Scottish Hydro Electric Power Distribution plc

Loch A' Choire Subsea Cable Replacement

Marine Environmental Appraisal

ASSIGNMENT A200682-S00
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REVISIONS & APPROVALS

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ABBREVIATIONS

TERM	DEFINITION
%	Percent
AA	Appropriate Assessment
AC	Alternative Current
ADCP	Acoustic Doppler Current Profiler
BEIS	Department of Business, Energy and Industrial Strategy
BWM	Ballast Water Management
CBA	Cost Benefit Analysis
CEMP	Construction Environmental Management Plan
CLV	Cable Lay Vessel
dB	Decibel
DC	Direct Current
DD	Decimal Degrees
DDM	Degrees and Decimal Minutes
DMS	Degrees, Minutes and Seconds
DSV	Dive Support Vessel
EC	European Community
ECoW	Ecological Clerk of Works
EMF	Electromagnetic Fields
EPS	European Protected Species
EU	European Union
EUNIS	European Union Nature Information System
FCS	Favourable Conservation Status
FIR	Fishing Industry Representative
FLMAP	Fisheries Liaison Mitigation Action Plan
FLO	Fisheries Liaison Officer
FO	Fibre Optic
ha	Hectare
HES	Historic Environment Scotland
HF	High Frequency
HMPA	Historic Marine Protected Area
HRA	Habitats Regulations Appraisal

TERM	DEFINITION
HVAC	High Voltage Alternating Current
IAMMWG	Inter-Agency Marine Mammal Working Group
IMO	International Maritime Organization
INNS	Invasive Non-Native Species
IRPCS	International Regulations for the Prevention of Collision at Sea
JNCC	Joint Nature Conservation Committee
KIS-ORCA	Kingfisher Information Service – Offshore Renewable and Cable Awareness
kHz	kilohertz
km	Kilometre
kV	Kilovolt
LF	Low Frequency
LSE	Likely Significant Effect
m	Metre
MarLIN	Marine Life Information Network
MARPOL	International Convention for the Prevention of Pollution from Ships
MBES	Multi-Beam Echosounder
MD-LOT	Marine Directorate – Licensing Operations Team
MEA	Marine Environmental Appraisal
MHWS	Mean High Water Springs
MLA	Marine Licence Application
MLWS	Mean Low Water Springs
µPA	Micro Pascal
MPA	Marine Protected Area
µT	Micro Tesla
NCMPA	Nature Conservation Marine Protected Area
NM	Nautical Miles
NMFS	National Marine Fisheries Service
NMPi	National Marine Plan Interactive
NSA	National Scenic Area
NtM	Notice to Mariners
OCT	Open Cut Trench
OHL	Overhead Lines

TERM	DEFINITION
OoS	Out of Service
PAC	Pre-Application Consultation
PAD	Protocol for Archaeological Discoveries
PLGR	Pre-Lay Grapnel Run
PMF	Priority Marine Feature
pUXO	Potential Unexploded Ordnance
PW	Phocid Carnivores in Water
RCZ	Recommended Clearance Zone
ROV	Remotely Operated Vehicle
SAC	Special Areas of Conservation
SBP	Sub Bottom Profiler
SCANS	Small Cetaceans in European Atlantic waters and the North Sea
SCFF	Scottish Creel Fishermen's Federation
SCOS	Special Committee on Seals
ScotMER	Scottish Marine Energy Research
SEPA	Scottish Environment Protection Agency
SHEPD	Scottish Hydro Electric Power Distribution plc
SMWWC	Scottish Marine Wildlife Watching Code
SNH	Scottish Natural Heritage
SOLAS	International Convention for the Safety of Life at Sea
SOPEP	Shipboard Oil Pollution Emergency Plans
SPA	Special Protection Area
SSEN	Scottish and Southern Electricity Networks
SSS	Side-Scan Sonar
SSSI	Site of Special Scientific Interest
t	Tonne
TDM	Touch Down Monitoring
TJP	Transition Joint Pits
UK	United Kingdom
UKHO	United Kingdom Hydrographic Office
USBL	Ultra Short Baseline
UXO	Unexploded Ordnance
VHF	Very High Frequency

TERM	DEFINITION
WCA 1981	Wildlife and Countryside Act 1981
WCRIFG	West Coast Regional Inshore Fisheries Group
WEWS	Water Environment and Water Services
WFD	Water Framework Directive

1 INTRODUCTION

Scottish Hydro Electric Power Distribution plc (SHEPD) holds a licence under the Electricity Act 1989 for the distribution of electricity in Scotland. It 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 provide a safe, secure and reliable supply to customers.

Following a routine inspection, SHEPD has determined that the existing Loch A' Choire North and South subsea cables are at the end of their operational life. Therefore, SHEPD intends to replace both cables to improve resilience of the network and deliver network security, as replacement of cables before they fail is essential to ensure a continued electricity supply to customers connected to these circuits. SHEPD intends to replace the two existing cables with two longer subsea cables (hereafter 'Kilmalieu - Loch A' Choire 1' and 'Kilmalieu - Loch A' Choire 2') ('the Project') in order to allow the removal of 4 kilometres (km) of Overhead Lines (OHL) on each circuit, the majority of which are largely inaccessible and difficult to maintain. The replacement of the two cables will be within the proposed cable corridor illustrated in Figure 1-1.

This Marine Environmental Appraisal (MEA) provides an assessment of the potential environmental impacts which may result from the Project and will be used to inform the licence applications. The mitigation requirements identified by this MEA will be included in the accompanying Marine Construction Environmental Management Plan (CEMP) (Document No. A-200682-S00-A-PLAN-001) to ensure they are effectively disseminated to and implemented by SHEPD and the cable installation contractor during the proposed cable installation activities.

This MEA should be read in conjunction with the following documents:

- Loch A' Choire Subsea Cable Replacement Project Description (A-200682-S00-A-REPT-002);
- Loch A'Choire Pre-Application Consultation (PAC) Report;
- Marine Licence Application (MLA) Form;
- European Protected Species (EPS) Licence Application Form;
- Basking Shark Licence Application Form;
- Marine CEMP;
- West Highlands Fisheries Liaison Mitigation Action Plan (FLMAP);
- How SHEPD co-exists with other marine users document[1];
- Operation, Inspection, Maintenance and Decommissioning Strategy (OIMD); and
- Cost Benefit Analysis (CBA) Summary Report.

[1] *https://www.ssen.co.uk/globalassets/about-us/projects-and-live-works/subsea-cables/how-shepd-co-exists-with-other-marine-users.pdf.*

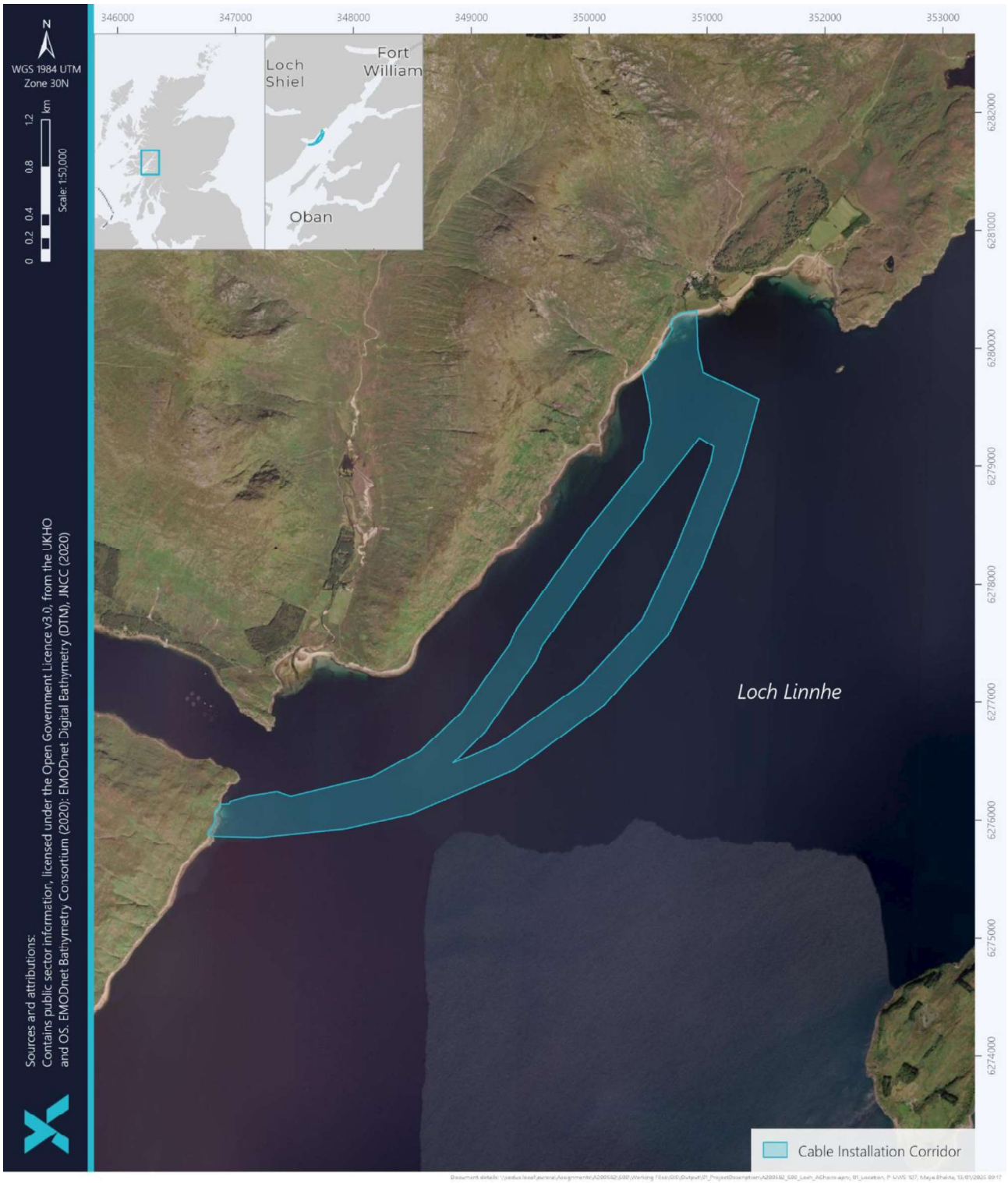

Figure 1-1 Loch A' Choire Proposed Cable Corridor

1.1 Project Need

The main driver behind this Project is to reduce the overall network risk associated with the two existing cables which, following routine cable inspections have been deemed to be at the end of their operational life and are therefore prioritised for Asset Replacement. Proactive replacement of cables before they fail is essential to ensure a continued electricity supply to customers connected to these circuits.

This Project will allow SHEPD to deliver upon two of its commitments within the RIIO ED2 business plan given both cables are named schemes within the plan. Additionally, the Project will benefit the region by removing 4 km of OHL on each circuit, the majority of which are largely inaccessible and difficult to maintain.

1.2 Consideration of Alternatives

Following routine inspection of the existing Loch A' Choire North and South subsea cables, the following options were considered to provide the best investment option and improve network resilience:

Option 1: Do minimum – replace on failure. This option would only replace each individual cable after it had failed. This was not considered a viable option as it would risk customers being without an electricity supply and would incur impact and constrained generation costs, with the cost of an emergency replacement being significantly higher than a planned replacement.

Option 2: Replace cable with new similar length cables. This option would replace both existing cables at the same time, following a similar cable route. This would improve resilience of the network, deliver network security and be sufficient to support energy supply demand for over 20 years based on current forecasted growth. Cost efficiencies would be realised in replacing both cables at the same time.

Option 3: Augmentation of the route with a second similar length cable. This option would replace one existing cable and leave the other cable in place without any upgrade. This option would improve the security of supply to connected customers until the existing cable fails but would offer reduced reliability of the network and would incur higher costs in replacing cables individually and as an emergency replacement.

Option 4: Replace both cables with a longer cable route. This option has the same benefits as Option 2 but allows the removal of an inaccessible section of overhead line, which will improve operator safety and network resilience.

Option 4 is considered to be the best option as it delivers the greatest benefits in terms of improving reliability of network and reducing potential for customer interruptions due to a subsea cable fault. It also reduces risk of incurring impact costs, improves onshore network access, safety and resilience, and offers efficiencies in delivering cable replacement of two end of life cables which support each other at the same time.

2 LEGISLATIVE CONTEXT

This Section presents the key United Kingdom (UK) and Scottish legislation and policies which are applicable to the proposed installation, operation and maintenance, and decommissioning activities and explains how and where these have been considered in the production of this MEA. This includes adherence to statutory legislation as well as to the policies presented in Scotland's National Marine Plan (Scottish Government, 2015). Where necessary, additional mitigation measures have been presented in topic-specific sections to ensure that the Project adheres to relevant legislation and policies and comply with the conditions required when granting applicable licences. The information is provided in table form for ease of reference, as shown in Table 2-1.

Table 2-1 Key UK and Scottish Legislation and Policies Pertinent to the Project

LEGISLATION OR POLICY	KEY REQUIREMENTS	RELEVANT SECTION (WHERE APPLICABLE)
Legislation		
Marine (Scotland) Act 2010	The Marine (Scotland) Act 2010 applies to Scottish territorial waters and makes provisions in relation to functions and activities in the Scottish marine area. The following regulations are pertinent to the proposed installation activities: • Under Section 21 of the Act a marine licence is required for any activity which involves: – Deposit of any substance or object in the sea or on or under the seabed; – Construction, alteration or improvement of works in or over the sea or on or under the seabed; and/or – Removal of substances or objects from the seabed. • Under Section 82 of the Marine (Scotland) Act 2010, MD-LOT, acting on behalf of the Scottish Ministers, is required to consider whether a licensable activity is capable of affecting (other than insignificantly) a protected feature of a Nature Conservation Marine Protected Area (NCMPA) or a marine historic asset in a Historic Marine Protected Area (HMPA); and • The seal haul-out sites, designated under The Protection of Seals (Designation of Haul-Out Sites) (Scotland) Order 2014 (as amended), are protected under Section 117 of the act.	SHEPD will submit an MLA form alongside this MEA for the proposed cable installation activities. Section 5: Designated Sites assesses the potential impacts on NCMPAs in the vicinity of the proposed cable corridor. There is one NCMPA with cetaceans as qualifying features within the connectivity range of 50 km of the proposed cable corridor: the Sea of Hebrides NCMPA, which is designated for basking shark (*Cetorhinus maximus*) and minke whale (*Balaenoptera acutorostrata*). The assessment in Section 5.5.1 concluded there would be no likely significant effects on the NCMPA. Section 7: Marine Megafauna assesses the potential for the proposed cable installation activities to injure or disturb seals. There are no designated seal haul-outs or grey seal breeding sites that overlap with or are located within 500 m of the proposed cable corridor. Section 0: Marine Archaeology assesses the potential impacts on marine archaeological protected features (including HMPAs). This assessment concluded that no significant effects on marine archaeology are to be expected.
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 (as amended in Scotland) transpose the European Habitats Directive (92/43/EEC) and Birds Directive (79/409/EEC) into Scottish Law. In addition, the Conservation (Natural Habitats) (European Union (EU) Exit) (Scotland) (Amendment) Regulations 2019 make provision for the selection, designation, registration and notification of sites to be protected under the European Community (EC) Directive 92/43/EEC on the conservation of natural habitats and of wild fauna and flora. The Habitats Regulations Appraisal (HRA) process forms part of these regulations. The HRA process requires that any proposal which has the potential to result in a Likely Significant Effect (LSE) to a European site or its designated features to be subject to an Appropriate Assessment (AA) carried out by the Competent Authority. The Conservation (Natural Habitats, & c) Regulations 1994 as amended make it an offence to deliberately or recklessly capture, kill, injure, harass or disturb an EPS. When EPS are present, licences to permit activities that will affect them can only be granted when: • There is a licensable purpose; • There are no satisfactory alternatives; and • The action authorised will not be detrimental to the maintenance of the population of the species concerned at a Favourable Conservation Status (FCS) in their natural range. The 2019 Regulations make amendments to the existing instruments that transpose the habitats and wild birds' directives so that they are operable.	Section 5: Designated Sites assesses the potential impacts on protected habitats and species. This assessment concluded that no LSE on a European Site or its designated features are to be expected from the Project. Section 7: Marine Megafauna assesses the potential impacts on EPS which have potential connectivity with the proposed cable installation activities (i.e. cetaceans). This assessment concluded that there will be no injurious impacts to these receptors; however, as disturbance could not be ruled out, an EPS licence application will be submitted to MD-LOT.

LEGISLATION OR POLICY	KEY REQUIREMENTS	RELEVANT SECTION (WHERE APPLICABLE)
Wildlife and Countryside Act 1981 (WCA 1981) (as amended) and the Nature Conservation (Scotland) Act 2004	The primary legislation for the protection of birds in the UK is the WCA 1981 (as amended) in combination with the Nature Conservation (Scotland) Act 2004. Under these acts, it is an offence to harm wild bird species, their eggs and nests. Additional protection is provided for certain bird species listed on Schedule 1 of the WCA 1981, 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. 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.	Section 0: Ornithology assesses the potential impacts on ornithological receptors. This assessment concluded that no significant effects on wild birds, their eggs, and nests are to be expected.
Policy		
Scotland's National Marine Plan (2015): General Policies – • **GEN 2 Economic benefit;** • **GEN 3 Social benefit;** • **GEN 5 Climate change;** • **GEN 6 Historic environment;** • **GEN 7 Landscape/seascape;** • **GEN 8 Coastal process and flooding;** • **GEN 9 Natural heritage;** • **GEN 10 Invasive non-native species;** • **GEN 12 Water quality and resource;** • **GEN 13 Noise; and** • **Gen 18 Engagement.**	**GEN 2 Economic benefit**: Sustainable development and use which provides economic benefit to Scottish communities is encouraged when consistent with the objectives and policies of this Plan.	Section 1: Introduction outlines the social and economic benefits of the Loch A' Choire Subsea Cable Replacement. The replacement of the two existing cables which are at the end of their operational life with two longer cables will provide social and economic benefits to the region by improving reliability of network and reducing potential for customer interruptions due to a subsea cable fault, reducing risk of incurring impact costs, improving onshore network access, safety and resilience as well as offering efficiencies in delivering cable replacement of two end of life cables which support each other at the same time. The Project will also benefit the region by removing 4 km of OHL on each circuit, the majority of which is inaccessible and unmaintainable.
	GEN 3 Social benefit: Sustainable development and use which provides social benefits is encouraged when consistent with the objectives and policies of this Plan.	
	GEN 5 Climate change: Marine planners and decision makers must act in the way best calculated to mitigate, and adapt to, climate change.	Climate change has been considered within the biological sections of the MEA including: Section 6: Seabed and Water Quality; Section 7: Marine Megafauna; Section 8: Benthic and Intertidal Ecology; and Section 0: Ornithology.
	GEN 6 Historic environment: Development and use of the marine environment should protect and, where appropriate, enhance heritage assets in a manner proportionate to their significance.	Section 0: Marine Archaeology assesses the potential interaction between the proposed cable installation activities and marine archaeological receptors including heritage assets. This assessment concluded that no significant effects on heritage assets are to be expected.
	GEN 7 Landscape/seascape Marine planners and decision makers should ensure that development and use of the marine environment take seascape, landscape and visual impacts into account.	The Project will have no significant negative long-term landscape/seascape effects. However, it should be noted that there will be potential landscape benefits as the Project will facilitate removal and replacement of 4 km of existing OHL on each circuit, as outlined in Section 1, thereby reducing existing visual impacts from the baseline environment.
	GEN 8 Coastal process and flooding: Developments and activities in the marine environment should be resilient to coastal change and flooding, and not have unacceptable adverse impact on coastal processes or contribute to coastal flooding.	Section 6: Seabed and Water Quality assesses the potential impact on coastal processes and flooding. This assessment concluded that the proposed cable installation activities will not result in changes to coastal processes and will not contribute to coastal flooding.
	GEN 9 Natural heritage: Development and use of the marine environment must (a) Comply with legal requirements for protected areas and protected species; (b) Not result in significant impact on the national status of Priority Marine Features; and (c) Protect and, where appropriate, enhance the health of the marine area.	The potential for the proposed cable installation activities to impact protected areas and protected species (including Priority Marine Features (PMFs)) is assessed within Section 5: Designated Sites as well as the biological sections of the MEA including: Section 7: Marine Megafauna; Section 8: Benthic and Intertidal Ecology; and Section 0: Ornithology.

LEGISLATION OR POLICY	KEY REQUIREMENTS	RELEVANT SECTION (WHERE APPLICABLE)
	GEN 10 Invasive non-native species: Opportunities to reduce the introduction of invasive non-native species to a minimum or proactively improve the practice of existing activity should be taken when decisions are being made.	Section 8: Benthic and Intertidal Ecology assesses the potential for the introduction of Invasive Non-Native Species (INNS) as a result of the proposed cable installation activities. This assessment concluded that the likelihood of INNS being introduced is low.
	GEN 12 Water quality and resource: Developments and activities should not result in a deterioration of the quality of waters to which the Water Framework Directive, Marine Strategy Framework Directive or other related Directives apply.	Section 6: Seabed and Water Quality assesses the potential impacts on the water quality of designated waters. This assessment concluded that no significant effects on the water quality of designated waters are to be expected.
	GEN 13 Noise: Development and use in the marine environment should avoid significant adverse effects of man-made noise and vibration, especially on species sensitive to such effects.	The potential for noise and vibration associated with the proposed cable installation activities to affect sensitive species has been considered within Section 7: Marine Megafauna. The noise impact assessment concluded that there will be no injurious impacts on sensitive species; however, as disturbance could not be ruled out, an EPS licence application will be submitted to MD-LOT. The EPS licence Application form submitted alongside this MEA contains full consideration of alternatives to noise emitting activities, including the "do nothing" option.
	GEN 18 Engagement: Early and effective engagement should be undertaken with the general public and all interested stakeholders to facilitate planning and consenting processes.	SHEPD has undertaken stakeholder engagement with the following: • Community council representatives via a PAC event held in Strontian (online 7th October and in-person 30th October 2024); • Marine and Coastguard Agency; • MD-LOT; • Argyll and Bute Council; • NatureScot; • Highland Council; • RSPB; • Northern Lighthouse Board; • Historic Environment Scotland; and • Representatives of other sea users, including Mowi Scotland Ltd. Fisheries representatives and stakeholder groups have been consulted with, including: • Ross, Sutherland, Skye & Lochalsh Fishermen's Association; • Scottish White Fish Producers Association; • Mull and Iona Fishermen's Association; • Clyde Fishermen's Association; • Scottish Fisherman's Federation; and • South-West Inshore Fisheries Group.

LEGISLATION OR POLICY	KEY REQUIREMENTS	RELEVANT SECTION (WHERE APPLICABLE)
Scotland's National Marine Plan (2015): Sea Fisheries Policies – • **Fisheries 1;** • **Fisheries 2; and** • **Fisheries 3.**	**FISHERIES 1**: Taking account of the EU's Common Fisheries Policy, Habitats Directive, Birds Directive and Marine Strategy Framework Directive, marine planners and decision makers should aim to ensure: • Existing fishing opportunities and activities are safeguarded wherever possible; • An ecosystem-based approach to the management of fishing which ensures sustainable and resilient fish stocks and avoids damage to fragile habitats; • Protection for vulnerable stocks (in particular for juvenile and spawning stocks through continuation of sea area closures where appropriate); • Improved protection of the seabed and historical and archaeological remains requiring protection through effective identification of high-risk areas and management measures to mitigate the impacts of fishing, where appropriate; • That other sectors take into account the need to protect fish stocks and sustain healthy fisheries for both economic and conservation reasons; • Delivery of Scotland's international commitments in fisheries, including the ban on discards; and • Mechanisms for managing conflicts between fishermen and/or between the fishing sector and other users of the marine environment.	As described in Section 11: Commercial Fisheries and Other Sea Users, SHEPD's existing regional West Highlands FLMAP identifies mitigation measures to minimise potential impacts on commercial fisheries and other sea users. A review of the West Highlands FLMAP is presented in Section 11 which concludes that given the embedded mitigation combined with the highly localised nature of the Project, the fact that the Project is replacing the existing cables and the short duration of the installation, no significant impacts on sea fisheries, are anticipated. Please refer to the West Highlands FLMAP for further detail on the proposed cable installation activities interaction with commercial fisheries.
	FISHERIES 2: The following key factors should be taken into account when deciding on uses of the marine environment and the potential impact on fishing: • The cultural and economic importance of fishing, in particular to vulnerable coastal communities; • The potential impact (positive and negative) of marine developments on the sustainability of fish and shellfish stocks and resultant fishing opportunities in any given area; • The environmental impact on fishing grounds (such as nursery, spawning areas), commercially fished species, habitats and species more generally; and • The potential effect of displacement on: fish stocks; the wider environment; use of fuel; socio-economic costs to fishers and their communities and other marine users.	
	FISHERIES 3: Where existing fishing opportunities or activity cannot be safeguarded, a Fisheries Management and Mitigation Strategy should be prepared by the proposer of development or use, involving full engagement with local fishing interests (and other interests as appropriate) in the development of the Strategy. All efforts should be made to agree the Strategy with those interests. Those interests should also undertake to engage with the proposer and provide transparent and accurate information and data to help complete the Strategy. The Strategy should be drawn up as part of the discharge of conditions of permissions granted.	
Scotland's National Marine Plan (2015): Recreation and Tourism Policy – • **Recreation and Tourism 2.**	**REC & TOURISM 2**: The following key factors should be taken into account when deciding on uses of the marine environment and the potential impact on recreation and tourism: • The extent to which the proposal is likely to adversely affect the qualities important to recreational users, including the extent to which proposals may interfere with the physical infrastructure that underpins a recreational activity; • The extent to which any proposal interferes with access to and along the shore, to the water, use of the resource for recreation or tourism purposes and existing navigational routes or navigational safety; • Where significant impacts are likely, whether reasonable alternatives can be identified for the proposed activity or development; and • Where significant impacts are likely and there are no reasonable alternatives, whether mitigation, through recognised and effective measures, can be achieved at no significant cost to the marine recreation or tourism sector interests.	As described in Section 11: Commercial Fisheries and Other Sea Users, a review of the potential impacts on recreation and tourism has been presented within the West Highlands FLMAP. This assessment concluded that no significant effects on recreational users and/or tourism are to be expected.

