, during these trenching operations. Additionally, a second trench will be required for a fibre optic earth. Both the armour earth and fibre option earth will extend to 50m below MLWS. The use of an excavator risks potential hydrocarbon or chemical release and any vessel-based releases in the subtidal area of operations could potentially wash ashore. Onshore, in the event of an accidental hydrocarbon release occurring, appropriate standard practice management procedures will be implemented accordingly and a suitable medium used to remove the spill. At sea, control measures and shipboard oil pollution emergency plans (SOPEP) will be in place and adhered to under The International Convention for the Prevention of Pollution from Ships (MARPOL) Annex I requirements for all vessels.

8.4.6.2 Subtidal

The use of vessels for cable installation has potential for hydrocarbon and chemical release. The sensitive benthic habitats in the Application Corridor are Annex I bedrock and stony reef habitat, sandbanks and PMFs 'Kelp beds', 'Tide-swept algal communities', 'Kelp and seaweed communities on sublittoral sediment', 'Maerl beds'. In addition, any releases in the subtidal area of the Application Corridor can potentially wash to intertidal habitats from offshore vessels.

Vessels likely to be used for cable installation and decommissioning activities include Cable Lay Vessels, Boulder Removal Vessel, Dive Support Vessel and other support vessels. The use of such vessels can risk the accidental release of hydrocarbons or chemicals including crude oil, lubrication oil, hydraulic fluid, corrosion inhibitors, control fluid and bunker, diesel, fuel and gas oils (ACOPS, 2017).

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. All project vessels will be legally required to adhere to MARPOL Annex I requirements, and the Sea Pollution Acts, which prohibit the discharge of waste and other pollutants, and require the secure storage of fuels and other materials on board.

Annex I bedrock and stony reef are sensitive to hydrocarbon and chemical releases. Hydrocarbon release is mainly related to surface waters, and any impact of subtidal turf communities is likely to be limited (Hartnoll, 1998). However, high swell and winds can lead to hydrocarbon mixing with seawater and subsequent impacts on subtidal habitats (Castège *et al.,* 2014). In addition, there have been reports of dead colonies of *A. digitatum*, recorded on the stony and bedrock reef, following the release of detergents and oil into the marine environment as well as an increase in developmental abnormalities in common taxa such as echinoderms (Smith, 1968; MarLIN, 2023). These effects are related to extensive spills rather than smaller spills that could be expected from installation vessels and detergents are not likely to be used on vessels in high quantities.

There is no direct evidence available regarding the impact of accidental hydrocarbon or chemical release from installation vessels on sandbanks. There is evidence, however, of a loss of component species and mortality following releases of hydrocarbons or chemicals (Tillin *et al*., 2010). These effects are related to extensive spills rather than small spills from installation vessels.

The PMF 'Kelp beds' is often composed of kelp species and red macroalgae. Kelp in this Application Corridor are unlikely to come into contact with freshly released oil as they are subtidal and the mucilaginous slime layer found on kelp can protect them from smothering by hydrocarbon release (Birkett *et al*., 1998; MarLIN, 2023). Previous hydrocarbon release events have shown little impact on kelp species post event (Rostron & Bunker, 1997). Red algae, often found in biotopes of this PMF, is sensitive to hydrocarbon contamination with evidence of reduced species richness and diversity of the habitat. This said, the habitat has been shown to recover quickly (MarLIN, 2023). 'Kelp beds' are sensitive to chemical release; however, these effects are related to extensive spills rather than small spills expected from installation vessels.

The PMF 'Tide-swept algal communities' are composed of macroalgae species, of which can be good bio accumulators of chemicals (Holt *et al.,* 1995). More mature macroalgae are considered to be relatively tolerant to chemical release, while younger stages may experience retarded growth (Bryan, 1984). In large quantities the release of hydrocarbons could potentially lead to severe damage, however the habitat should recover reasonably quickly (Marine Scotland, 2023a). 'Tide-swept algal communities' have low sensitivity to the release of hydrocarbons or chemicals. Best practice and compliance measures will be in place to minimise the likelihood of any accidental releases and provide an action plan if they do occur to minimise any effect.

The PMF 'Kelp and seaweed communities on sublittoral sediment' is sensitive to the release of hydrocarbons or chemicals, and the large surface area that seaweeds occupy can exacerbates this sensitivity (Marine Scotland, 2023a). These effects, however, are related to extensive spills rather than small spills from installation vessels.

There is not enough information available to complete a sensitivity assessment of 'Maerl beds'. However, due to concern over potential impacts, the PMF has been deemed sensitive to the release of hydrocarbons or chemicals from vessels (Marine Scotland, 2023a).

Best practice and compliance measures will be in place to minimise the likelihood of any accidental releases and minimise any effect should a release occur. Control measures and shipboard oil pollution emergency plans (SOPEP) will be in place and adhered to under The International Convention for the Prevention of Pollution from Ships (MARPOL) Annex I requirements for all vessels. In the event of an accidental fuel release occurring appropriate standard practice management procedures will be implemented accordingly. Vessels will only be used when necessary and for a relatively short duration of around two weeks. After such mitigation the risk presented is very low and therefore can be seen as acceptable to the project.

8.4.7 Introduction or spread or invasive / non-native species

8.4.7.1 Intertidal

No invasive non-native species (INNS) were identified in the intertidal survey of the Application Corridor. In addition, there are no sensitive habitats within this area.

8.4.7.2 Subtidal

The sensitive benthic habitats in the Application Corridor are Annex I bedrock and stony reef habitat, sandbanks and PMFs 'Kelp beds', 'Tide-swept algal communities', 'Kelp and seaweed communities on sublittoral sediment' and 'Maerl beds'. Only the PMFs 'Tide-swept algal communities' and 'Kelp and seaweed communities on sublittoral sediment' are potentially sensitive to the INNS identified.

Screening of the area surrounding the Application Corridor, 40km radius, was also undertaken. It was found that there have been observations of the polychaete *Goniadella gracilis* in soft sediments (OneBenthic, 2023).

The INNS seaweed *Sargassum muticum* was identified in the site-specific survey of the subtidal area of the Application Corridor. An increase in the abundance of *S. muticum* can lead to decline in cover of large brown algae and other macroalgae (Stæhr *et al*., 2000). Of all the habitats recoded, the PMFs 'Tide-swept algal communities' and 'Kelp and seaweed communities on sublittoral sediment' are generally the most sensitive to the introduction or spread of INNS. In 'Tide-swept algal communities' habitats, seaweed communities can be displaced by *S. muticum*, however recoverability has been assessed as high (Marine Scotland, 2023a). In 'Kelp beds' habitats, *S. muticum* tends to occupy minimal space on the seabed and not displace other species (Marine Scotland, 2023a).

The PMF 'Tide-swept algal communities' is composed of kelp beds and seaweed communities which are dominated by dense kelp forests and a high diversity of red seaweeds. Screening of the area found that *Codium fragile subsp. fragile* has been observed within close proximity to the Application Corridor (WoRMS, 2023). *C. fragile subsp. fragile* is a non-native seaweed that can successfully compete with native kelps and exploits gaps within the beds. The algal mats created by *C. fragile subsp. fragile* can prevent recolonisation by other macroalgae (Scheibling & Gagnon, 2006).

Best practice measures for cleaning of subsea equipment, ballast water management and vessel maintenance will be followed throughout operations, minimising any potential Introduction of INNS. Ballast water discharges from vessels will be managed under International Convention for the Control and Management of Ships' Ballast Water and Sediments, 2004 (BWM Convention). The BWM Convention, adopted in 2004, aims to prevent the spread of harmful aquatic organisms from one region to another, by establishing standards and procedures for the management and control of ships' ballast water and sediments.

8.5 Mitigation

Mitigation measures that are embedded in the project design are listed in Table 4-1 and Table 4-2. Following assessment, there are no additional mitigation measures proposed.

8.6 Conclusion

The above assessment has demonstrated that installation, operation and decommissioning activities associated with the cable replacement will not significantly affect the benthic subtidal and intertidal ecology in terms of the spatial extent at which environmentally sensitive habitats were recorded. Any impacts of cable installation on the habitats and species within the Application Corridor will be temporary and habitat loss will be localised. Micro-routing of the installation corridor will be undertaken to (where possible) avoid sensitive habitats and species to ensure they are not significantly affected by the installation activities. Cable installation activities will be short term and the footprint is spatially small relative to the extent of the surrounding benthic environment. Cable protection measures will be used in some areas to ensure cable protection and stability as well as reducing abrasion impacts. The footprint of the deposits will be the minimum required to ensure cable safety and stability.

9. ORNITHOLOGY

9.1 Introduction

This section outlines the ornithological interests within the Application Corridor, outlines the impacts associated with the cable installation activities on bird species and presents the findings of the environmental assessment.

The general ornithological features within/in the vicinity of the Application Corridor are described in the separate EPS and Protected Sites and Species Risk Assessment for the Argyll geographical area, Xodus 2023 (document reference: Xodus A-303128-S04-A-REPT-002, 2023) (Appendix C). As such, this section discusses only the receptors sensitive to the installation operations and Special Protection Areas (SPAs) that overlap with the Application Corridor.

9.2 Data sources

The baseline has been informed using the following sources:

- The Jura to Islay Subsea cable Replacement Environmental Desk study Report, ERM 2022
- The EPS and Protected Sites and Species Risk Assessment – Argyll, document reference A-303128-S04-A-REPT-002, Xodus 2023 (Appendix C)
- The Jura to Islay subsea Cable Replacement ECoW Summary Report, ERM 2023

In order to establish baseline conditions a desktop review of published information has been undertaken supported by consultation with relevant bodies. Any other data sources used are referenced throughout the document.

9.3 Ornithology description

The coastline of western Scotland is important for a wide range of nationally and internationally important bird populations, acting as both breeding sites and foraging areas (Xodus, 2023). The cliffs and island habitat are vital for nesting seabirds and the isles of Jura and Islay are renowned for their diverse bird assemblages housing numerous populations throughout the year (The Argyll Bird Club, 2023). Bird populations present on the islands varies corresponding to breeding and migratory periods, with the breeding bird season running from the 1st March to the 31st August (ERM, 2022).

As described in Section 5 “Protected Sites”, the Application Corridor overlaps the Jura, Scarba and the Garvellachs Special Protection Area (SPA) designated for the golden eagle (*Aquila chrysaetos*). This SPA is designated across the whole of Jura with the island known to have a permanent presence of golden eagles, support up to nine breeding pairs, and host more than 2% of the UK population (JNCC, 2015; NatureScot, 2021a). A thorough assessment of the impacts of the installation activities to the Jura, Scarba and the Garvellachs SPA is provided in Section 5 “Protected Sites”.

On the Islay side of the Application Corridor there is a known golden eagle nest <500m of the Islay landfall. Although the nest is not protected within a designated SPA it is considered a sensitive receptor to the installation activities and as such has been taken forward for assessment.

A disturbance licence will be required for the project but no further details will be in place prior to submission of the Marine Licence application. This will be the subject of a separate licencing process.

9.4 Impact assessment

The sensitivity of bird populations to human disturbance varies temporally with birds being most vulnerable when at sea during the moulting season when they disperse from their coastal colonies to

offshore waters and become flightless, spending more time on the sea surface (Xodus, 2023). During these periods the likeliness of interactions with operational vessels and the potential for collision risk increases as well as the sensitivity to visual and above water noise disturbance increases. Further information on the important life-history periods for seabird species is provided in the EPS and Protect Sites and Species Risk Assessment (Xodus, 2023).

For golden eagles, the species are most sensitive to human disturbance in the period just before and during egg laying (Scottish Raptor Monitoring Scheme, 2015). With females known to lay and incubate eggs in early March (RSPB, 2023a), nest should therefore not be approached throughout March and early April.

Sea users (commercial fisheries, shipping and others) likely to be present in the area are outlined in Section 11 and 13, and it is not envisaged that vessel presence will constitute a significant change from typical baseline conditions. Given the short term and transient nature of installation activities in combination with mitigation measures embedded as part of the project design, impacts to general ornithological features within/in the vicinity of the Application Corridor have not been taken forward for assessment. An assessment of vessel presence and visual and above water noise disturbance on the golden eagles nesting in proximity of the Islay landfall has however been undertaken.

9.4.1 Vessel presence

During the installation activities there is likely to be an increase in vessel traffic in the nearshore area as well as the presence of installation equipment at the landfalls. This has the potential to disturb nesting golden eagles present in the vicinity of the Islay landfall.

The presence of vessels in the nearshore area as well as that of installation equipment at the landfalls has the potential to disturb nesting golden eagles present in the vicinity of the Islay landfall. These disruptions may impact foraging and breeding activities, ultimately leading to a reduction in fitness. However, given the short-term, localised and transient nature of the installation activities any disturbances will be temporary. Furthermore, an Ecological Clerk of Works (ECoW) support and monitoring survey, conducted during the initial preparatory works for the cable installation, monitored golden eagles nesting on Islay during the cable survey works and observed the species to show no signs of distress or disturbance whilst these works were carried out. Whilst it was suggested from observations by the ECoW that non-incubating adult eagles actively avoided the area where vessels were close to shore and cable surveyors were present, following completion of the cable survey works these individuals were observed to return immediately to the area. Therefore, given the short duration of the installation activities any disturbance to nesting golden eagles in the vicinity of the Islay landfall as a result of vessel presence will be temporary in nature and no significant effects to the species are expected.

9.4.2 Visual (and above water noise) disturbance

Golden eagles present in the vicinity of the Islay landfall site have the potential to experience disturbance to their breeding, nesting and foraging behaviours as a result of the installation activities in the intertidal region. Visual disturbance can impact the species choice of nesting site with golden eagles preferring nest sites that provide good visibility, protection from predators, and access to prey. Visual and above water noise disturbance can therefore have impacts to the species overall reproductive success.

However, the Ecological Clerk of Works (ECoW) support and monitoring survey conducted during initial preparatory works for the cable concluded that a majority of the golden eagles monitored during this survey showed no signs of distress or disturbance whilst cable surveyors completed the on land cable survey works and any individuals seen to be disturbed were observed to immediately return to the area upon completion of the survey works. Therefore, given the short term duration of the installation activities in the intertidal area, any potential visual and above water noise disturbance

effects will be temporary in nature and any disturbance to golden eagles will be temporary, with any disturbed individuals expected to return to the area immediately following completion of the project. Thus no significant impacts to the species are expected from visual and above water noise disturbances within the intertidal area.

9.5 Mitigation measures

Mitigation measures that are embedded in the project design are listed in Table 4-1. Following assessment, the following additional mitigation measures are proposed:

- An Ecological Clerk of Works who will have the authority to direct works, assess noise levels, make amendments where necessary and respond to any monitoring of the breeding pair of eagles as appropriate.
- Further consultation will be undertaken with NatureScot in regard to the golden eagle nest on Islay on any requirements to avoid disturbance to these species during the most sensitive times of year.

9.6 Conclusion

The above assessment has demonstrated that although nesting golden eagles in the vicinity of the Islay landfall may experience a slight change in behavioural pattern during the Jura to Islay cable installation, this will be temporary with the eagles known to return to normal behaviour immediately after a disturbing activity has ceased. Therefore, given the short-term, localised and transient nature of the installation activities, the impact to nesting golden eagles is expected to be not significant.

10. MARINE ARCHAEOLOGY

10.1 Introduction

This section describes the key characteristics of the marine historic environment along the Application Corridor between, the beach north of Glas Eilean, Jura and Tràigh Bhàn, Islay and provides an assessment of potential impacts of the installation activities on marine archaeology along with the mitigation and management measures to remove or reduce these impacts.

10.2 Data sources

A review of publicly available information on marine archaeological sites within/in the vicinity of the Application Corridor was conducted to inform this assessment. Key data sources used included:

- The United Kingdom Hydrographic Office (UKHO) wrecks database, containing recorded wreck and obstruction data.
- Statutory lists, registers and designated areas, including Lists of Scheduled Monuments, Designated Wrecks and Historic Marine Protected Areas (HMPAs).
- The National Record of the Historic Environment (NRHE) of Scotland, using the Canmore database website (https://canmore.org.uk/).

This information has been supplemented with historic Environment Records (HER) held by West of Scotland Archaeology Service (WOSAS) on behalf of Argyll & Bute Council (ABC) containing a database of recorded archaeological sites, find spots, and archaeological events; and other publicly available website databases and publications, where used, are cited in the text. Any other data sources used are referenced throughout the document.

10.3 Marine archaeology description

Marine archaeology encompasses not only shipwrecks, but also other evidence of human exploitation of maritime resources, such as shipyards, piers, fish traps, anchor sites and submerged landscapes where human beings and early hominids previously lived or hunted on terrain which was at that time dry land, or where they exploited fish and shellfish on the coast which is now submerged (Marine (Scotland) Act 2010, Section 73, Paragraph 5).

The Application Corridor is situated within the Sound of Islay, between Jura and Islay. Notable archaeological findings within the vicinity of the Application Corridor are presented in Figure 10-1 (Drawing ref: P2635-ARCH-001). There are no charted wrecks within the Application Corridor and no wrecks were observed in the recent surveys within the Application Corridor (Aspect, 2023). There are eight charted wrecks located to the north and south of the Application Corridor the location and distance from the closest point of the Application Corridor are listed in Table 10-1.

Table 10-1 Known marine archaeological assets located in the Sound of Islay

Name	Water Depth (m)	Latitude (WGS84 UTM29N)	Longitude (WGS84 UTM29N)	Distance to RPL (km)
Kay D	25	55 49.995 N	6 6.06 W	2.01
Edith Morga	10	55 47.745 N	6 3.894 W	2.36
Crissila (possibly)	12	55 47.612 N	6 3.877 W	2.61
Glen Holme	6	55 50.595 N	6 5.394 W	2.94
Lily Melling	13	55 51.995 N	6 6.06 W	5.61

Name	Water Depth (m)	Latitude (WGS84 UTM29N)	Longitude (WGS84 UTM29N)	Distance to RPL (km)
Wyre Majestic (Bow)	9	55 52.95 N	6 7.14 W	7.58
Wyre Majestic (Stern)	-1	55 52.969 N	6 7.252 W	7.65
Unknown Wreck	10	55 53.439 N	6 7.416 W	8.53

Source: UKHO – wrecks database, 2023

The occurrence of sites with marine archaeological significance (such as drifted debris) within the Application Corridor is thought to be unlikely given the data available.

JURA-ISLAY DISTRIBUTION CABLE REPLACEMENT

ARCHAEOLOGY

Wrecks in and around the Sound of Islay

Drawing No: P2635-ARCH-001	A

Legend

- Indicative RPL
- Installation Corridor

Wrecks

- Dangerous Wreck
- Non-dangerous Wreck
- Wreck Showing any Portion of Hull or Superstructure

N

NOT TO BE USED FOR NAVIGATION

Date	2023-08-31 09:00:47
Coordinate System	OSGB36 / British National Grid
WKID	EPSG:27700
Scale @A3	1:60,000
Data Sources	OS; UKHO; SHEPD; ESRI
File Reference	J:\P2635\Mxd_QGZ \P2635.qgz
Created By	Oliver Bula
Reviewed By	Emma Kilbane
Approved By	Aodhfin Coyle

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0 1 2 3 4 km

10.4 Impact Assessment

There are no known wrecks that are present within the Application Corridor, however, it is possible that debris from shipwrecks cannot be ruled out solely from the data available. Notwithstanding this, it cannot be ruled out that the installation of the distribution cable may have the potential to cause damage to historic archaeological artefacts. The potential for damage to occur is limited to cable lay operations, if damage were to occur to a maritime artefact during cable lay operations, this damage would be permanent and there would be no ability to recover, which would cause the impact on historic records to be significant.

10.4.1 Abrasion/disturbance at the surface of the substratum

The proposed replacement cable will be surface laid for the whole marine route, with the exception of the intertidal area, and as such no disturbance to archaeological features in the area is expected. The seabed footprint associated with cable installation activity will be largely confined to the physical footprint of the cable and the potential use of concreate mattresses for cable crossings and rock bags as cable stabilisation measures. With the cable being surfaced laid, the installation activities will not result in significant levels of sediment resuspension. Therefore, offshore sedimentation related impacts have been screened out and the archaeological assessment focuses on the potential impacts caused by the surface lay of the cable and stabilisation material.

Geophysical survey works have been undertaken to inform the replacement cable route design. However, as detailed in the Project Description (Appendix A) and Section 4.2, a pre lay survey will be undertaken as a final check of the cable route for archaeological features and debris.

10.4.2 Penetration and/or disturbance of the substrate below the surface of the seabed, including abrasion

During installation, direct impacts to known and unknown archaeological features or artefacts on the seabed or intertidal area could be caused by activities resulting in the removal of marine material from the intertidal area. Cable trenching activities at landfalls could have the potential to interact with archaeological artefacts below the surface, if present, as this would penetrate the seabed surface. If this were to occur, it could result in the potential destruction of any cultural heritage beneath and in the immediate vicinity of the cable route. Cable burial and trench backfilling in the intertidal areas and stabilisation methods such as rock placement have the potential to cause direct damage to sites of marine archaeological features and artefacts through compression.

10.5 Mitigation

Mitigation measures that are embedded in the project design are listed in Table 4-1. Following assessment, there are no additional mitigation measures proposed.

The pre lay survey will allow for any potential wrecks (and any other potential sites of archaeological significance) not identified during the route design to be identified prior to any cable installation works starting. In addition, the following measures were implemented during the route design process to further ensure the protection of marine archaeological receptors.

All wrecks or features of archaeological significance will be avoided by a buffer of ≥50m during detailed route design;

- The locations of wrecks and features of archaeological significance will be identified on electronic charts onboard the installation vessel and will be utilised to guide installation operations;
- The locations of any wrecks or features of archaeological significance will be provided to Historic Environment Scotland and the UKHO; and

- If required by licence, The Crown Estate's 'Protocol for Archaeological Discoveries' (PAD) (The Crown Estate, 2021) will be implemented during installation works.

It is acknowledged that there is the potential that archaeological features could still be present within the Application Corridor, which are not identified by preconstruction surveys. In order to account for this, and subject to further discussion with Historic Environment Scotland, the Crown Estate's PAD (TCE, 2021) could be used as a basis for further mitigation during installation activities. The role of the Implementation Service described within the above protocol would be replaced by an archaeological service provider appointed by SHEPD or their installation contractor.

10.6 Conclusion

There are no known marine archaeological features known to be present within the Application Corridor. As such above assessment has concluded that the installation and operation of the Jura-Islay cable will not adversely affect the marine archaeology within or in the vicinity of the Application Corridor.

11. COMMERCIAL FISHERIES AND OTHER SEA USERS

11.1 Introduction

This section provides details of commercial fishing and aquaculture activity within the vicinity of the Application Corridor. Other sea users in the region, excluding shipping and navigation are also reviewed (see Section 13 for Shipping and Navigation). Potential impacts to these receptors have been assessed, along with the mitigation and management measures utilised to remove or reduce any potential impacts or risks. This section should be read in conjunction with the separate regional Fisheries Liaison Mitigation Action Plan (FLMAP) – Argyll (Appendix B) which provides a summary assessment of all the potential marine interactions, including commercial fisheries, which could influence or be affected by the proposed replacement cable works.

11.2 Data sources

Prior to commencement of any works on the Project, a FLMAP was prepared to set out how SHEPD will interact with all legitimate sea users, prior to and during any operational activities associated with the Jura to Islay cable. This information has been used to inform the baseline overview of this Section, with assessment findings being summarised as well.

The section has been further supplemented by data sources used to inform the baseline description and assessment including but not limited to the following:

- Jura – Islay Cable Gear Observation Survey Technical report, Brown & May Marine, 2023
- Jura to Islay Subsea cable Replacement Environmental Desk Study Report, ERM 2022
- Scottish Sea Fisheries Statistics 2021, (Scottish Government, 2022)
- AIS data, EMODnet, June and December 2020
- Any other data sources used are referenced throughout the document.

11.3 Commercial fisheries and other sea users description

11.3.1 Commercial fisheries

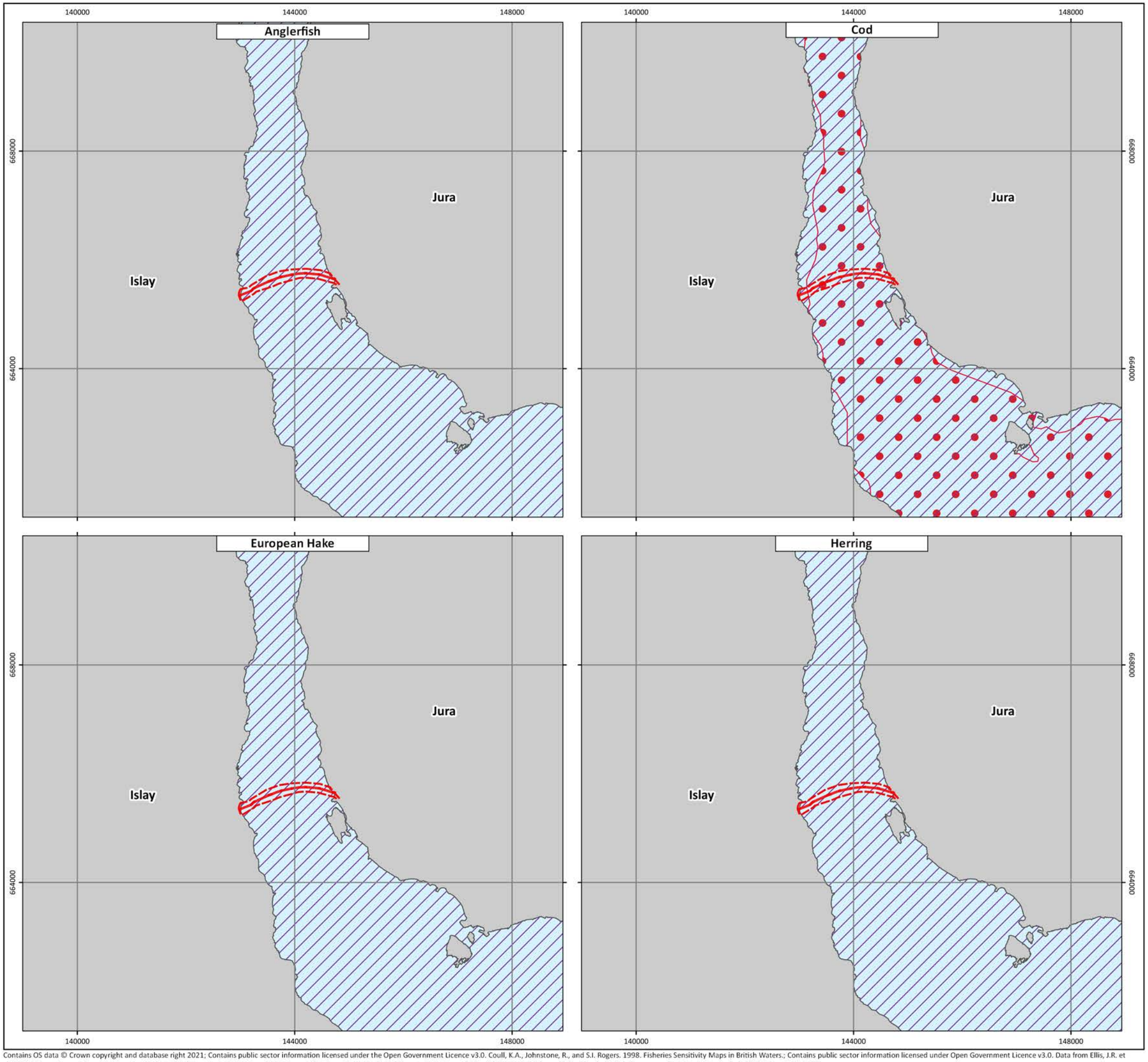
11.3.1.1 Fish and shellfish

The oceanic characteristics in the Sound of Islay make the area a prime spawning and/or nursery ground for a number of commercially important species. The installation is scheduled to take place between Q2 and Q4 of 2024, possibly 2025 thus overlapping with the spawning and nursing periods of ten fish and shellfish species (Table 11-1 and Figure 11-1 to 11-3, Drawing reference: P2635-FISH-001 - 003).

Table 11-1 Summary of spawning and nursery periods for commercially important fish species within the Application Corridor

Species	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Scheduled installation												
Anglerfish (N)	N	N	N	N	N	N	N	N				
Atlantic Cod (N)	N	N	N	N	N	N						
Atlantic Herring (N)	N	N	N	N	N	N						
European hake (N)	N	N	N	N	N	N	N	N				
Atlantic mackerel (N)		N	N	N	N	N	N	N				
Nephrops (SN)	SN	SN	SN	SN	SN	SN	SN	SN	SN	SN	SN	SN
Sandeel (N)	N	N	N	N							N	N
Spotted ray (N)					N	N	N					
Whiting (N)		N	N	N	N	N	N	N				
Spurdog	Viviparous species (gravid females can be found all year)											
Key	S = Spawning			N = Nursery			SN = Spawning and Nursery			Blank = No data		

Source: Coull *et al.*, 1998; Ellis *et al.*, 2012



JURA-ISLAY DISTRIBUTION CABLE REPLACEMENT

FISH AND FISHING ACTIVITIES

Fish Spawning and Nursery Areas (Sheet 1 of 3)

Drawing No: P2635-FISH-001	A

Legend

Cable Route

- Indicative RPL
- Installation Corridor

Nursery and Spawning Grounds

- UK Nursery Grounds (2010)
- UK Nursery Grounds (1998)
- UK Spawning Grounds (1998)
- UK Spawning Grounds (2010)

NOT TO BE USED FOR NAVIGATION

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Created By	Oliver Bula
Reviewed By	Emma Kilbane
Approved By	Aodhfin Coyle

Scottish & Southern Electricity Networks

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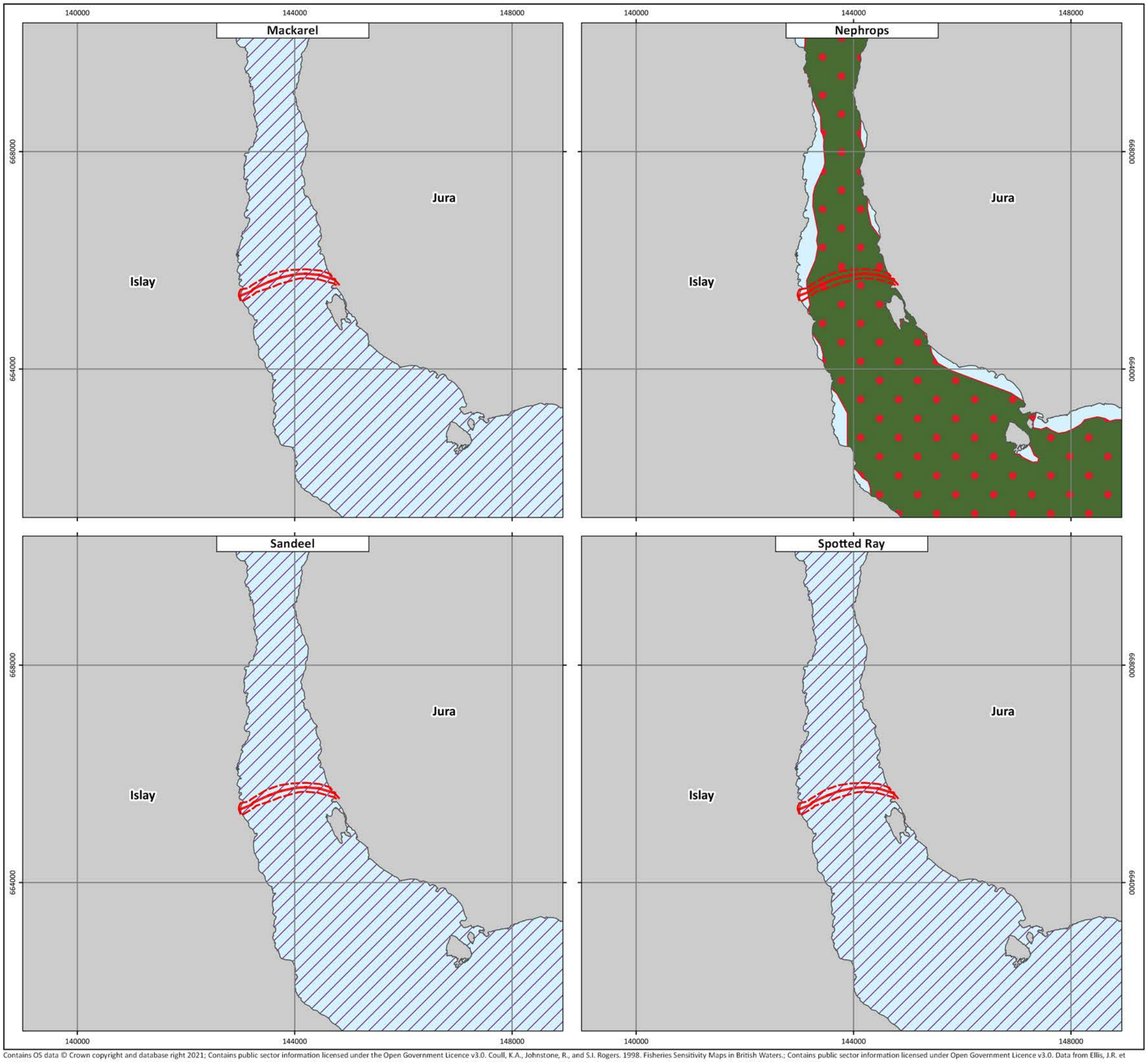

JURA-ISLAY DISTRIBUTION CABLE REPLACEMENT

FISH AND FISHING ACTIVITIES

Fish Spawning and Nursery Areas (Sheet 2 of 3)

Drawing No: P2635-FISH-002 | A

Legend

Cable Route
- Indicative RPL
- Installation Corridor

Nursery and Spawning Grounds
- UK Nursery Grounds (2010)
- UK Nursery Grounds (1998)
- UK Spawning Grounds (1998)
- UK Spawning Grounds (2010)

N

NOT TO BE USED FOR NAVIGATION

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Created By	Oliver Bula
Reviewed By	Emma Kilbane
Approved By	Aodhfin Coyle