LEGISLATION OR POLICY	KEY REQUIREMENTS	RELEVANT SECTION (WHERE APPLICABLE)
Scotland's National Marine Plan (2015): Shipping, Ports, Harbours and Ferries Policies – • **Transport 1; and** • **Transport 6.**	**TRANSPORT 1**: Navigational safety in relevant areas used by shipping now and in the future will be protected, adhering to the rights of innocent passage and freedom of navigation contained in UN Convention on the Law of the Sea (UNCLOS). The following factors will be taken into account when reaching decisions regarding development and use: • The extent to which the locational decision interferes with existing or planned routes used by shipping, access to ports and harbours and navigational safety. This includes commercial anchorages and defined approaches to ports; • Where interference is likely, whether reasonable alternatives can be identified; and • Where there are no reasonable alternatives, whether mitigation through measures adopted in accordance with the principles and procedures established by the International Maritime Organization can be achieved at no significant cost to the shipping or ports sector.	As described in Section 11: Commercial Fisheries and Other Sea Users, a review of shipping, ports, harbours and navigational safety around the proposed cable corridor during the proposed cable installation activities has been presented within the West Highlands FLMAP. This assessment concluded that no significant effects on shipping, ports, harbours and ferries are to be expected.
	TRANSPORT 6: Marine planners and decision makers and developers should ensure displacement of shipping is avoided where possible to mitigate against potential increased journey lengths (and associated fuel costs, emissions and impact on journey frequency) and potential impacts on other users and ecologically sensitive areas.	
Scotland's National Marine Plan (2015): Submarine Cables Policies – • **Cables 1;** • **Cables 2; and** • **Cables 3.**	**CABLES 1**: Cable and network owners should engage with decision makers at the early planning stage to notify of any intention to lay, repair or replace cables before routes are selected and agreed. When making proposals, cable and network owners and marine users should evidence that they have taken a joined-up approach to development and activity to minimise impacts, where possible, on the marine historic and natural environment, the assets, infrastructures and other users. Appropriate and proportionate environmental considerations and risk assessments should be provided which may include cable protection measures and mitigation plans. Any deposit, removal or dredging carried out for the purpose of executing emergency inspection or repair works to any cable is exempt[2] from the marine licensing regime with approval by Scottish Ministers. However, cable replacement requires a marine licence. Marine Licensing Guidance should be followed when considering any cable development and activity.	This MEA provides a description of how potential impacts on the marine environment associated with the installation of the proposed cables and removal of the existing faulted cable sections have been minimised. A full description of the proposed cable installation activities, including cable protection methods, is provided in the Loch A' Choire Subsea Cable Replacement Project Description (Document No. A-200682-S00-A-REPT-002).
	CABLES 2: The following factors will be taken into account on a case-by-case basis when reaching decisions regarding submarine cable development and activities: • Cables should be suitably routed to provide sufficient requirements for installation and cable protection; • New cables should implement methods to minimise impacts on the environment, seabed and other users, where operationally possible and in accordance with relevant industry practice; • Cables should be buried to maximise protection where there are safety or seabed stability risks and to reduce conflict with other marine users and to protect the assets and infrastructure; • Where burial is demonstrated not to be feasible, cables may be suitably protected through recognised and approved measures (such as rock or mattress placement or cable armouring) where practicable and cost-effective and as risk assessments direct; and • Consideration of the need to reinstate the seabed, undertake post-lay surveys and monitoring and carry out remedial action where required.	
	CABLES 3: A risk-based approach should be applied by network owners and decision makers to the removal of redundant submarine cables, with consideration given to cables being left in situ where this would minimise impacts on the marine historic and natural environment and other users.	A justification for the chosen method of cable replacement (including removal of sections of the faulted cable) is summarised in Section 1.2: Consideration of Alternatives and provided in the Loch A' Choire Subsea Cable Replacement Project Description (Document No. A-200682-S00-A-REPT-002).

[2] *The Marine Licensing (Exempted Activities) (Scottish Inshore Region) Order 2011 (Amended 2012) and The Marine Licensing (Exempted Activities) (Scottish Inshore Region) Order 2011 (Amended 2012).*

3 PROJECT DESCRIPTION

3.1 Summary

A summary of the activities considered within this MEA is provided in the bullets below. Please refer to the Loch A' Choire Subsea Cable Replacement Project Description for further detail (Document No. A-200682-S00-A-REPT-002).

- Pre-installation surveys to identify debris / obstructions;
- Pre-Lay Grapnel Run (PLGR) and boulder clearance;
- Removal of relevant sections of Out of Service (OoS) cable(s);
- Intertidal cable installation via Open Cut Trench (OCT) between Mean Low Water Springs (MLWS) and Mean High Water Springs (MHWS) at each landfall location;
- Subtidal cable installation including;
  - Cable laying;
  - Post lay trenching; and
  - Cable protection and stabilisation, including split pipe, rock bags and/or mattresses.
- Sea earths; and
- Post-installation surveys.

3.2 Cable Installation and Replacement

This Section provides an overview of the proposed subsea cable replacement activities. The proposed cable installation activities are currently planned to be undertaken from July 2025. The licence duration being sought by SHEPD is 18 months for contingency in case the installation programme is delayed and cannot be completed before winter. The proposed cable installation activities are expected to take up to 63 days. These dates do not include transit to and from the survey area, waiting on weather or other stand-by time. This anticipated duration includes all nearshore and offshore works as well as cable pull-in.

Based on the options appraisal, the existing cables are to be replaced with two longer cables. The proposed cables consist of two 33 kilovolt (kV) submarine cables with an external diameter of 141.6 millimetres (mm) (unarmoured diameter of 103 mm). The total lengths of the proposed cables below MHWS are approximately 7.4 km and 6.8 km for Kilmalieu-Loch A'Choire 1 and Kilmalieu-Loch A'Choire 2, respectively. The intention is to lay and trench (where possible) the cables within the subtidal region of the proposed cable corridor, with any obstructions and/or debris avoided where possible or removed by conducting PLGR if required. However, given the ground conditions within the proposed cable corridor (e.g. the presence of boulder fields and steep slopes), the proposed cables will be surface laid for some sections in the subtidal region. The proposed cables will be surface laid for approximately 0.85 km (Kilmalieu-Loch A' Choire 1) and 0.6 km (Kilmalieu-Loch A' Choire 2). Post-lay trenching in the subtidal region will be conducted via a jet trencher or a Controlled Flow Excavator (CFE), depending on the seabed make up.

The intertidal cable sections at the landfall locations at Camas a' Chaiginn and Camas a' Chairn Duibh will be buried via OCT using land-based excavators working at low tide as a first choice. There will be two trenches required at each

landfall. However, where trenching is not feasible due to seabed constraints (e.g. shallow bedrock), the cables will be surface laid with split pipe.

OoS cables may be removed in the intertidal area at both ends to allow the new cables to be installed at the best approach angle, removals will be conducted using mechanical plant. Further sections of the OoS cables may be removed offshore to allow the new cables to cross the route. Each cable end will be cut, peeled back and secured with clump weights and left within the proposed cable corridor.

Prior to cable installation, a pre-installation survey may be conducted using a Remotely Operated Vehicle (ROV) to assess seabed conditions and the presence of debris / obstructions within the proposed cable corridor. During all ROV operations, Ultra Short Baseline (USBL) positioning systems will be used to monitor the underwater position of the subsea equipment. Additional survey equipment may include a Multi-Beam Echosounder (MBES), Side-Scan Sonar (SSS) and Hi-Resolution Cameras. During installation, a similar survey may be utilised to monitor the installation process. Touch Down Monitoring (TDM) will be conducted using an ROV deployed from the CLV or other support vessel, or CableFish which will monitor the lay parameters during the installation.

The selection of the proposed cable corridor was based on the avoidance of environmental constraints (as informed by the results of the survey campaign detailed in Section 4.1), whilst ensuring it will be technically feasible to install a cable within it. An assessment for cable on-bottom stability within the proposed cable corridor is currently underway to inform detailed route engineering. Cable on-bottom stability will be assessed by reviewing the SSS and MBES survey data.

In order to allow sufficient flexibility for detailed route engineering, SHEPD are seeking consent for the 3.32 km^2 proposed cable corridor that is considered within this MEA. The location of the proposed cable corridor is provided in Figure 1-1, with coordinates of the bounding points provided in Table 3-1.

Table 3-1 Cable Corridor Coordinates (WGS84) in Degrees, Minutes and Seconds (DMS), Degrees and Decimal Minutes (DDM) and Decimal Degrees (DD)

LATITUDE DMS	LONGITUDE DMS	LATITUDE DDM	LONGITUDE DDM	LATITUDE DD	LONGITUDE DD
56° 38' 12" N	005° 25' 20" W	56° 38.203' N	005° 25.333' W	56.63671446	-5.42221986
56° 37' 52" N	005° 25' 29" W	56° 37.866' N	005° 25.478' W	56.63111095	-5.42464149
56° 37' 06" N	005° 26' 01" W	56° 37.108' N	005° 26.021' W	56.6184715	-5.43367897
56° 36' 47" N	005° 26' 32" W	56° 36.778' N	005° 26.528' W	56.61298013	-5.44213101
56° 36' 28" N	005° 27' 15" W	56° 36.469' N	005° 27.253' W	56.60782387	-5.45422424
56° 36' 15" N	005° 28' 06" W	56° 36.250' N	005° 28.095' W	56.60416854	-5.46825721
56° 36' 10" N	005° 28' 38" W	56° 36.172' N	005° 28.631' W	56.60287545	-5.47718172
56° 36' 07" N	005° 29' 21" W	56° 36.118' N	005° 29.342' W	56.60197491	-5.48903477
56° 36' 07" N	005° 29' 46" W	56° 36.119' N	005° 29.774' W	56.601986	-5.49623218
56° 36' 16" N	005° 29' 41" W	56° 36.263' N	005° 29.687' W	56.60438707	-5.49479043
56° 36' 16" N	005° 29' 36" W	56° 36.266' N	005° 29.604' W	56.60444463	-5.49339349
56° 36' 17" N	005° 29' 36" W	56° 36.278' N	005° 29.596' W	56.60463939	-5.49326697

LATITUDE DMS	LONGITUDE DMS	LATITUDE DDM	LONGITUDE DDM	LATITUDE DD	LONGITUDE DD
56° 36' 20" N	005° 29' 13" W	56° 36.331' N	005° 29.213' W	56.60551988	-5.48687778
56° 36' 19" N	005° 29' 06" W	56° 36.312' N	005° 29.097' W	56.6051941	-5.4849536
56° 36' 25" N	005° 28' 26" W	56° 36.414' N	005° 28.431' W	56.60689818	-5.47384988
56° 36' 32" N	005° 28' 02" W	56° 36.540' N	005° 28.039' W	56.60901462	-5.46731689
56° 36' 43" N	005° 27' 42" W	56° 36.724' N	005° 27.706' W	56.6120692	-5.46176748
56° 37' 03" N	005° 27' 20" W	56° 37.042' N	005° 27.327' W	56.61737381	-5.45544197
56° 37' 07" N	005° 27' 17" W	56° 37.116' N	005° 27.275' W	56.61860555	-5.45458638
56° 37' 54" N	005° 26' 16" W	56° 37.903' N	005° 26.275' W	56.63172288	-5.43790912
56° 38' 04" N	005° 26' 13" W	56° 38.073' N	005° 26.221' W	56.63454974	-5.43702091
56° 38' 18" N	005° 26' 18" W	56° 38.305' N	005° 26.306' W	56.63841966	-5.43843955
56° 38' 22" N	005° 26' 12" W	56° 38.373' N	005° 26.203' W	56.63955708	-5.43671419
56° 38' 24" N	005° 26' 11" W	56° 38.405' N	005° 26.180' W	56.64009052	-5.43633812
56° 38' 31" N	005° 26' 04" W	56° 38.512' N	005° 26.070' W	56.64186731	-5.43449969
56° 38' 31" N	005° 26' 06" W	56° 38.519' N	005° 26.095' W	56.64198934	-5.43491898
56° 38' 32" N	005° 26' 06" W	56° 38.527' N	005° 26.103' W	56.64212408	-5.43504171
56° 38' 32" N	005° 26' 06" W	56° 38.533' N	005° 26.094' W	56.6422267	-5.43489987
56° 38' 34" N	005° 26' 04" W	56° 38.564' N	005° 26.066' W	56.64273766	-5.43442764
56° 38' 35" N	005° 26' 00" W	56° 38.585' N	005° 26.005' W	56.64308064	-5.4334113
56° 38' 36" N	005° 25' 53" W	56° 38.596' N	005° 25.878' W	56.64327157	-5.43130993
56° 38' 25" N	005° 25' 51" W	56° 38.422' N	005° 25.856' W	56.6403642	-5.43094316
56° 38' 19" N	005° 25' 48" W	56° 38.315' N	005° 25.806' W	56.63857532	-5.43009243
56° 38' 12" N	005° 25' 20" W	56° 38.203' N	005° 25.333' W	56.63671446	-5.42221986
56° 38' 01" N	005° 25' 49" W	56° 38.016' N	005° 25.819' W	56.63359849	-5.43030931
56° 37' 59" N	005° 25' 42" W	56° 37.979' N	005° 25.695' W	56.63297511	-5.42824778
56° 37' 02" N	005° 27' 04" W	56° 37.041' N	005° 27.060' W	56.61734638	-5.45099415
56° 36' 58" N	005° 27' 06" W	56° 36.972' N	005° 27.108' W	56.61620065	-5.45179608
56° 36' 35" N	005° 27' 24" W	56° 36.585' N	005° 27.399' W	56.60974737	-5.45665047
56° 36' 29" N	005° 27' 46" W	56° 36.490' N	005° 27.766' W	56.60817166	-5.46276142
56° 36' 38" N	005° 27' 30" W	56° 36.638' N	005° 27.506' W	56.6106276	-5.45843936
56° 36' 52" N	005° 26' 43" W	56° 36.875' N	005° 26.710' W	56.61458075	-5.44516971
56° 37' 11" N	005° 26' 14" W	56° 37.176' N	005° 26.2389' W	56.61960461	-5.43731462

For the avoidance of doubt, the landward boundaries of the cable corridor covered by the MEA are the MHWS. The landfall boundaries defined by the coordinates within this document should be considered approximations, due to the requirement to limit the number of vertices.

3.3 Cable Protection and Stabilisation

Split pipe and burial have been recommended as primary cable protection and stabilisation for the Project; however, some rock bags may be needed to stabilise the ends of the split-pipe sections and a small number of concrete mattresses may be used to replace small sections of split pipe. Additionally, rock bags and/or concrete mattresses may be required for cable stabilisation at the point where split-pipe protection ends, beyond the intertidal zone. Engineering studies are ongoing which may alter the final quantity of cable stabilisation required but the information which forms the basis of this MEA is based on anticipated worst-case scenario and includes a 10% contingency.

Split pipe is commonly used for cable protection both at landfalls, as well as subtidal sections of cables. A worst-case of 1,648 m of split pipe protection may be required for the cable. Split pipe can be applied during the shore end installation, being fitted on the CLV whilst the cable is being paid out or retrofitted at low tide. Split pipe can also be installed by divers in the subtidal area using a Dive Support Vessel (DSV), after the cable has been laid on the seabed. Additional protection afforded by articulated split pipe has been incorporated into the route engineering with respect to both shore end landfalls and out to include the nearshore subtidal rocky outcrops and boulder fields. On either shore above the MLWS limit, where sufficient depths of lowering cannot be achieved, split pipe will be fitted around the cable for additional protection in the event of exposure.

Sea Earths (earthing cables) will be installed in order to protect the cable infrastructure from surges and lightning strikes. It is expected that two or three earthing cables will be required at each shore end using stainless steel cables with a cross sectional diameter of 95 mm^2. One cable will earth the armour of the High Voltage Alternating Current (HVAC) cable system, while the other provides an earth for the Fibre Optic (FO) armour (integral to the HVAC cable system). The earthing wires will be installed in the OCT alongside the new cable above MHWS, and at MLWS the two earth wires will separate and continue on the surface of the seabed for up to 50 m.

A maximum of 97 rock bags (either 4 t or 6 t) and 97 concrete mattresses for both cables (up to 8.5 t each, 825 t collectively) may be installed to stabilise and protect the proposed cables. Installation of rocks bags and/or mattresses will either be from the CLV deck, a separate large installation vessel with ROV, or multicat vessel.

Additionally, up to four concrete clump weights (60 kg; 240 kg collectively) or 20 rock anchors (2 kg each; 40 kg collectively) may be utilised to anchor sea earths and to secure any cable ends at sections of the OoS cables that are removed.

4 ASSESSMENT METHODOLOGY

This MEA supports SHEPD's applications for authorisation to complete the proposed cable installation activities by providing an assessment of potential impacts on sensitive environmental receptors. Where potentially significant adverse effects are identified, appropriate mitigation will be prescribed in order to reduce the magnitude of effect to an acceptable level.

An assessment of environmental impacts has been undertaken to support the submission of the MLA and works licence and EPS licence applications. The scope of this assessment is exclusively focused on impacts to receptors pertaining to the proposed cable installation activities below MHWS.

Data sources used to input into the subsequent assessment have been derived from:

- Relevant information and project-specific survey reports supplied by SHEPD; and
- Publicly available literature and data.

Potential impacts have been evaluated to determine how the proposed cable installation activities could affect the environment and the corresponding significance of those impacts. Where potential impacts are likely to be significant, specific mitigation measures have been identified for implementation.

4.1 Marine Surveys

SHEPD has conducted geophysical, geotechnical and drop-down video benthic surveys of the proposed cable corridor. A geophysical and environmental baseline survey was carried out by Spectrum Geosurvey Limited, in association with Benthic Solutions Limited for Briggs Marine UK on behalf of SHEPD along the proposed cable corridor (Benthic Solutions Ltd, 2024a). The geophysical survey was performed using MBES, SSS, magnetometer and Sub-Bottom Profiler (SBP). The environmental baseline survey consisted of an intertidal walk-over survey at each cable landfall undertaken in August 2023 and a subtidal survey undertaken between August and October 2023 (Benthic Solutions Limited, 2024a, 2024b). The results were presented in the environmental baseline report (Benthic Solutions Limited, 2024a) and the habitat assessment report (v. 2.0) (Benthic Solutions Limited, 2024b). An additional survey was carried out in December 2024, as presented in the habitat assessment report (v. 3.0) (Benthic Solutions Limited, 2024c). During the intertidal survey, samples were collected along 16 transects (eight at the Camas a' Chairn Duibh (northern) landfall and eight at the Camas a' Chaiginn (southern) landfall)), with a total of five stations sampled for physicochemistry and macrofauna (four at Camas a' Chairn Duibh and a single station at Camas a' Chaiginn). The subtidal survey consisted of drop-down video and grab sampling, with grab samples and camera transects co-located at eight locations, with an additional eight camera transects proposed to ground-truth additional features of interest.

4.2 Assessment Criteria

This MEA provides an assessment of potential impacts on environmental receptors, resulting from the effects of the proposed cables, and proposed cable installation activities. The terms effect and impact are different, as one drives the other. Effects are measurable physical changes in the environment (e.g. volume, time and area) arising from

proposed cable installation activities, while impacts consider the response of a receptor to an effect. Impacts can be defined as direct or indirect, beneficial or adverse.

In order to implement a systematic assessment of impacts between the different receptors, an overall approach to the assessment of impact significance has been implemented. The process considers:

- Sensitivity and value of a receptor;
- Magnitude of effect; and
- Determination and qualification of the significance of the impact.

4.2.1 Sensitivity and Value

The sensitivity of a receptor is a function of its capacity to accommodate change and reflects its ability to recover if it is impacted. Sensitivity of a receptor is based on the following factors:

- Tolerance to change;
- Recoverability;
- Adaptability; and
- Value.

The scale of sensitivity is as follows; negligible, low, medium, high, very high.

4.2.2 Magnitude of Effect

The magnitude of an effect can be characterised by considering the following factors:

- Duration of the impact;
- Size and scale;
- Timing/seasonality; and
- Frequency.

Categorisation of the magnitude of effect will vary for specific topics. The magnitude categories used are negligible, minor, moderate, and major.

4.2.3 Significance of Impact

The significance of potential impact has been determined by a combination of the sensitivity and value of a receptor and the magnitude of an effect. The general framework for assessing the significance of potential effects is outlined below Table 4-1.

Table 4-1 Significance of Impact

MAGNITUDE	SENSITIVITY / VALUE				
	NEGLIGIBLE	LOW	MEDIUM	HIGH	VERY HIGH
NEGLIGIBLE	Negligible	Negligible	Negligible	Minor	Minor
MINOR	Negligible	Negligible	Minor	Minor	Moderate
MODERATE	Negligible	Minor	Moderate	Moderate	Major
MAJOR	Minor	Minor	Moderate	Major	Major

In general, moderate or major impacts are classified as significant and will require additional mitigation in order to reduce the magnitude of effect to an acceptable level. Where a range of potential effects are identified, expert judgement will be used to determine the final significance.

4.3 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. During the assessment of impacts in the receptor specific assessment sections, all embedded mitigation is considered when assessing the significance of an impact. Details of the embedded mitigation which SHEPD is committed to implementing, and hence, the measures considered within the impact assessments presented in this MEA, are included in Table 4-2. All embedded mitigation is included within the outline Marine CEMP (Document No. A-200682-S00-A-PLAN-001).

Where required, additional mitigation has been suggested on a receptor specific basis, informed by the impact assessments.

Table 4-2 Embedded Mitigation and Best Practice Relevant to the Project

MEASURE	DETAILS
Production of a Marine CEMP	The Marine CEMP is designed to provide a consolidated point of reference for SHEPD and their marine contractors. It ensures all embedded and additional mitigation measures identified by this MEA and supporting documents are effectively disseminated to and implemented by the Project team during Project activities, thus ensuring that any potential environmental impacts are minimised.
All Project personnel will be trained and informed of their responsibility to implement the environmental and ecological mitigation outlined in the Marine CEMP	Toolbox talks, inductions, and awareness notices will be used to disseminate this information among all relevant personnel.
Pre-installation surveys may be conducted to inform detailed route engineering	Further pre-installation surveys may be required to inform detailed cable route engineering within the consented corridor. Where the surveys confirm the presence of sensitive benthic receptors in the proposed cable corridor, micro siting will be used to avoid the features where practicable. Route engineering has recommended trenching where possible in soft sediments, to mitigate risk of interaction with the cables from mobile gear fishing activity and anchoring. Any obstructions or debris will be removed, if possible. A work class ROV or PLGR may be used to remove debris. In the nearshore area, a diver may be required to remove debris. If large boulders are relocated within the proposed cable corridor appropriate notifications will be provided, as described below. Furthermore, a detailed Unexploded Ordnance (UXO) risk assessment has been carried out by 6 Alpha Associates Ltd. (2023) within the proposed cable corridor (see the Loch A' Choire Subsea Cable Replacement Project Description (Document No. A-200682-S00-A-REPT-002)). During all operations the contractor(s) involved will be made aware there is a low to medium risk of UXO encounter so that any unexpected or un-identifiable anthropogenic objects identified based on the magnetometer survey data (i.e. potential UXO (pUXO)) are noted and micro-routed around. Given that any UXO or pUXO identified would be avoided through cable micro-

MEASURE	DETAILS
	routeing, there will be no UXO clearance[3] associated with the proposed activities and therefore UXO clearance is not assessed further within this MEA.
Marine archaeological features	All wrecks or features of potential archaeological significance shall be avoided by a buffer of at least 50 m during detailed route design. The locations of wrecks and features of potential archaeological significance will be clearly identified on electronic charts on board the installation vessel and utilised to guide the proposed cable installation activities. The location of any wrecks or features of potential archaeological significance will be provided to HES, and the UKHO. Given that no marine archaeological assets have been identified within the proposed cable corridor, a Protocol for Archaeological Discoveries (PAD) is not proposed, unless required by the licence conditions.
Scottish Marine Wildlife Watching Code (SMWWC) and Basking Shark Code of Conduct	NatureScot developed the SMWWC as part of its duties under the Nature Conservation (Scotland) Act 2004. The SMWWC aims to minimise disturbance to marine wildlife. All Project vessels will adhere to the provisions of the SMWWC during the proposed cable installation activities, including reducing speed to the safest minimum when passing wildlife and avoiding sudden unpredictable changes in speed, direction and engine noise. Where animals are displaying signs of disturbance (e.g. sudden movement, aggressive behaviour), Project vessels will move away and if possible, take an alternative route or wait for the animals to move on. Additionally, all vessels will adhere to the Basking Shark Code of Conduct, such as reducing speed if basking sharks are sighted and avoiding sudden changes in speed (Shark Trust, 2024).
Lighting on board installation vessels will be kept to a minimum	Lighting on-board all installation vessels will be appropriately directed and kept to the minimum level required to ensure safe operations. This will minimise disturbance to seabird receptors, and the minimised light levels will reduce visual disturbance.

[3] *In the unlikely event that UXO clearance is required, this will be consented separately and subject to a separate MLA and associated MEA.*

MEASURE	DETAILS
Deployment of anchor chains on the seabed will be kept to a minimum and within the identified anchor / spud areas	Deployment of anchor chains on the seabed will be kept to a minimum and within the identified anchor / spud areas (see Loch A' Choire Subsea Cable Replacement Project Description (Document No. A-200682-S00-A-REPT-002)), therefore reducing the potential for disturbance to benthic habitats and species including those which utilise the seabed.
Vessels will be travelling at a slow speeds during installation works	The slow speed of Project installation vessels will minimise the risk of disturbance and injury impacts to seabird and marine mammal receptors.
Production of an Emergency Spill Response Plan	An Emergency Spill Response Plan will help to ensure that the potential for release of pollutants from the Project is minimised.
Control measures and Shipboard Oil Pollution Emergency Plans (SOPEP) will be in place and adhered to under MARPOL Annex I requirements for all vessels.	As per the MARPOL 73/78 requirement under Annex I, all ships with 400 gross tonnage and above must carry an oil prevention plan as per the norms and guidelines laid down by International Maritime Organization (IMO) under Marine Environmental Protection Committee (MEPC) Act. Production of this plan will help to ensure that the potential for release of pollutants from installation, operation and decommissioning is minimised. In the event of an accidental fuel release occurring appropriate standard practice management procedures will be implemented accordingly.
Vessels will be equipped with waste disposal facilities (sewage treatment or waste storage) IMO MARPOL Annex IV Prevention of Pollution from Ships standards	A Waste Management Plan will be developed and implemented to ensure the waste hierarchy is followed and all waste is sent onward to recycling or disposal via a licenced waste route. Additionally, all recovered debris will be taken ashore and sent for appropriate recycling or disposal at a licenced waste handling facility.

MEASURE	DETAILS
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 INNS introduction during the proposed cable installation activities is minimised.
Use of clean materials	Only clean stone (free from organic contaminants) shall be used in rock bags to reduce the risk of INNS.
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 FLMAP	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 the proposed cable installation activities.
Consultation with commercial fishing stakeholders to identify acceptable and feasible mitigation options with the aim of minimising potential effects on commercial fishing	SHEPD will, in consultation with commercial fishing stakeholders, work towards identifying acceptable and feasible mitigation options with the aim of minimising any potential effects on commercial fishing associated with the replacement of submarine electricity cables. There are various options available to mitigate the risks, including: • Continuing effective positive liaison with commercial fishing stakeholders through the pre-installation, installation and operational phases of any cable replacement; • Continued employment of FLO/FIR services until the completion of the replacement works; • Ensuring contractors comply with the contractor's obligations outlined above so as to minimise any interference to commercial fishing activities; • Managing the cable replacement works so as to minimise any potential effects on the marine environment, habitats and commercial fishing; • Raising awareness of the danger of fishing in the vicinity of submarine cables; • Adopting a hierarchical approach to submarine cable protection, taking account of sea users concerns; • Organising an installation phasing workshop (if new cable is required) to inform commercial fishermen of planned activities; • Organising installation schedules (if new cable is required) as far as is practicably possible in order to reduce the combined loss of fishing area associated with safety zones;

MEASURE	DETAILS
	• Distributing weekly notice of operations; • Providing information in plotter format to enable fishermen to easily interpret the information; and/or • Scouting surveys to identify potting areas and any other relevant static gear areas.
Notice to Mariners (NtMs), local notifications to marine users, Kingfisher bulletins, Radio Navigational Warnings, and/or broadcast warnings will be promulgated in advance of any proposed works. The notices will 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. Notices will also be issued if any OoS cables / boulders are removed or moved and chart updates will be provided.
Compliance with International Regulations for the Prevention of Collision at Sea (IRPCS) (IMO, 1972) and the International Regulations for the Safety of Life at Sea (SOLAS)	IRPCS 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 installation, 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.
As built survey data will be provided to the United Kingdom Hydrographic Office (UKHO) and Kingfisher for inclusion on Admiralty Charts and the Kingfisher Information Service – Offshore Renewable and Cable Awareness (KIS-ORCA) charts	Ensure navigational safety and minimise the risk of equipment snagging.
Avoidance of Otter Holts, Layups and Couches	A protected species survey has been carried out at each landfall. Pre-works checks will be conducted by an Ecological Clerk of Works (ECoW) prior to the commencement of the proposed cable installation activities and will include the cable landfall areas and a 200 m mitigation zone. Any identified otter holts, layups and couches will be identified and avoided by a 40 m buffer.