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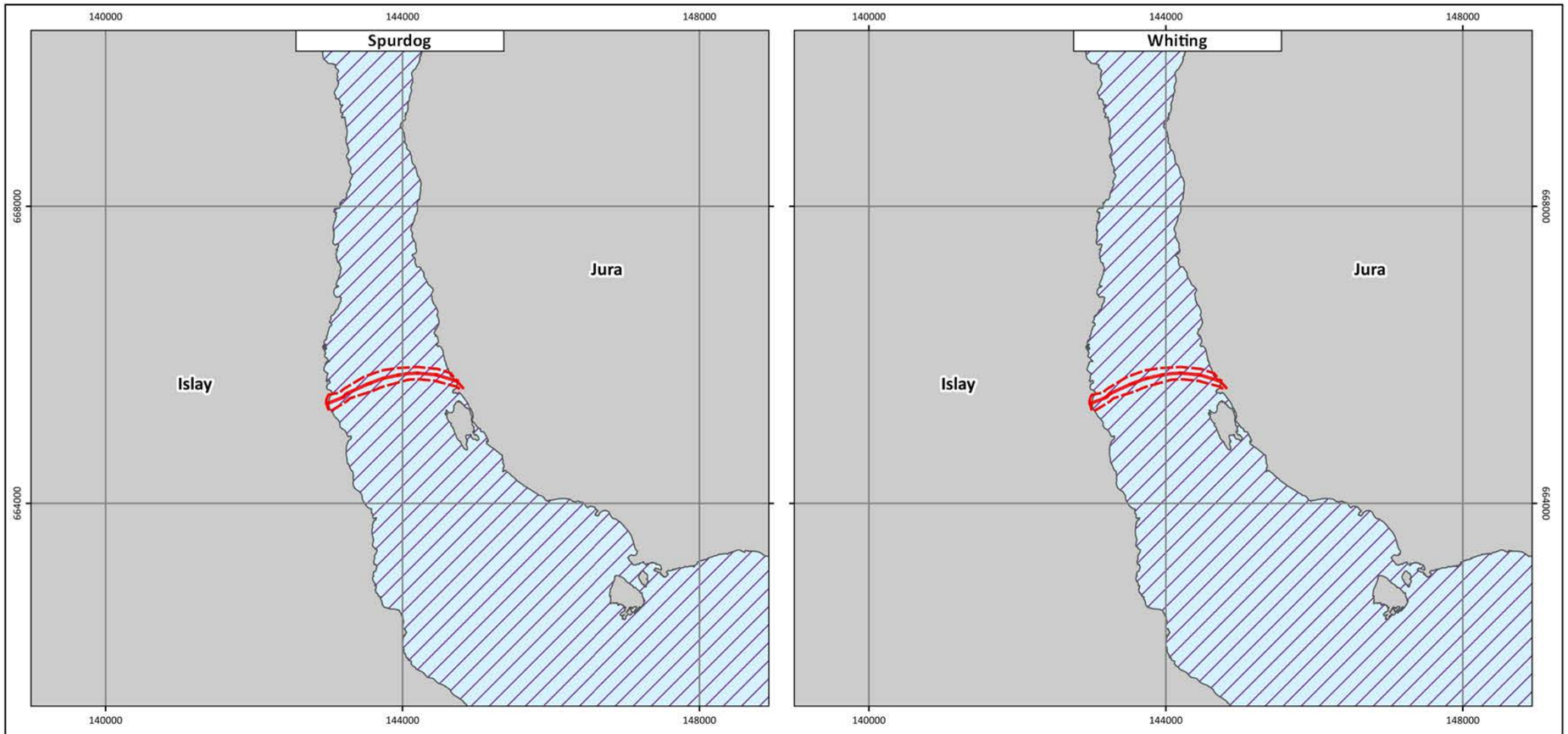

JURA-ISLAY DISTRIBUTION CABLE REPLACEMENT

FISH AND FISHING ACTIVITIES

Fish Spawning and Nursery Areas (Sheet 3 of 3)

Drawing No: P2635-FISH-003	A

Legend

Cable Route

- Indicative RPL
- Installation Corridor

Nursery and Spawning Grounds

- UK Nursery Grounds (2010)
- UK Nursery Grounds (1998)
- UK Spawning Grounds (1998)
- UK Spawning Grounds (2010)

NOT TO BE USED FOR NAVIGATION

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Created By	Oliver Bula
Reviewed By	Emma Kilbane
Approved By	Aodhfin Coyle

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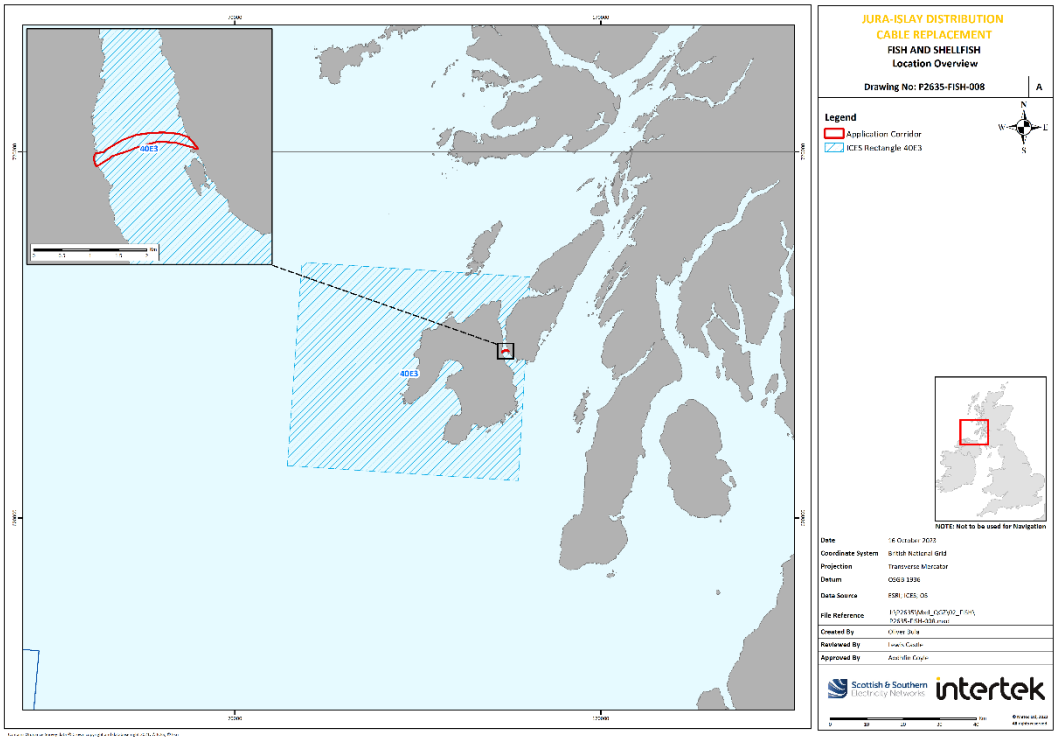
0 1 2 3 4 km

11.3.1.2 Fisheries activity

The west coast of Scotland is located in the International Council for Exploration of the Seas (ICES) "Celtic Seas" ecoregion, further defined as ICES Division 6a. This Division is used in ICES stock assessments and management advice, so has an ecological basis. The Application Corridor is located within ICES rectangle 40E3 (Figure 11-4; Drawing reference; P2635-FISH-008).

Figure 11-4 ICES Rectangle 40E3 (Drawing reference: P2635-FISH-008)



This rectangle is in an area predominantly targeted for shellfish species with this sector typically being the most valuable in terms of £ per tonne (Table 11-2). In the region crab (*Cancer pagurus*), lobster (*Homarus gammarus*), scallops (*Pectinidae*), razor clam (*Siliqua patula*) and whelk (*Buccinum undatum*) are the top five highest value and quantity catch (The Scottish government, 2022). In terms of gear type, the most commonly used in the Argyll area are potting (creeling), demersal twin trawling targeting *Nephrops* and scallop dredging. However, potting (creeling) vessels represent the primary fishery that may interact with the cable, due to their nearshore location (SHEPD, 2021). There are low levels (<5 hours) of mobile gear fishing effort recorded in the region (SHEPD, 2021) every month of the year with the exception of January and October, and in the vicinity of the Application Corridor fishery activity is low with fishing vessel density averaging 0.55 hours per kilometre per month (km^2) throughout the year (EMODnet, 2023). During site specific surveys of fishing gear in the Application Corridor, no gear was observed (Brown and May Marine 2023). Although this doesn't necessarily mean there are no fishers operating within the area, it does reinforce the low levels of fishing activity recorded.

Table 11-2 Fishing landed quantity and relative value for rectangle 40E3

Year	Quantity (tonnes)			Value (£)		
	Demersal	Pelagic	Shellfish	Demersal	Pelagic	Shellfish
2018	2	0	897	3,608	0	2,623,854
2019	1	0	1,244	1,518	0	3,104,268
2020	0	0	726	19,911	0	1,565,117
2021	0	0	792	448	0	2,325,312

Source: The Scottish Government, 2022

11.3.1.3 Fisheries density

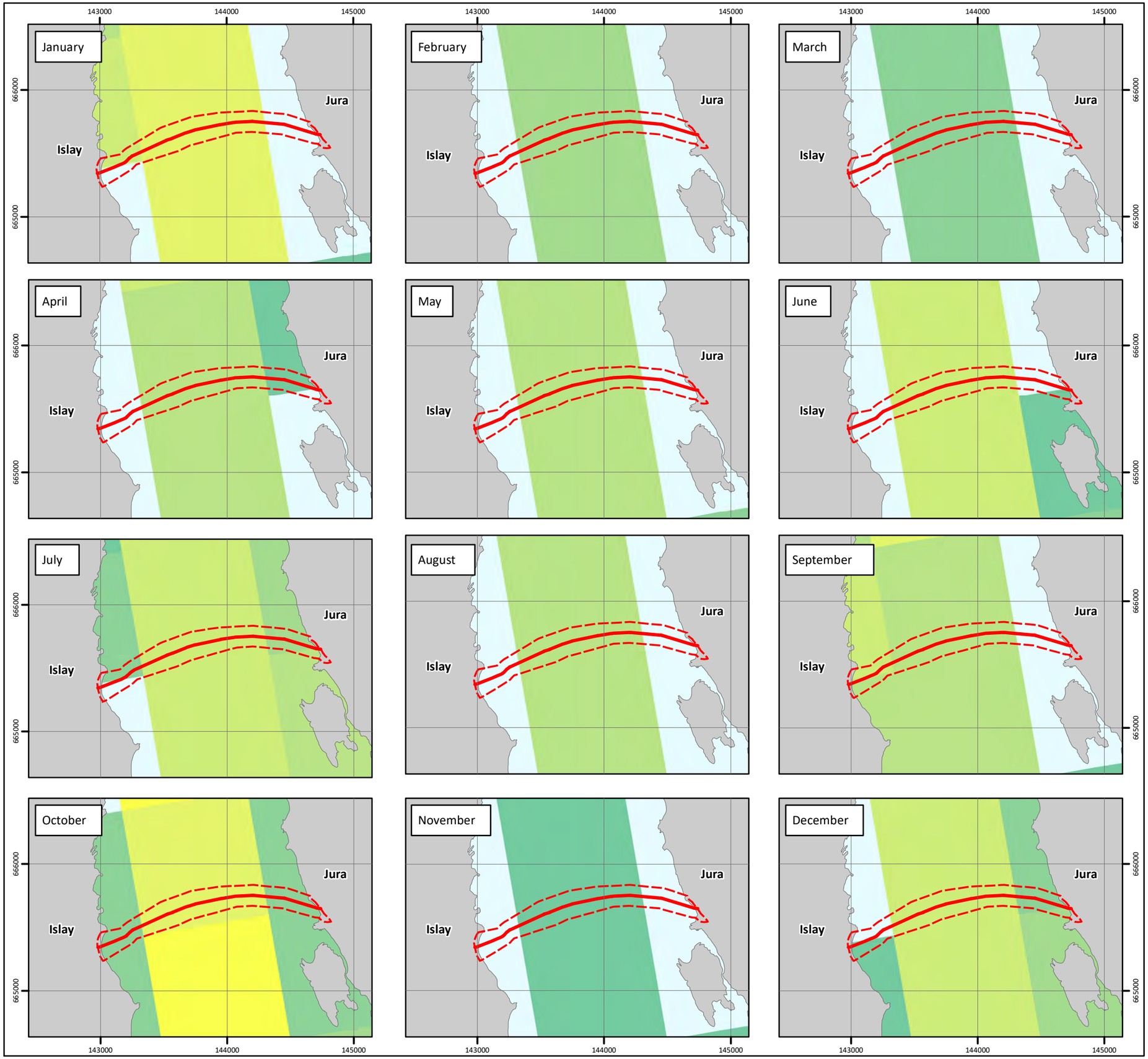
The Application Corridor is a low-density fishing area for local fishers within the region (Xodus, 2023). Figure 11-4 (drawing reference. P2635-AIS-002) below shows the monthly fishing vessel density within the vicinity of the Application Corridor in the year 2021. It can be seen from Figure 11-4 that the months with the highest density of fishing activity per km^2 are January, June, July, October and December. These months have average vessel hours between 0.5 and 5 hours per km^2, whereas during the remaining months of the year fishing activity is limited with vessels hours ranging from 0 --0.2 fishing vessel hours per km^2.

JURA-ISLAY DISTRIBUTION CABLE REPLACEMENT

AIS VESSEL DENSITY

Monthly Vessel Densities (2021) Fishing Vessels

Drawing No: P2635-AIS-002 | **A**



Legend

- Indicative RPL
- Installation Corridor

2021 Vessel Density

Vessel Hours (per km²)

- 0 - 0.05
- 0.05 - 0.1
- 0.1 - 0.2
- 0.2 - 0.5
- 0.5 - 1
- 1 - 2
- 2 - 5
- 5 - 10
- 10 - 20
- 20 - 50
- 50 - 100
- 100 - 200
- 200 - 500
- > 500

NOTE: Not to be used for Navigation

Date	31 August 2023
Coordinate System	British National Grid
Projection	Transverse Mercator
Datum	OSGB 1936
Data Source	OS; GEBCO; SHEPD; EMODnet
File Reference	J:\P2635\Mxd_QGZ\03_AIS\ P2635-AIS-002.mxd
Created By	Oliver Bula
Reviewed By	Emma Kilbane
Approved By	Aodhfin Coyle

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km
0 0.5 1 1.5 2

11.3.2 Aquaculture

There are no aquaculture sites located in the vicinity of the Application Corridor. The closest such site is an active pacific oyster farm situated 24.6km to the southeast (Figure 11-8).

11.3.3 Recreational sea users

As reported in the FLMAP, there are also low levels of power boating, and very low levels of canoeing, kayaking and surfing occurring over the Application Corridor (Xodus, 2023). There are no Royal Yachting Association (RYA) clubs within the vicinity of the Application Corridor.

11.3.4 Military areas

The Project is located outside of military operating areas and it is highly unlikely that any submarines operate within the Project area. Military vessels are known to steam through the Sound of Islay occasionally, as there is a Military Practice and Exercise Area (PEXA) within the vicinity of the Application Corridor. X5534 is 6 nautical miles (nm) south and X5543 is 13nm north of the Application Corridor. During construction, there is potential for minor disruption to these military vessels, however with ongoing communication and publishing of Notice to Mariners (NtM) the coordination of any potential conflicting activities will be managed.

11.4 Potential impacts

Potential impacts to commercial fisheries and other sea users in the vicinity of the Application Corridor may arise due to:

11.4.1 Loss of fishing ground

There is potential for the presence of installation vessels to restrict access to fishing grounds or to cause fishing vessels to deviate from their typical navigation route, resulting in a loss of earnings, additional fuel costs or disruption of normal fishing activities. Longer term impacts relate specifically to reduced fishing effort within traditional fishing grounds, particularly for trawl fisheries where there is an increased risk of gear being snagged on the replacement cable and associated protection measures (e.g. rock bags and concrete mattresses) – see Section 11.4.2.

Regarding the immediate loss of access to fishing grounds and navigation routes due to the presence of installation vessels, the impacts relate to the 500 metre (m) safety zone that will be enforced around the installation vessel when in operation. When the installation schedule for the cable is finalised, this will be circulated amongst local fishers ahead of the activities to provide as much notice as possible, allowing for temporary changes in routing to be made. Due to the linear nature of the cable installation route and transient nature of this safety zone however, the duration of time where fishing vessels will be displaced will be minimal. As such, pressures resulting from the loss of access to commercial fisheries and other sea users are not expected to be significant.

11.4.2 Loss of fishing gear and increased snagging risk

The most popular fishing gear used in the vicinity of the Application Corridor is potting (creeling), demersal twin trawling and scallop dredging (see Section 11.3.2). This gear is all commonly used to target benthic species and as such snagging risks resulting from the cable are possible. However, fisheries activity within the Application Corridor is reported to be low and during fisheries observations no gear was reported in the Application Corridor. It's therefore considered unlikely for there to be interaction between the cable and these types of fisheries activities. As such there will be no adverse effect of the Project to the traditional fishing grounds in the area.

While occasional maintenance of the cable may occur in the future, such activities will be clearly communicated ahead of time with typical safety procedures (such as those used in this Project) being followed, thus ensuring impacts to local fishermen are kept to a minimum.

11.4.3 Disruption to Military vessels

There are two military PEXA areas north and south of the Application Corridor as outlined in Section 11.3.4. During construction, there is potential for minor disruption to these military vessels, however ongoing communication and publishing of NtM will ensure coordination of any potential conflicting activities. As such, pressures resulting from disruption to access of military vessels and other sea users are not expected to be significant.

11.5 Conclusion

The assessment demonstrates that there will be no significant effects to commercial fisheries interests or the other sea users (discussed within the Section) within in or in close proximity to the Application Corridor. The Sound of Islay supports nursing and spawning grounds for commercially important fish and shellfish species and fishing is dominated by potting (creeling), trawling and dredging gear types targeting predominantly crab, lobster and scallop species. Any loss of access to fishing grounds caused by the installation of the replacement cable will be minor and temporary due to their short-term, localised and transient nature of the works.

The Sound of Islay also supports other sea users such as, military vessels, and recreational sea users such as sailing, power boating, kayaking and canoeing. Any disruption to other sea users that operate within the Sound of Islay will be mitigated against with ongoing communication and publishing of NtM ensuring coordination of any potential conflicting activities. Any disruption to other sea users caused by the installation of the replacement cable will be minor and temporary due to their short-term and localised works.

12. UXO AND EXISTING UTILITIES

12.1 Introduction

This section details the presence of any existing utilities and the potential for Unexploded Ordnance (UXO) to be present, outlines the potential impacts associated with the proposed cable installation activities on these, and presents the findings of the environmental assessment.

For the purpose of this section:

- UXO refers to explosive weapons that did not detonate when they were deployed and still poses a risk of detonation as it seldom degrades or loses its high explosive effectiveness over time. UXO have been deployed in the marine space worldwide and therefore there is the potential that they could be present within the Application Corridor.
- Utilities refers to existing structures such as cables, oil and gas infrastructure, and offshore renewable energy infrastructure.

12.2 Data sources

As part of the route engineering process, 6 Alpha Associates delivered a desk-based Preliminary UXO Threat Assessment as part of the Phase 1 Risk Management Framework. This was developed to support the placement of Horizontally Directionally Drilled (HDD) installation for multiple routes assessed between the islands of Jura and Islay. In addition, Ordtek carried out the Phase 2 and 3 UXO risk and mitigation strategy assessment for the Project (6Alpha, 2022; Ordtek, 2023).

Utilities data is available across multiple sources such as Crown Estate Scotland (CES), North Sea Transition Authority (NSTA), Kingfisher Information Service – Offshore Renewable & Cable Awareness project (KIS-ORCA), and European Marine Observation and Data Network (EMODNet). All data sources used are referenced throughout this Section.

12.3 Baseline and receiving receptors

12.3.1 UXO

Many explosives were left in the marine environment after World Wars I and II. The explosives might be isolated or in regions where munitions are dumped. Any new marine development or activity must demonstrate that the region is free of UXO or that UXO can be safely avoided before work can begin (Gov UK, 2022).

In comparison to other British coastal regions like those on the east and south coastlines of England, the Inner Hebrides experienced less significant military activity during World Wars I and II. The Ordtek desktop study area still has evidence of military activity in the area, including German mining from World War I, military training grounds, and the potential for contamination from torpedoes, depth charges, and dropped bombs (Ordtek, 2023). While military activity was found in the wider Ordtek study area, within the Application Corridor no activity was noted.

It was identified that there may be one potential UXO (pUXO) 4.2m south of the indicative RPL on the Jura side of the Sound of Islay (easting: 682742.81, northing: 6189560.00), the dimensions characteristics of the potential UXO are 0.93m x0.41m x0.35m. Figure 12-1(Drawing reference: P2365-INFR-002) outlines the pUXO within the Application Corridor. The pUXO target will either be avoided by routing, or inspected to determine if this is a confirmed UXO (cUXO) or not a UXO target.

In July 2023, Ordtek issued an ALARP certification, this certification has specifically been designed to provide evidence that the UXO risk has been reduced to an acceptable level, i.e. to the extent

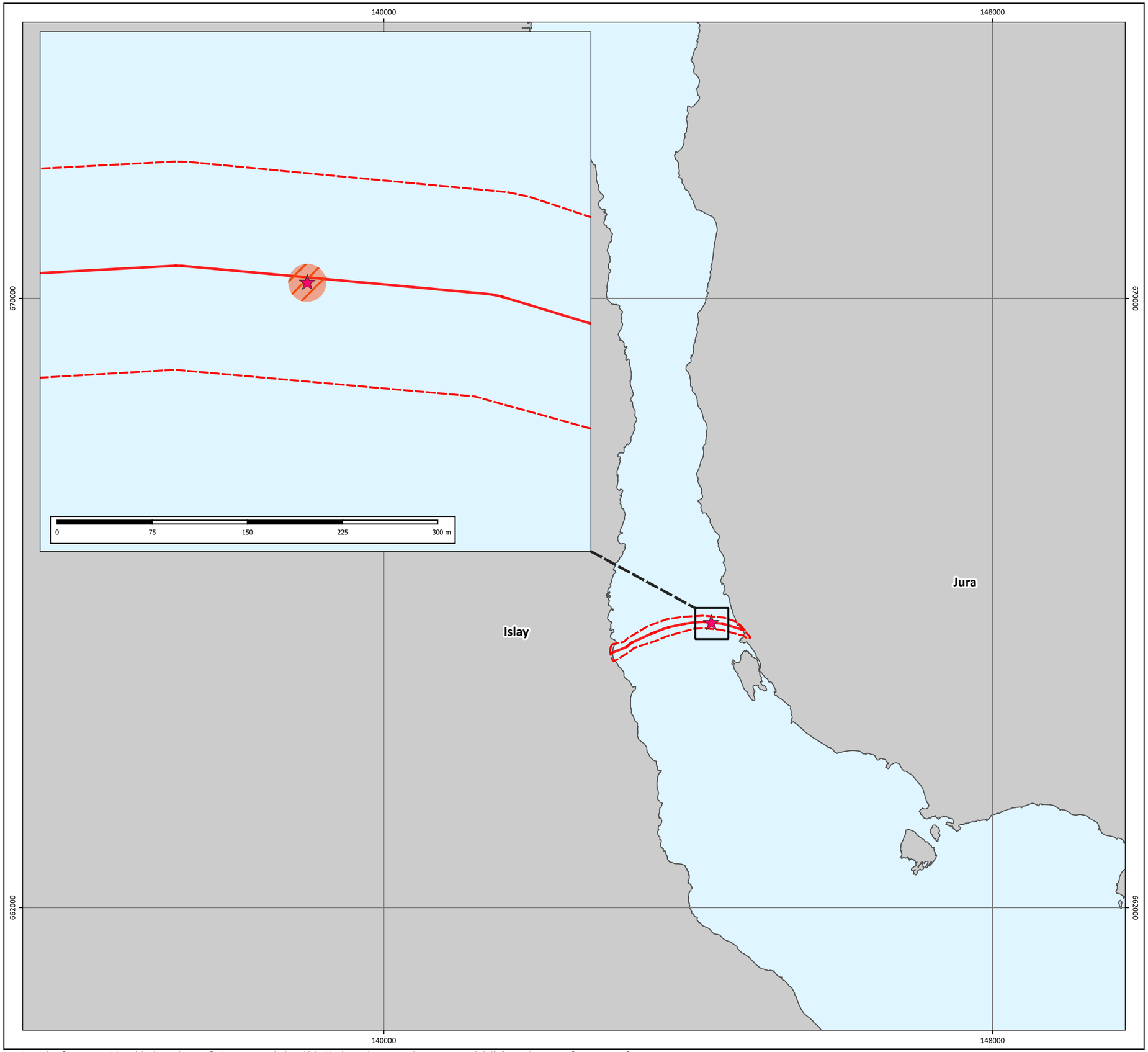
necessary for both human safety and environmental protection and conforms with the Health & Safety Executive (HSE) and CIRIA (C754 2015) ALARP principle and Society for Underwater Technology (SUT) OSIG 2014 (ISBN 0 906940 54 0).

JURA-ISLAY DISTRIBUTION CABLE REPLACEMENT

INFRASTRUCTURE

Potential Unexploded Ordnance (UXO)

Drawing No: P2635-INFR-002	A



Legend

- Potential UXO
- Potential UXO Exclusion Zone
- Indicative RPL
- Application Corridor

N

NOT TO BE USED FOR NAVIGATION

Date	2023-08-30 17:21:24
Coordinate System	OSGB36 / British National Grid
WKID	EPSG:27700
Scale @A3	1:50,000
Data Sources	OS; GEBCO; SHEPD; ORDTEK
File Reference	J:\P2635\Mxd_QGZ \P2635.qgz
Created By	Oliver Bula
Reviewed By	Lewis Castle
Approved By	Aodhfin Coyle

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0 0.75 1.5 2.25 3 km

12.3.2 Existing utilities

Marine utilities include renewable energy infrastructure, telecommunication cables, oil and gas infrastructure and aggregates for marine extraction and disposal. Figure 12-2 (Drawing Reference: P2635-INFR-001) presents an overview of existing marine utilities in the vicinity of the Application Corridor.

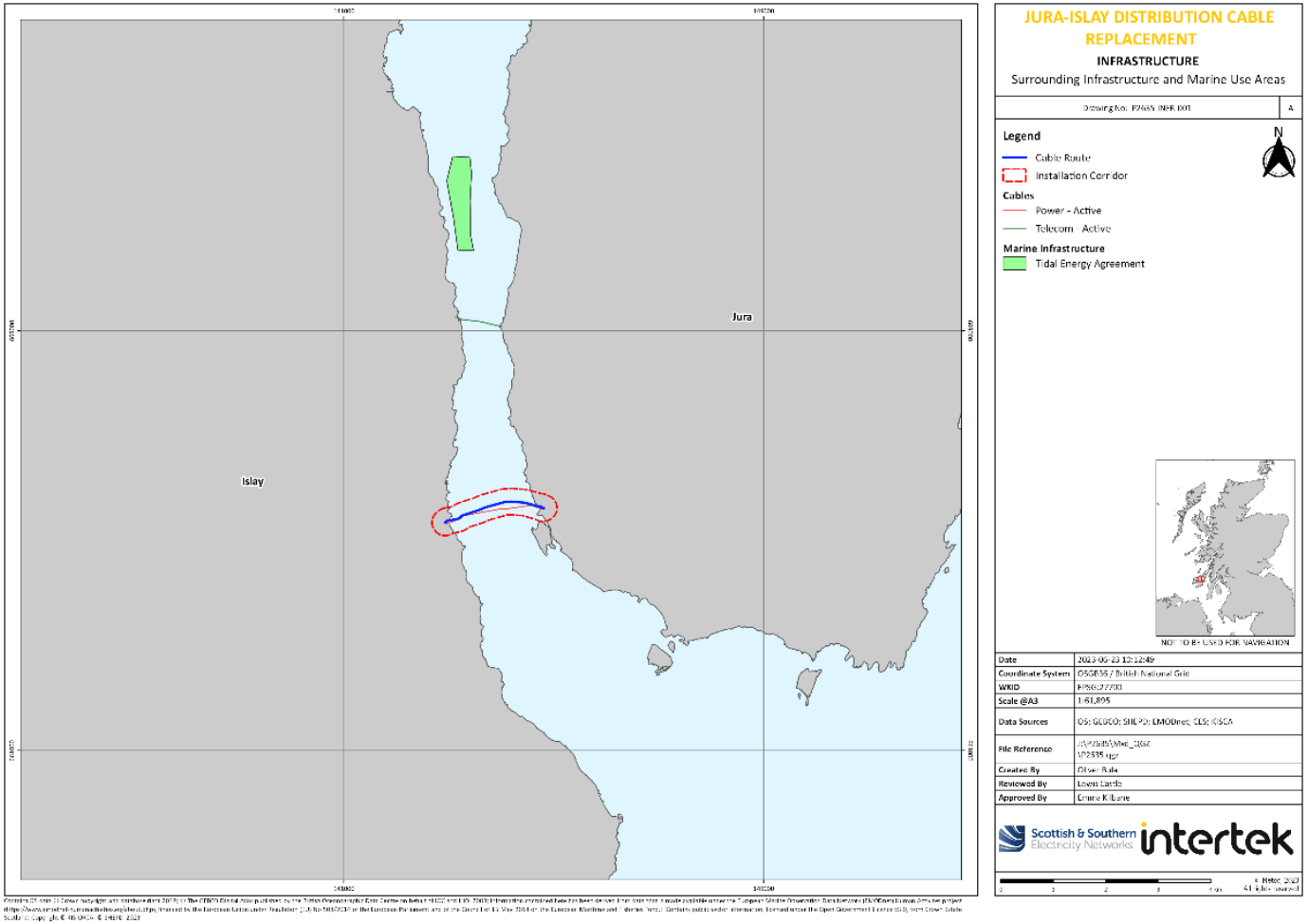
There is only one site for energy infrastructure near the Application Corridor, a potential tidal array, which is being developed by Nova Innovation Ltd, located approximately 4.8km to the north. ScotWind sites (the leasing process which allowed developers to apply for seabed rights with 20 projects securing seabed option agreements} are not located within the vicinity of the Application Corridor with the nearest site, under development by Machair Wind Scottish Power Renewables, located approximately 27km away (CES, 2023).

There are no active 3rd party cables within the immediate vicinity of the Application Corridor. The nearest active cable is a telecommunication cable located approximately 3km north, operated by British Telecommunications (BT) (KIS-ORCA, 2023). There are no oil and gas structures, including pipelines, wells and platforms/rigs within 100km of the Application Corridor (NSTA, 2023).

Large volumes of sand and gravel are extracted from sedimentary deposits on-land primarily for use in construction and road building, however these demands are ever increasing. As such, the extraction of marine aggregates, deposits of sand and gravel found on the inner continental shelf, is becoming more common. Although the abundance of sand and gravel in the marine environment is vast, it is ultimately a limited marine natural resource (The Crown Estate, 2021). There are no marine aggregate extraction sites located within the Application Corridor however there is a site of gravel extraction located around 14km north (EMODnet, 2023).

There are no dredge spoil disposal locations within the Application Corridor, with the nearest site, Port Ellen, located approximately 22km south-east of the Application Corridor (EMODnet, 2023).

Figure 12-2 Surrounding infrastructure and marine use areas (Drawing Reference: P2635-INFR-001)



12.4 Impact assessment

Table 4-2 in section 4 outlines the pressures, zone of influence and screening decisions of the receptors for the Project. This table outlines three pressures on UXO and existing utilities.

- Abrasion / disturbance at the surface of the substratum
- Penetration and / or disturbance of the substrate below the surface of the seabed.
- Damage to third party assets

The preliminary desk assessment carried out by 6Alpha did not identify any UXO threats within 5km of the Application Corridor and categorised encountering UXO at the site as unlikely. However, the geophysical survey (Side Scan Sonar) that was undertaken by Aspect Land and Hydrographic surveys, found there is potentially one UXO within the application corridor. This assessment was concluded on the basis that there are no known historical or current sources of UXO threat in the vicinity of the Application Corridor that could have otherwise produced a possible UXO hazard. However, the threat of background UXO in the surrounding area may still exist.

Ordtek, in their Phase 2 and 3 UXO mitigation and strategy assessment, devised a “likelihood of encounter value”. It was identified that likelihood of encounter of UXO is low with some evidence of explosive ordnance in the wider region, however it would be unusual for it to be encountered. The risk assessment results were produced by comparing the likelihood of encounter value to project activities. According to Ordtek, the majority of the UXO risk within the Project is Low or Low Moderate. High-energy activities such as anchoring or trenching were assessed as a “Moderate” UXO risk. Drilling as part of HDD operations in water depths under 10m presents an "Intolerable" UXO risk and requires active mitigation. The only UXO type which was assessed as having a “likelihood of encounter” value related to WWI German Mines, however this was classed as possible only however with no indisputable evidence they will occur.

Although there is a high probability of encountering segments of OOS cable within the Application Corridor the risk level for these has been concluded as low (OceaniQ, 2022). There is no other known material asset or infrastructure located within the vicinity of the Application Corridor therefore, no significant effects will occur to existing utilities during the proposed installation works.

12.5 Mitigation

Mitigation measures that are embedded in the project design are listed in Table 4-1. Following assessment, Ordtek issued an ALARP certification, this certification has specifically been designed to provide evidence that the UXO risk has been reduced to an acceptable level. If pUXO are discovered during any phase of the Project, the location of the UXO item will be recorded and immediate advice will be sought from the relevant authorities. If a UXO is identified during the construction phase, then works will cease immediately until advice and remedial actions are implemented. In addition, munitions awareness briefings will be given to contractor’s and ship personnel prior to and during the construction phases. The MoD and emergency services will be consulted as appropriate.

12.6 Conclusion

While there exists the potential for UXO to be present within the Application Corridor as was established during the geophysical survey, the risk of encountering UXO along the route will be not significant as the mitigation measures that are outlined above and the 15m exclusion zone around the potential UXO will reduce risk of encountering the potential ordnance.

There is no infrastructure, except for the existing distribution cable and segments of out of service cable, within the immediate vicinity of the Application Corridor and therefore no significant effects are envisaged from installation operations.

13. SHIPPING AND NAVIGATION

13.1 Introduction

This section identifies the potential risk to shipping and navigation arising from activities associated with installation of the replacement cable and the presence of the replacement cable during its operational lifespan.

Where relevant, any limitations related to the baseline conditions, data sources or scientific understanding/interpretation within the process of assessing the effects have been highlighted.

13.2 Data sources and study area

Vessel traffic Automatic Identification System (AIS) data has been used to inform the shipping baseline outlined in this section. As per Regulation 19 of Chapter V, Safety of Navigation, of the Annex to the International Convention for the Safety of Life at Sea (SOLAS V), 1 July 2002, an AIS must be installed and operated on: all ships of 300 gross tonnage (GT) and upwards engaged on international voyages; cargo ships of greater than 500GT not engaged on international voyages; all passenger vessels irrespective of size and fishing vessels greater than 15 metres (m). In recent years, AIS has increasingly been installed by other maritime users on smaller crafts, including yachts, fishing vessels, and pleasure crafts, making it a robust and reliable indicator of marine traffic.

A review of shipping and navigation within and in the vicinity of the Application Corridor has been carried out as part of a Shipping and Navigation Review (Anatec, 2022) which utilised two months of 2021 AIS data, June and December. This review identified navigational features present, provided vessel densities using AIS data and presented on anchoring and fishing activity. Further review of shipping and navigational features was carried out as part of the Cable Route Desktop Study (ERM, 2022) which included a review of AIS data for the years 2020 and 2021. This study also identified potential hazards to the cable system, potential impact, mitigative measures applied to the Project and the risk outcome.

Baseline conditions for shipping and navigation have been established by undertaking a desktop review of published information and available reports for the project in relation to shipping, fishing and navigation. The data sources used to inform the baseline description and assessment included the following:

- AIS data, EMODnet (2023).
- Royal Yachting Association (RYA) Data for 2019.
- Royal National Lifeboat Institution (RNLI) incidents 2008 to 2021. https://data-rnli.opendata.arcgis.com/.
- Marine Accident Investigation Branch (MAIB) annual reports 2018 to 2022. https://www.gov.uk/government/collections/maib-annual-reports.

13.2.1 Study area

The study area covers the marine components of the cable installation works in the Sound of Islay between Glas Eilean, Jura and Traigh Ban, Islay and has been defined as 10km either side of the proposed Application Corridor.

All AIS data and navigational features datasets presented in this section are limited to the area of the assessment, hereby known as the Study Area.

13.3 Guidance methodology

The Navigation Risk Assessment (NRA) methodology used in this section differs slightly from a significance assessment and has been prepared in accordance with the guidance below:

- International Maritime Organisation (IMO) Guidelines for Formal Safety Assessment (FSA) – MSC-MEPC.2/Circ.12/Rev.2.