4.4 Cumulative Impact Assessment

The current 'Marine Projects' list on Marine Directorate's website (Marine Directorate, 2024a) was reviewed to identify other developments or activities with the potential to result in cumulative effects. A radius of search of 50 to 100 km was used to identify a number of ports & harbours and cables developments which are currently listed at pre-application, application, licence and post-consent status. However, considering the extremely localised nature of the effects likely to be associated with the Project, no potential cumulative effects were identified, and no further assessment is required.

5 DESIGNATED SITES

5.1 Introduction

This Section will provide the information required to support the HRA and MPA assessment processes. As such, the proposed cable installation activities will be assessed as to whether they are likely to constitute an LSE on a European Site, in line with the HRA process, or if they are capable of affecting (other than insignificantly), an NCMPA. Therefore, magnitude and significance of impact will not be discussed within this Section, and these will be determined in the topic-specific sections.

LSE on European sites which include Special Protection Areas (SPA), Special Areas of Conservation (SAC) and Ramsar sites will be determined. In addition to this, the potential impact on NCMPAs and designated seal haul-outs will also be assessed as per Sections 82 and 117 of the Marine (Scotland) 2010 Act.

The following criteria has been used to screen designated sites for the assessment of LSE or assessment of whether the Project is capable of affecting (other than insignificantly) on a NCMPA:

- SACs and NCMPAs (including proposed and candidate sites) with cetaceans and basking sharks as qualifying features within 50 km of the proposed cable corridor;
- SACs (including proposed and candidate sites) with harbour seal interests within 50 km of the cable corridor and breeding grey seal within 20 km of the proposed cable corridor;
- Designated seal haul-outs or grey seal breeding sites that overlap with or are located within 500 m of the proposed cable corridor;
- SACs and NCMPAs (including proposed and candidate sites) with otter interests that overlap with or are located within 500 m of the proposed cable corridor;
- SPAs (including proposed sites) and NCMPAs (including proposed sites) with birds as qualifying features that overlap with or are located within 2 km of the proposed cable corridor;
- SACs and NCMPAs (including proposed and candidate sites) with seabed / benthic protected features that overlap with the proposed cable corridor; or
- Other sites of importance, including SSSIs, National Scenic Area (NSAs) and World Heritage Sites which transect the proposed cable corridor.

It should be noted that all distances to associated sites have been calculated on a straight-line basis. For marine mammal designations, the travel distances of species to the proposed cable corridor may be significantly greater than this in reality. Where no LSE is predicted on a European site or the Project is not predicted to be capable of affecting (other than insignificantly) on a NCMPA or designated seal haul-out, the site has been screened out for further assessment in this report. Where an LSE cannot be ruled out, a more detailed assessment has been carried out. Details of mitigation measures have then been presented where necessary. Further details on impacts to qualifying features will also be assessed in the topic-specific impact assessments.

5.2 Data Sources

The designated sites within the vicinity of the proposed cable corridor have been identified through publicly available geospatial data (e.g. National Marine Plan Interactive (NMPi) (Marine Directorate, 2024b) and the Joint Nature Conservation Committee (JNCC) Marine Protected Area (MPA) Mapper (JNCC, 2024).

5.3 Baseline and Receptor Identification

The designated sites located in the vicinity of the proposed cable corridor which have the potential to be impacted by the proposed cable installation activities subject to the selection criteria above are illustrated in Figure 5-1 and described in the following Sections.

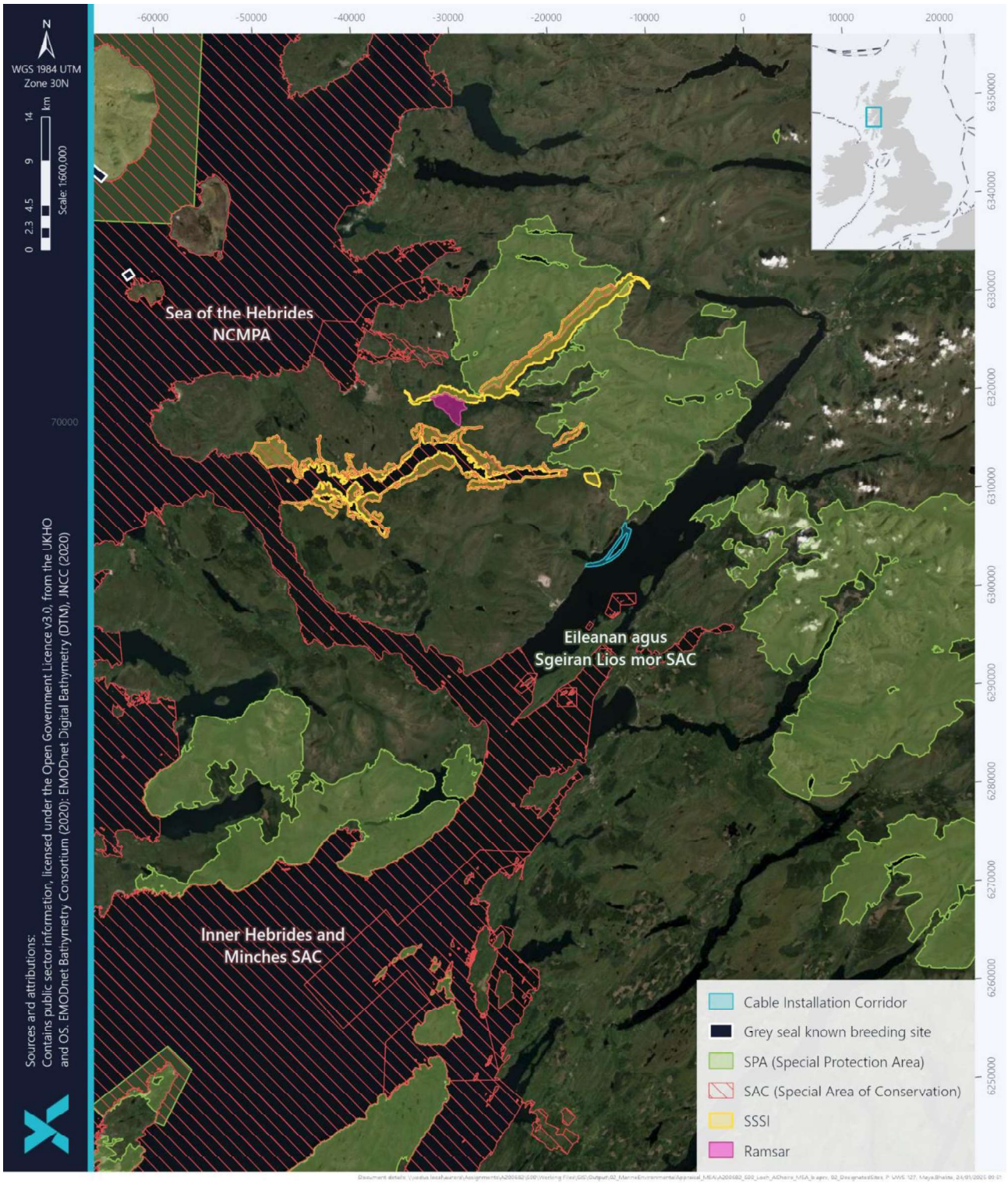

Figure 5-1 Designated Sites within the Vicinity to the Proposed Cable Corridor

5.3.1 SACs and NCMPAs with Cetaceans and Basking Sharks as Qualifying Features

All species of cetacean (whale, dolphin and porpoise) occurring in UK waters are listed in Annex IV of the Habitats Directive. Harbour porpoise (*Phocoena phocoena*) and bottlenose dolphin (*Tursiops truncates*) are listed under Annex II of the Habitats Directive and are given additional protection through the designation of SACs for those species. Basking sharks are protected under Section 9 of the Wildlife and Countryside Act 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 Inner Hebrides and the Minches SAC is located approximately 8 km southeast of the proposed cable corridor (Figure 5-1; Figure 5-2) and is designated for harbour porpoise. Furthermore, the Sea of the Hebrides NCMPA, located approximately 35 km northwest (Figure 5-1; Figure 5-2), is designated for basking shark and minke whale. There is potential for disturbance or injury associated with the vessel presence during the proposed cable installation activities and noise emissions during pre-installation surveys and therefore these two sites with cetaceans as qualifying features are screened in for further assessment.

5.3.2 SACs with Harbour or Grey Seal as a Qualifying Feature

The Eileanan agus Sgeiran Lios mor SAC is located approximately 3 km southeast and is designated for harbour seal (*Phoca vitulina*) (Figure 5-1; Figure 5-3). Harbour seals are most sensitive to disturbance during the pupping and moulting seasons which occur from mid-June to July and from August to September, respectively. The proposed cable installation activities will be undertaken in July 2025 overlapping with the pupping season for harbour seal. Furthermore, given the licence duration, the proposed cable installation activities could continue into the moulting season if there are weather or other unforeseen delays. However, given the intervening distance there is no potential for the proposed cable installation activities to result in disturbance to harbour seal adults / pups on land during the pupping / moulting seasons. Nevertheless, as a mobile species there is potential for disturbance to harbour seals in the water associated with the proposed cable installation activities (i.e. underwater noise and vessel presence) and therefore SACs with harbour or grey seal as a qualifying feature are screened in for further assessment.

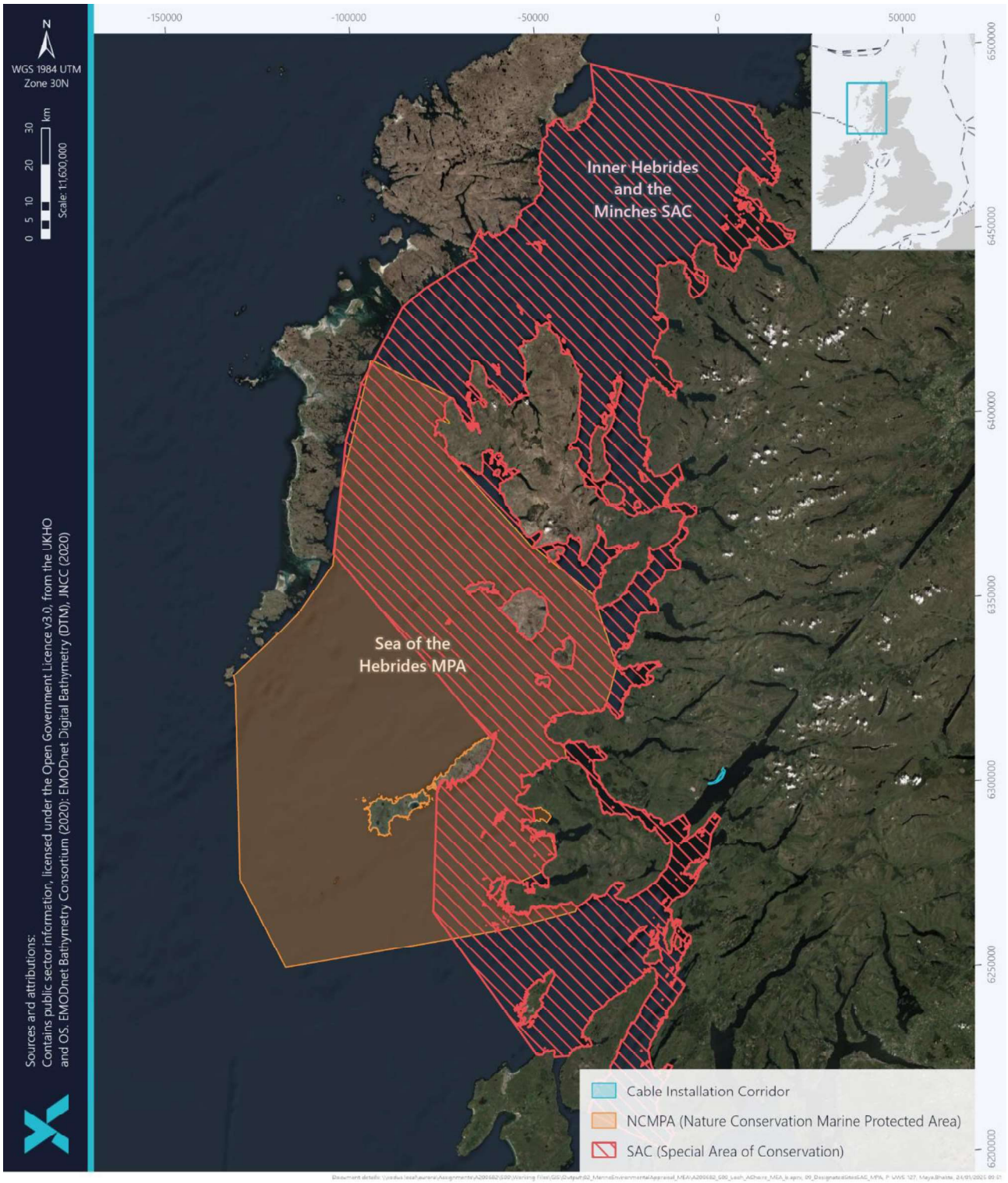

Figure 5-2 Extent of SACs and NCMPAs with Cetaceans and Basking Sharks as Qualifying Features

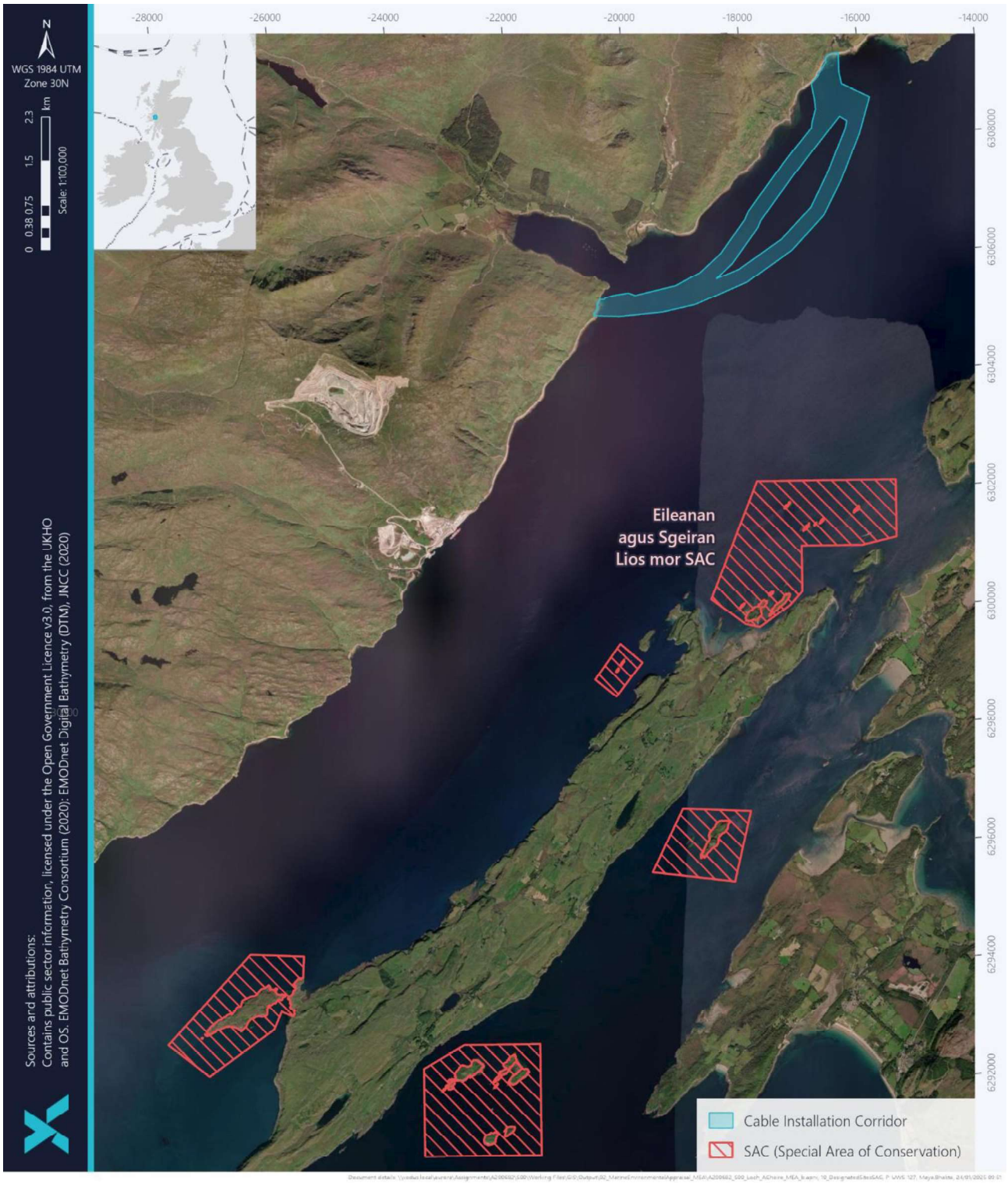

Figure 5-3 Extent of SACs with Harbour or Grey Seal as a Qualifying Feature

5.3.3 Designated Seal Haul-Outs or Grey Seal Breeding Sites

There are no designated seal haul-outs or grey seal breeding sites that overlap with or are located within 500 m of the proposed cable corridor. Therefore designated seal haul-outs and grey seal breeding sites are screened out and will not be considered in the assessment.

5.3.4 SACs and NCMPAs with Otter Interests

The Eurasian otter (*Lutra lutra*) are listed in Annex IV of the Habitats Directive as EPS. They are small, semi-aquatic mammals which inhabit riverine, brackish and coastal environments throughout the UK. Although land mammals, otters depend on both freshwater and marine environments for food. Their marine habitat comprises low, peat-covered coastlines with shallow, seaweed rich waters and a consistent freshwater supply (Department of Business, Energy and Industrial Strategy (BEIS[4]), 2022).

There are no SACs and/or NCMPAs (including proposed and candidate sites) with otter interests that overlap with or are located within 500 m of the proposed cable corridor. The closest site is the Morvern Woods SAC located ~ 9.5 km away. Therefore, SACs and NCMPAs with otter interests are screened out and will not be considered in the assessment.

5.3.5 SPAs and NCMPAs with Birds as Qualifying Features

There is one SPA within 2 km of the proposed cable corridor: the Moidart and Ardgour SPA (ID: UK9020305), located approximately 0.4 km northeast. The Moidart and Ardgour SPA qualifies under Article 4.1 by regularly supporting a breeding population of golden eagle (*Aquila chrysaetos*), representative of 2.4% of the Great Britain breeding population (NatureScot, 2024).

There are no known nesting sites within 1 km of the proposed cable corridor (NatureScot, 2024, *pers. comms.*). Golden eagles are unlikely to be utilising the marine areas which will be affected by the proposed cable installation activities, so no adverse effects on this species is expected. Therefore, SPAs and NCMPAs with birds as qualifying features are screened out and will not be considered in the assessment.

5.3.6 SACs and NCMPAs with Seabed / Benthic Protected Features

There are no SACs and/or NCMPAs (including proposed and candidate sites) with seabed / benthic protected features that overlap with the proposed cable corridor. Therefore, SACs and NCMPAs with seabed / benthic protected features are screened out and will not be considered in the assessment.

[4] *Now the Department for Energy Security and Net Zero (DESNZ).*

5.3.7 Other Sites of Importance

There are no other sites of importance (including SSSIs, Ramsar, NSAs and/or World Heritage Sites) which transect the proposed cable corridor. The closest site is the Sunart SSSI, designated for otter, located approximately 5 km northwest. Therefore, other sites of importance are screened out and will not be considered in the assessment.

5.4 Potential Connectivity with Designated Sites

Although there are designated sites within relatively close proximity to the proposed cable corridor, for a LSE to arise, there has to be potential ecological connectivity between the proposed cable installation activities and the qualifying features of a designated site. An initial consideration has been provided within Table 5-1 identifying whether particular designated sites or particular impacts require a more detailed investigation of whether there is a potential LSE. Those sites or impacts for which no LSE is expected are not considered for further assessment.

Table 5-1 Designated Sites Within the Vicinity of the Proposed Cable Corridor as per the Selection Criteria and Potential Connectivity (JNCC, 2024)

DESIGNATED SITE (NAME AND DESIGNATION)	REASON FOR SELECTION	DISTANCE TO PROPOSED CABLE CORRIDOR (KM)	RELEVANT QUALIFYING FEATURES	POTENTIAL IMPACT PATHWAY	REQUIREMENT FOR FURTHER ASSESSMENT
Moidart and Ardgour SPA	This site is located within 2 km of the proposed cable corridor.	0.4	• Golden eagle.	Plant and vessel presence nearshore.	N – Golden eagles are unlikely to be utilising the marine areas which will be affected by the proposed cable installation activities, so no adverse effects on this species is expected.
Eileanan agus Sgeiran Lios mor SAC	This site is located within 50 km of the proposed cable corridor.	3.2	• Harbour seal.	Vessel presence offshore and pre-installation surveys (including noise emissions).	Y – There is potential connectivity to the site from disturbance to harbour seal during the breeding and moulting season due to vessel presence offshore and pre-installation surveys associated with the proposed cable installation activities. Therefore, further assessment is required.
Inner Hebrides and the Minches SAC	This site is located within 50 km of the proposed cable corridor.	7.8	• Harbour porpoise.	Vessel presence offshore and pre-installation surveys (including noise emissions).	Y – There is potential connectivity to the site from disturbance to harbour porpoise associated with vessel presence during the proposed cable installation activities and noise emissions during pre-installation surveys. Injurious impacts are not anticipated and are screened out of further assessment (Appendix A).
Sea of Hebrides NCMPA	This site is located within 50 km of the proposed cable corridor.	34.7	• Basking shark; and • Minke whale.		Y – There is potential connectivity to the site from disturbance to basking shark and minke whale associated with vessel presence during the proposed cable installation activities and noise emissions during pre-installation surveys. Injurious impacts are not anticipated and are screened out of further assessment (Section 7).

5.5 Assessment of Likely Significant Effects

The following Sections will assess the potential for LSE for SACs or whether the Project is capable of affecting (other than insignificantly) a NCMPA, which require further assessment. For each designated site that has the potential to be affected by the proposed cable installation activities, embedded mitigation measures have been considered based upon site-specific protected features.

5.5.1 SACs and NCMPAs with Cetaceans and Basking Shark as Qualifying Features

As per the assessment criteria outlined in Section 5.1, there is one SAC and one NCMPA with cetaceans basking sharks as qualifying features within the connectivity range of 50 km of the proposed cable corridor. The Inner Hebrides and the Minches SAC, designated for harbour porpoise, is located approximately 8 km away. The Sea of Hebrides NCMPA, designated for basking shark and minke whale, is located approximately 35 km away. Further details on the assessment of potential impacts on pinnipeds is detailed within Section 7: Marine Megafauna.

Underwater Noise

Underwater noise emissions have the potential to cause physical injury or disturbance to cetaceans, particularly if they fall within their generalised hearing range (Southall *et al.*, 2019; NMFS, 2018). As detailed in Section 7: Marine Megafauna and Appendix A: Noise Impact Assessment, no realistic injury risk is associated with the Project and the disturbance range is limited to approximately 207 m. The number of individuals which may incur a strong disturbance associated with USBL was < 0.1 individuals for both harbour porpoise and minke whale. As the proposed cable installation activities will be transient, temporary, and localised, any disturbance to cetaceans at these sites resulting from underwater noise emissions will be limited. Basking shark are identified as having a low sensitivity to underwater noise, and hence are not expected to be affected by disturbance from the temporary, transient and localised underwater noise emissions. As such, no LSE is anticipated for the Inner Hebrides and the Minches SAC from underwater noise emissions. Similarly, the Project is not considered capable of affecting (other than insignificantly) the conservation objectives of the Sea of Hebrides NCMPA, from underwater noise emissions.

Vessel Presence

With the increase in vessel traffic associated with the proposed cable installation activities, harbour porpoise, basking shark and minke whale could potentially be at an increased risk of collision and disturbance. However, as the installation vessels will be slow-moving, collision risk is generally considered to be low. Additionally, all vessels will adhere to the SMWWC. As such, there is no LSE is anticipated for the Inner Hebrides and the Minches SAC from vessel presence. Similarly, the Project is not considered capable of affecting (other than insignificantly) the conservation objectives of the Sea of Hebrides NCMPA from vessel presence.

5.5.2 SACs with Harbour or Grey Seal as a Qualifying Feature

As per the assessment criteria outlined in Section 5.1, there is one SAC with harbour seal as a qualifying feature within the connectivity range of 50 km of the proposed cable corridor. The Eileanan agus Sgeiran Lios mor SAC is located 3 km from the proposed cable corridor. Further details on the assessment of potential impacts on pinnipeds is detailed

within Section 7: Marine Megafauna. There are no SACs with grey seal as a qualifying feature within the connectivity range of 20 km of the proposed cable corridor.

Underwater Noise

Underwater noise emissions have the potential to cause physical injury or disturbance to seals, particularly if they fall within their generalised hearing range (Southall *et al.*, 2019; NMFS, 2018). As detailed in Section 7: Marine Megafauna and Appendix A: Noise Impact Assessment, no realistic injury risk is associated with the Project, and the disturbance range is limited to approximately 207 m. The proposed cable installation activities are due to take place in July 2025 and therefore will coincide with the pupping season for harbour seal. Additionally, given the licence duration of 18 months the proposed cable installation activities may continue into the moulting season. However, considering the intervening distance between the SAC and the proposed cable corridor, and the availability of comparable marine habitat surrounding the proposed cable corridor, the potential for impacts on harbour seals is considered limited and are not anticipated to impede their ability to forage or transit to or from their breeding sites within the SAC. As the proposed cable installation activities will be transient, temporary, and localised, any disturbance to seals at these sites resulting from underwater noise emissions will be limited. As such, no LSE on the Eileanan agus Sgeiran Lios mor SAC is expected from underwater noise emissions.

Vessel Presence

With the increase in vessel traffic associated with the proposed cable installation activities, harbour seal could potentially be at an increased risk of collision and disturbance. However, as the installation vessels will be slow-moving, collision risk is generally considered to be low. Additionally, all vessels will adhere to the SMWWC. As such, there is no LSE expected on the Eileanan agus Sgeiran Lios mor SAC.

6 SEABED AND WATER QUALITY

6.1 Introduction

This Section provides an overview of potential impacts on seabed conditions and water quality resulting from the proposed cable installation activities (including trenching and potential deposits from rock bags and /or mattresses) and the potential for removal of sections of OoS cables. Details on baseline seabed conditions presented in this Section provides the relevant information for the purposes of the impact assessment and is not intended for engineering applications.

The subtidal section of the proposed cables will be either surface laid or trenched. The proposed cables will be surface laid in areas where the seabed is dominated with boulder fields or steep slopes where trenching is not possible. The proposed cables will be protected by articulated (split) pipe at both landfall areas where surface laid. During post-lay trenching operations, the proposed cables will be trenched using a jet trencher or CFE. Sections of OoS cables may be removed in the nearshore at both ends, subject to project requirements, with removal conducted using mechanical plant working at low tide. Associated impacts on benthic features are discussed in Section 8. As such, potential effects on seabed quality have been screened out of this assessment.

The seabed footprint of the Project will be confined to the physical footprint of the proposed cables and any cable protection or trenching. Trenching activities have the potential to result in sediment resuspension and therefore the potential impact of coastal and subtidal sediment suspension is screened in for the water quality assessment. Additionally, the potential impact of changes to sediment and water quality following accidental release of hydrocarbons is screened in for the water quality assessment.

6.2 Data Sources

Seabed sediments and bathymetry has been characterised through site-specific survey data (Benthic Solutions, 2024a; 2024b), and corroborated by publicly available geospatial data (e.g. NMPi and EMODnet). Water quality and the presence of designated water bodies have been identified through SEPA River Basin Management 3 database (SEPA, 2024).

6.3 Baseline and Receptor Identification

6.3.1 Seabed Sediments and Bathymetry

The environmental baseline survey results indicate that the water depth along the proposed cable corridor ranges from approximately + 5 m Lowest Astronomical Tide (LAT) to a maximum of -82.1 m LAT associated with a steep ridge (Benthic Solutions Limited, 2024a) (Figure 6-1). The subtidal seabed sediments are primarily muddy sediments, composed of silty mud, gravelly mud with shell fragments and mixed sediments (Figure 6-2).

In the intertidal region, the sediment is composed of boulders, cobbles, shingles, gravel and sand (Benthic Solutions Limited, 2024a) (Figure 6-3). Particle Size Analysis (PSA) was undertaken for five sampling locations in the intertidal

region and eight sampling locations in the subtidal region. The PSA results indicate a higher proportion of sands within the intertidal region while the subtidal region was characterised by a higher proportion of fines (Benthic Solutions Limited, 2024a). Gravel content was low and consistent across the intertidal and subtidal regions.

The samples were assigned the BGS modified folk classifications of 'sand' and 'slightly gravelly sand' across the intertidal locations and 'sandy mud', 'slightly gravelly sandy mud', 'muddy sand', 'mud' and 'slightly gravelly muddy sand' for the subtidal locations (Benthic Solutions Limited, 2024a).

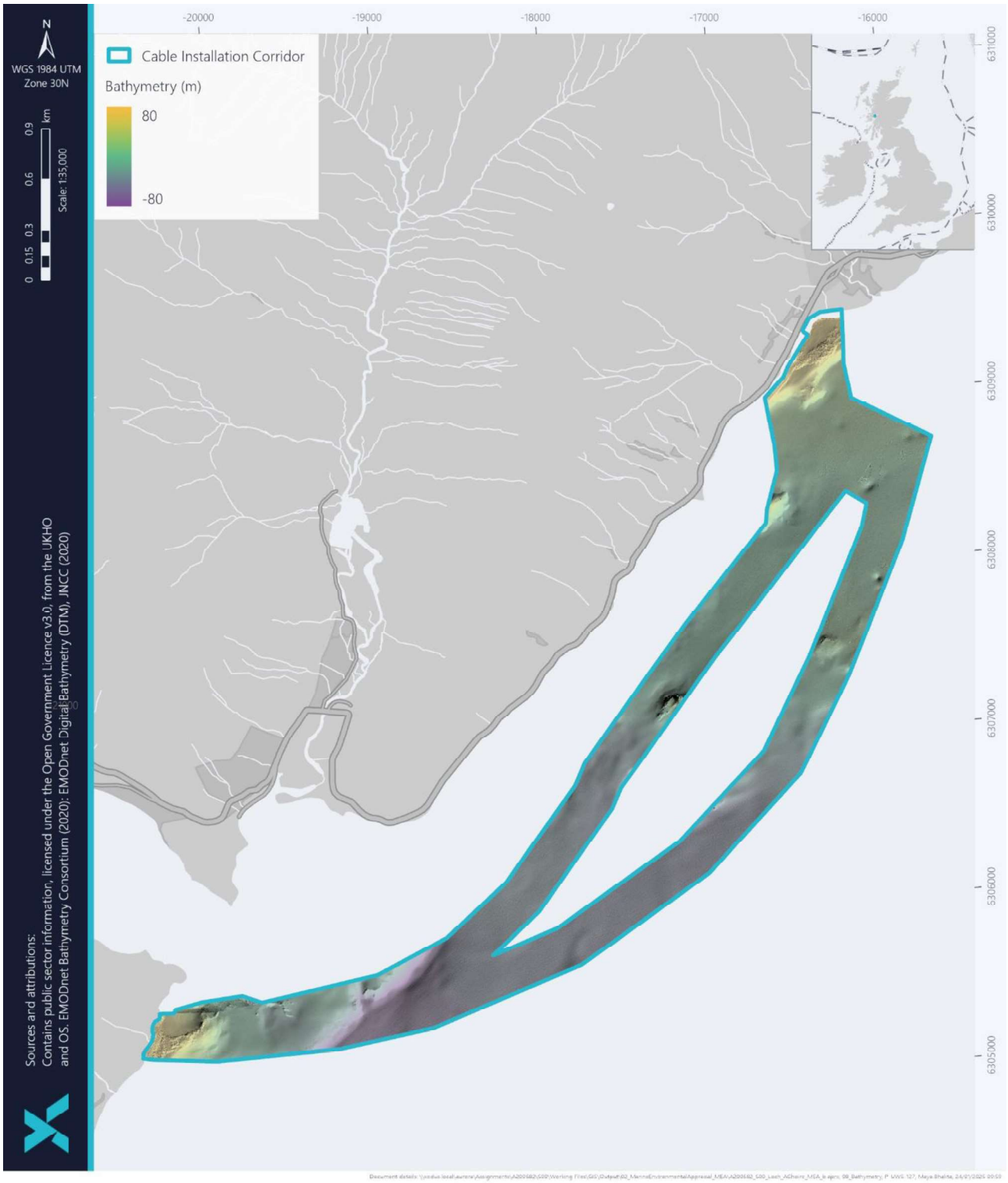

Figure 6-1 Bathymetry along the proposed cable corridor

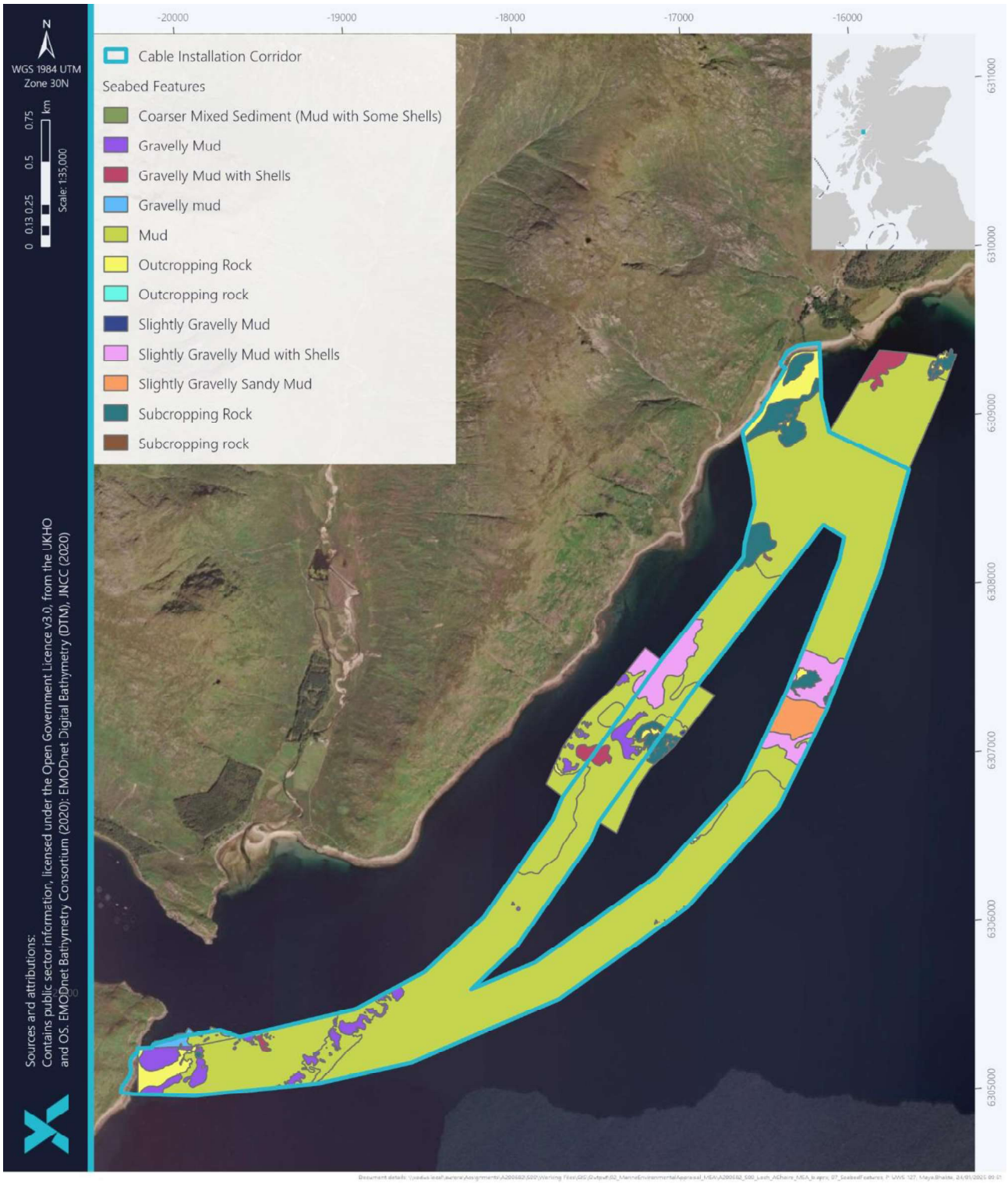

Figure 6-2 Seabed features (Benthic Solutions Limited,2024c)

6.3.2 Water Quality

The EU Water Framework Directive (2000/60/EC) (WFD) (as implemented into Scottish law through the Water Environment and Water Services (Scotland) (WEWS) Act 2003 and regulated through the Water Environment (Controlled Activities) (Scotland) Regulations 2011) ensures the protection of inland, transitional and coastal surface waters, and groundwaters through regulating individual pollutants, to remove and reduce pollution in water sources and prevent deterioration. Designated waterbodies are required to be kept in 'Good' status, both ecologically and chemically.

The proposed cable corridor is situated within the Loch Linnhe (South) (ID: 200081) designated coastal waterbody (SEPA, 2024a). The Loch Linnhe (South) coastal waterbody has an area of 148.7 km^2 and is in overall 'Good' condition, with 'Good' water quality and freedom from invasive species and 'High physical condition (SEPA, 2024a). It is projected to remain in 'Good' overall condition for 2027 and long-term.

The proposed cable corridor does not overlap with any bathing waters. The closest site is the Ganavan bathing water (ID: UKS7616024) which is in 'Excellent' condition and is greater than 20 km from the proposed cable corridor (SEPA, 2024b). Therefore no effects on the water quality status of the bathing water are predicted as a result of the Project.

The proposed cable corridor does not overlap with any shellfish water protected areas; however, the Lismore (ID: SWPA25) and Loch Creran (ID: SWPA32) shellfish water protected areas are within approximately 5 km and 10 km respectively (SEPA, 2024b). The Lismore shellfish water protected area is harvested for pacific oyster (*Magallana gigas*) (SEPA, 2024c), and the Loch Creran shellfish water protected area is harvested for pacific oyster and common mussel (*Mytilus edulis*) (SEPA, 2024d). Both locations have historically been listed as 'not at target objective' and 'fair' overall status; however, the 2018 revised status is listed as 'Good' (SEPA, 2024c,d).

6.4 Impact Assessment

6.4.1 Coastal Sediment Suspension

In the intertidal areas between MHWS and MLWS, the proposed cables will be trenched at both landfalls using OCT method as a first choice. This will be conducted using conventional land-based excavators working within a tidal window, i.e. when the intertidal area is exposed, avoiding works below the waterline. However, where trenching is not feasible due to seabed constraints (e.g. shallow bedrock), the cables will be surface laid with split pipe. Furthermore, small sections of OoS cable may also be removed in the intertidal area at both ends to allow the new cables to be installed. This will be conducted at low tide. It is therefore expected that there will be no disturbance of submerged sediments resulting from these intertidal activities. There may be temporary and highly localised increases in suspended sediment caused by the incoming tide interacting with the trench walls and associated spoil. However, this will not be significantly greater than that expected by wave action causing low-level erosion of the shoreline sediments.

Assessment of Impact Significance

The Project is located within the Loch Linnhe South) (ID: 200081) designated coastal waterbody which is currently in 'Good' overall condition. The proposed cable corridor is 3.32 km^2, which represents ~2% of the overall waterbody area. Given the limited spatial overlap with the coastal waterbody and no overlap (and >5 km intervening distance) with any designated bathing waters or shellfish water protected areas, with the good condition of the waterbody and no pressures identified, the overall sensitivity is **low**.

All Project activities at the landfall locations will be tidally dependent, working at low water thereby reducing the extent of resuspended sediment. Increased suspended sediment in the intertidal region will only occur during the interaction between the incoming tide, the trench walls and spoil heaps. This will result in highly localised and temporary increases in suspended sediment. Therefore, the magnitude of effect is assessed as **minor**, resulting in a **negligible** consequence.

Embedded mitigation measures considered as part of the Project design are listed in Section 4.3.

SENSITIVITY	MAGNITUDE OF EFFECT	CONSEQUENCE
Low	Minor	Negligible

Impact Significance – **NOT SIGNIFICANT**

6.4.2 Subtidal Sediment Suspension

Sections of the offshore portion of the cable are expected to be trenched via jet trenching or CFE. Jet trenching is a method of fluidising and transporting the sediment by injecting water with low pressure and high volume below the sediment surface via jet legs/swords. When the water pressure is removed, a proportion of the sediment resettles over the cable. It is expected that in general approximately 60% to 80% of the fluidised sediment would remain or settle back into the trench, and only the remaining 20-40% would be suspended into the water column. A study on the Environmental Impact of Subsea Trenching Operations (Gooding *et al.*, 2012) identified that impacts from sediment disturbance are localised and considered to be restricted to the immediate vicinity of the trench (less than 10 m either side). Suspended sediment concentrations, although elevated immediately after trenching, have been shown to fall to ambient levels within 66 m of trenching activity in hard ground areas and 70 m in sandy areas. CFE may be used to trench some sections of the cable, depending on local seabed conditions, however subtidal sediment effects from CFE are expected to be comparable to those resulting from jet trenching.

Effects on surrounding sediment type and geological features could occur due to the displacement and redistribution of sediment during trenching operations which would result in deposition of a layer of sediment over the immediate area.

Given that the seabed sediment in the subtidal region is primarily comprised of fine muds and mixed sediments (sandy mud) (Benthic Solutions Ltd., 2024; see Section 8.3.2), the suspended sediment may settle over a larger area than those predicted by Gooding *et al.*, 2012 and therefore at a lower level of deposition. However, effects are expected to be limited to the immediate vicinity of the cable trench and not extend beyond the limit of the proposed cable corridor. Sediment will re-deposit over a short period of time and the effects to the water quality and seabed conditions will be localised and short-term.

Assessment of Impact Significance

The Project is located within the Loch Linnhe South) (ID: 200081) designated coastal waterbody which is currently in 'Good' overall condition. The proposed cable corridor is 3.32 km^2, which represents ~2% of the overall waterbody area. Given the limited spatial overlap with the coastal waterbody and no overlap (and >5 km intervening distance) with any designated bathing waters or shellfish water protected areas, with the good condition of the waterbody and no pressures identified, the overall sensitivity is **low**.

In the subtidal region, post-lay trenching activities will result in highly localised and temporary increases in suspended sediment. It is expected that the finer sediments within the subtidal region will be re-suspended over a larger area; however, the majority of re-distributed sediments will be highly localised and will be spatially limited to the area of the trench. Therefore, the magnitude of effect is assessed as **minor**, resulting in a **negligible** consequence.

Embedded mitigation measures considered as part of the Project design are listed in Section 4.3.

SENSITIVITY	MAGNITUDE OF EFFECT	CONSEQUENCE
Low	Minor	Negligible

Impact Significance – **NOT SIGNIFICANT**

6.4.3 Changes to Sediment and Water Quality Following Accidental Release of Hydrocarbons

There is the potential for an unplanned spill to occur in the event of a collision with another vessel, if one of the Project vessels loses containment of hydrocarbon bunkers, or a hydraulic line leaks or fails (for example associated with cranes and ROVs). The main release risk associated with the proposed cable installation activities is a loss of diesel fuel from the installation and support vessels. Diesel has very high levels of light ends, evaporating quickly on release. The low asphaltene content prevents emulsification, therefore reducing its persistence in the marine environment. Light oil (such as diesel) tends to dissipate completely through evaporation and physical dispersion within 1 – 2 days and does not normally form emulsions. Some small-dispersed globules of semi-solid oil may persist for some time if the oil possesses wax or other persistent components. Any discharge of hydrocarbons will be limited to the inventory of each vessel during the proposed cable installation activities. Due to the low viscosity of diesel, it

will spread very rapidly to form a thin sheen at the surface. The sheen will break up rapidly under the influence of spreading and evaporation. Diesel is unlikely to persist within the water column once the spill has occurred.

Based on the volume and components of marine diesel, it is unlikely that diesel will percolate to the seabed and deposit on sediments. Therefore, sediments are unlikely to be affected by a spill. As such, it is not considered to present a major risk to the environment. As outlined in Section 4.3, the Emergency Spill Response Plan, and the SOPEPs in place for each vessel, will provide a clear protocol in the event of a release scenario, resulting in rapid and effective remedial action, limiting the extent of any spill.

Accidental releases of hydraulic fluids from the cranes on the project vessels and used for the ROVs are possible. Hydraulic fluids are used as part of a closed system (i.e. lines) in cranes and other machinery equipment (such as ROVs). The potential impacts of a hydraulic fluid release depend on the properties and components of each hydraulic fluid. Hydraulic fluids can either be oil or water-based. Water-based hydraulic fluids used are unlikely to be toxic to the marine environment and will disperse rapidly as they tend to not bioaccumulate and are biodegradable. Any accidental spills of oil-based hydraulic fluid are unlikely to form a sheen, as the potential volume of hydraulic fluid spilled is likely to be small and mineral oil content is low. Equipment (cranes, ROVs etc.) used during the Project will be regularly maintained, reducing the likelihood of a release.

A large spill of hydrocarbons or hydraulic fluids is very unlikely during the proposed cable installation activities. The impact of an accidental release (diesel or hydraulic fluid) is therefore considered to be minor and not significant.

Assessment of Impact Significance

The Project is located within the Loch Linnhe South (ID: 200081) designated coastal waterbody which is currently in 'Good' overall condition. There are no pressures identified on this waterbody, and no significant physical, chemical, biological or morphological changes to the waterbody are expected proposed cable and as such no impacts on waterbody status are predicted as a result of the Project. Given the distance from the proposed cable corridor, no effects on water quality status of the shellfish water protected areas are predicted as a result of the Project. The proposed cable corridor is 3.32 km^2, which represents ~2% of the overall waterbody area. Given the limited spatial overlap with the coastal waterbody and no overlap (and >5 km intervening distance) with any designated bathing waters or shellfish water protected areas, with the good condition of the waterbody and no pressures identified, the overall sensitivity is **low**.

Best practice will be followed, and it is therefore unlikely that a spill from would occur during the operations. Impact significance will vary depending on the size, volume and nature of the spill. Based on the very low likelihood of such an event, the magnitude of effect is assessed as **moderate**, resulting in a **minor** consequence.

Embedded mitigation measures considered as part of the Project design are listed in Section 4.3.

SENSITIVITY	MAGNITUDE OF EFFECT	CONSEQUENCE
Low	Moderate	Minor

Impact Significance – NOT SIGNIFICANT

6.4.4 Operation

The proposed cables have been designed to be maintenance free, as such no planned ongoing maintenance activities are proposed. SHEPD will conduct routine inspections and surveys of the proposed cables throughout their operational life to ensure they remain in good condition (please refer to the OIMD strategy submitted alongside this MEA). There is a potential for remedial cable repair works to be required, in the event the proposed cables are damaged or the need for additional stabilisation materials is identified during the routine surveys; however, this would be subject to a separate licensing process.

If required, impacts on seabed and water quality resulting from cable repairs will be analogous to those occurring during installation, although significantly reduced on both spatial and temporal scales. It should be noted that cable repair activities would be subject to a separate licensing process. As such, impacts during the operational phase are considered to be not significant.

6.5 Conclusion

There is potential for increases in coastal and subtidal sediment suspension resulting from the trenching of the proposed cables in the and removal of OoS cables in the subtidal region; however, the resulting increased suspended sediment concentrations will be temporary in nature and highly localised to the footprint of the proposed cable corridor in the subtidal region. The majority of proposed cable installation activities at the landfall locations will be tidally dependent. Increased suspended sediment will only occur during the interaction between the incoming tide, the trench walls and spoil heaps and as a result of cable removal activities. This will result in highly localised and temporary increases in suspended sediment which will not have a significant impact on coastal water quality or the waterbody status. Therefore, the impact is considered negligible and not significant. Best practice will be followed by all installation vessels, therefore the likelihood of accidental hydrocarbon releases from the installation vessel is extremely remote. The level of impact is therefore considered minor and not significant.

7 MARINE MEGAFAUNA

7.1 Introduction

This Section of the report provides further detail on marine megafauna, including marine mammals (cetaceans and pinnipeds), basking sharks, and otters in the vicinity of the proposed cable corridor, and presents results from an assessment of potential impacts on key sensitive species. Management and mitigation measures to ensure impacts are minimised will also be suggested. This Section also provides an EPS and Protected Species Risk assessment, with regard to potential impacts on cetaceans, basking sharks and otters which will support any required EPS or basking shark derogation licence applications.

7.2 Data Sources

The presence of marine mammals within the vicinity of the proposed cable corridor have been characterised through publicly available geospatial data (e.g. NMPi) and relevant literature sources, including the findings of the Small Cetaceans in European Atlantic waters and the North Sea (SCANS) SCANS-IV survey (Gilles *et al.*, 2023), Special Committee on Seals (SCOS) 2022 report and 2023 interim advice (SCOS, 2022; 2023) and Carter *et al.*, (2022) seal at sea density mapping.

7.3 Baseline and Receptor Identification

7.3.1 Cetaceans

Twenty-three species of cetaceans have been recorded in Hebridean waters, with the most common species sighted including harbour porpoise, minke whale, common dolphin (*Delphinus delphis*), bottlenose dolphin (*Tursiops truncatus*), white-beaked dolphin (*Lagenorhynchus albirostris*), Risso's dolphin (*Grampus griseus*), killer whale (*Orcinus orca*) and humpback whale (*Megaptera novaeangliae*) (Hebridean Whale and Dolphin Trust (HWDT), 2018).

The SCANS-IV survey indicates that five of these species were observed within block CS-F which overlaps with the proposed cable corridor: harbour porpoise, bottlenose dolphin, Risso's dolphin, common dolphin and minke whale (Gilles *et al.*, 2023). The following provides a description of these species, including their density (animals / km^2) and abundance:

- Harbour porpoises are considered to be a resident species off the west coast of Scotland, with frequent sightings year-round (HWDT, 2018; Department for Business, Energy, & Industrial Strategy (BEIS), 2022). Harbour porpoises are commonly observed alone or in small groups of up to five animals, although occasionally larger aggregations are observed in the Hebrides (Hague *et al.*, 2020; HWDT, 2018). Harbour porpoises are widespread and can be seen in most coastal areas of the Hebrides (HWDT, 2018), with sightings in the Minches peaking in the summer months between June and September (BEIS, 2022). The Inner Hebrides and the Minches SAC, located approximately 8 km from the proposed cable corridor, is designated for harbour porpoise. The population estimate within the SAC is estimated to range between 2,426 and 12,191 animals. The abundance of harbour

porpoise observed in block CS-F during the SCANS-IV survey was 3,064 animals, with a density of 0.2 animals per km^2 (Gilles *et al.*, 2023);

- Minke whales are the smallest, most abundant baleen whale to be sighted in Scottish waters (HWDT, 2018). Minke whales are often observed alone or in small groups of two to three, although larger aggregations can be observed at feeding grounds. Minke whales are considered seasonal visitors in the Minches and western Scotland, present from May through October with a peak in sightings between July and September (HWDT, 2018). There is a high density of minke whales in the Sea of Hebrides and to south and west of the Hebrides, and this species is frequently observed in this region (Paxton *et al.*, 2014). The Sea of the Hebrides NCMPA which is located approximately 35 km from the proposed cable corridor has been designated for minke whale. The abundance of minke whale observed in block CS-F during the SCANS-IV survey was 209 animals, with a density of 0.01 animals / km^2 (Gilles *et al.*, 2023);
- Common dolphins are considered a primarily offshore species, but over the past decade there has been an increase in sightings in the Inner Hebrides, and common dolphins are now the most commonly sighted cetacean in the Sea of Hebrides and the Minch (HWDT, 2018). Common dolphins are often observed in groups of up to 30 individuals, although during the summer pods of hundreds have been observed (HWDT, 2018). Common dolphins are primarily a summer visitor, with a peak in sightings from April to October, although some common dolphins now remain into the winter months (HWDT, 2018). The abundance of common dolphins in lock CS-F during the SCANS-IV survey was 829 animals, with a density of 0.05 animals / km^2 (Gilles *et al.*, 2023);
- Bottlenose dolphins are considered to be a resident species off the west coast of Scotland, with sightings year-round (HWDT, 2018). Bottlenose dolphins are most often observed in small groups of three to ten individuals, but larger groups are not unusual in the Hebrides (BEIS, 2022; HWDT, 2018). The abundance of bottlenose dolphins in block CS-F during the SCANS-IV survey was 647 animals, with a density of 0.04 animals / km^2 (Gilles *et al.*, 2023);
- Risso's dolphins are common in deeper, offshore waters (Hague *et al.*, 2020); however, in the Hebrides there is deep water close to shore and as such this species has been observed along the coast (HWDT, 2018). Risso's dolphins are seen year-round in the Hebrides and often observed alone or in groups of up to 20 individuals (HWDT, 2018). The abundance of Risso's dolphins in block CS-F during the SCANS-IV survey was 41 animals, with a density of 0.003 animals / km^2 (Gilles *et al.*, 2023);
- Other Species:
  - Killer whales are seen throughout the west of Scotland, both in coastal and offshore waters year-round; however, sightings are considered infrequent (HWDT, 2018). The majority of sightings have been attributed with individuals which belong to a small, resident group known as the 'West Coast Community' (HWDT, 2018). During the SCANS-IV survey, there were too few killer whales sighted to be able to determine abundance (Gilles *et al.*, 2023);
  - White-beaked dolphins are considered to be a resident species off the west coast of Scotland, with sightings year-round (HWDT, 2018); however, sightings are most frequent from June to October (BEIS, 2022). White-beaked dolphins are rarely seen alone and frequently observed in groups of five to 20 animals, although larger groups of several hundred are occasionally observed (HWDT, 2018). White-beaked dolphins tend to prefer offshore waters in the northern part of the Minch and west of the Outer Hebrides (BEIS, 2022). There we no sightings of white-beaked dolphin in block CS-F during the SCANS-IV survey; and
  - Humpback whales are considered a migratory species in the Hebrides and have occasionally been sighted in the summer months (HWDT, 2018; BEIS, 2022). Since 2004 there have been less than 10 sightings recorded, with sightings primarily around Skye and the Outer Hebrides (HWDT, 2018). Therefore this species is

considered unlikely to be present. Furthermore, there we no sightings of humpback whales in block CS-F during the SCANS-IV survey.

The distribution, density, and abundance of the five most commonly occurring cetacean species around the proposed cable corridor are presented in Table 7-1.