Whilst not necessarily directly applicable to marine cable projects, consideration to linear cables in relation to offshore renewable structures has been considered using:

- Maritime and Coastguard Agency (MCA) MGN 543 (Merchant and Fishing) Safety of Navigation Offshore Renewable Energy Installations (OREIs) – Guidance on United Kingdom (UK) Navigational Practice, Safety and Emergency Response (MCA 2016) and industry best-practice.
- Marine Guidance Note "Offshore Renewable Energy Installations (OREIs) – Guidance to Mariners operating in the vicinity of UK OREIs".
- Methodology for Assessing the Marine Navigational Safety Risks & Emergency Response of Offshore Renewable Energy Installations.

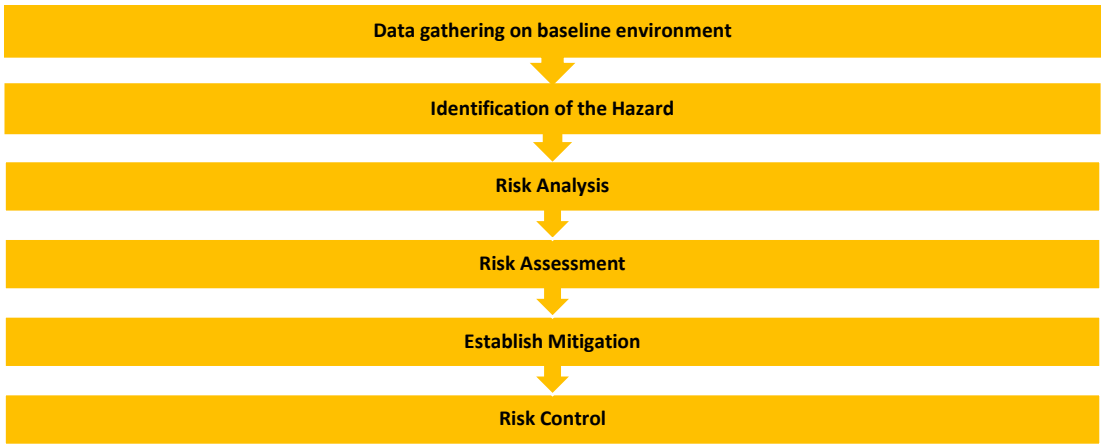
Where applicable, further consideration has been given to:

- Port Marine Safety Code (PMSC) (Dept. for Transport & Maritime and Coastguard Agency Nov 2016).
- Guide to Good Practice on Port Marine Operations (GtGP) (Dept. for Transport & Maritime and Coastguard Agency Feb 2018).

The assessment has been informed by the above guidance which states that the assessment stage should follow a clear progression; from the characterisation of the hazard, the risk that hazard has on (in the case of this assessment) the existing shipping baseline and the steps & risk controls that are in place to reduce the overall impact of the hazard to As Low As Reasonably Practicable (ALARP).

The assessment process involves the following main steps presented in Figure 13-1.

Figure 13-1 Assessment steps



For the purposes of this section the definition of "Hazard", "Risk" and "Maximum Displacement" are detailed below.

- **Hazard** - A potential source of marine incidences & collisions to the existing baseline of other marine users.

- **Risk**- The probability of suffering harm, loss or displacement and is a measure of the probability and consequence of a hazard.
- **Maximum Displacement** – defined as the maximum number of vessels affected and duration of displacement during the installation operations, as a result of the installation operations.

The steps presented in Figure 13-1 are described in more detail below.

13.3.2 Data gathering on baseline environment

To assess the potential effects resulting from the Project it is necessary to establish the current shipping conditions and features that exist along and near the Proposed Development. A 10km buffer has been applied around the Project to ensure that all shipping patterns and navigational features are captured.

The analysis has included:

- Potential accidents resulting from navigation activities (MAIB & RNLI).
- Navigation activities affected by the Proposed Development.
- Project structures that could affect navigation activities, such as external protection installed on the seabed.
- Project phases that could affect navigation activities.
- Other structures and features that could affect navigation activities.
- Vessel types involved in navigation activities.
- Conditions affecting navigation activities.
- Human actions related to navigation activities for use in hazard identification (if possible).

13.3.3 Identification of the hazard

The hazard identification phase seeks to build on the work of the data gathering and identify known hazards expected to be encountered as a result of the marine operations and presence of project vessels.

The hazards have been identified in relation to where the Project may make it more likely that existing vessels will deviate from the International Regulations for Preventing Collisions at Sea (COLREGS), either as an intended or unintended action.

This may include any effects which the Project might have on existing vessels such as vessels giving appropriate clearance to cable operations when undertaking cable installation and obstruction to the light and sound signals made by vessels and navigational aids in particular circumstances.

The approach used for hazard identification comprises a combination of both creative and analytical techniques, the aim being to identify all relevant hazards. Where relevant, consultation has been undertaken with stakeholders to help to identify hazards. The creative element is to ensure that the process is proactive and not confined only to hazards that have materialized in the past.

13.3.4 Risk analysis

The risk analysis introduces the concept of risk in a qualitative way in order to prioritise the hazards identified during the hazard identification process and assesses their impact on navigational safety.

Risk is the combination of frequency and consequence which are defined in Table 13-1 and 13-2 below. The definitions below have been developed using the IMO guidelines which includes effects on human safety and ships, however this assessment also focuses on displacement of existing vessels and this is the most likely consequence of the proposed development.

Table 13-1 Frequency of a hazard

Value	Description	Definition
1	Extremely Remote	Likely to occur once in the lifetime of the project (25 years)
2	Remote	Likely to occur once per year
3	Probably	Likely to occur once per month
4	Very Probable	Likely to occur once per week
5	Frequent	Likely to occur once per day

Table 13-2 Consequence of a hazard

Value	Description	Definition		
		Effects on Human Safety	Effect on Ship(s)	Displacement of Vessel(s)
1	Minor	Single or minor injuries	Single local equipment damage	Temporal displacement of vessel (hours)
2	Significant	Multiple minor injuries	Multiple local equipment damage	Temporal displacement of vessel (days)
3	Severe	Multiple or severe injuries	Non-severe ship and equipment damage	Temporal displacement of vessel (weeks)
4	Serious	Single fatality or multiple severe injuries	Severe damage to ship and equipment	Temporal displacement of vessel (months)
5	Catastrophic	Multiple fatalities	Total loss of ship and equipment	Permanent displacement of vessels

Risk prioritisation is an important part of the process, the greater the potential of a hazard, the greater the need to ensure that there are mitigation measures in place to control the risk.

13.3.5 Risk assessment

IMO Guidelines above define a hazard as "something with the potential to cause harm, loss or injury" the realisation of which results in potential accidents and, in this case, vessel displacement. The potential for a hazard to be realised can be combined with an estimated (or known) consequence of outcome. This combination is termed "risk". Risk is therefore a measure of the frequency and consequence of a hazard. One way to compare risk levels is to use a matrix approach.

Having established the frequency and consequence of the hazard, a risk assessment has been carried out using a risk matrix, adapted from the guidance above, presented in Table 13-3.

Table 13-3 Risk matrix

		Consequence				
		Minor	**Significant**	**Severe**	**Serious**	**Catastrophic**
Frequency	**Extremely Remote**	**1**	**2**	**3**	**4**	**5**
	Remote	**2**	**4**	**6**	**8**	**10**
	Probably	**3**	**6**	**9**	**12**	**15**
	Very Probable	**4**	**8**	**12**	**16**	**20**
	Frequent	**5**	**10**	**15**	**20**	**25**

At the low end of the scale, frequency is extremely remote and consequence minor; risk can be said to be negligible. At the high end, where hazards are defined as frequent and the consequence catastrophic, then risk is intolerable.

The result of using this matrix approach is to ensure that the level of risk is reduced to ALARP for the effects that the Project has on the baseline shipping environment. This is undertaken prior to any mitigation. Best Practice and Project Specific Mitigation will then be applied to generally reduce the effects to ALARP.

Definitions of the risk levels are provided in Table 13-4 below.

Table 13-4 Definitions of risk levels with respect to vessel displacement

Score	Classification	Definition
1-2	Negligible	A hazard which causes noticeable changes in the navigation environment but without effecting its sensitivities. Generally considered as insignificant.
3-4	Minor	A hazard that alters the character of the navigation environment in a manner that is consistent with existing baseline. Hazards are generally considered as minor and adequately controlled by best practice and legal controls. Opportunities to reduce hazards further through mitigation may be limited and are unlikely to be cost effective.
5-9	Moderate	A hazard which, by its frequency and consequence alters the aspect of the navigation environment. Generally considered as Moderate but effects are those, considered to be tolerable. However, it is expected that the hazard has been subject to feasible and cost-effective mitigation and has been reduced to As Low As Reasonably Practicable (ALARP) and that no further measures are feasible.
10-14	Major	An effect which, by its frequency and consequence alters most of the aspects of the navigation environment. Generally regarded as unacceptable prior to any mitigation measures being considered.
15-25	Intolerable	Regarded as unacceptable prior to any mitigation measures being considered.

13.3.6 Establish mitigation

The risk assessment includes a review of existing hazards and their associated mitigation measures. As a result, new mitigation measures (or changes to existing mitigation measures) may be identified for consideration, both where there are gaps in existing procedures and where mitigation need to be enhanced.

Mitigation measures are the actions or systems proposed to manage or reduce the potential negative effects identified. Mitigation measures that are embedded in the project design are listed in Table 4-1.

13.3.7 Risk control

The aim of assessing the Project operations on the existing shipping baseline is to reduce risk to ALARP.

The risk assessment is repeated taking into consideration the application of Best Practice and Project Specific Mitigation. This determines the risk level of the hazard with mitigation applied. When the risk assessment is carried out after mitigation is applied, the resulting risk level is referred to as ALARP.

Risks that have been assessed as **Major** or above after considering mitigation will normally require additional analysis and consultation to discuss and possibly further mitigate hazards where possible. Where further mitigation is not possible a residual hazard may remain.

13.4 Marine campaign works

The project description is provided in Appendix A and provides details of the proposed route and operational aspects of the marine campaign works such as cable installation, site preparation and cable protection methods. A schedule is also included estimating the timeframe for the various marine activities.

Existing vessels will be requested to remain at least 500m from project vessels whilst they are engaged in cable installation activities. This is due to the cable lay vessel's limited ability to manoeuvre whilst undertaking operations.

Pertinent Information from the project description that is directly relevant to the marine activities is outlined below.

Pre-Lay Survey
A detailed geophysical pre-lay survey will be undertaken across the entire Application Corridor. Typically, vessels survey at approximately **800 metres per hour(m/hr)** therefore it will take an estimated **2 days**.

Therefore, as a worst case the maximum area for disruption would be 1km wide by 1047m long per 24-hour period.

Pre-Lay Grapnel Run (PLGR) including boulder clearance and cable removal
PLGR progress rates are approximately **1.85km/hr** and will therefore take **approximately 6 days** for a PLGR to be undertaken. This usually clears the route of any debris such as out of service cables and fishing gear etc.

Large boulders that cannot be avoided during the route engineering process will need to be cleared on a case-by-case basis. Operational progress rates for these operations are currently unknown.

Therefore, as a worst case the maximum area for disruption during a PLGR would be 1km wide by 349m long per 24-hour period.

Cable Shore End Pull-In Operations
During the cable pull in operations the cable lay vessel (CLV) will be stationed around the 10m water depth contour. Once the cable is laid across the seabed, the cable lay vessel will remain on station at the 10m water depth contour at the other shore end. The cable will then float off the vessel to shore to complete the second cable pull in operation. The total cable pull in operation is estimated to take 2 days (1 day at each landfall).

Cable Lay Operations
Once the cable is successfully pulled (first cable pull-in) to its required position onshore, the buoyancy units will be removed and the CLV will commence laying operations until the second cable pull in. The CLV is a DP2 class vessel and expected laying speed will be between **250m/hr** and **350m/hr**. Cable lay operations are expected to take place over **approximately 4 days**.

Therefore, as a worst case the maximum area for disruption would be 1km wide by 233m long per 24-hour period.

Articulated Pipe Installation
The cable protection strategy may include the installation of Articulated Pipe. Generally, this is installed following the cable pull-in operations by divers or from the CLV, or by a combination of both methods therefore where areas that require articulating piping. Typical speeds for installing articulated piping are around **0.6m/hr**. Articulated pipe installation will be undertaken over **approximately 9 days**.

Rock protection
Subject to final engineering design rock placement may be utilised to protect the cable from potential damage from activities such as over-trawling. The method of cable protection would require to installation of graded rock to be deposited on top of the cable using a DP. Where required subject to final engineering design rock placement may occur over **approximately 9 days**.

13.5 Existing baseline assessment

13.5.1 Shipping overview

The Sound of Islay is widely used by mariners actively avoiding the open sea to the west of Islay. The Sound forms part of the Inshore Traffic Route and as such vessel movement is high with passenger vessels, fishing vessels, pleasure crafts, tugs and special craft and tankers all known to transit within

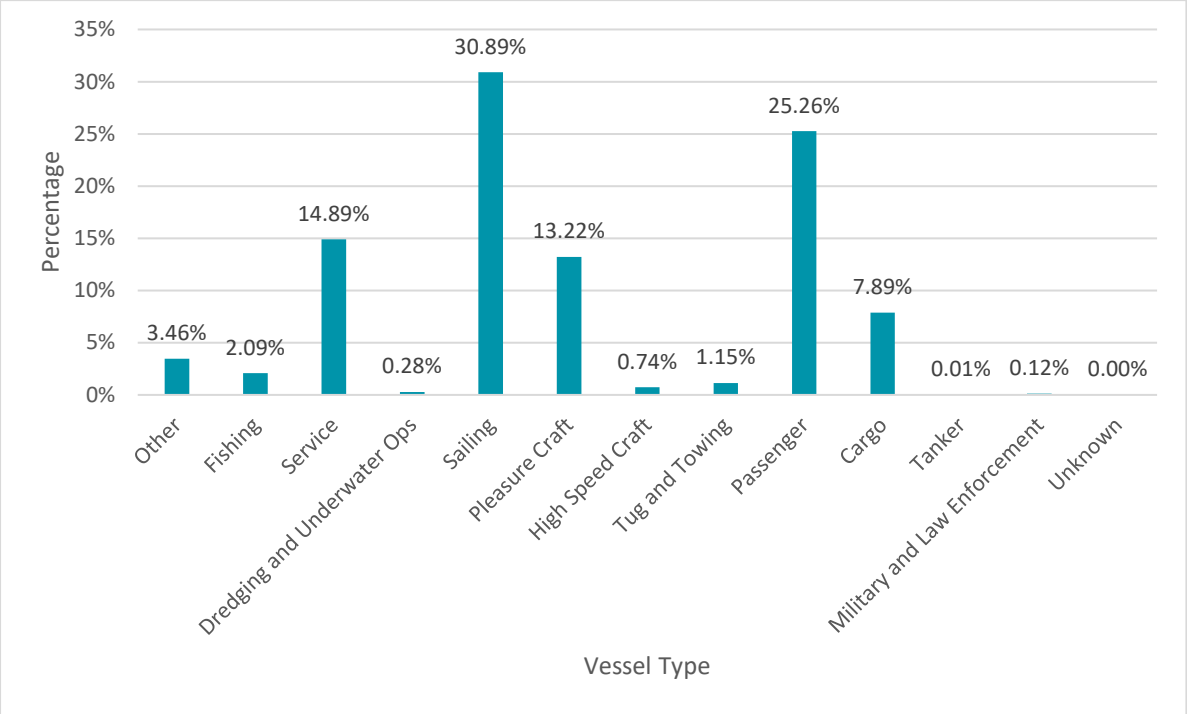
the sound at varying densities (ERM, 2022). Further discussion of marine traffic density within the Sound of Islay is provided in the Cable Route Desktop Study (ERM, 2022). In addition to the marine traffic aforementioned, the following cargo lines also have vessels using the Sound on a regular basis:

- Aasen Shipping and Chartings (Norway);
- Seatrans (Norway);
- Lys Line (Norway);
- Scotline Marine Holdings (UK); and
- Arklow Shipping Ltd (Ireland).

A review of marine traffic within the Sound of Islay also identified an area of high vessel density north of the Application Corridor along a chartered ferry route running between Feolin (Jura) and Port Askaig (Islay). Furthermore, the Application Corridor intersects the Kennacraig – Islay (Port Askaig) ferry route operated by CalMac Ferries (ERM, 2022). During the marine survey campaign, to gather information to inform the application for a Marine Licence to install this replacement cable, arrangements between the Project and CalMac were made to ensure that both survey vessel activities and ferry operations coexisted in harmony. This arrangement was very successful throughout the marine surveys and will continue into the installation phase of operations as a mitigation measure.

Analysis of vessel distribution by vessel type concluded that within the Application Corridor sailing and passenger vessels are the dominant vessel type present (Figure 13-2). Furthermore, 12 months of AIS data from January to December 2021 (EMODnet, 2023) were analysed to examine the typical patterns of vessel activity within/in the vicinity of the Application Corridor. The total average monthly vessel density within the Application Corridor can be observed in Figure 13-3 (P2635-AIS-001). Vessel density within the Application Corridor is high with an average 10 – 20 vessel hours per km^2 per month recorded across the Application Corridor in 2021 (Figure 13-3-AIS-001). It was identified within the Shipping and Navigation Review that the majority of vessel types passing north-south through the Sound were passenger vessels, accounting for 40% of all traffic (Anatec, 2022). Other vessel types commonly observed in the Sound of Islay included recreational and cargo vessels accounting for 22% and 20% of vessel traffic respectively (Anatec, 2022). The Royal Yachting Association (RYA) has classified the activity of recreational vessels in the Sound of Islay as “Light Recreational Use” (RYA, 2019).