Table 7-1 Population Parameters of Cetaceans Potentially Present within the Vicinity of the Proposed Cable Corridor (Gilles et al., 2023; Inter-Agency Marine Mammal Working Group (IAMMWG), 2022)

SPECIES	ESTIMATED DENSITY[5] (ANIMALS / km^2) (GILLES *et al.*, 2023)	ESTIMATED ABUNDANCE WITHIN THE PROJECT AREA (3.32 km^2)	MANAGEMENT UNIT (MU) / BIOGEOGRAPHICAL POPULATION ESTIMATE (IAMMWG, 2022)	PROPORTION OF THE MU POTENTIALLY AFFECTED BY THE PROPOSED CABLE INSTALLATION ACTIVITIES (%)
Harbour porpoise	0.20	0.66	24,305	0.003
Bottlenose dolphin	0.04	0.13	45	0.289
Risso's dolphin	0.003	0.01	8,687	0.0001
Common dolphin	0.05	0.17	57,417	0.0003
Minke whale	0.01	0.03	10,288	0.0003

7.3.2 Seals

Two pinniped (seal) species regularly occur in the Scottish offshore and coastal environment: grey seals and harbour seals. Both grey and harbour seals are listed under Annex II of the Habitats Directive and are PMFs. In the Inner Hebrides, the onset of pupping for grey seals is in early September and carries on through the end of October with moulting between November to December (SCOS, 2022). For harbour seals, pupping occurs between June to July, with moulting occurring in August (BEIS, 2022).

Similar to seabirds, seals are central-place foragers, utilising a terrestrial 'base' for important life history events (i.e. breeding, pupping, moulting, etc.) and to rest, and then undertake foraging trips at sea before returning to land (Pollock, 2000). While both species are associated with shallower shelf waters, grey seals often make longer foraging trips to deeper waters than harbour seals.

As discussed in Section 5, there is one SAC with harbour seal as a qualifying feature, the Eileanan agus Sgeiran Lios mor SAC located approximately 3 km from the proposed cable corridor. SCOS (2022) reports that the estimated abundance of harbour seals in the Eileanan agus Sgeiran Lios mor SAC is currently stable. There are no SACs with

[5] *Based on SCANS-IV block CS-F.*

grey seals as a qualifying feature within the connectivity range of 20 km of the proposed cable corridor. Furthermore, there are no designated seal haul-outs or grey seal breeding sites within 500 m to the proposed cable corridor.

Harbour seals are widespread around the west coast of Scotland and throughout the Hebrides (SCOS, 2022). The proposed cable corridor is within the south sub-region (Ardnamurchan to Scarba) of the West Scotland Seal Management Unit (SMU). The most recent August counts of harbour seals at haul out sites (2016 – 2019) was 15,600 seals for the West Coast SMU with a count of 7,053 seals in the south sub-region of the West Coast SMU (SCOS, 2022). The most recent estimate of the harbour seal population (2016 – 2021) in the West Scotland SMU was 21,666 seals, which represents a large proportion (50%) of the overall UK harbour seal population based on the most recent count (SCOS, 2022).

Carter *et al.*, (2022) modelled the habitat preference of grey and harbour seals and predicted at sea seal distribution on a 5 km x 5 km grid for both species. These data have been processed according to the method described in SCOS (2022), utilising scalars to generate estimates of number of seals within each grid cell (and 95% confidence limits). This is calculated by scaling the Carter *et al.*, (2022) relative density in a cell to an absolute at sea seal density (mean numbers of seals per cell) using the most recent independent estimate of the grey or harbour seal population and the proportion of the population at sea at a given time. In line with this, the mean predicted absolute abundance of grey and harbour seals per 25 km^2 is provided below in Figure 7-1. The population densities overlapping the proposed cable corridor are estimated to be between 25 to 50 harbour seals per 25 km^2 and 0 – 1 grey seals per 25 km^2 in the southern grid square and 50 to 75 harbour seals per 25 km^2 and 1 – 3 grey seals per 25 km^2 in the northern grid square (Figure 7-1).

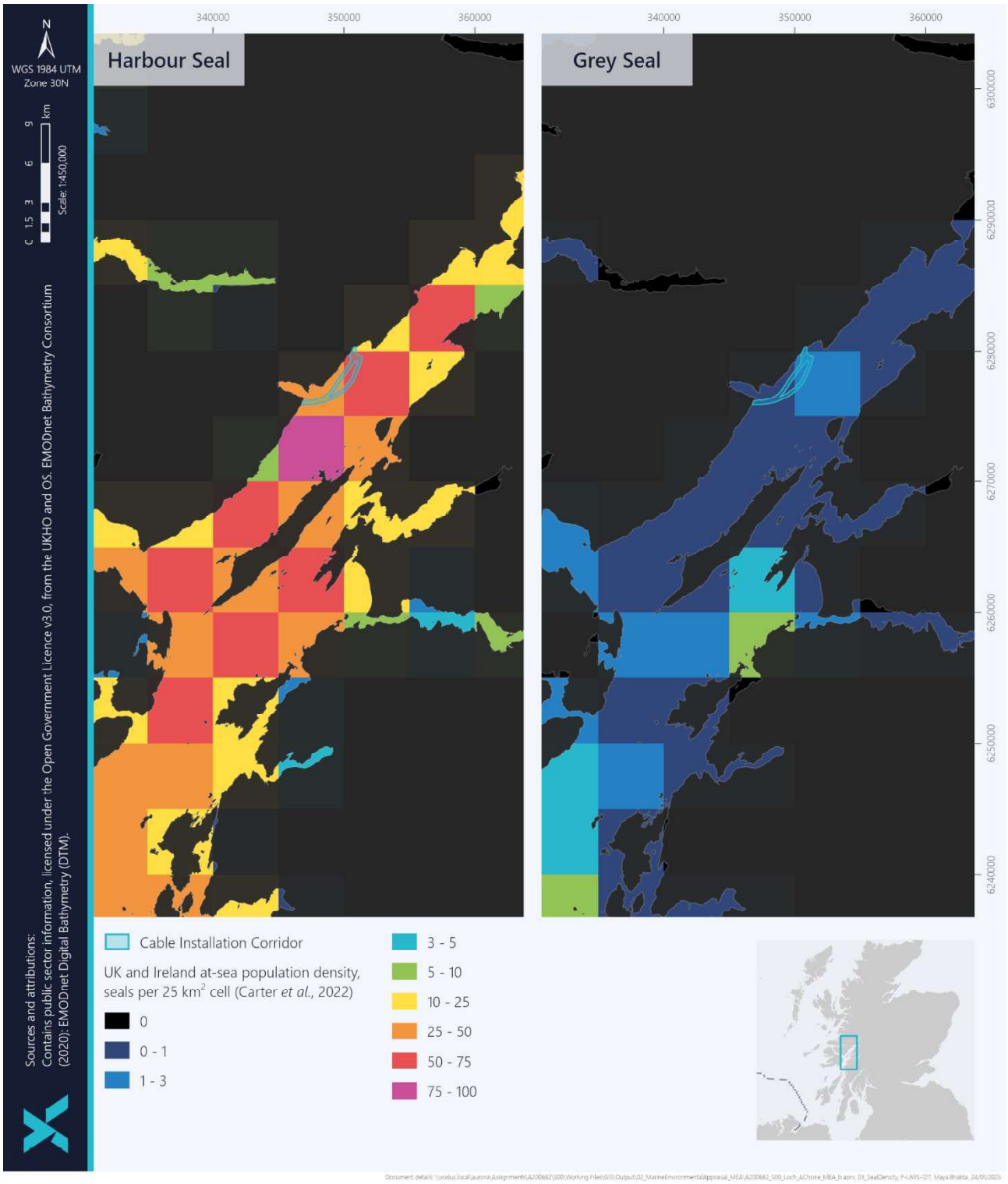

Figure 7-1 Mean Predicted Absolute Density of At Sea Harbour and Grey Seals per 25 km² (Carter et al., 2022)

7.3.3 Basking Sharks

Basking sharks (*Cetorhinus maximus*) are protected under Schedule 5 of the WCA 1981 which prohibits the killing, injuring, or taking by any method of those wild animals listed on Schedule 5 of the WCA 1981. The Nature Conservation (Scotland) Act 2004, Part 3 and Schedule 6 make amendments to the WCA 1981, 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.

Basking shark is the second largest fish in the world (Sims, 2008). This species can be found throughout the offshore waters in the UK continental shelf (Sims, 2008) and are considered frequent visitors to the north and west coasts of Scotland with the waters here having a high suitability for basking sharks (HWDT, 2018; Witt et al., 2012; Austin et al., 2019). They are widely distributed in cold and temperate waters and feed predominantly on plankton and zooplankton e.g. barnacles, copepods, fish eggs and deep-water oceanic shrimps by filtering large volumes of water through their wide-open mouth. They typically move very slowly (around 4 miles per hour). In the winter, they dive to great depths to get plankton while in the summer they are mostly near the surface, where the water is warmer.

Due to their size, slow swimming speeds and preference for swimming in coastal waters during the summer months, basking sharks are considered to be at potential risk of collision with vessels associated with the cable installation activities. Given that basking sharks are slow to mature and have a long gestation period, the species can be slow to recover if populations are rapidly depleted.

Basking sharks are most frequently seen in the Hebrides between May and October, with sightings peaking at the height of summer in July and August (HWDT, 2018). Basking sharks are unlikely to be present within Loch Linnhe. A long-term record of basking shark sightings (1987 – 2016) indicates that the highest density of sightings (i.e. 100+) in the Hebrides are present around the Small Isles and Coll to Tiree, whereas Loch Linnhe is in a region of low sightings (i.e. 1 – 10) (Department for Business, Energy and Industrial Strategy (BEIS), 2016).

7.3.4 Otters

Otters are small, semi-aquatic mammals which inhabit riverine, brackish and coastal environments throughout the UK. Although land mammals, otters depend on both freshwater and marine environments for food. Their marine habitat comprises low, peat-covered coastlines with shallow, seaweed rich waters and a consistent freshwater supply (BEIS, 2022). There is a large coastal otter population throughout the west of Scotland.

As described in Section 5.3.4, there are no designated sites with otter as a protected feature overlapping with the proposed cable corridor. The closest site is the Morven Woods SAC located approximately 9.5 km away.

7.4 Impact Assessment

This Section outlines the proposed cable installation activities which have the potential to impact upon marine megafauna species, including cetaceans, pinnipeds and otters.

7.4.1 Identification of Potential Impacts

This Section reviews potential impacts to marine megafauna receptor species from the proposed cable installation activities and narrows down which activities require further assessment to identify the likelihood and significance of those impacts. Impacts from accidental releases from pollution for all marine megafauna have not been considered for further assessment, given that the likelihood of this is extremely low (Section 6.4.3).

Marine Mammal Impacts

Underwater noise emissions from the proposed cable installation activities are likely to constitute the greatest potential risk to marine mammals within the vicinity of the proposed cable corridor. Noise has the potential to impact cetaceans and other marine species in two ways:

- Injury – physiological damage to auditory or other internal organs; and
- Disturbance (temporary or continuous) – disruptions to behavioural patterns, including, but not limited to: migration, breathing, nursing, breeding, foraging, socialising and / or sheltering (note: this impact factor does not have the potential to cause injury).

If a noise emission is composed of frequencies which lie outside the estimated auditory bandwidth for a given species, then the potential for auditory impact is considered to be very unlikely (National Marine Fisheries Service (NMFS), 2018). To understand the potential for noise-related impacts, the likely hearing sensitivities of different marine mammal hearing groups has been summarised in below in Table 7-2 (Southall *et al.*, 2019).

Table 7-2 Auditory Bandwidth Estimated for Marine Megafauna (Southall et al., 2019; NMFS, 2018)

HEARING GROUP	ESTIMATED AUDITORY BANDWIDTH
Low-frequency (LF) cetaceans (e.g. baleen whales, such as minke whales)	7 Hz to 35 kilohertz (kHz)
High-frequency (HF) (e.g. dolphins)	150 Hz to 160 kHz
Very high-frequency (VHF) cetaceans (e.g. harbour porpoises)	275 Hz to 160 kHz
Phocid carnivores in water (PW) (e.g. grey and harbour seal)	50 Hz to 86 kHz

The potential sources of underwater noise associated with the proposed cable installation activities include:

- Vessel noise from ships;
- Noise associated with cable-laying activities;
- Noise from the USBL positioning device during installation, associated with the deployment of ROVs, and other subsea equipment; and
- Noise from geophysical survey devices used during pre and post installation survey, and inspection including MBES and SSS.

While vessel noise is broadband and will be audible to marine mammals, the presence of the vessels within the proposed cable corridor will not constitute a substantive change from baseline vessel numbers, or types of vessels in the area. Additionally, the duration of the proposed cable installation activities is relatively short-lived. As such the presence of vessels will not result in a significant change to the existing soundscape in the area, hence, this aspect does not have the potential to result in adverse underwater noise impacts on cetaceans and is not considered further.

Underwater noise emissions resulting from the cable laying activities are expected to be minimal. Moreover, trenching activities in the intertidal area will be conducted at low water when the area is dry, and hence there is no potential for underwater noise emissions to result from this activity. As such, noise from cable laying activities does not have any potential for adverse effects on cetaceans and pinnipeds and is not considered further. Further details on the cable lay methodologies are described in the Loch A' Choire Subsea Cable Replacement Project Description (Document No. A-200682-S00-A-REPT-002).

MBES and SSS will operate at frequencies > 200 kHz and therefore are above the hearing threshold for marine mammals; however, USBL devices commonly operate in a frequency range which makes them audible to cetaceans and pinnipeds, and hence this activity does have the potential to result in adverse effect on these receptors. The highly mobile nature of cetaceans and pinnipeds and the temporary, localised nature of USBL noise emissions associated with the activities dramatically reduces the likelihood of interactions between the Project and cetacean and pinniped receptors resulting in significant impacts. However, as the risk of injury or disturbance to a small number of individual cetaceans remains, an EPS licence may be required, and hence impacts from noise emissions associated with USBL have been carried forward for further assessment.

Collision risk is another potential risk to marine mammals in the area and may cause mortality and sublethal injury (Laist *et al.*, 2001). However, marine mammals are highly mobile and as the proposed cable installation activities are due to take place from slow moving vessels operating in well-defined routes, collision risk is anticipated to be negligible. Any remaining residual risk from vessel movements will be further reduced on the basis of the embedded mitigation measures outlined in Section 4.3, which includes the management of vessel speed and the commitment for vessels to adhere to the SMWWC. For this reason, vessel movements have not been identified as having the potential to cause adverse or significant impacts to the Favourable Conservation Status (FCS) of any marine mammal population and has therefore been screened out from further assessment.

The marine mammal species recorded in the vicinity of the Project cable corridor do not rely extensively on eyesight for hunting and navigation. Therefore, potential impacts resulting from localised elevations of mobilised suspended sediment are not expected to impede their ability to hunt or navigate. Considering this and the fact that changes to water quality are expected to be minimal (as detailed in Section 6), water quality impacts are not discussed further.

Vessel and human presence in the immediate vicinity of seal haul-outs may potentially impact seals. Seals are particularly susceptible to disturbance during their respective pupping and moulting seasons, when the residency of seals at haul-outs and in surrounding waters elevates the relative density of each species. The proposed cable installation activities in July 2025 will overlap with the pupping season for harbour seal. Given the licence duration of 18-months, there is also the potential to extend into the moulting season for harbour seal.

As such, impacts to harbour seals from landfall activities have been carried forward for further assessment.

Basking Sharks Impacts

The basking shark is an elasmobranch (sharks and rays) which is a group with generally low sensitivity to noise vibrations due to the fact they do not have a swim bladder. The hearing range of basking sharks is not known; however, five other elasmobranchs have been found to have a hearing range between 20 Hz to 1 kHz (Macleod et al., 2011). It is acknowledged that this may not be entirely transferable to basking sharks, however since the USBL equipment operates at a minimum frequency of 20kHz which is several orders of magnitude higher than 1 kHz, it is unlikely this equipment will be audible to basking sharks. Any noise emissions resulting from the cable installation equipment is also expected to be minimal and unlikely to result in any injury or significant disturbance (as described above). On this basis, the potential for noise emissions to impact upon basking sharks is screened out of further assessment.

Vessel collision does pose a threat to this slow-moving species. Collision risk increases with increasing vessel speed. As the survey vessels will be moving slowly, collision risk is generally low, however does warrant further assessment.

Otter Impacts

Otters are particularly sensitive to anthropogenic changes to their habitats, as their coastal habitat use is highly dependent on the inclusion of freshwater features (Loy *et al.*, 2022). As such, the location of their holts (or dens) is restricted, and anthropogenic changes to their habitat may have dramatic repercussions, including localised extinctions. There is potential for vessel and human presence to result in visual disturbance to otters outwith designated sites, particularly during the intertidal works with plant operating in the intertidal area.

The results of the protected species survey found no otter holts or rest-ups found within 200 m of the proposed landfalls; however, during the intertidal survey an otter was sighted at the Kilmalieu-Loch A' Choire 2 landfall, along with crab carcasses and mussel shell debris. It was noted that there is potential for otters to create new territories and therefore it is recommended that pre-works checks are carried out by an ECoW. Thus, pre-works checks will be conducted by an EcoW prior to the commencement of proposed cable installation activities and will include the cable landfall areas and a 200 m mitigation zone. Any otter holts, layups and couches will be identified and avoided by a 40 m buffer.

7.4.2 Injury and Disturbance from Noise Emissions

Underwater noise generated by USBL constitutes the only source of sound with the potential to cause injury or significant disturbance to marine mammals. USBL typically operates in the frequency range of 24 – 33.5 kHz, and as such is audible to all marine mammal species likely to be present in the vicinity of the proposed cable corridor. The USBL source level utilised during the proposed cable installation activities will be limited to 207 dB re 1µPa (peak).

Noise modelling has been undertaken to identify the potential range (i.e. the straight-line distance from the source) in which noise impacts to marine mammals could occur. This assessment was based on the methods and thresholds provided by the current best practice guidance, as presented by NMFS (2018) and Southall *et al.* (2019). The full noise assessment has been presented in Appendix A; a summary of the results is presented below.

Based on a source level of 207 dB re 1µPa (peak), under the worst-case scenario, the largest injury range resulting from USBL was 104 m for VHF cetaceans (harbour porpoises), when considering cumulative sound exposure levels

for a stationary animal. For whale, dolphin, and seal receptors (LF, VHF and PW hearing groups) the potential injury ranges were significantly reduced. While a theoretical injury risk is identified by the underwater noise modelling, this is based on a cumulative exposure over an extended time period. As such, in order for a harbour porpoise to be at risk of injury, an animal would have to remain within 104 m of the USBL device for a period of several hours. The likelihood of this scenario occurring is extremely low when considering that the source is deployed from a moving vessel, and that animals will tend to move away from sources of acoustic disturbance.

As such, the assessment concludes that there is no realistic risk of injury to marine mammals, resulting from the use of USBL with source levels up to 207 dB re 1µPa (peak).

Whilst no injury impacts are expected, noise emissions have the potential to affect the behaviour of marine mammals in the vicinity of the noise source. Significant or strong disturbance may occur when an animal is at risk of a sustained or chronic disruption of behaviour or habitat use resulting in population-level effects. The potential impacts resulting from USBL noise was modelled in the noise assessment in Appendix A.

Under the worst-case scenario, it was predicted that a behavioural change may occur for marine mammals within 207 m of the cable installation vessel. As such, underwater noise emissions from the use of USBL have the potential to elicit a strong behavioural response in marine mammals which could be classed as a disturbance of EPS offence as defined under Regulations 39(1) or 39(2).

However, for the relevant biogeographical population MU for harbour porpoise, bottlenose dolphin, Risso's dolphin, common dolphin and minke whale, which all occur in the area, this will not result in population levels effects or adverse impact the FCS of the species. This is due to the fact that the noise assessment predicts that less than 0.1% of the biogeographic populations of relevant cetacean species will be impacted by noise-related disturbance as a result of USBL operations. Moreover, the number of animals within the disturbance range at any one time is predicted to be < 0.1. This means that on average, there will be no marine mammals within the disturbance range for 90% of USBL operations, making potential disturbance impacts at the population level arising from this equipment negligible.

As the vessel and/or the subsea equipment (e.g. an ROV) will generally not be stationary during USBL operations, animals within a particular area will not be exposed to extended periods of underwater noise. Rather, individuals would have to follow the moving equipment to be subjected to lasting or prolonged periods of acoustic disturbance. As such, the exposure to disturbance from USBL operations will be extremely limited in duration, and hence does not have the potential to result in adverse effects at a population or species level.

Given the transient, highly localised and short-term nature of the USBL activities, it is highly unlikely that any disturbance offences from use of USBL would negatively impact upon the FCS of any of the cetacean species which may be present in the survey area. This is on the basis that the modelled level of disturbance is unlikely to affect the ability of any individual animal to survive or reproduce and will not have significant population-level impacts to any marine mammal. As such, no additional mitigation, above the embedded mitigation, is required to limit the potential impacts on marine mammals resulting from USBL operations.

The above notwithstanding, it is possible that a small number of cetaceans may experience some level of disturbance for the short period that they encounter the proposed cable installation activities. As such, EPS licences are expected

to be required for the USBL-related activities which will be conducted during the of the proposed cable installation activities (as per Regulation 39(2)) (Scottish Government, 2014).

Assessment of Impact Significance

As cetaceans are EPS, and therefore afforded strict protection under the Habitats Regulations, and also potentially vulnerable to underwater noise impacts, the sensitivity is assessed as high. There will be no injurious impacts to marine mammals as a result of noise-generating installation activities. However, there is potential for disturbance to marine mammals from underwater noise. Activity-related disturbance is expected to be limited to one or a few individuals of a species and will therefore not result in any adverse impact to the FCS of any marine mammal species. Therefore, the magnitude of effect is assessed as minor, resulting in a minor consequence.

As the impact is not significant, no additional mitigation measures are required. Embedded mitigation measures considered as part of the Project design are listed in Section 4.3.

SENSITIVITY	MAGNITUDE OF EFFECT	CONSEQUENCE
High	Minor	Minor

Impact Significance – NOT SIGNIFICANT

7.4.3 Potential Disturbance from Nearshore and Intertidal Activities

There will be a number of vessels and vehicles present on site during Project activities, including onshore plant during intertidal works, which have the potential to result in visual disturbance risk to seals and otters; however, it is noted that the vessel activity will not be a substantive change from baseline vessel activity within the area.

The Eileanan agus Sgeiran Lios mor SAC, designated for harbour seal, is located approximately 3 km from the proposed cable corridor. The greatest potential for disturbance is during the pupping season between June to July and moulting period in August. The proposed cable installation activities will take place in July 2025 which will overlap with the pupping season for harbour seal. Furthermore, given the licence duration of 18 months there is potential to overlap with the moulting period. However, given the distance to the SAC there is no line of sight between the seals on land and the proposed cable installation activities. Given that seals are a mobile species, there is potential to disturb at-sea seals during foraging; however, as detailed in Section 5.5.2, the vessel activity associated with the proposed cable installation activities will not be a substantive change from baseline vessel activity within the area, and given the embedded mitigation (e.g. vessels travelling at slow speeds and adhering to the SMWWC) (see Section 4.3), no likely significant impacts on the harbour seals associated with the Eileanan agus Sgeiran Lios mor SAC are anticipated.

Vessel, vehicle and human presence also have the potential to disturb otters at the landfall sites. In the intertidal areas, the cables will be either buried via OCT or surface laid at both landfalls which has the potential to result in

additional disturbance to otters. Although there is the potential for disturbance to otters, this is likely to be greatly reduced, owing to the temporary nature of the nearshore Project activities and the associated embedded mitigation for otters, as described in Section 4.3 above.

Assessment of Impact Significance

There is potential for disturbance risk to seals and otters from the presence of vessels and vehicles during the proposed cable installation activities. Due to the potential vulnerability of seals to disturbance impacts during breeding and moult periods, combined with the protection afforded to seals under the Marine Scotland (2010) Act, seals are assessed as having a high sensitivity. Similarly, due to the protected afforded to otters as EPS, and the potential vulnerability to changes in their coastal habitat, otters are also assessed as having a high sensitivity. With the implementation of the proposed embedded mitigations (e.g. vessels travelling at slow speeds, adhering to the SMWWC and avoiding key otter habitats), no adverse impacts to harbour seals associated with the Eileanan agus Sgeiran Lios mor SAC are anticipated and any disturbance to otters will be minimal. Therefore, the magnitude of impact is assessed as minor, resulting in a minor consequence. Embedded mitigation measures considered as part of the Project design are listed in Section 4.3.

SENSITIVITY	MAGNITUDE OF EFFECT	CONSEQUENCE
High	Minor	Minor

Impact Significance – NOT SIGNIFICANT

7.4.4 Injury or Disturbance from Vessel Presence (Basking Sharks)

As discussed in Section 7.4.1, impacts on marine mammals resulting from vessel presence are screened out of this assessment. However, basking sharks are considerably less mobile than marine mammals and are therefore identified as being more sensitive to vessel presence. Additionally, basking sharks are frequently sighted in the Sea of Hebrides, for which basking shark are now a protected feature of the Sea of Hebrides NCMPA.

Project vessels will be moving slowly during the cable installation works reducing the risk of collision and disturbance to basking sharks in line with the Basking Shark Code of Conduct (Shark Trust, 2024), and SHEPD are committed to ensuring vessels adhere to the SMWWC (SNH, 2017). In addition, only a small number of vessels are required for the cable installation activities, which will be present in the area for a short duration only. Furthermore, basking shark densities are expected to be relatively low in the nearshore waters within which the proposed cable corridor is located (BEIS, 2016), reducing the potential for collision risk, with the likelihood of this impact being limited to the short installation period only. These factors considerably reduce the risk of injury or disturbance to basking sharks resulting from interaction with project vessels. Therefore, given that basking sharks are unlikely to be present, with consideration of the embedded mitigation measures, the risk of collision between basking shark and project vessels is considered to be low.

Considering these factors, and that the presence of the project vessels will not constitute a substantive change from baseline vessel activity in the vicinity of the proposed cable corridor, it is concluded that vessel presence will not adversely affect the FCS of basking sharks. However, since the risk of disturbance cannot be entirely ruled out, a basking shark derogation licence may be required under the WCA 1981.

Assessment of Impact Significance

Due to the potential vulnerability of basking sharks to injury and disturbance resulting from vessel presence, combined with the protection of the species under the WCA 1981, a high sensitivity has been assigned.

The risk of injury or disturbance of basking sharks as a result of vessel presence during the Loch A' Choire cable replacement projects is extremely limited, and not expected to reduce FCS of the species, and as such the magnitude of effect is minor, resulting in an overall minor consequence.

As the impact is not significant, no additional mitigation measures are required. Embedded mitigation measures considered as part of the Project design are listed in Section 4.3.

SENSITIVITY	MAGNITUDE OF EFFECT	CONSEQUENCE
High	Minor	Minor

Impact Significance – NOT SIGNIFICANT

7.4.5 Operation

The proposed cables have been designed to be maintenance free, as such no planned ongoing maintenance activities are proposed. SHEPD will conduct routine inspections and surveys of the proposed cables throughout their operational life to ensure they remain in good condition (please refer to the OIMD strategy submitted alongside this MEA). There is a potential for remedial cable repair works to be required, in the event the proposed cables are damaged or the need for additional stabilisation materials is identified during the routine surveys; however, this would be subject to a separate licensing process.

If required, impacts on marine megafauna resulting from cable repairs will be analogous to those occurring during installation, although significantly reduced on both spatial and temporal scales. As such, impacts during the operational phase are considered to be not significant.

Underwater noise from routine inspections and surveys of the proposed cables will have the potential to affect marine mammals, however these will be consented separately through the EPS licence regime and are not considered further.