Figure 13-2 Vessel distribution across the Jura to Islay Application Corridor

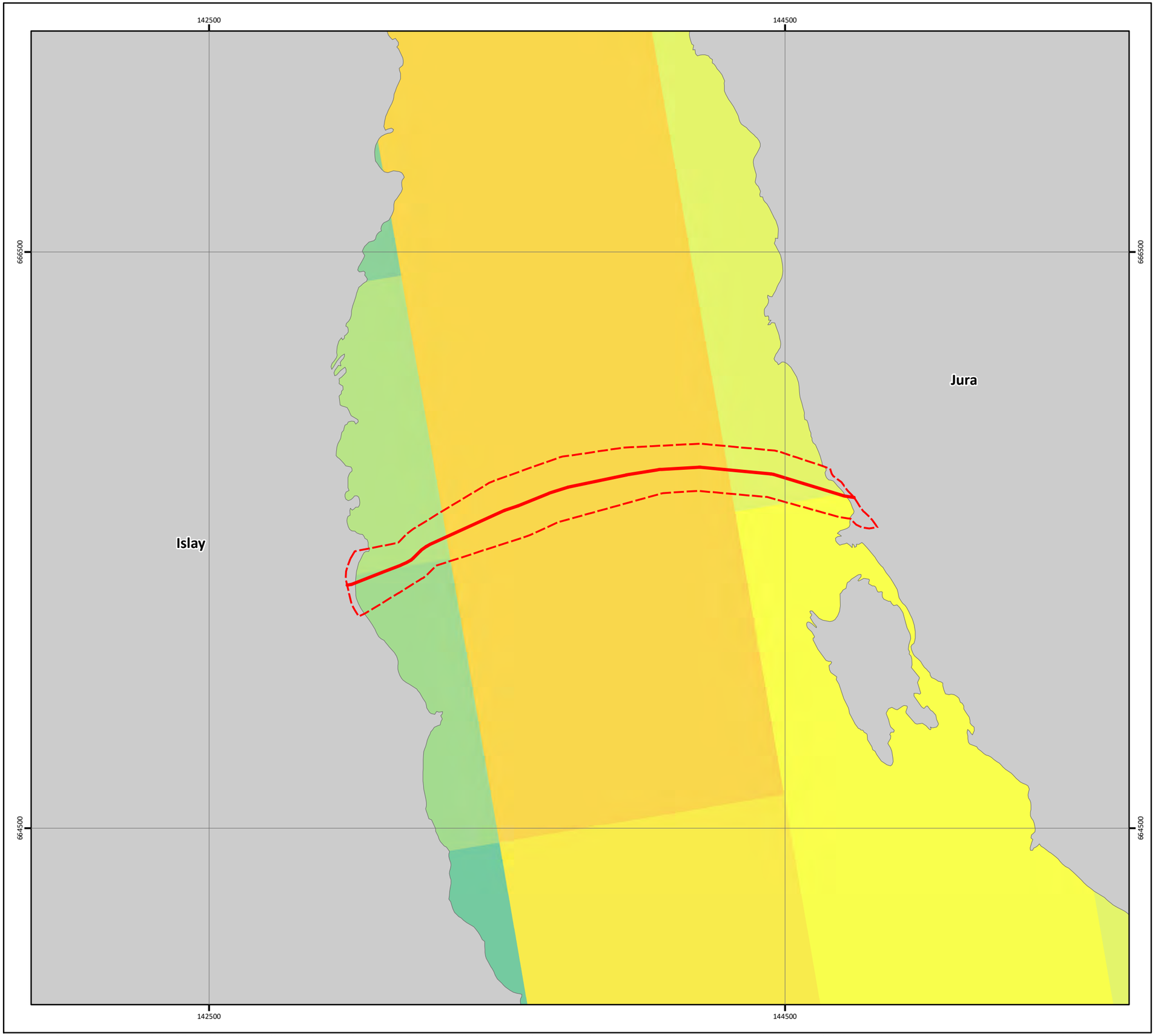


JURA-ISLAY DISTRIBUTION CABLE REPLACEMENT

AIS VESSEL DENSITY

Average Monthly Vessel Hours (2021) All Vessels

Drawing No: P2635-AIS-001	A



Legend

- Indicative RPL
- Installation Corridor

2021 Vessel Density

Vessel Hours (per km²)

- < 0.05
- 0.05 - 0.1
- 0.1 - 0.2
- 0.2 - 0.5
- 0.5 - 1
- 1 - 2
- 2 - 5
- 5 - 10
- 10 - 20

N W E S

NOTE: Not to be used for Navigation

Date	31 August 2023
Coordinate System	British National Grid
Projection	Transverse Mercator
Datum	OSGB 1936
Data Source	OS; GEBCO; SHEPD; EMODnet
File Reference	J:\P2635\Mxd_QGZ\03_AIS\ P2635-AIS-001.mxd
Created By	Oliver Bula
Reviewed By	Emma Kilbane
Approved By	Aodhfin Coyle

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0 200 400 600 800 Meters

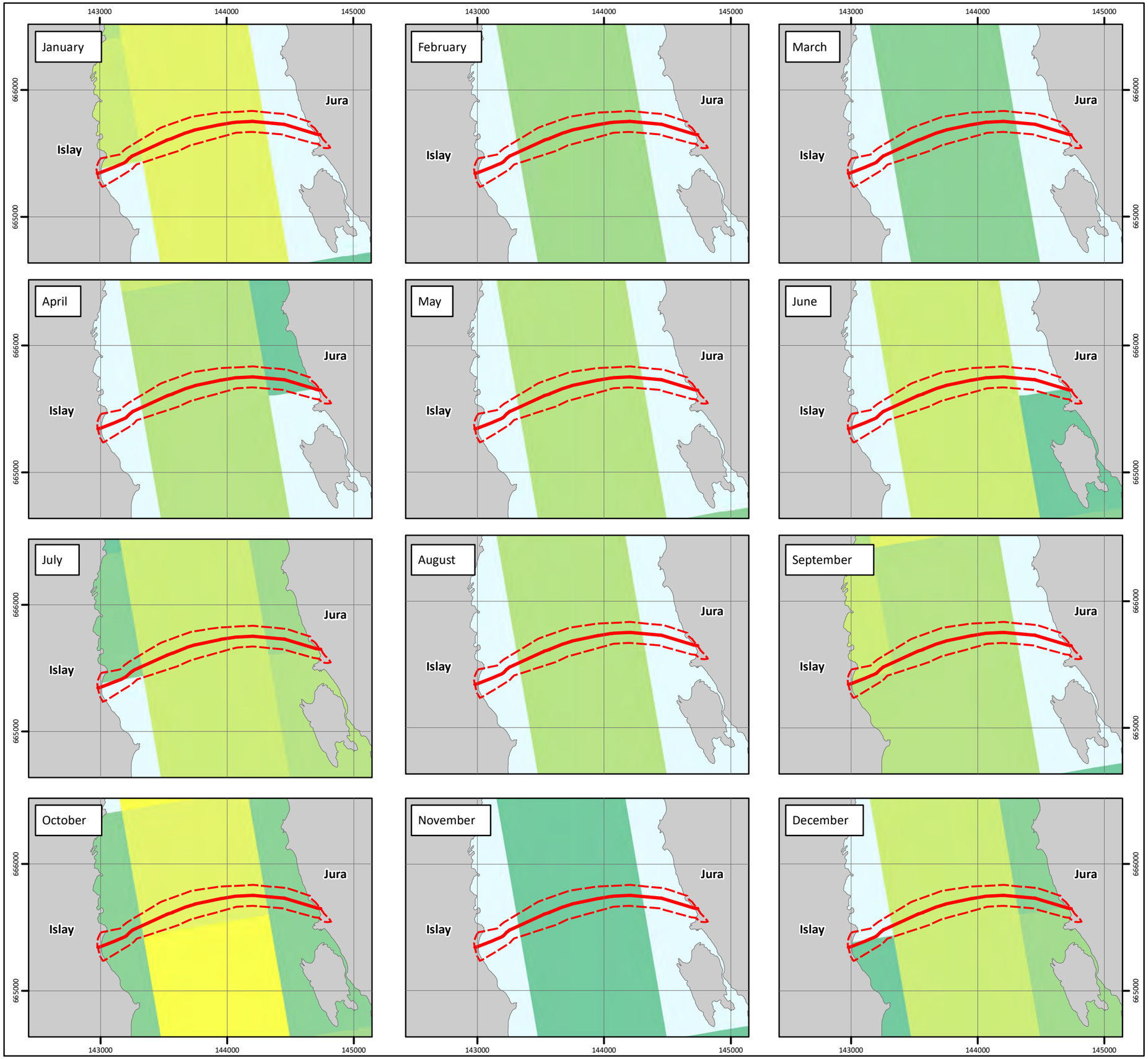
Seasonal distribution of the vessel traffic has been analysed in full concluding that the busiest months for fishing vessels within the Application Corridor are January and October and cargo vessels show a consistently moderate density year round (Figure 13-4 and Figure 13-5 drawing reference P2635-AIS-002 and 003).

JURA-ISLAY DISTRIBUTION CABLE REPLACEMENT

AIS VESSEL DENSITY

Monthly Vessel Densities (2021) Fishing Vessels

Drawing No: P2635-AIS-002 | **A**



Legend

- Indicative RPL
- Installation Corridor

2021 Vessel Density

Vessel Hours (per km²)

- 0 - 0.05
- 0.05 - 0.1
- 0.1 - 0.2
- 0.2 - 0.5
- 0.5 - 1
- 1 - 2
- 2 - 5
- 5 - 10
- 10 - 20
- 20 - 50
- 50 - 100
- 100 - 200
- 200 - 500
- > 500

NOTE: Not to be used for Navigation

Date	31 August 2023
Coordinate System	British National Grid
Projection	Transverse Mercator
Datum	OSGB 1936
Data Source	OS; GEBCO; SHEPD; EMODnet
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Created By	Oliver Bula
Reviewed By	Emma Kilbane
Approved By	Aodhfin Coyle

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km
0 0.5 1 1.5 2

January

February

March

April

May

June

July

August

September

October

November

December

Jura

Islay

143000

144000

145000

666000

665000

JURA-ISLAY DISTRIBUTION CABLE REPLACEMENT

AIS VESSEL DENSITY

Monthly Vessel Densities (2021) Cargo Vessels

Drawing No: P2635-AIS-003 | **A**

Legend

- Indicative RPL
- Installation Corridor

2021 Vessel Density

Vessel Hours (per km²)

- 0 - 0.05
- 0.05 - 0.1
- 0.1 - 0.2
- 0.2 - 0.5
- 0.5 - 1
- 1 - 2
- 2 - 5
- 5 - 10
- 10 - 20
- 20 - 50
- 50 - 100
- 100 - 200
- 200 - 500
- > 500

N W E S

NOTE: Not to be used for Navigation

Date	31 August 2023
Coordinate System	British National Grid
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File Reference	J:\P2635\Mxd_QGZ\03_AIS\ P2635-AIS-003.mxd
Created By	Oliver Bula
Reviewed By	Emma Kilbane
Approved By	Aodhfin Coyle

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km

0 0.5 1 1.5 2

13.5.2 Navigational features and anchorages

The Jura to Islay route has been engineered to avoid all anchorages and as such there are no anchorages within the Application Corridor. Five anchorages are located within the Sound of Islay, three to the north of the Application corridor and two the south (ERM, 2022). The McDougall's Bay and Whitefarland Bay anchorages, located approximately 2.4km and 4.76km from the Application Corridor respectively, both provide shelter for small crafts in depths of around 7m. Two anchorages northwest and northeast of Am Fraoch Island have a seabed of mainly sand and weed. They are located approximately 3.17km and 5.26km from the Application Corridor respectively. And finally, the anchorage at Bunnahabhain Bay is a convenient place to wait for a south-going tide and is located 8.28km from the Application Corridor. During an inspection of the existing Jura-Islay cable, carried out in 2021, no evidence of anchor strike was found. One aid to navigation, the Carraig Mòr lighthouse, lies onshore within the north cable search area (ERM, 2022).

13.5.3 Royal Yachting Association (RYA)

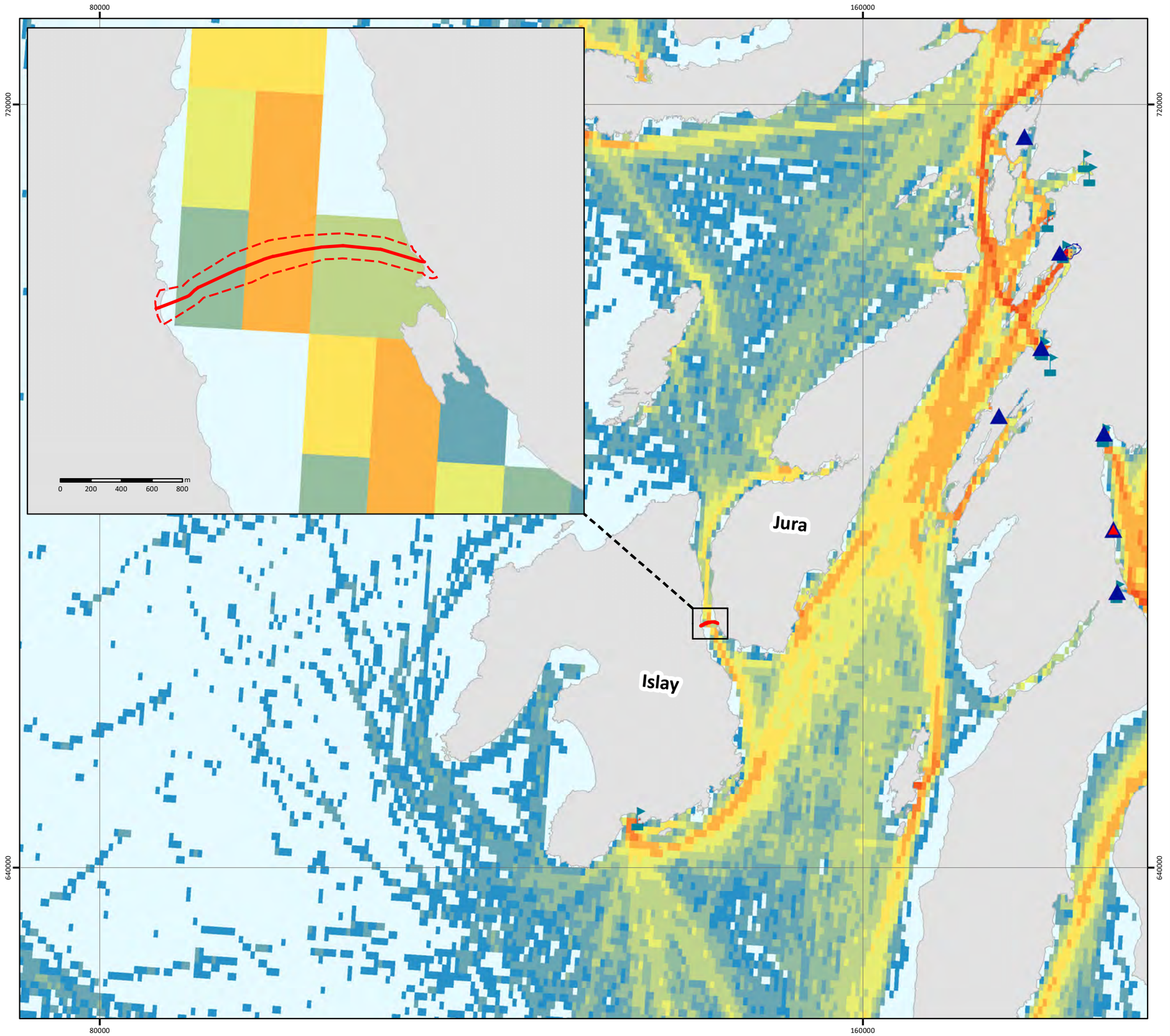
RYA clubs, training centres, marinas as well as the RYA AIS data and the Application Corridor are illustrated in Figure 13-6 (Drawing reference: P2635-REC-001). The figure also presents a heat map of AIS data of the recreation boating activity across study area. Within the Application Corridor recreational yachting occurs at averagely moderate levels (Figure 13-6, drawing reference: P2635-REC-001).