7.5 Conclusion

Underwater noise emissions are the impact mechanism most likely to affect marine megafauna in the area of activities. Noise modelling used to inform the assessment (see Appendix A: Noise Impact Assessment), demonstrates that whilst there may be some disturbance to marine mammals resulting from USBL operations, this is likely to be limited in space and time and should only affect a few individuals of any species.

There will be no injurious impacts to cetaceans, seals or otters as a result of proposed cable installation activities and no requirement to apply for an EPS licence in that respect; however, there is potential for disturbance to cetaceans, and therefore an EPS licence application has been submitted alongside this MEA. The disturbance is expected to be limited to one or a few individuals of the local population and will therefore not result in any adverse impact to the FCS of any marine mammal species. With respect to impacts on otters, no evidence of otter presence has been found, but if any are detected during further pre-installation surveys, a buffer zone will be implemented as described in Sections 7.4.1 and 7.4.3. As such, impacts on otters are expected to be extremely limited, and will not impair an otter's ability to survive, breed or reproduce, or rear or otherwise care for its young, and there will be no adverse impact on the FCS of otters in the region. Therefore, an EPS licence is not required for otters.

The proposed cable installation activities will not result in the catching or killing of seals, and thus the protection provided to the two species by the Conservation (Natural Habitats, &c.) Regulations 1994 (as amended) will not be breached.

It is acknowledged that the presence of the installation vessels does have the potential to result in adverse (injury or disturbance) interactions with basking sharks if present. However, as described above basking sharks are unlikely to be present within Loch Linnhe (BEIS, 2016). Taking the low likelihood of basking shark presence into consideration, along with the embedded mitigation measures (e.g. slow vessels speeds) and short duration of Project activities, the vessel collision risk is low. Therefore no adverse impact on the FCS of basking shark is expected. Nevertheless, SHEPD will apply for a basking shark derogation licence, since the risk cannot be entirely ruled out.

Considering the temporary and localised nature of the activities there are not anticipated to be any significant impacts to individuals or populations of marine megafauna in the area.

8 BENTHIC AND INTERTIDAL ECOLOGY

8.1 Introduction

This Section provides detail on the benthic and intertidal habitats and species located along, and in the immediate vicinity of, the proposed cable corridor. An assessment of potential impacts on key sensitive habitats and species is presented, along with an outline of secondary mitigation requirements, which may be undertaken if potential significant impacts are identified. The impact assessment focuses on habitats that are protected or are qualifying features of conservation sites located within the proposed cable corridor and that have the potential to be impacted.

8.2 Data Sources

The benthic subtidal and intertidal habitats and species have been characterised through the results of the environmental baseline survey (Benthic Solutions Ltd., 2024) as described in Section 4.1, in addition to the publicly available geospatial data (Marine Directorate, 2024; EMODnet, 2023) as well as through descriptions provided in the Marine Life Information Network (MarLIN) database (MarLIN, 2024) and Tyler-Walters *et al.*, (2016) descriptions of Scottish PMFs.

8.3 Baseline and Receptor Identification

8.3.1 Overview

The following Sections characterise the seabed habitats and species likely to be present along the proposed cable corridor, including the potential presence of sensitive features (e.g. PMFs) and Annex I habitats.

8.3.2 Subtidal

As described in Section 6.3.1, the subtidal seabed sediments are primarily muddy sediments, composed of silty mud, gravelly mud with shell fragments and mixed sediments (Benthic Solutions Limited, 2024a). The seabed sediment samples were assigned the BGS modified folk classifications of 'sandy mud', 'slightly gravelly sandy mud', 'muddy sand', 'mud' and 'slightly gravelly muddy sand' (Benthic Solutions Limited, 2024a). The benthic and intertidal habitats were characterised using the European Nature Identification System (EUNIS) (2022) habitat classification system. The following EUNIS habitats were assigned in the subtidal region (Benthic Solutions Limited, 2024b) (Figure 8-1):

- Circalittoral Fine Mud (MC62):
  - Seapens and Burrowing Megafauna in Circalittoral Fine Mud (MC62161);
- Circalittoral Mixed Sediment (MD421);
- Kelp and Seaweed Communities on Sublittoral Sediment (MB321):
  - *Saccharina latissima* and Red Seaweeds on Infralittoral Sediments (MB3211); and
- Brachiopod and Ascidian Communities (MC123):
  - *Antedon spp.*, Solitary Ascidians and Fine Hydroids on Sheltered Circalittoral Rock (MC1233).

Subtidal Macrofaunal Analysis

There were eight samples taken forward for macrofaunal analysis as part of the subtidal survey. The macrofaunal analysis found 295 individuals (infauna and solitary epifauna), with 59 taxa taken forward for univariate and multivariate analysis (Benthic Solutions Limited, 2024a). Within the 59 taxa, none were solitary epifauna. The individuals were primarily molluscs (19 species accounting for 49.2% of the total individuals), followed by annelids (26 species, 26.4%), echinoderms (five species, 20%) and crustaceans (seven species, 3.4%) (Benthic Solutions Limited, 2024a). Additionally, 'other' taxa comprising of Nemertea and Phoronis accounted for 1% of the total number of individuals.

Subtidal Features of Interest

During the subtidal survey the tall seapen (*Funiculina quadrangularis*), northern feather star (*Leptometra celtica*) and fireworks anemone (*Pachycerianthus multiplicatus*) were recorded (Figure 8-1). All species are considered to be Scottish PMFs, with the tall seapen and fireworks anemone listed as UK BAP species.

Benthic Solutions Limited (2024b) undertook an assessment to determine if the 'Seapen and Burrowing Megafauna Communities' habitat was present. The 'Seapen and Burrowing Megafauna Communities' habitat is listed on the OSPAR list of threatened and/or declining species and habitats and is considered a Scottish PMF. The classification of the habitat is determined by the presence of burrowing megafauna, as seapens may or may not be present. During the survey burrowing megafauna such as the Norway lobster (*Nephrops norvegicus*) and squat lobster (*Anomura spp.*) were frequently observed (Benthic Solutions Limited, 2024b). In order to classify as the 'Seapen and Burrowing Megafauna Communities' habitat, the presence of burrowing species or burrows must be present at a density of at least 'frequent' on the SAFCOR scale (JNCC, 2014). The assessment concluded that at 14 of the 16 survey transects small burrows were categorised as 'Occasional' to 'Common' and large burrows varied between 'Frequent' to 'Abundant. Given the presence of the 'Frequent' large burrows, the transects were categorised as the 'Seapens, including *Funiculina quadrangularis* and burrowing megafauna in undisturbed circalittoral fine mud' habitat (MC62161).

There were sufficient numbers of tall seapen and northern feather star recorded to determine the abundance based on the SAFCOR scale. Tall seapens were found to be 'Abundant' at the 14 transects, as described above (Benthic Solutions Limited, 2024b). The northern feather star was found to be 'Superabundant' or 'Abundant' at five transects (Benthic Solutions Limited, 2024b). While the fireworks anemone was observed at four transects, the number of individuals present was insufficient for application for the SACFOR scale. The number of fireworks anemone at the four transects ranged from one to four individuals present (Benthic Solutions Limited, 2024b).

During the subtidal survey areas of bedrock were observed which required further assessment to determine if the bedrock classified as Annex I geogenic reefs (stony and bedrock reef). The Golding *et al.*, (2020) criteria was applied for assessing rocky reefs and found that 'rocky reef with low and high biodiversity' habitat was present along the proposed cable corridor. The Irving (2009) criteria was used for determining potential stony reef. The initial assessment found occurrences of 'Low' stony reef; however, ultimately it was concluded as 'Not reef' given the lack of key reef species (Benthic Solutions Limited, 2024b). While the presence of bedrock reef is noted, as discussed in Section 5.3.6 the proposed cable corridor does not overlap with any SACs and therefore the reef identified is not designated as Annex I Reef within a SAC.

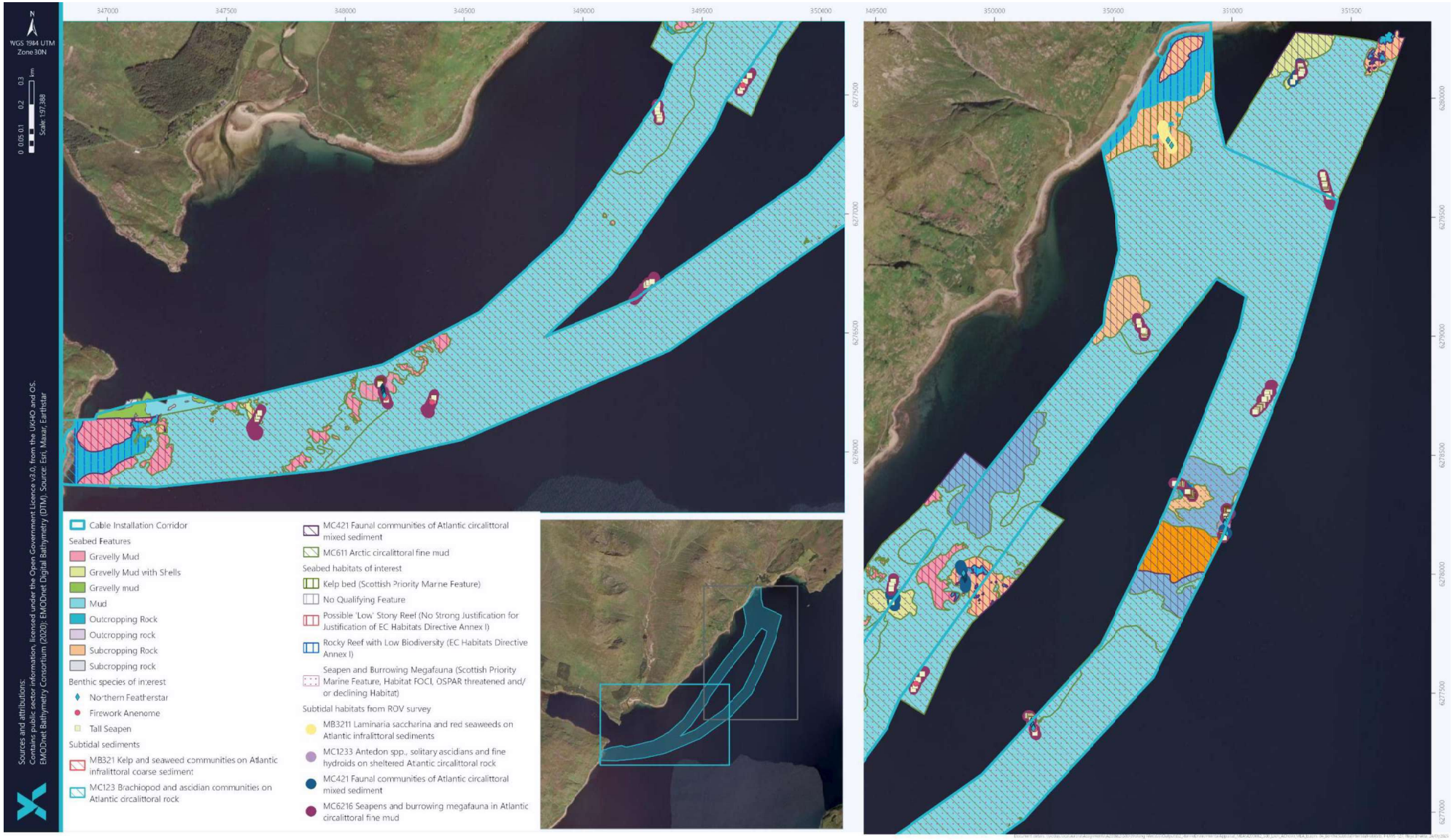

Figure 8-1 Subtidal sediments and features of interest. It should be noted that polygon data reflects predicted habitats (Benthic Solutions Ltd., 2024a,b)

8.3.3 Intertidal

During the intertidal surveys a total of 32 habitats were recorded across both landfalls (Benthic Solutions Limited, 2024c). The characterisation of the intertidal habitats within each landfall are described in the following Sections.

Northern Landfall (Camas a' Chairn Duibh)

The northern landfall is comprised of boulders, cobbles, shingles, gravel and sand (Benthic Solutions Limited, 2024a). The eastern coastline comprises of a shingle beach with patches of seaweed (*fucoids*) on cobbles and pebbles, with underlying sand (Benthic Solutions Limited, 2024c). Additionally, the freshwater influence from the Abhainn Bheag ('little river') has resulted in the presence of species resilient to salinity changes (Benthic Solutions Limited, 2024c). The central region was less influenced by the freshwater input, with seaweed species present including channelled wrack (*Pelvetia canaliculata*), spiral wrack (*Fucus spiralis*), bladder wrack (*Fucus vesiculosus*) and toothed wrack (*Fucus serratus*) (Benthic Solutions Limited, 2024c). Shelly sands were observed in the lower eulittoral zone (Benthic Solutions Limited, 2024c). The western region comprised of outcropping bedrock with a similar habitat composition to the central region; however, there were fewer patches of sands and instead cobbles led to the low water mark where kelp was dominant (Benthic Solutions Limited, 2024c). Overall, there were 21 EUNIS habitats recorded (Figure 8-2) summarised as follows:

- Atlantic Littoral Rock (MA12):
  - Lichens or Small Green Algae on Atlantic Supralittoral and Littoral Fringe Rock (MA121);
    - *Verrucaria maura* on Very Exposed to Very Sheltered Upper Littoral Fringe Rock (MA12132).
  - Seaweeds Communities on Full Salinity Atlantic Littoral Rock (MA123); and
    - *Pelvetia canaliculata* on Sheltered Littoral Fringe Rock (MA123B);
    - *Fucus spiralis* on Full Salinity Upper Eulittoral Mixed Substrata (MA123C2);
    - *Fucus vesiculosus* on Mid Eulittoral Mixed Substrata (MA123D2);
    - *Ascophyllum nodosum* on Full Salinity Mid Eulittoral Mixed Substrata (MA123E2); and
    - *Fucus serratus* on Full Salinity Lower Eulittoral Mixed Substrata (MA123F2).
  - Fucoids on Variable Salinity Atlantic Littoral Rock (MA125);
    - *Pelvetia canaliculata* on Sheltered Variable Salinity Littoral Fringe Rock (MA1251);
    - *Fucus spiralis* on Sheltered Variable Salinity Upper Eulittoral Rock (MA1252);
    - *Fucus vesiculosus* on Variable Salinity Mid Eulittoral Boulders and Stable Mixed Substrata (MA1253); and
    - *Fucus ceranoides* on Reduced Salinity Eulittoral Rock (MA1257).
- Atlantic Littoral Coarse Sediment (MA32):
  - Barren Littoral Shingle (MA3211);
- Atlantic Littoral Mixed Sediment (MA42):
  - Seaweed Communities on Atlantic Littoral Mixed Sediment (MA421);
  - Ephemeral Green and Red Seaweeds (Freshwater Influenced, or Disturbed or Organically Enriched) on Atlantic Littoral Mixed Substrata (MA4211); and
  - Barnacles and *Littorina spp*. On Unstable Atlantic Littoral Mixed Sediment (MA4231).
- Atlantic Littoral Sand (MA52):
  - Barren or Amphipod Dominated Atlantic Littoral Mobile Sand (MA523);
  - Polychaete/Amphipod Dominated Atlantic Littoral Fine Sand (MA524); and
  - *Lanice conchilega* in Atlantic Littoral Sand' (MA5255).

- Coastal Shingle (N2):
  - Atlantic, Baltic and Arctic Coastal Shingle Beach (N21); and
  - Atlantic and Baltic Shingle Beach Drift Lines (N212).
- Rock Cliffs, Ledges and Shores, Including the Supralittoral (N3):
  - Temperate Atlantic Sea-cliffs and Rocky Shores (N313).

Southern Landfall (Camas a' Chaiginn)

The southern region of the Camas a' Chaiginn landfall comprises of a diverse rocky shore habitat with orange lichens present on large boulders, black lichen-dominated areas and channelled wrack (*Pelvetia canaliculata*) towards the shore (Benthic Solutions Limited, 2024c). Closer to shore a greater diversity of algae, barnacles and limpets were observed as well as occasional mussels (Benthic Solutions Limited, 2024c). The northern region is characterised by exposed bedrock and greater wave exposure, with a variety of lichen (orange, grey, green, black), a dense barnacle crust community on the bedrock and finally a variety of seaweeds (channelled wrack, spiral wrack, bladder wrack, toothed wrack and knotted wrack (*Ascophyllum nodosum*)). Overall, there were 20 EUNIS habitats recorded (Figure 8-3), summarised as follows:

- Atlantic Littoral Rock (MA12):
  - Lichens or Small Green Algae on Atlantic Supralittoral and Littoral Fringe Rock (MA121);
    - Yellow and Grey Lichens on Atlantic Supralittoral Rock (MA1211); and
    - *Verrucaria maura* on Very Exposed to Very Sheltered Upper Littoral Fringe Rock (MA12132).
  - *Mytilus edulis* and/or Barnacle Communities on Wave Exposed Atlantic Littoral Rock (MA122);
    - *Semibalanus balanoides*, *Patella 70analic* and *Littorina spp.* On Exposed to Moderately Exposed or Vertical Sheltered Eulittoral Rock (MA12231);
    - *Semibalanus balanoides*, *Fucus vesiculosus* and Red Seaweeds on Exposed to Moderately Exposed Eulittoral Rock (MA12232); and
    - *Semibalanus balanoides* and *Littorina spp.* On Exposed to Moderately Exposed Eulittoral Boulders and Cobbles (MA12233).
  - Seaweeds Communities on Full Salinity Atlantic Littoral Rock (MA123);
    - *Pelvetia canaliculata* on Sheltered Littoral Fringe Rock (MA123B);
    - *Fucus spiralis* on Full Salinity Upper Eulittoral Mixed Substrata (MA123C2);
    - *Ascophyllum nodosum* on Full Salinity Mid Eulittoral Mixed Substrata (MA123E2); and
    - *Fucus serratus* on Full Salinity Lower Eulittoral Mixed Substrata (MA123F2).
  - Mussel and/or Barnacle Communities with Seaweeds on Atlantic Littoral Rock (MA124); and
    - *Pelvetia canaliculata* and Barnacles on Moderately Exposed Littoral Fringe Rock (MA1241);
    - *Fucus spiralis* on Full Salinity Exposed to Moderately Exposed Upper Eulittoral Rock (MA1242); and
    - *Fucus vesiculosus* and Barnacle Mosaics on Moderately Exposed Mid Eulittoral Rock (MA1243).
  - Communities of Atlantic Littoral Rockpools (MA126):
    - Coralline Crust-dominated Shallow Eulittoral Rockpools (MA1262).
- Atlantic Littoral Coarse Sediment (MA32):
  - Barren Littoral Shingle (MA3211);
- Atlantic Littoral Mixed Sediment (MA42):
  - Unvegetated Atlantic Littoral Mixed Sediment (MA423).
- Atlantic Infralittoral Rock (MB12):

  - *Laminaria digitata* on Moderately Exposed Atlantic Sublittoral Fringe Rock (MB1217)[6]; and
  - Faunal Communities on Full Salinity Atlantic Infralittoral Mixed Sediments (MB423)[7].
- Coastal Shingle (N2):
  - Atlantic, Baltic and Arctic Coastal Shingle Beach (N21); and
  - Atlantic and Baltic Shingle Beach Drift Lines (N212).
- Rock Cliffs, Ledges and Shores, Including the Supralittoral (N3):
  - Temperate Atlantic Sea-cliffs and Rocky Shores (N313).

Intertidal Macrofaunal Analysis

Macrofaunal analysis was carried out on five samples acquired during the intertidal survey. The results of the macrofaunal analysis found 152 individuals (infauna and solitary epifauna), with univariate and multivariate analysis undertaken for 13 taxa (Benthic Solutions Limited, 2024a). Within the 13 taxa, none were solitary epifauna. The individuals were primarily annelids (seven species accounting for 53.8% of the total individuals), followed by crustaceans (three species, 33.3%) and molluscs (three species, 25.5%) (Benthic Solutions Limited, 2024a). No echinoderms were present within the intertidal samples.

Intertidal Features of Interest

During the intertidal surveys the 'Yellow and Grey Lichens on Atlantic Supralittoral Rock' (MA1211) habitat was identified at the southern landfall (Camas a' Chaiginn) (Benthic Solutions Limited, 2024b). The 'Yellow and Grey Lichens on Atlantic Supralittoral Rock' (MA1211) habitat is listed as a UK Biodiversity Action Plan (UK BAP) priority habitat. This habitat is commonly found on boulders in the supralittoral zone of rocky shores, with communities of yellow and grey lichens, such as maritime sunburst lichen (*Xanthoria parietina*), orange sea lichen (*Caloplaca marina*) and sea ivory (*Ramalina spp*.) present as well as black lichen (*Verrucaria maura*) (Tyler-Walters, 2016). The habitat at Camas a' Chaiginn was characteristic of the common description for this habitat, with the habitat confined to the upper shore atop boulders and cobbles, with communities of maritime sunburst lichen, orange sea lichen, sea ivory and black lichen all present (Benthic Solutions Limited, 2024b).

Additionally, dog whelks (*Nucella lapillus*), listed on the OSPAR list of threatened and/or declining species and habitats, were also observed during the intertidal survey of the Camas a' Chaiginn landfall (Benthic Solutions Limited, 2024b). Dog whelk were found to be present within the ''*Fucus vesiculosus* and Barnacle Mosaics on Moderately Exposed Mid Eulittoral Rock' (MA1243) habitat.

There we no sensitive habitats or species recorded at the northern landfall (Camas a' Chairn Duibh).

[6] *Benthic Solutions Limited (2024c) note that while this habitat is not an intertidal habitat, the survey was conducted during low spring tide and the habitat was revealed.*
[7] *Benthic Solutions Limited (2024c) note this habitat as possibly present.*

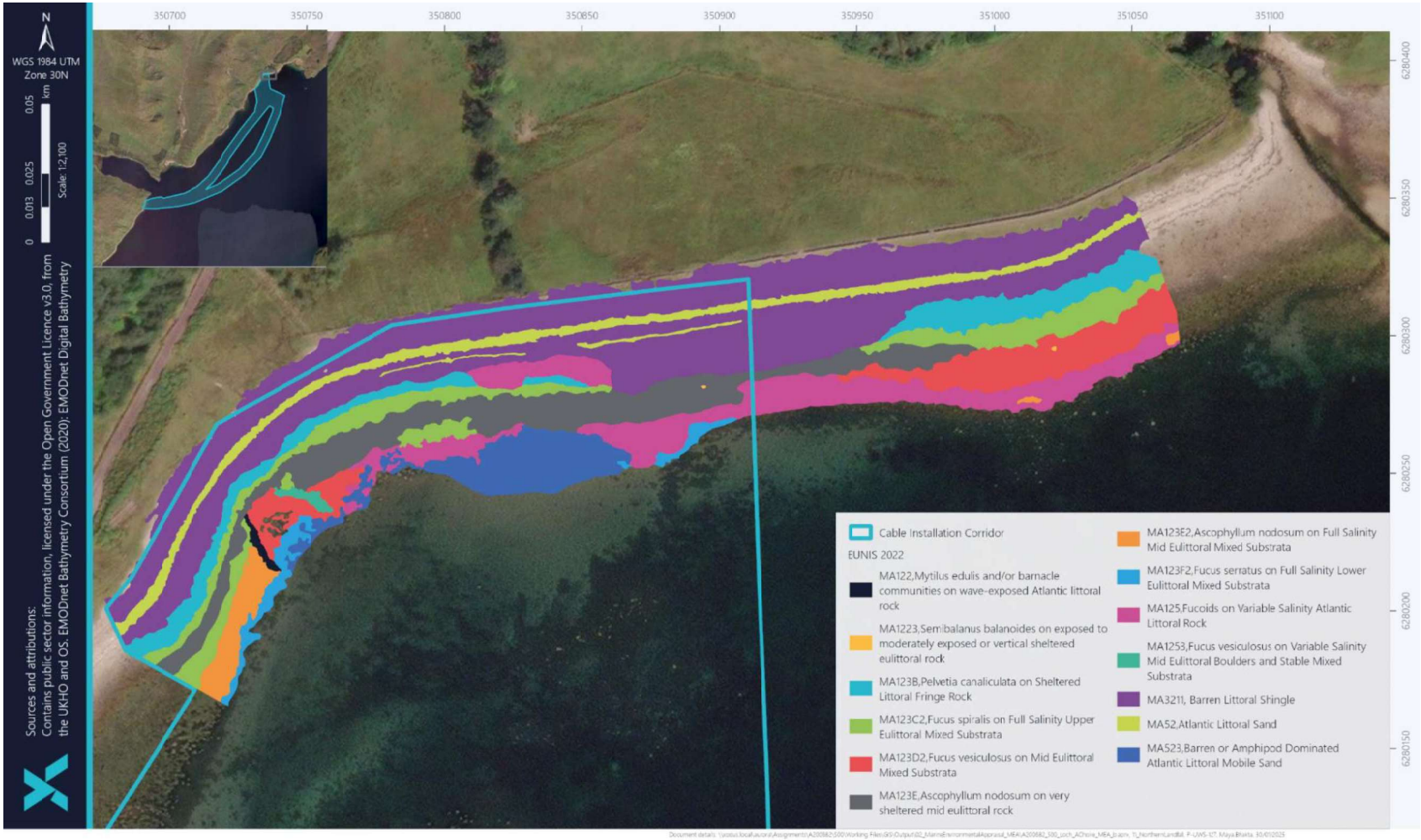

Figure 8-2 Marine and coastal EUNIS habitats and associated biotopes were assigned in the intertidal region (Camas a' Chairn Duibh)

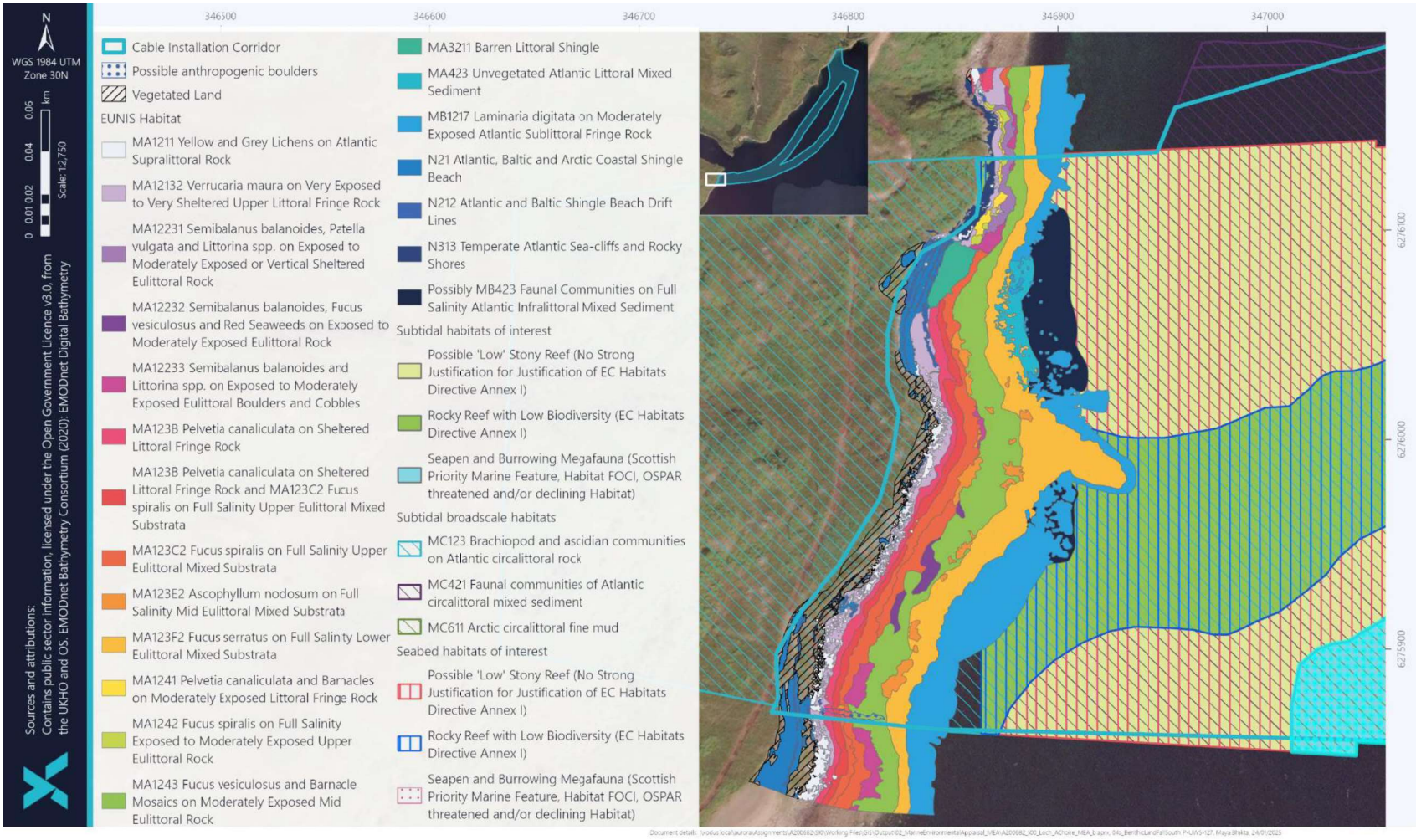

Figure 8-3 Marine and coastal EUNIS habitats and associated biotopes were assigned in the intertidal region (Camas a' Chaiginn) (Benthic Solutions Ltd., 2024b)

8.4 Impact Assessment

8.4.1 Area of Impact

Potential impacts associated with the proposed cable installation activities and removal of the OoS cables include the following: direct habitat loss or disturbance, temporary increases in suspended sediment and associated deposition, introduction of INNS and accidental release of hazardous substances. The proposed cables, cable trenching, cable stabilisation/protection and spud/anchor deployments will be in direct contact with the seabed and have the potential for direct impacts on benthic species and habitats within the Project footprint. The proposed cable corridor will cross a variety of benthic habitats and biotopes as described in Section 8.3. Use of cable stabilisation materials will be minimised to reduce the seafloor footprint while maintaining adequate protection and stabilisation of the proposed cables. The exact cable locations cannot currently be determined and therefore the impact footprint on specific habitat types encountered along the proposed cable corridor cannot be estimated.