JURA-ISLAY DISTRIBUTION CABLE REPLACEMENT

RECREATIONAL ACTIVITIES

Royal Yachting Association UK Coastal Atlas of Recreational Boating

Drawing No: P2635-REC-001 | **A**



Legend

- Indicative RPL
- Installation Corridor

RYA UK Costal Atlas of Recreational Boating

- RYA Club
- RYA Training Centre
- Marina

AIS Intensity (Recreational Yachting)

Intensity

- Low
- High

NOTE: Not to be used for Navigation

Date	06 September 2023
Coordinate System	British National Grid
Projection	Transverse Mercator
Datum	OSGB 1936
Data Source	OS; RYA; SHEPD; ESRI
File Reference	J:\P2635\Mxd_QGZ\11_REC\ P2635-REC-001.mxd
Created By	Lewis Castle
Reviewed By	Oliver Bula
Approved By	Aodhfin Coyle

Scottish & Southern Electricity Networks intertek

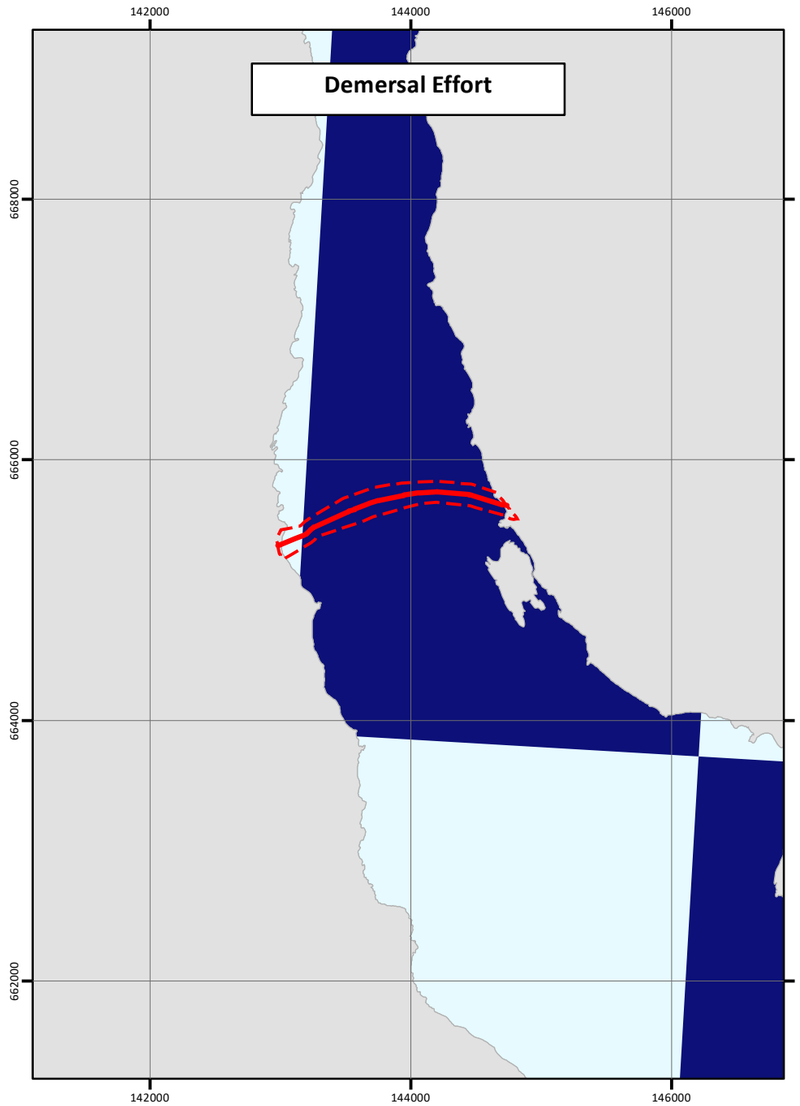
0 5 10 15 20 km

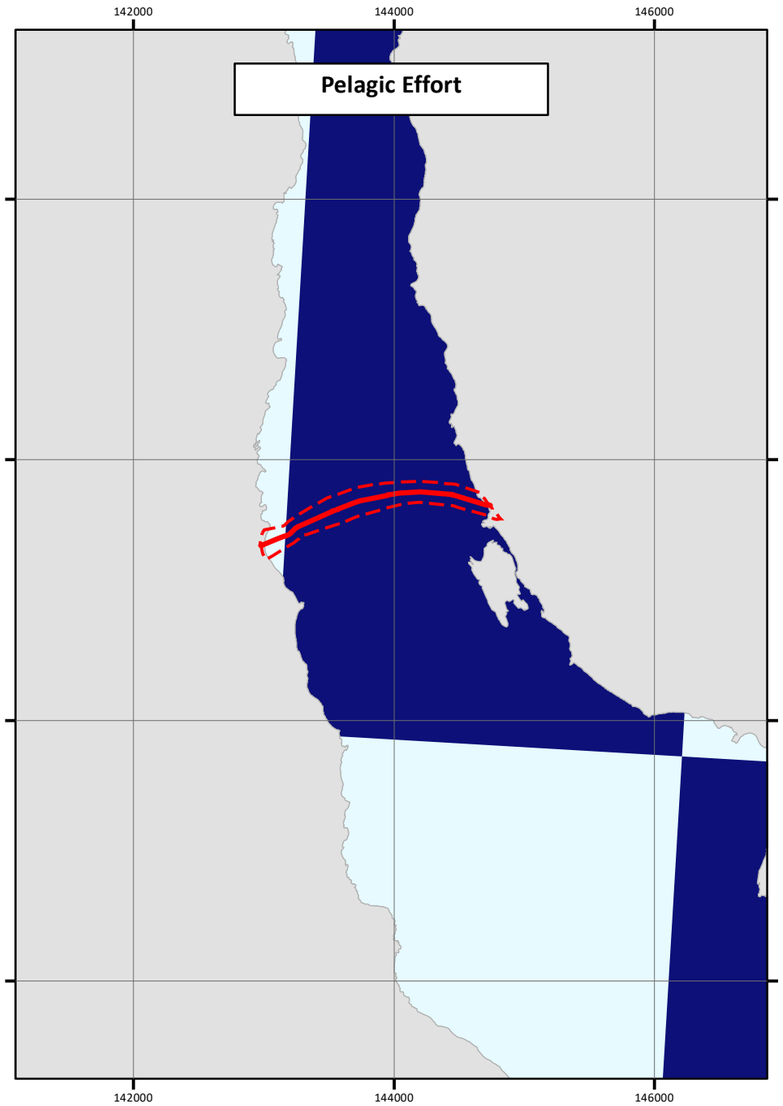
13.5.4 Fishing overview

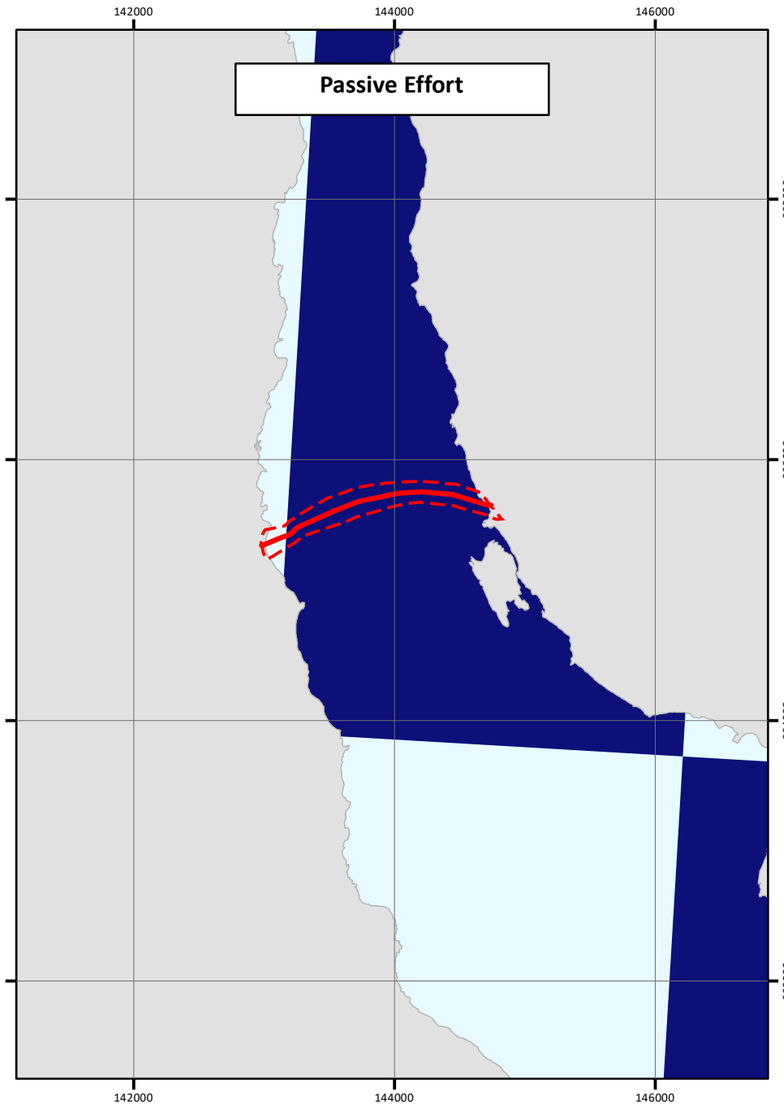
Section 11 “Commercial fisheries and other sea users” of this report provides a detailed assessment of the effects that the installation/operation of the replacement cable could have on fishing within/in the vicinity of the Application Corridor.

Many different fishing gears and fishing methods are used by commercial fisheries. Each gear type is used for specific activities and different gears can have very different impacts on the marine environment. In the Argyll area the most common gear types are potting (creeling), demersal twin trawling targeting *Nephrops* and scallop dredging (Appendix B) though fishing effort across the Application Corridor is low (Figure 13-7, drawing reference: P2635-FISH-007). There is no recorded evidence of trawling within the Application corridor (ERM, 2022).

By analysing the fishing vessel density seasonally (Figure 13-4, drawing reference: P2635-AIS-002), it can be seen that throughout the year fishing activity is moderate to low peaking in January and October with fishing vessel densities of 1 – 2 vessel hours per km^2.







JURA-ISLAY DISTRIBUTION CABLE REPLACEMENT FISHING ACTIVITY - Fishing Effort in kwh for ≥ 15m UK Vessels 2020

Drawing No: P2635-FISH-007 | A

Legend

- Indicative RPL
- Installation Corridor

Effort
(kilowatt/hours)

- > 0 - 2,500 (kilowatt/hours)
- > 2,500 - 5,000
- > 5,000 - 10,000
- > 10,000 - 20,000
- > 20,000 - 40,000
- > 40,000 - 80,000
- > 80,000 - 160,000
- > 160,000 - 320,000
- > 320,000 - 640,000
- > 640,000 (kilowatt/hours)

NOTE: Not to be used for Navigation

Date	06 September 2023
Coordinate System	British National Grid
Projection	Transverse Mercator
Datum	OSGB 1936
Data Source	MMO; OS; ESRI; SHEPD
File Reference	J:\P2635\Mxd_QGZ\02_FISH\ P2635-FISH-007.mxd
Created By	Lewis Castle
Reviewed By	Oliver Bula
Approved By	Aodhfin Coyle

Scottish & Southern Electricity Networks

intertek

0 0.5 1 1.5 2 km

13.5.5 Marine accident data

This section reviews the maritime incidents that have occurred within 10km of the Application Corridor across the Sound of Islay. The analysis is intended to provide a general indication as to whether the area of the Project is currently a low or high-risk area in terms of maritime incidents. If it were found that the proposed development resided in a high-risk area for incidents, this may indicate that the development could add to the existing maritime safety risks in the area.

Incident type and corresponding years for across the area of interest are presented in Figure 13-8. RNLI categories that are not relevant to this assessment have assigned to the category 'other'.

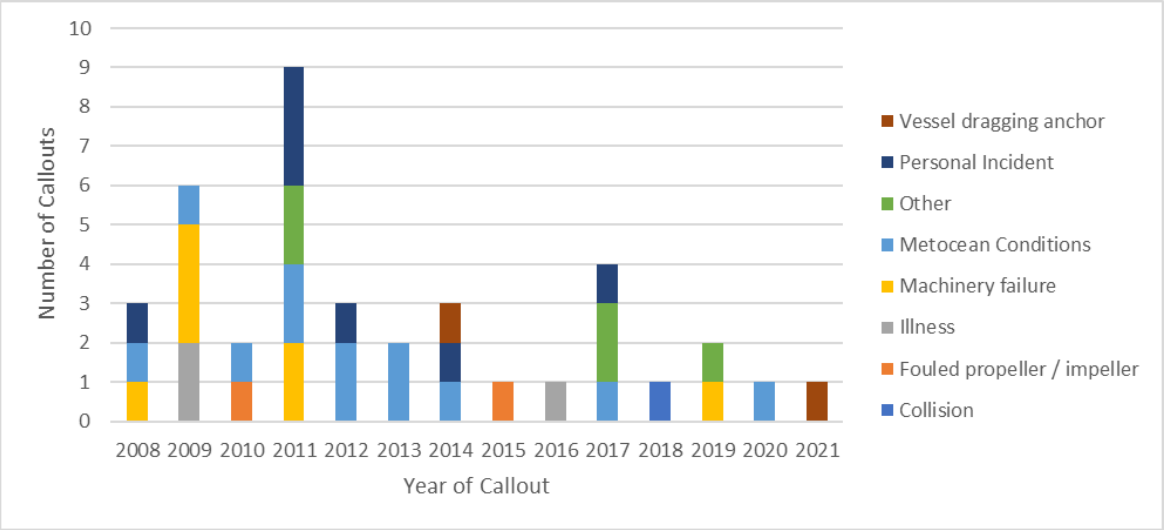
13.5.5.1 RNLI

The most recent available RNLI data (collected between 2008 and 2021) has been plotted spatially and analysed across the study area.

The dataset is a condensed Return of Service data from RNLI callouts across the United Kingdom and the Republic of Ireland (RoI). It is worth noting that there are records present that have not been spatially adjusted to their exact locations but does give an indication of the number of marine incidences in the area (RNLI, 2021).

A total of 39 launches across the study area (all to unique incidents) were recorded by the RNLI (excluding hoaxes and false alarms). This corresponds to an average of around 3 incidents per year indicating that the number of incidents in the Sound of Islay is relatively low.

Figure 13-8 RNLI yearly callouts



It can be seen that 'Metocean conditions' account for the largest portion of the dataset, followed by 'personal incident' and 'machinery failure'. There was only one recorded collision in the study area within the 13 year period analysed.

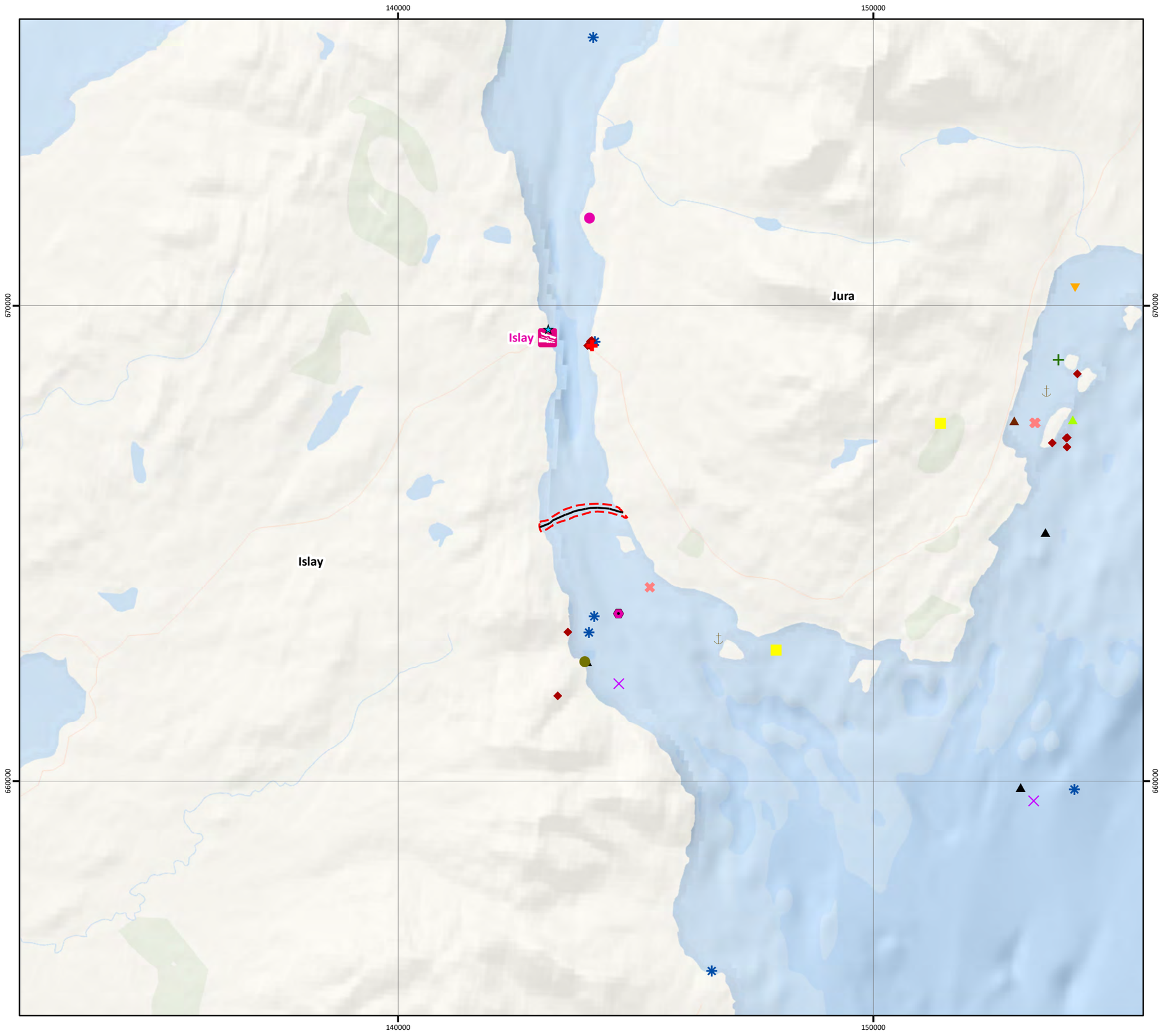
Due to the temporal effects of the offshore marine campaign works, and that incidences are largely as a result of personal incident, machinery failure and vessels being caught out in severe met ocean conditions, it is not thought that the presence of project vessels will increase the risks to the existing baseline of marine safety.

Figure 13-9 (Ref: P2635-RNLI-001) presents the locations of incidences recorded by the RNLI.

JURA-ISLAY DISTRIBUTION CABLE REPLACEMENT

RNLI
Return of Service Data 2008 - 2021

Drawing No: P2635-RNLI-001	A



Legend

- Indicative RPL
- Application Corridor
- RNLI Lifeboat Station

RNLI Returns of Service Incidents

- Ambulance or doctor call
- Collision with rocks
- Darkness or poor visibility
- Fouled propeller / impeller
- Ill crewman on vessel
- Illness
- In danger of drowning
- Machinery Failure
- Man overboard
- Person Injured
- Person on shoreline in difficulty
- Stranding / Grounding
- Thought to be in trouble
- Unknown
- Vessel dragging anchor
- Vessel overdue

NOTE: Not to be used for Navigation

Date	31 August 2023
Coordinate System	British National Grid
Projection	Transverse Mercator
Datum	OSGB 1936
Data Source	RNLI; OS; GEBCO; SHEPD; ESRI
File Reference	J:\P2635\Mxd_QGZ\05_RNLI\ P2635-RNLI-001.mxd
Created By	Oliver Bula
Reviewed By	Emma Kilbane
Approved By	Aodhfin Coyle

Scottish & Southern Electricity Networks intertek

0 1 2 3 4 km

13.5.5.2 Marine accident investigation branch

All UK-flagged commercial vessels are required by law to report accidents to MAIB. Non-UK flagged vessels do not have to report unless they are within a UK port/harbour or are within the UK 12 nautical miles (nm) and carrying passengers to or from a UK port. However, the MAIB will always record details of significant accidents of which they are notified by bodies such as the Coastguard. The Maritime and Coastguard Agency, harbour authorities and inland waterway authorities also have a duty to report accidents to the MAIB (Gov.uk, 2023).

The last five years of annual MAIB reports from 2018 to 2022 have been analysed to determine if any accidents have occurred within the Sea of Hebrides. The findings have been summarised below as:

- **2022**: Fatal man overboard from a motor cruiser while assisting a yacht in Port Ellen, Isle of Islay.
- **2022**: An attempt to free a grounded motor vessel from rocks within Port William, Dumfries and Galloway resulted in it sinking while under tow. The sole occupant was recovered from the vessel and later declared deceased.
- **2021**: Fall of a suspended buoy resulted in serious injury to a deckhand off the Isle of Muck, Scotland.
- **2021**: Fatal man over board in the Sound of Rùm, Scotland.
- **2020**: No incidents or accidents relating to vessels at sea within the vicinity of the study area.
- **2019**: No incidents or accidents relating to vessels at sea within the vicinity of the study area.
- **2018**: No incidents or accidents relating to vessels at sea within the vicinity of the study area.

One marine incident was reported within the Sound of Islay, corresponding to an average of 0.2 incidences a year, and it can be seen that in 2018 to 2020, there were no incidents or accidents reported by MAIB in the Sea of Hebrides.

It is worth noting that none of the incidents relate to a collision with other vessels so this area of the sea can be deemed relatively incident free.

13.6 Hazard identification

Marine operations and their associated hazards have been identified and listed in Table 13-5. A hazard has been assigned to each aspect of the marine operation including the zone of influence, resulting in a worst-case assessment. The zones of influence are also presented in the table below.

Table 13-5 Marine operations and identified hazards – shipping and navigation

Project Phase	Operation	Hazard Identified	Receptor	Zone of Influence
Pre-Lay	Pre-Lay Survey	▪ Displacement of vessels due to avoidance of project vessels ▪ Vessel Collision ▪ Project vessels blocking navigational features ▪ Fishing interaction with Surface laid cable	Project vessels; Commercial shipping; Recreational, boating and fishing vessels	1km wide x 2km along centreline (in any 24-hour period)
	Pre-Lay Grapnel Run			1km wide x 2km along centreline (in any 24-hour period)
				1km wide x 2km along centreline (in any 24-hour period)

Project Phase	Operation	Hazard Identified	Receptor	Zone of Influence
Installation	Shore End Operations (cable pull in)	▪ Accidental anchoring on surface laid cable ▪ Extreme weather conditions ▪ Displacement of vessels due to avoidance of project vessels		1km wide x 2km along centreline (in any 24-hour period)
	Cable Lay			1km wide x 2km along centreline (in any 24-hour period)
	Offshore installation, post-lay trenching			1km wide x 2km at crossing and burial locations (in any 24-hour period)
	Mattress Installation			3m wide x 60m along centreline (in any 24-hour period)
	Articulated Pipe Installation			260mm wide x 788m along centreline (in any 24-hour period)
	Rock Bag Installation			2.8m wide x 823m along centreline (in any 24-hour period)

13.7 Risk analysis

13.7.1 Displacement of vessels due to the avoidance of project vessels

Existing vessels may have to re-route around or reduce speed on approach to the project vessels which may causing a disturbance in the existing shipping patterns.

The presence of the project vessels will add an additional hazard for mariners to be aware of, which will potentially make them more vigilant when navigating through the area. There is ample 'sea room' for existing shipping to manoeuvre around the project vessels.

Since the project vessels will be moving at restricted speeds, any disruption will be temporary and short term in any one location. As shipping will have to make minor diversions to avoid the project vessels, their frequency has been assessed as **Probable**.

The Consequence has been assessed as **Minor** because it will be very short-term, temporary and acceptable alternatives for route planning are available for shipping traffic to easily manoeuvre around project vessels.

13.7.2 Vessel collisions

Existing vessels may have to re-route around project vessels which may create pinch points and alter the rate of encounters. Therefore, there is the potential for vessel-to-vessel collisions to occur as a result from existing shipping avoiding the marine operations, particularly across shipping lanes, near fishing grounds and at landfall areas.

Vessels will be operating in compliance with international shipping standards therefore vessel masters will be competent and adept at navigating in unfamiliar waters.

The probability of a vessel to vessel collision is **Extremely Remote** but the consequence could be **Catastrophic.**

13.7.3 Project vessels blocking navigational features

Project vessels have the potential to block key navigational features such as anchorages or leading lights for vessels on approach to ports.

While the Jura - Islay route does not intersect any known anchorages some displacement of vessels may occur and consideration to existing vessels may need to be carried out for the pull in operations.

However, these effects are temporary, and the cable route does enter any port authority areas, so the probability is expected to be **Remote** but consequence **Significant.**

13.7.4 Fishing interaction with surface laid cable

Fishing vessel gear will have the potential to interact with the cable route as the cable is surface laid. However, there is no recorded evidence of fishing gear interactions with the currently existing Jura – Islay cable (ERM, 2022).

Once established, appropriate mitigation is needed to ensure the cable is suitably protected against fishing and anchoring in the area. While it is advised in The Mariners Handbook and as per European Subsea Cables Association (ESCA) standard industry guidelines that fishing should be avoided across subsea cables, it is assumed that fishing may occur across the cable once installed.

During the installation phase, there will be a designated Fisheries Liaison Officer (FLO). With these services in place, there will be a FLO monitoring body present during the installation process. The project FLO can disseminate information to the guard vessels (if employed) regarding seasonal variations in fishing patterns.

The probability of a fishing gear interacting with the cables is **Remote**, but the consequence could be **Significant**.

13.7.5 Accidental anchoring on surface laid cable

Vessel anchors will have the potential to interact with the cable route if deployed where the cable is surface laid. However, it is very unlikely that an anchor will be deployed offshore in deeper waters and away from designated anchorage areas. The probability of an anchor deployment on a surface laid cable has been determined to be remote but remains a low probability in the event of an emergency or accidental deployment of an anchor.

As identified above, the project may have guard vessels during cable installation operations. Any guard vessels (if employed) will be required to possess the correct insurances and be on the approved SHEPD framework prior to their deployment.

The probability of a ships anchor interacting with the cables are **Extremely Remote**, but the consequence could be **Significant**.

13.7.6 Extreme weather conditions

A long-range weather forecast is usually monitored hourly when conducting marine operations which mitigates the risk of encountering any adverse or extreme weather conditions. However, the project vessels may need to shelter in port if weather exceeds working limitations. This would mean seeking shelter before the weather reaches the limitations of the vessel and its crew, however during the cable lay process this could mean cutting and buoying the cable in a situation that is too dangerous to continue working.

The probability of project vessels encountering extreme weather is **Remote**, but the consequence is likely to be **Minor**.

13.8 Risk assessment

In this risk assessment the hazard has been ranked by expected risk, based on the estimated frequency and consequence with no mitigation measures applied creating a 'Inherent Risk' to the project. The exercise was repeated with compliance mitigation and industry best practice measures which results in a residual risk allowing the hazards to be reduced to ALARP. No hazards more than a moderate risk are present as identified in the risk assessment.

13.8.1 Risk control

13.8.1.1 Compliance and best practise mitigation

Compliance measures are required to be undertaken to meet environmental and health and safety legislation. When undertaking the assessment, it is assumed that these measures as well as Best Practise Mitigation will be complied with; either as a matter of best practice or to ensure compliance with statute. Compliance and Best Practise Mitigation measures are outlined in Section 4 "Methodology".

13.9 Risk assessment

Table 13-6 presents the risk assessment conducted on the marine operations and associated hazards. All hazards have reached a risk level tolerable to the project through the ALARP process.

Navigation Risk Assessment **Cable Route: Jura - Islay**

Risk Assessment: Operation	Hazard	Inherent Risk							Risk Mitigation	Residual Risk						
		Frequency	Consequence			Risk Rating				Frequency	Consequence			Risk Rating		
			Effect on Human Safety	Effect on Ship(s)	Displacement of Vessel(s)	Effect on Human Safety	Effect on Ship(s)	Displacement of Vessel(s)			Effect on Human Safety	Effect on Ship(s)	Displacement of Vessel(s)	Effect on Human Safety	Effect on Ship(s)	Displacement of Vessel(s)
Route Clearance	Presence of Project vessels	3	1	1	2	3	3	6	EM14, EM17, EM13, EM12, EM19, EM16	3	1	1	1	3	3	3
	Vessel collision	2	5	5	3	10	10	6		1	5	5	2	5	5	2
	Project vessels blocking navigational features	3	1	1	2	3	3	6		1	1	1	1	1	1	1
	Extreme weather conditions	2	2	2	2	4	4	4		2	1	1	1	2	2	2
Shore end Operations	Presence of project vessels	3	1	1	2	3	3	6	EM14, EM17, EM13, EM12, EM19, EM16	3	1	1	2	3	3	6
	Vessel collision	2	5	5	4	10	10	8		1	5	5	3	5	5	3
	Project vessels blocking navigational features	3	1	1	3	3	3	9		2	1	1	2	2	2	4
	Fishing interaction with Surface laid cable	2	2	2	2	4	4	4		1	2	2	1	2	2	1
	Accidental anchoring on surface laid cable	2	2	2	2	4	4	4		1	2	2	2	2	2	2
	Extreme weather conditions	2	2	2	2	4	4	4		2	1	1	1	2	2	2
Cable Lay	Presence of Project vessels	3	1	1	3	3	3	9	EM14, EM15, EM17, EM13, EM12, EM19, EM16	3	1	1	1	3	3	3
	Vessel collision	2	5	5	4	10	10	8		1	5	5	3	5	5	3
	Project vessels blocking navigational features	3	1	1	3	3	3	9		2	1	1	2	2	2	4
	Fishing interaction with Surface laid cable	2	2	2	2	4	4	4		1	2	2	2	2	2	2
	Accidental anchoring on surface laid cable	2	2	2	2	4	4	4		1	2	2	2	2	2	2
	Extreme weather conditions	2	2	2	2	4	4	4		2	1	1	1	2	2	2
Post Lay Inspection	Presence of project vessels	3	1	1	3	3	3	9	EM14, EM15, EM17, EM13, EM12, EM19, EM16	2	1	1	2	2	2	4
	Vessel collision	2	5	5	4	10	10	8		1	5	5	3	5	5	3
	Project vessels blocking navigational features	3	1	1	3	3	3	9		2	1	1	2	2	2	4
	Fishing interaction with Surface laid cable	2	2	2	2	4	4	4		1	2	2	1	2	2	1
	Accidental anchoring on surface laid cable	2	2	2	2	4	4	4		1	2	2	2	2	2	2
	Extreme weather conditions	2	2	2	2	4	4	4		2	1	1	1	2	2	2
Additional External Cable Protection	Presence of project vessels	3	1	1	3	3	3	9	EM14, EM15, EM17, EM13, EM18, EM12, EM19, EM16	2	1	1	2	2	2	4
	Vessel collision	2	5	5	4	10	10	8		1	5	5	3	5	5	3
	Project vessels blocking navigational features	3	1	1	3	3	3	9		2	1	1	2	2	2	4
	Fishing interaction with Surface laid cable	2	2	2	2	4	4	4		1	2	2	1	2	2	1
	Accidental anchoring on surface laid cable	2	2	2	2	4	4	4		1	2	2	2	2	2	2
	Extreme weather conditions	2	2	2	2	4	4	4		2	1	1	1	2	2	2
	Change in water depth	1	2	2	2	2	2	2		1	2	2	1	2	2	1

14. CONCLUSION

This MEA supports the Marine Licence Application that SHEPD is submitting for installation activities associated with the replacement cable between Jura and Islay. This MEA includes an assessment of the potential impacts of the cable installation activities on sensitive receptors (Sections 5-13). Table 14-1 below provides a summary of the assessment findings. As a result of the findings, along with the embedded mitigation and best practice measures detailed in Section 4.2, it can be concluded that activities associated with installation of the replacement cable will not result in any significant effect on any relevant receptor.

Table 14-1 Assessment Summary

Environmental Receptor	Assessment Outcome	Additional Mitigation (where required)	Overall LSE / Impact Significance
Protected Sites (Section 5)	The assessment of protected sites has determined that the installation activities related to cable replacement will not have a negative impact on the conservation goals of any designated site within or in the vicinity of the Application Corridor. Any disruption caused by the cable installation will be minimal and temporary due to the short-term, localised, and transient nature of the activities. Therefore, there will be no Likely Significant Effects on any protected site due to these installation activities.	N/A	No LSE
Seabed and Water Quality (Section 6)	The evaluation of seabed and water quality has determined that the installation and operation of the Jura to Islay cable will not have an adverse impact on the seabed and water quality within or adjacent to the Application Corridor. Any sediment released during the cable installation process will quickly settle, becoming indistinguishable within the water column to levels typically associated with natural tidal and wave movements. As the majority of the cable will be surface laid, any disturbance resulting from direct habitat loss is expected to be highly localised, confined to the specific area covered by the cable, uraduct, and any rock bags, split pipe, or concrete mattresses (if deemed necessary). Therefore, there will be no significant loss of habitat or natural features as a consequence of these activities.	N/A	Not significant
Megafauna (Section 7)	The marine megafauna assessment has determined that due to the short-term, localised and transient nature of cable installation activities in combination with the low densities of marine megafauna in the area (common seal usage is estimated between 10-100 individuals, grey seal usage is estimated between 10-50 individuals, no encounters of flapper skate), there are unlikely to be any adverse effects to cetacean, pinniped and elasmobranchs as a consequence of the planned cable installation activities.	N/A	Not significant
Benthic and Intertidal Ecology (Section 8)	The benthic and intertidal ecology assessment has demonstrated that installation, operation and decommissioning activities associated with the cable replacement will not significantly affect the ecology in terms of the spatial extent at which environmentally sensitive habitats were recorded. Any impacts of cable installations on the habits and species within the Application Corridor will be temporary and habitat loss will be localised. Cable installation activities will be short term and the footprint is spatially small relative to the extent of the surrounding benthic environment.	N/A	Not significant - Slight
Ornithology (Section 9)	The ornithology assessment has determined that while nesting golden eagles near the Islay landfall area might exhibit a temporary alteration in their behaviour during the installation of the Jura to Islay cable, they are known to quickly return to their usual behaviour once the disruptive activity ends. Consequently, considering the brief, localised, and transitory nature of the installation activities, the expected impact on nesting golden eagles will be minimal.	N/A	Not significant
Marine Archaeology	The marine archaeological evaluation has established that no known features are present within the Application	N/A	Not significant

Environmental Receptor	Assessment Outcome	Additional Mitigation (where required)	Overall LSE / Impact Significance
(Section 10)	Corridor. Therefore, based on this assessment, it has been determined that the installation and operation of the Jura-Islay cable will not have any adverse impacts on marine archaeology within or near the Application Corridor.		
Commercial fisheries and other users (Section 11)	The assessment of commercial fisheries and other sea users has concluded that there will be no significant impacts on the interests of commercial fisheries or other sea users within or adjacent to the Application Corridor, as discussed in Section 11. Any temporary loss of access to fishing grounds resulting from the installation of the replacement cable will be minor given the short-term, localised, and transient nature of the cable installation activities. The Sound of Islay also accommodates various other sea users, including military vessels and recreational sea users engaged in activities such as sailing, power boating, kayaking, and canoeing. Any disruptions to these sea users operating within the Sound of Islay will be effectively managed through continuous communication and the publication of Notices to Mariners, ensuring coordination to prevent conflicts with potential activities. Any disturbances experienced by other sea users due to the installation of the replacement cable will be minor and temporary, in line with the short-term and localised nature of the work.	N/A	Not significant
UXO and existing utilities (Section 12)	Although there is a possibility of encountering unexploded ordnance (UXO) within the Application Corridor, as indicated by the findings of the geophysical survey, the likelihood of encountering UXO along the route is not considered to be significant. This reduced risk is attributed to the mitigation measures detailed in Section 12 and the establishment of a 15m exclusion zone around potential UXO. Within the immediate vicinity of the Application Corridor, there is no infrastructure apart from the existing distribution cable and segments of out-of-service cable. Consequently, no substantial impacts are anticipated from cable installation operations.	N/A	Not significant
Shipping and Navigation (Section 13)	The assessment of shipping and navigation has determined that the likelihood of interaction between project vessels and other vessels using the sound is high given the presence of shipping lanes, fishing activity, recreational boating and ferry routes. However, the arrangements made with CalMac ferries, requirement for all project vessels to comply with COLREGs and absence of the Application Corridor crossing any official Traffic Separation Schemes ensures that interactions are minimal and no significant effects will occur. Furthermore, after application of relevant best practise measures all identified, hazards are reduced to As Low As Reasonably Practicable, lowering the overall risk ratings.	N/A	Not significant

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APPENDIX A

Jura – Islay Distribution Cable Replacement

Project Description

APPENDIX B

Argyll Fisheries Liaison Mitigation Action Plan

APPENDIX C

Jura to Islay EPS Risk and Protected Sites and Species Assessment

APPENDIX D

Jura to Islay Offshore Construction Environmental Management Plan