As discussed in Section 3, it is expected that the proposed cables will be both surface laid and trenched along the subtidal section of the proposed cable corridor (MLWS to MLWS). In the intertidal areas between MHWS and MLWS, the proposed cables will be trenched at both landfalls via OCT as a first choice; however, where trenching is not feasible, the proposed cables will be surface laid and protected with split pipe. Sections of the OoS cables may be removed to allow the new cables to be installed, in which case cable ends will be cut and pulled back and secured with clump weights. The estimated lengths of the proposed cables to be surface laid and trenched are summarised in Table 8-1. The lengths and associated impacts of the proposed cables and associated deposits have been included in Table 8-2.

Table 8-1 Length of the Proposed Cables to be Surface Laid and Trenched

INSTALLATION TYPE	LOCATION	EXTENT	LENGTH (m)
Surface Laid (Subtidal and Intertidal)	Kilmalieu-Loch A' Choire 1	Maximum length of surface laid cables (MLWS to MLWS)	850
	Kilmalieu-Loch A' Choire 2		600
Trenching (Subtidal)	Kilmalieu-Loch A' Choire 1	Maximum length of trenched cables in the subtidal areas between MLWS to MLWS	6,630
	Kilmalieu-Loch A' Choire 2		5,760
Trenching (Intertidal)	Kilmalieu-Loch A' Choire 1	Maximum length of trenched cables in the intertidal areas between MHWS and MLWS	-
	Camas a' Chairn Duibh Landfall		43
	Camas a' Chaiginn Landfall		42
	Kilmalieu-Loch A' Choire 2		-
	Camas a' Chairn Duibh Landfall		33
	Camas a' Chaiginn Landfall		54
	TOTAL (+10% contingency)		172
Total Length	Kilmalieu-Loch A' Choire 1	Surface Laid + Trenched (including 10% contingency)	8,080
	Kilmalieu-Loch A' Choire 2		7,433

The following worst-case assumptions have been made for the area of seabed impacted:

- Temporary footprint:
  - The intertidal impact corridor for OCT (~ 1 m) where excavation and the FO and Sea Earths are required in the intertidal area has been assessed based on the length of the proposed cables expected to be trenched (+10% contingency) with an assumed 20 m wide working corridor;
  - The subtidal impact corridor of the offshore section of the cable corridor is assessed as 10 m wide to include the requirement for jet-trenching considering the footprint of the trencher, this conservatively assumes trenching will be attempted over the full length of the cables. It should be noted that disturbance arising from all other pre-installation activities (PLGR and boulder/debris clearance) will occur within this footprint.
  - Spud can/anchoring areas:
    - The DSV will either be deployed with spud legs or mooring lines / anchors;
    - Spud legs: a maximum spud diameter of 0.914 m has been assumed for a seabed footprint of 0.66 m^2 per spud leg (total seabed footprint per placement, assuming four spud legs, is 2.62 m^2). While the total number of deployments is unable to be predicted (see Loch A' Choire Subsea Cable Replacement Project Description [Document No. A-200682-S00-A-REPT-002], it has been assumed that there will be a total of 14 placements, with six in the south (three per cable) and eight in the north (four per cable), resulting in a total area of 15.8 m^2 (south) and 20.9 m^2 (north), or 36.7 m^2 in total. Furthermore, it is assumed that spud legs are only deployed within two designated spud leg 'boxes' covering both landfalls; and
    - Anchors: Each 2 t anchor impacts an area of 6.24 m2 (based on 2.4 m x 2.6 m dimensions), at a quantity of four for total area of ~25 m^2 per landfall or a total area of ~50 m^2.

- Permanent footprint:
  - The surface laid cables have a cross sectional diameter of 141.6 mm, resulting in a footprint of approximately 0.1 m on the seabed, with a total length of 1,450 m (850 m Kilmalieu-Loch A' Choire 1; 600 m Kilmalieu-Loch A' Choire 2);
  - Cast iron split pipe protection has been assessed based on the total length required for the proposed cables at 1,450 m, with a cross section diameter of approximately 0.213 m;
  - Each 6 t rock bag is assumed to impact an area of 5.726 m^2 (2.7 m diameter);
  - Each concrete mattress measures 6 m x 3 m, therefore impacting an area of 18 m^2 each;
  - Cable protection utilised is likely to be a combination of split pipe, rock bags and concrete mattresses. The cable stabilisation materials are alternatives, and it is not expected that 100% of all the rock bags and mattresses will be used. The cumulative footprint of all rock bags is less than that of the concrete mattresses, and therefore the footprint of concrete mattresses has been taken as a worst-case scenario. This also covers the unlikely and conservative scenario that 100% of rock and 50% of the mattresses would be used; and
  - Clump weights for the Sea Earthing cables are 1 m diameter with a footprint of 0.79 m^2. Rock anchors may be used in lieu of clump weights; however, the footprint of the rock anchors would be less than that of the clump weights and therefore the footprint of the clump weights is assumed as a worst-case scenario.

Table 8-2 Footprint of Cable Installation Methods and Permanent Materials Along the Proposed Cable Corridor

INSTALLATION METHOD	DESCRIPTION	AREA OF SEABED IMPACT (m^2)	AREA OF SEABED IMPACT (km^2)
Temporary Footprint			
Intertidal Impact Corridor	Total trenching footprint (+10% contingency) of 172 m, with a 20 m wide working corridor (noting the trench itself will be 1 m).	6,880	0.0069
Subtidal Impact Corridor	The total length of the surface laid cables excluding trenched length, assuming a 10 m wide corridor. It should be noted that all other cable laying and protection works will be within this footprint.	138,400	0.138
Spud Can / Anchoring work Areas	Seabed footprint associated with spud leg placement (three placements per cable in the south, four placements per cable in the north, for 14 placements total) and anchoring for the DSV vessel in the nearshore. Assumes 0.914 m diameter spud legs and anchor footprint of 2.4 m x 2.6 m.	36.7	0.000037
		Maximum Temporary Footprint	*0.14494*
Permanent Footprint			
Surface Laid Cable (MLWS to MLWS)	Surface laid cable with split pipe (subtidal) for a total length of 1,450 m with a 0.213 m seabed footprint.	308.9	0.0003
Rock Bags (6 t)	Each 6 t rock bag impacts an area of 5.726 m^2 (2.7 m diameter). The quantity required will be up to 97.	555.4	0.0005
Concrete Mattresses	Each mattress (6 m x 3 m) impacts an area of 18 m^2. The quantity required will be up to 97.	1,746	0.0017
Clump Weights	Each clump weight has a seabed footprint of 0.79 m^2. The quantity required will be up to 20.	15.8	0.00002
		Maximum Permanent Footprint	*0.00252*

8.4.2 Direct Loss / Disturbance to Benthic Habitats and Communities

The proposed cable installation activities have the potential to result in direct loss and/or disturbance of benthic habitats and communities, including the sensitive seabed features and habitats as described in Section 8.3.

Temporary habitat loss / disturbance will be associated with proposed cable installation activities including trenching and pre-lay debris removal (e.g. PLGR). Permanent loss / disturbance may result from the surface laying of the proposed cables and potential placement of protective deposits on the seabed (i.e. rock bags and concrete mattresses). This may lead to direct habitat loss within the footprint of the proposed cables, notably for where hard structures are introduced on soft habitats (i.e. circalittoral fine mud). Where hard structures are placed on hard substrates (e.g. coarse sediments and rock), there is potential for re-colonisation of the surface laid cables and associated material by epifauna, and habitat loss in this habitat type will only be temporary.

As described in Section 8.3.2 and Section 8.3.3, there are a number of sensitive habitats and species listed as UK BAP features, Scottish PMFs and/or on the OSPAR list of threatened and/or declining species and habitats that were recorded within the proposed cable corridor during the subtidal and intertidal surveys. These habitats and species include the 'Yellow and Grey Lichens on Atlantic Supralittoral Rock' (MA1211) habitat, the 'Seapen and Burrowing Megafauna Communities' habitat, the tall seapen, the northern feather star, the fireworks anemone and the dog whelk.

It is acknowledged that SHEPD are committed to avoiding sensitive benthic habitats and species during detailed route engineering, informed by the pre-installation survey. However, it should be noted that the extent of the 'Seapen and Burrowing Megafauna Communities' habitat makes this feature unavoidable within the proposed cable corridor. However, SHEPD will seek to avoid where possible, the more localised features identified by the pre-installation surveys (Section 8.3.2) including the northern feather stars, tall seapens, and fireworks anemone, insofar as is practical. Since it is currently not possible to determine to what extent avoidance of these features will be possible, this embedded mitigation has not been accounted for during the assessment. The assessment therefore represents the worst case.

The footprint of the proposed cable installation activities will be highly localised (0.14494 km^2 temporary and 0.00252 km^2 permanent).

Overall, given the small footprint of the proposed cable installation activities, the direct habitat loss / disturbance will result in imperceptible change to the wider available habitat and will not change the ecology of the area.

Assessment of Impact Significance

Given the presence of a number of habitats and species identified as having high conservation or national and international importance, the overall sensitivity is **high**.

Overall, a minor shift from baseline conditions is anticipated; however, the impact will be localised and temporary occurring over a short-term duration resulting in a minor change to a small proportion of the receptor population. Given the extremely localised footprint, and the wider availability of these seabed habitats and species, the magnitude of effect is considered **minor**, resulting in a **minor** consequence.

Embedded mitigation measures considered as part of the Project design are listed in Section 4.3.

SENSITIVITY	MAGNITUDE OF EFFECT	CONSEQUENCE
High	Minor	Minor

Impact Significance – **NOT SIGNIFICANT**

8.4.3 Temporary Increase in Suspended Sediments and Associated Sediment Deposition

The proposed cables in the intertidal areas will be installed via OCT by land-based excavation. The timing of the works will be tide dependent (working at low water when the intertidal area is exposed). However, where trenching is not feasible the cables may be surface laid with split pipe. Therefore, there will be no disturbance of submerged sediments. There may be temporary and highly localised increase in suspended sediment caused by the incoming tide and wave action interacting with the trench walls and associated spoil. Furthermore, sections of the OoS cables may be removed offshore to allow the new cables to cross the route. This may result in temporary and highly localised increases in suspended sediment in the subtidal region.

The primary source of increases in suspended sediment in the subtidal region will be from subtidal trenching activities. Jet trenching has the potential to result in suspended sediment loads that will resettle on the seabed. As described in Section 6, suspended solid concentrations are expected to reach ambient levels within 70 m of the trench, and the resettlement of sediments is therefore expected to occur within the proposed cable corridor.

The habitat complexity of the intertidal zone supports a wide range of species that will demonstrate different sensitivities to increased turbidity and sediment deposition. The temporary reduction in water quality and resettlement of sediments is expected to occur locally around the installation activities, and the impacts will be most applicable to sessile and less mobile fauna. Suspension and deposition of fine particles may have an effect on low mobility filter feeders including the northern feather starts and tall seapens identified as being present in the area; however, the benthic communities in muddy and sandy sediments will be generally adapted to high sediment loading and have a high tolerance to temporary and localised increases in suspended sediment, and associated sediment deposition.

Assessment of Impact Significance

The sensitivity of the varied intertidal and subtidal communities to increased suspended sediment and associated deposition resulting from the proposed cable installation activities is considered **high** on a precautionary basis; however, if the impact occurs it will be highly localised and temporary in nature. Therefore, the magnitude of effect is **minor**, resulting in a **minor** consequence.

Embedded mitigation measures considered as part of the Project design are listed in Section 4.3.

SENSITIVITY	MAGNITUDE OF EFFECT	CONSEQEUNCE
High	Minor	Minor

Impact Significance – **NOT SIGNIFICANT**

8.4.4 Impact from Invasive Non-Native Species (INNS)

There were no non-native taxa recorded during the environmental baseline survey; however, it is noted there are a number of active aquaculture sites (finfish and shellfish) within proximity to the proposed cable corridor, e.g. the Kingairloch (Site ID: FS0241) finfish aquaculture farm operated by Mowi Scotland Ltd and Shuna Point (Site ID: FS1354) finfish aquaculture farm operated by Scottish Sea Farms Ltd at the north end of Shuna Island and west side of Lismore (Scotland's Aquaculture, 2024). Additionally, there is an active pacific oyster (*Magallana gigas*) shellfish farm, Eilean Nam Meann (Site ID: SS0553), located at the north end of Lismore, operated by Lismore Shellfish(see the West Highlands FLMAP). The transport of fish and shellfish associated with these sites increases the potential for INNS to be present in the vicinity of the proposed cable corridor. Furthermore, the marine vessel activity associated with the transport of aggregates from the Glensanda coastal granite quarry which is located to the south of the proposed cable corridor presents an existing risk for INNS to be present in the vicinity of the proposed cable corridor. Ballast water discharges from vessels will be managed under the International Convention for the Control and Management of Ships' Ballast Water and Sediments, 2004 (BWM Convention). Implementation of the BWM Convention will not mitigate the risk of an INNS being introduced via biofouling on a vessel. However, this vector is considered to carry a lower risk of INNS introduction than ballast water and the installation vessel movements are unlikely to constitute a change from baseline conditions with respect to the potential for introducing INNS. The rock contained within the rock bags will be terrestrially sourced, clean and free from organic material. Concrete mattresses and clump weights will be new, and free from organic material. The protective deposits do not therefore present a risk of transport and introduction of INNS.

In addition to the above, larger vessels will utilise anti-fouling measures in order to reduce INNS impacts. Anti-fouling measures also help reduce the fuel consumption of the vessels being used which will in-turn reduce the volume of emissions.

The embedded biosecurity measures, including management of ballast water in adherence with the BWM Convention, will ensure that there are no pathways for INNS to be introduced by the proposed cable installation activities and subsequently spread. Therefore, the likelihood of introduction of INNS and the likelihood of spread and establishment are reduced to low, and the residual impact is not significant.

Assessment of Impact Significance

Given the presence of a number of habitats and species identified as having high conservation or national and international importance, the overall sensitivity is **high**. Nevertheless, the embedded mitigation measures as described in Section 4.3 will ensure that there are no pathways for INNS to be introduced and spread as a result of the proposed cable installation activities. Therefore, the magnitude of effect is **negligible**, resulting in a **minor** consequence.

SENSITIVITY	MAGNITUDE OF EFFECT	CONSEQUENCE
High	Negligible	Minor

Impact Significance – **NOT SIGNIFICANT**

8.4.5 Accidental Release of Hazardous Substances

The use of vessels could lead to a fuel release, or of cleaning fluids, oils and hydraulic fluids used on board vessels and during ROV operations, which could be released overboard or accidentally discharged. These discharges can be potentially harmful and can lead to localised organic enrichment and a change in the balance of the food chain. However, as the vessels will be < 12 NM from shore, there will be no discharge of grey water, sewage, food waste or drain water.

All vessels will be compliant with IMO and MARPOL requirements and as such, the risk of oils and other contaminants entering the marine environment is very low. Neither organic enrichment nor oxygen depletion is considered likely, due to the relatively small cumulative volume of any discharges. Any reduced water quality will be short-term and localised in nature within the proposed cable corridor, occurring sequentially with the location of the installation activities, and near the seabed. A temporary and localised reduction low in water quality is unlikely to cause a detectable change to the benthic species and habitats along the proposed cable corridor.

Assessment of Impact Significance

Given the presence of a number of habitats and species identified as having high conservation or national and international importance, the overall sensitivity is **high**. Nevertheless, the embedded mitigation measures as described in Section 4.3 will ensure the risk of releases of hazardous substances being released into the marine environment are minimised, impacts on benthic receptors are expected to be minimal. Therefore, the magnitude of effect is **negligible**, resulting in a **minor** consequence.

SENSITIVITY	MAGNITUDE OF EFFECT	CONSEQUENCE
High	Negligible	Minor

Impact Significance – **NOT SIGNIFICANT**

8.4.6 Operation

Maintenance Activities

The proposed cables have been designed to be maintenance free, as such no planned ongoing maintenance activities are proposed. SHEPD will conduct routine inspections and surveys of the cable throughout their operational life to ensure they remain in good condition (please refer to the OIMD strategy submitted alongside this MEA). There is a potential for remedial cable repair works to be required, in the event the proposed cables are damaged or the need for additional stabilisation materials is identified during the routine surveys; however, this would be subject to a separate licensing process.

If required, impacts on benthic ecology resulting from cable repairs will be analogous to those occurring during installation, although significantly reduced on both spatial and temporal scales. As such, impacts during the operational phase are considered to be not significant.

Heating and Electromagnetic Fields (EMF)

While operational, subsea power cables generate heat since they are not made from perfect conductors, and as such in theory could result in increased temperatures in their surrounding environs. However, due to the very high specific heat capacity of sea water, this effect will be highly localised, and limited to the immediate vicinity (the surface) of the proposed cables. As such, the impact resulting from heat emitted by the cable will be wholly within the footprint of the proposed cables, and has therefore been assessed as habitat loss, so is not considered further.

The effects of EMF on benthic communities is currently not well understood as there has been limited research to date, as illustrated by the inclusion of impacts of EMF on benthic species as a key evidence gap within the ScotMER benthic evidence map (ScotMER, 2024). Recent studies on this subject have focussed on cables associated with marine renewables, transmission links and interconnectors which operate at much higher voltages and currents than this project's proposed cables. Where studies have investigated the effects of EMF on benthic species (e.g. crustaceans), the studies have considered the effects of Direct Current (DC) cables rather than Alternating Cables (AC). The

proposed cables consist of two 33 kV HVAC subsea cables. The Feature Activity Sensitivity Tool (FeAST) defines a benchmark EMF changes with the potential to affect electro-sensitive species as a change in the local B-field variation from the natural GMF of 10 µT due to anthropogenic means (NatureScot, 2025).

A study by Normandeau *et al.*, (2011) presented modelling of EMF associated with HVAC cables ranging from 35 – 132 kV and found that the average B-fields for the modelled HVAC cables (assuming 1 m depth of lowering) were 7.85 µT at the seabed directly above the cable (i.e. horizontal distance from the cable = 0). As such the strengths of EMF resulting from the operation for the Project are anticipated to be below the FeAST benchmark of 10 µT.

Therefore, EMFs resulting from the operation of the proposed cables are not anticipated to be of a magnitude which may result in adverse effects on benthic organisms according to the current literature and fall within the natural range of the earth geomagnetic field in the vicinity of the Project. Therefore, no significant effects are anticipated.

8.5 Conclusion

Physical disturbance through seabed preparation, excavation and cable laying activities and smothering of benthic habitat and species via sediment re-suspension and settlement are likely to occur within the footprint of the proposed cable installation activities. The effects of the proposed cable installation activities are expected to be highly localised and temporary. Consequently, there will be no significant impact on the benthic and intertidal ecology resulting from the proposed cable installation activities.

9 ORNITHOLOGY

9.1 Introduction

This Section of the report provides further detail on the bird receptors in the vicinity of the proposed cable corridor and presents results from an assessment of potential impacts which may result from the proposed cable installation activities. Management and embedded mitigation measures to ensure the identified impacts are minimised will also be suggested where necessary.

9.2 Data Sources

This Section draws on a number of data sources including published papers (NatureScot, 2020) and publicly available geospatial data (Marine Directorate, 2024b).

9.3 Baseline and Receptor Identification

The Scottish coastal and marine environment forms vital habitat to a variety of seabird species (Pollock *et al.*, 2000). While the marine environment forms important habitat to seabirds year-round, birds are most vulnerable to human disturbance at sea during the moulting period when many species become flightless and spend greater time on the sea surface (Pollock *et al.*, 2000). After the breeding season ends, moulting birds disperse from their coastal colonies to head to offshore waters. This at sea period increases the likelihood of interactions with survey vessels and potential collision risk.

As described in Sections 5.3.5, there is one SPA within 2 km of the proposed cable corridor: the Moidart and Ardgour SPA located approximately 0.4 km away. The Moidart and Ardgour SPA is designated for a breeding population of golden eagle.

9.4 Impact Assessment

9.4.1 Installation

The proposed cable installation activities are planned to occur in July 2025 which is within the breeding season the golden eagle (March to August) which is the qualifying feature of the Moidart and Ardgour SPA located approximately 400 m northeast of the proposed cable corridor. However, as described in Section 5.3.5 the golden eagle is unlikely to be using the marine areas in which the proposed cable installation activities will occur and following consultation with NatureScot it has been confirmed there are no known nest sites within 1 km of the proposed cable corridor (NatureScot, 2024 *Pers. Comms.*). As such, no adverse effects on this species are expected. There are no other SPAs with birds as qualifying features within the connectivity range of 2 km.

The proposed cable installation activities are short-lived (i.e. 63 days) and transient, and there is very low potential for direct disturbance of breeding birds within coastal nesting sites or loafing birds on the sea surface. The proposed cable installation activities do have the potential to affect seabirds at sea, out-with any SPA boundary, due to the

mobile nature of the species. However, the proposed cable installation activities are considered extremely unlikely to result in any adverse effects on the FCS of sensitive ornithological receptors. This is concluded for the following reasons:

- No adverse effects on water quality (and associated changes to prey availability) are anticipated, as detailed in Section 6;
- Cable installation vessels will be slow moving, as detailed in Section 4.3, reducing the potential for disturbance;
- During night-time operations and intertidal operations, vessel lighting will be minimised insofar as possible whilst allowing for safety, as detailed in Section 4.3. This will reduce the potential for bird strikes or disturbance of seabirds; and
- The waters in the vicinity of the proposed cable corridor are subject to moderate levels of vessel activity, predominantly associated with aquaculture, fishing and recreational boating. As such, the presence of the installation vessels required to facilitate the proposed cable installation activities will not constitute substantive change from baseline vessel activity.

Assessment of Impact Significance

The proposed cable installation activities are within the breeding season for the golden eagle; however, the golden eagle is considered to be unlikely to be using the marine areas in which the proposed cable installation activities will occur. There are no other SPAs within the connectivity range of 2 km (see Section 5.1). It is acknowledged that given the transient nature of seabirds, the vessel presence, vehicle presence and light disturbance has the potential to disturb seabird species that may be breeding/foraging outwith SPAs. Therefore the sensitivity is **medium** on a precautionary basis.

Given that the presence of the installation vessels and onshore vehicles during intertidal works will not constitute a change from baseline conditions, together with the transient, localised and temporary nature of potential impacts whilst considering the embedded mitigation measures (Section 4.3); effects on ornithological receptors outwith SPAs are expected to be minor, and no adverse effects on the FCS of any species are anticipated. Therefore, the magnitude of effect is assessed as **minor**, resulting in a **minor** consequence.

SENSITIVITY	MAGNITUDE OF EFFECT	CONSEQUENCE
Medium	Minor	Minor

Impact Significance – **NOT SIGNIFICANT**

9.4.2 Operation

The proposed cables have been designed to be maintenance free, as such no planned ongoing maintenance activities are proposed. SHEPD will conduct routine inspections and surveys of the proposed cables throughout their operational life to ensure they remain in good condition (please refer to the OIMD strategy submitted alongside this MEA). There is a potential for remedial cable repair works to be required, in the event the proposed cables are damaged or the need for additional stabilisation materials is identified during the routine surveys; however, this would be subject to a separate licensing process.

If required, impacts on ornithological receptors resulting from cable repairs will be analogous to those occurring during installation, although significantly reduced on both spatial and temporal scales. As such, impacts during the operational phase are considered to be not significant.

9.5 Conclusion

Breeding birds have the potential to be disturbed by the physical presence of vessels during the proposed cable installation activities in the intertidal and nearshore areas. However, given the temporary and relatively short-term nature of proposed cable installation activities, the potential impacts on birds will not result in killing of individuals or disturbance of eggs and nests, particularly with the implementation of the embedded mitigation measures outlined in Section 4.3, activities are unlikely to significantly impact populations of birds.

10 MARINE ARCHAEOLOGY

10.1 Introduction

This Section provides detail on marine archaeological features in the vicinity of the proposed cable corridor. An assessment of potential impacts on these features is then presented, along with recommendations for additional mitigation measures that may be required in order to ensure losses of or impacts to the archaeological record are minimised.

10.2 Data Sources

A review of publicly available information pertaining to marine archaeological sites has been conducted in order to inform this assessment. The key sources utilised were:

- UKHO wrecks database (UKHO, 2024); and
- HES – Canmore (HES, 2024a) and PastMap (HES, 2024b) Databases.

10.3 Baseline and Receptor Identification

There are no wrecks directly overlapping with the proposed cable corridor; however, there are a number of listed wrecks within 5 km of the proposed cable corridor, as illustrated in Figure 10-1:

- Dangerous Wreck – A dangerous wreck is located approximately 0.2 km from the proposed cable corridor (UKHO, 2024). This wreck has been identified through multibeam;
- Ossian (Loch Linnhe) (Canmore ID: 118092) is a 19th century steamship which was built in 1876 and lost in 1897[8]. This wreck is classified as an unverified wreck; and
- Multiple Unverified Wrecks –
  - Unknown: Shuna, Loch Linnhe (Canmore ID: 293982). A 19th century craft which is recorded as lost in 1818. This wreck is classified as an unverified wreck off of Shuna Island;
  - Ballachulish Packet: Loch Linnhe (Canmore ID: 284516) and the Pharos: Loch Linnhe (Canmore ID: 284515). The Ballachullish Packet and Pharos 19th century smacks classified as unverified wreck(s). Canmore archaeological records indicate that following a collision between the Pharos and Ballachullish Packet, both vessels sunk off Shuna Island in 1859[9,10].
  - Plover: Shuna Island, Loch Linnhe (Canmore ID: 118093). A 19th century steamship which was built in Glasgow in 1892 and lost the following year in 1893[11]. This wreck is classified as an unverified wreck off of Shuna Island;

[8] *https://canmore.org.uk/site/118092/ossian-loch-linnhe.*
[9] *https://canmore.org.uk/site/284516/ballachulish-packet-loch-linnhe.*
[10] *https://canmore.org.uk/site/284515/pharos-loch-linnhe.*
[11] *https://canmore.org.uk/site/118093/plover-shuna-island-loch-linnhe.*

- **Martha: Shuna, Loch Linnhe** (Canmore ID: 210992). A 19th century wooden smack with a cargo of slates which has a date of loss of 1877[12]. This wreck is classified as an unverified wreck off of Shuna Island;
- **Unknown 1818** (Canmore ID: 329107). No further details are listed beyond the date of loss of 1818[13];
- **Glenrose: Caulchenna Point, Loch Linnhe** (Canmore ID: 293983). A 19th century steamship which was stranded at Caulchenna Point, Loch Linnhe in 1911[14]; and
- **Petrel: Loch Linnhe** (Canmore ID: 293981). A 19th century schooner which was wrecked at Loch Linnhe, near North Lochaber in 1881[15].

With regards to the multiple unverified wrecks, it should be noted that the positions assigned to these losses are noted as being arbitrary, and hence very little confidence can be placed in them.

No wrecks were identified within the proposed cable corridor during the geophysical and benthic surveys conducted to date.

[12] *https://canmore.org.uk/site/210992/martha-shuna-loch-linnhe.*
[13] *https://canmore.org.uk/site/329107/unknown-1818.*
[14] *https://canmore.org.uk/site/293983/glenrose-caulchenna-point-loch-linnhe.*
[15] *https://canmore.org.uk/site/293981/petrel-loch-linnhe.*

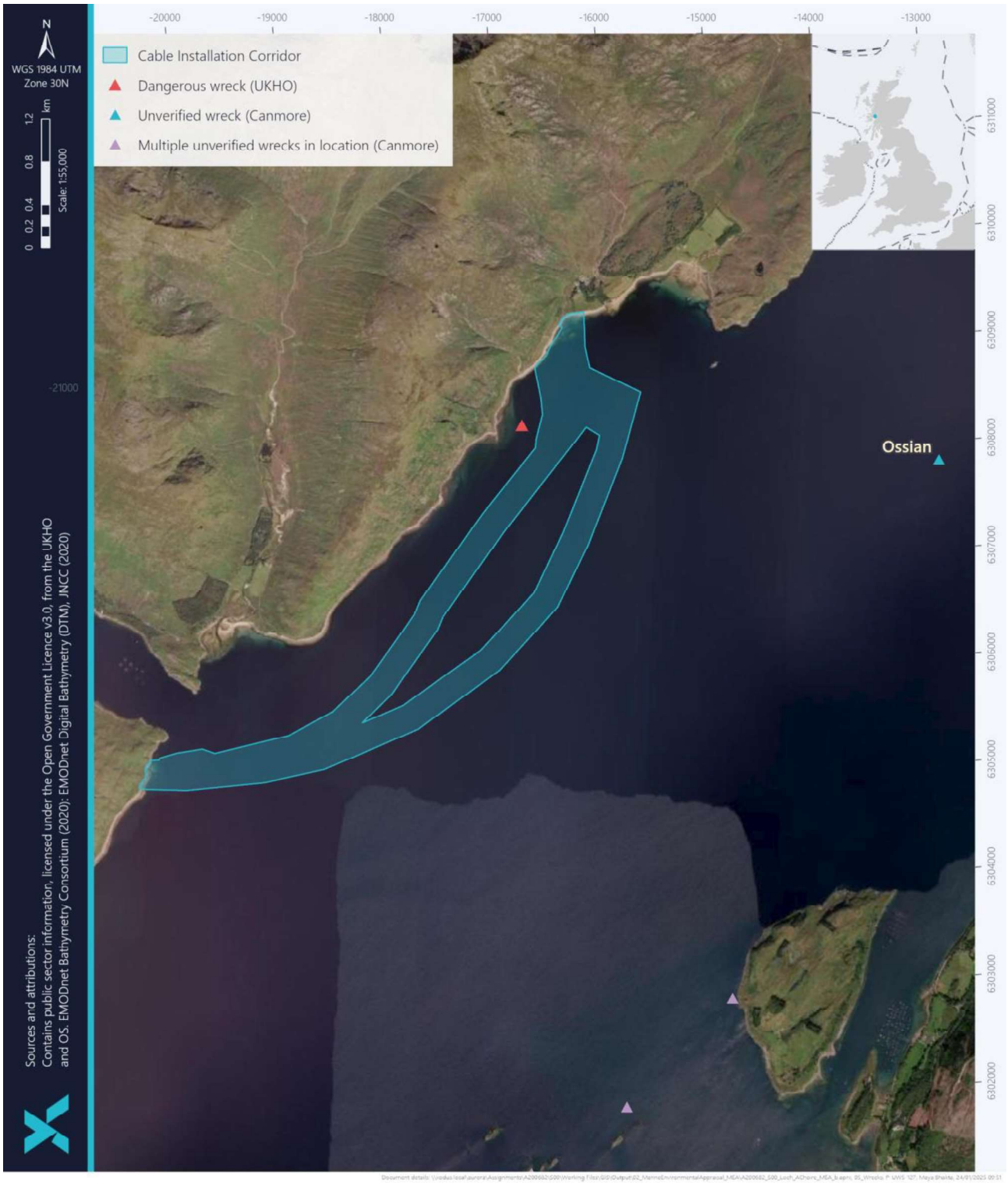

Figure 10-1 Marine Archaeology Wreck Sites within the Vicinity of the Proposed Cable Corridor (UKHO, 2024)

10.4 Impact Assessment

10.4.1 Installation

As described in Section 10.3, there are no wrecks directly overlapping with the proposed cable corridor; however, there are a number of listed wrecks within 5 km of the proposed cable corridor, including the dangerous wreck, Ossian and multiple unverified wrecks. It should be noted that the dangerous wreck is within close proximity (i.e. within 200 m) of the proposed cable corridor (Figure 10-1). Therefore, the presence of currently unidentified wrecks or associated archaeological material within the proposed cable corridor cannot be ruled out.

As such, the proposed cable installation activities have the potential to result in damage to or loss of the historic record. This would be limited to interactions with wrecks or artefacts during cable laying operations, trenching, and the placement of stabilisation measures. Should such interactions occur, the damage or loss of archaeological features would be a permanent effect on a potentially highly sensitive receptor, which has no ability to recover, and as such could constitute a significant impact on historic records.

However, as detailed in Section 4.14.3, pre-installation surveys have been undertaken and no wrecks have been identified in the proposed cable corridor to date. If further surveys are undertaken to inform the final routing of the proposed cables, the geophysical data will be reviewed for presence of features of potential archaeological significance. During detailed route design, the following provisions shall be implemented with regard to wrecks or other features of potential archaeological value identified in the survey data (Section 4.3):

- All wrecks or features of potential archaeological significance shall be avoided by a buffer of at least 50 m during detailed route design;
- The locations of wrecks and features of potential archaeological significance will be clearly identified on electronic charts on board the installation vessel and utilised to guide installation activities; and
- The location of any wrecks or features of potential archaeological significance will be provided to HES, and the UKHO.

Given that no marine archaeological assets have been identified within the proposed cable corridor, a Protocol for Archaeological Discoveries (PAD) is not proposed, unless required by the licence conditions.

Overall, given the analysis of pre-installation survey data and the embedded mitigation measures (e.g. avoidance of features of archaeological significance), it is considered that the proposed cable installation activities will not result in an adverse effect on marine archaeological receptors.

Assessment of Impact Significance

Due to the presence of historic sites (e.g. wrecks) within the vicinity of the proposed cable corridor, the sensitivity is assessed as **high**. Although there is the potential for disturbance / damage to marine archaeological receptors as a result of the Project activities, given the embedded mitigation (see Section 4.3), no adverse impacts on marine archaeology are anticipated. Therefore, the magnitude of effect is assessed as **negligible**, resulting in a **minor** consequence.

SENSITIVITY	MAGNITUDE OF EFFECT	CONSEQUENCE
High	Negligible	Minor

Impact Significance – **NOT SIGNIFICANT**

10.4.2 Operation

The proposed cables have been designed to be maintenance free, as such no planned ongoing maintenance activities are proposed. SHEPD will conduct routine inspections and surveys of the proposed cables throughout their operational life to ensure they remain in good condition (please refer to the OIMD strategy submitted alongside this MEA). There is a potential for remedial cable repair works to be required, in the event the proposed cables are damaged or the need for additional stabilisation materials is identified during the routine surveys; however, this would be subject to a separate licensing process.

If required, impacts on archaeological receptors resulting from cable repairs will be analogous to those occurring during installation, although significantly reduced on both spatial and temporal scales. As such, impacts during the operational phase are considered to be not significant.

10.5 Conclusion

A review of publicly available data revealed the presence of the dangerous wreck and the Ossian (Canmore ID: 118092) shipwrecks in addition to multiple unverified wrecks within 5 km of the proposed cable corridor. As such, it was determined that the proposed cable installation activities have the potential to result in significant adverse effects on the historic record. However, given the implementation of the embedded mitigation measures as described in Section 4.3, it is considered to be extremely unlikely that the proposed cable installation activities would result in the loss or damage of archaeological features. As such this assessment concludes that the Project will not result in any adverse impacts on the historic record.

11 COMMERCIAL FISHERIES AND OTHER SEA USERS

11.1 Introduction

Through good communication and understanding of viewpoints, SHEPD aim to minimise any potential impacts by agreeing mitigation strategies before the proposed cable installation activities begin. This approach continues through all phases of the Project, thus enabling co-existence with other marine users as SHEPD and their Contractors carry out the proposed cable installation activities.

Works are planned to keep unnecessary interference with other legitimate sea users to a minimum. SHEPD achieve this by actively engaging with legitimate sea users and those with consented development rights close to the operations.

SHEPD's consultations and agreements are tracked through the West Highlands FLMAP. This is a key document which shows the associated risks to the commercial fishing industry and other legitimate sea users, addresses the potential effects and identifies how to minimise and mitigate potential impacts.

SHEPD will give as much notice as is practicably possible for the activities and provides updates when things change.

11.2 Supporting Documents

11.2.1 West Highlands FLMAP

The purpose of the West Highlands FLMAP is to:

- Illustrate the associated risks to the commercial fisheries industry and other legitimate sea users (e.g. aquaculture, shipping (i.e. navigation risk) and address the potential effects (highlighted in the marine licenced evidence); and
- Identify how to minimise and mitigate potential impacts on local communities.

A summary assessment of all the potential marine interactions and activities which could influence or affect the proposed cable installation activities is provided within Sections 6 and 7 of the West Highlands FLMAP.

11.2.2 FLMAP Delivery Programme

The West Highlands FLMAP Delivery Programme sets out how the FLO and Fishing Industry Representative (FIR) will communicate during the proposed cable installation activities and how the deliverables, set out in the Wets Highlands FLMAP will be measured and fulfilled. This document will also highlight any regional specific communication and consultation that is required, which may extend the notice period required to issue NtMs and communicate upcoming works. It will also highlight any ongoing issues which may arise throughout the works.

It is concluded that given the embedded mitigation, combined with the highly localised nature of the Project which is to replace existing cables, and the short duration of the installation, no significant impacts on fisheries, fish stocks,

or the associated habitats on which these species depend, are anticipated. Local and national fishermen's associations have been consulted regarding the Project, and it is noted that no concerns were raised in relation to the proposal.

11.2.3 Co-existence between SHEPD and Other Marine Users

SHEPD have produced a co-existence strategy, 'How Scottish Hydro Electric Power Distribution co-exists with other marine users'[16]. This document outlines SHEPD's approach to minimising interactions with other marine users as far as is practicable to maximise the potential for coexistence. The key principles of SHEPD's approach to co-existence include:

- Stage 1 – Identifying other marine users, and all relevant stakeholders potentially affected by the Project;
- Stage 2 – Identifying efficient communication channels for the promulgation of information to other marine users; and
- Stage 3 – Engaging and addressing the concerns of other marine users to agree co-existence plans and mitigation activities.

Further details on the specific mitigations to minimise impacts on other marine users (including recreational users and non-fishing vessel traffic) are detailed within the West Highlands FLMAP. It is noted that the proposed cable corridor is located away from the nearest harbours, and while the area might be used recreationally by kayakers, given the short duration of proposed cable installation activities (i.e. 63 days) there will be no long-term impacts to recreational uses.

11.3 Approach to Mitigation

A summary of SHEPD's approach to mitigating interactions with commercial fisheries and other sea users during the installation, operation and maintenance and decommissioning of the proposed cables are presented in Table 11-1 below.

[16] *https://www.ssen.co.uk/globalassets/about-us/projects-and-live-works/subsea-cables/how-shepd-co-exists-with-other-marine-users.pdf.*

Table 11-1 Summary of Mitigation for Commercial Fisheries and Other Sea Users

MEASURE	DETAILS
Project Design	With regards to commercial fisheries and other sea users, route engineering has recommended trenching where possible in soft sediments to mitigate risk of interaction with the cables from mobile gear fishing activity and anchoring.
Fisheries Liaison	Employment of a Fisheries Liaison Officer (FLO) will ensure all commercial fisheries operators in the vicinity of the Project will be proactively and appropriately communicated with in terms of the proposed installation activities.
NtMs (including local), Kingfisher bulletins, Radio Navigational Warnings, and/ or broadcast warnings will be promulgated in advance of any proposed works the notices will include the time and location of any work being carried out, and emergency event procedures.	Due to the range in levels of activity for all other sea users there is scope for conflicting demands on the same area of sea. It is anticipated that the formal notifications such as NtMs, COLREGS and the code of good practise for all vessels will provide sufficient mitigation for potential interactions.
Compliance with IRPCS (IMO, 1972) and SOLAS.	IRPCS 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 installation, 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 proposed cable installation activities its compliance will ensure navigational safety.
Guard Vessels	A guard vessel, marshalling a 500 m Recommended Clearance Zone (RCZ), may be used during the installation campaign where a potential risk to the asset or danger to navigation has been identified.
Communication and Consultation	Compliance with the FLMAP Delivery Programme and how SHEPD co-exist with other marine users. Specifically: • Ensure that notice and information distribution is not less than 20 days, if possible, for individual vessels mobilisations; • Regular liaison and updates by Fishing Industry Representative with local fishermen of proposed timings with confirmations when operations are finalised; and • Regular liaison and updates by FLO with other legitimate sea users of proposed timings with confirmations provided when planned works are finalised.
	Ongoing consultations with ports and harbour authority, including Glensanda Harbour Master, to ensure continued awareness and communication of installation and harbour specific details relevant to minimising disruption.

MEASURE	DETAILS
As built survey data will be provided to the UKHO and Kingfisher for inclusion on Admiralty Charts and the KIS-ORCA Charts	Ensure navigational safety and minimise the risk and equipment snagging.

12 CONCLUSION

The MEA supports SHEPD's application for a marine licence and works licence to complete the proposed cable installation activities which are anticipated to take place in July 2025. It provides a robust assessment of potential impacts of the proposed cable installation activities on groups of sensitive environmental receptors (Sections 5 to 11). Where relevant, these impact assessments have considered interactions with protected sites, and indirect impacts on other receptors. Specifically, environmental assessments of potential impact from the proposed cable installation activities have been carried out for the following receptors:

- Designated sites;
- Seabed and Water Quality;
- Marine Megafauna;
- Benthic and Intertidal Ecology;
- Ornithology;
- Marine Archaeology; and
- Commercial Fisheries and Other Sea Users.

Table 12-1 provides an overview of the findings from the environmental assessments undertaken within this MEA. On the basis of the findings and recommendations of the impact assessments presented in Sections 5 to 11, and the embedded mitigation requirements discussed in Section 4.3: Mitigation Requirements, it is anticipated that the proposed cable installation activities will be conducted without significant impact on any relevant environmental receptor.

Table 12-1 Outcomes of Environmental Assessments of Receptors

ENVIRONMENTAL RECEPTOR	ASSESSMENT UNDERTAKEN	LEVEL OF IMPACT	ASSESSMENT OUTCOME	OVERALL LSE / SIGNIFICANCE	ADDITIONAL MITIGATION	POST MITIGATION IMPACT
Designated Sites (Section 5)	SACs and NCMPAs with Cetaceans as Qualifying Features (*Inner Hebrides and the Minches SAC and the Sea of Hebrides NCMPA*)	No LSE	Due to the temporary, transient and localised nature of the proposed cable installation activities, no potential LSE is predicted on the Inner Hebrides and the Minches SAC from underwater noise emissions or vessel presence. Similarly, the Project is not considered capable of affecting (other than insignificantly) the conservation objectives of the Sea of Hebrides NCMPA. Overall, the Project constitutes work of an overriding public need whilst presenting an insignificant and temporary disturbance in a limited area.	No LSE	No additional mitigation measures identified specific to designated sites. See Section 4.3: Mitigation Requirements for embedded mitigation, and topic specific mitigation presented in Sections 5 through 11.	No LSE
	SACs with Harbour or Grey Seal as a Qualifying Feature (*Eileanan agus Sgeiran Lios mor SAC*)	No LSE				
Seabed and Water Quality (Section 6)	Coastal Sediment Suspension	Negligible	All proposed cable installation activities at the landfall locations will be tidally dependent. Increased suspended sediment will only occur during the interaction between the incoming tide, the trench walls and spoil heaps and as a result of any cable removal activities. Furthermore, any suspended sediment associated with cable trenching in parts of the subtidal region will be highly localised, with an expectation that suspended sediment concentrations will return to ambient levels within a short distance from the trench. This will result in highly localised and temporary increases in suspended sediment which will not have a significant impact on coastal or subtidal water quality. Best practice will be followed by all installation vessels, therefore the likelihood of an accidental hydrocarbon release from one of the installation vessels is extremely remote. The level of impact is therefore considered minor and not significant.	Not Significant	No additional mitigation measures identified specific to designated sites. See Section 4.3: Mitigation Requirements for embedded mitigation.	Not Significant
	Subtidal Sediment Suspension	Negligible				
	Changes to Sediment and Water Quality Following Accidental Release of Hydrocarbons	Minor				

ENVIRONMENTAL RECEPTOR	ASSESSMENT UNDERTAKEN	LEVEL OF IMPACT	ASSESSMENT OUTCOME	OVERALL LSE / SIGNIFICANCE	ADDITIONAL MITIGATION	POST MITIGATION IMPACT
Marine Megafauna (Section 7)	Injury or Disturbance from Noise Emissions	Minor	Underwater noise is considered the impact mechanism most likely to affect marine megafauna in the proposed area of activities. Noise modelling used to inform the assessment, presented in Appendix A, demonstrates no realistic risk of injury to any species exists resulting from USBL operations. While there may be some disturbance, this is likely to be limited in space and time and should only affect a few individuals of any species. There will be no injurious impacts to marine mammals as a result of the proposed cable installation activities and no requirement to apply for an EPS licence in that respect; however, as there is potential for disturbance, SHEPD will apply for an EPS licence alongside this MEA. Disturbance is expected to be limited to one or a few individuals of the local population and will therefore not result in any adverse impact to the FCS of any cetacean or pinniped species, and no mitigation is proposed for USBL operations. Given the transitory nature of the activities with the mobile nature of marine mammals, there are not anticipated to be any significant impacts to individuals or populations of marine megafauna in the area.	Not Significant	No additional mitigation measures identified specific to designated sites. See Section 4.3: Mitigation Requirements for embedded mitigation.	Not Significant
	Potential Disturbance from Nearshore Activities	Minor	The presence of vessels during the proposed cable installation activities, including vehicles during intertidal works, have the potential to result in visual disturbance to seals and otters. While the proposed cable installation activities are planned to occur in July 2025 which overlaps with the pupping season for harbour seal. Furthermore, given the licence duration of 18-months there is potential to extend into the moulting season. The vessel and vehicle activity associated with the proposed cable installation activities (including in the nearshore area) will not be a substantive change from baseline activity within the area. Furthermore, all vessels will adhere to the SMWWC which will minimise disturbance to marine wildlife, lighting on board will be kept to a minimum to reduce potential light disturbance and vessels will be travelling at slow speeds to reduce the potential collision risk. The protected species survey concluded that there were no otter holts or rest-ups within 200 m of the proposed landfalls. However, an otter was sighted during the environmental baseline survey at the Loch A' Choire South landfall, along with crab carcasses and mussel shell debris. The protected species survey noted that there is potential for otters to create new territories and therefore it is recommended that pre-works checks are carried out by an ECoW. Otter holts, layups and couches will be avoided by 40 m. Therefore, it is not likely for significant impacts on grey seal or otters to occur.			

ENVIRONMENTAL RECEPTOR	ASSESSMENT UNDERTAKEN	LEVEL OF IMPACT	ASSESSMENT OUTCOME	OVERALL LSE / SIGNIFICANCE	ADDITIONAL MITIGATION	POST MITIGATION IMPACT
Benthic and Intertidal Ecology (Section 8)	Direct Loss of/ Disturbance to Benthic Habitats and Communities	Minor	Physical disturbance through seabed preparation, landfall excavation activities, cable laying and trenching and OoS cable removal activities, smothering of benthic habitat and species via sediment re-suspension and settlement are likely to occur within the footprint of the proposed cable installation activities There are no designated sites with benthic qualifying features overlapping the proposed cable corridor; however, a number of species and habitats of conservation and international or national importance were identified during the subtidal and intertidal surveys, including the 'Sea Pen and Burrowing Megafauna Communities' habitat, tall seapen, northern feather star, fireworks anemone and dog whelk. Bedrock resembling Annex I rocky reef was identified; however, this is located outwith any SAC and therefore not designated as Annex I reef. It is anticipated that sensitive features will be able to be avoided through micro-siting; however, given that the extent of avoidance is unknown at this time the potential effect on the sensitive habitats has been considered as a worst-case. Any effect would be highly localised and temporary, and therefore no effects on the overall ecological function of the benthic habitats and species (e.g. population level effects) are anticipated. The potential impact associated with introduction and/or spread of INNS and accidental releases are considered to be wholly managed through the embedded mitigation in Section 4.3: Mitigation Requirements. Therefore, it is not likely for significant impacts on benthic and intertidal ecology receptors to occur.	Not Significant	No additional mitigation measures identified specific to designated sites. See Section 4.3: Mitigation Requirements for embedded mitigation.	Not Significant
	Temporary Increase in Suspended Sediments and Associated Sediment Deposition	Minor				
	Impact from Invasive Non-Native Species (INNS)	Minor				
	Accidental Release of Hazardous Substances	Minor				

ENVIRONMENTAL RECEPTOR	ASSESSMENT UNDERTAKEN	LEVEL OF IMPACT	ASSESSMENT OUTCOME	OVERALL LSE / SIGNIFICANCE	ADDITIONAL MITIGATION	POST MITIGATION IMPACT
Ornithology (Section 0)	Wild birds, their eggs and nests	Minor	The proposed cable installation activities are expected to occur in July 2025 which falls within the breeding season for the golden eagle which is designated at the Moidart and Ardgour SPA located 400 m from the proposed cable corridor. However, the golden eagle is unlikely to be using the marine areas in which the proposed cable installation activities will occur and NatureScot have confirmed there are no known nest sites within 1 km of the proposed cable corridor. There are no other SPAs within 2 km of the proposed cable corridor. While there are no SPAs designated for seabirds, it is acknowledged that given their transient nature, the proposed cable installation activities (e.g. vessel presence, vehicle presence and light disturbance) have the potential to disturb seabird species that may be breeding/foraging outwith SPAs. Given that the proposed cable installation activities will be temporary and highly localised with the mitigation measures described in Section 4.3: Mitigation Requirements, the proposed cable installation activities are unlikely to result in a significant impact to seabird populations or any designated sites with birds as a qualifying feature.	Not Significant	No additional mitigation measures identified specific to designated sites. See Section 4.3: Mitigation Requirements for embedded mitigation.	Not Significant
Marine Archaeology (Section 0)	Damage or Loss of Historic Record – Wreck Sites	Minor	There are no recorded wrecks directly overlapping with the proposed cable corridor; however, there are a number of wrecks located within proximity (5 km) of the proposed cable corridor including the dangerous wreck within 200 m, the Ossian and multiple unverified wrecks. As such, it was determined that the proposed cable installation activities have the potential to result in significant adverse effects on the historic record. However, given the implementation of the embedded mitigation measures as described in Section 4.3,, including avoidance of features of archaeological significance through detailed route design, it is considered to be extremely unlikely that the proposed cable installation activities would result in the loss or damage of archaeological features. As such this assessment concludes that the proposed cable installation activities will not result in any adverse impacts on the historic record.	Not Significant	No additional mitigation measures identified specific to designated sites. See Section 4.3: Mitigation Requirements for embedded mitigation.	Not Significant
Commercial Fisheries and Other Sea Users (Section 11)	Assessment of impacts on commercial fisheries and other sea users has been presented in the West Highlands FLMAP	Not Significant – as per West Highlands FLMAP	The proposed cable installation activities have the potential to disrupt commercial fisheries and other sea users. SHEPD has taken a pro-active approach to minimising impacts on commercial fisheries and other sea users through the implementation of the West Highlands FLMAP. As discussed within the West Highlands FLMAP, appropriate mitigation measures and consultations will be in place to minimise potential impacts on commercial fisheries and other sea users (including aquaculture). Once these consultations and mitigation measures have been implemented, no significant impact on commercial fisheries and other sea users are expected. This information has been provided in the West Highlands FLMAP.	Not Significant	No additional mitigation measures identified specific to designated sites. See Section 4.3: Mitigation Requirements for embedded mitigation.	Not Significant

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APPENDIX A NOISE IMPACT ASSESSMENT

During the cable lay, an ROV or CableFish with USBL will be utilised, deployed from the support vessel or CLV, to monitor the proposed cables at the touch down locations with the seabed. This will capture seabed information at the contact point and helps observe the lay tension that is applied to the proposed cables from the vessel. This will also help to minimise the potential for proposed cable suspensions along the route.

This Section describes the potential impacts and disturbance to marine mammal species in the area as a result of utilising USBL.

A.1 Acoustic Injury or Disturbance Criteria for Marine Mammals

A.1.1 Injury

NMFS (2018) defines two different types of sound that have the potential to result in acoustic injury:

- Impulsive: sounds which are short in duration (i.e. less than 1 second long) and temporary, occupy a broadband bandwidth, and have rapid rise and decay times with a high peak pressure level; and
- Non-impulsive: sounds which may occupy a broadband, narrowband or tonal bandwidth, can be brief, prolonged, continuous or intermittent in nature, and are not characterised by rapid rise and decay times or a high peak pressure level.

A dual-metric approach has been adopted which identifies the range of potential injury to marine mammals from both the peak sound pressure level (SPL_{PEAK}; also called the source level) and cumulative Sound Exposure Level (SEL) for the operation of USBL which is the only equipment identified to require consideration for noise-related injury. The thresholds above which each marine mammal hearing group may experience noise-related injury are presented in Table 13-1 below. These thresholds are derived from measurements of marine mammal hearing using weighting functions which account for peak hearing abilities for each hearing group (NMFS, 2018).

Table 13-1 Criteria Considered in this Assessment for the Onset of Injury in Marine Mammals from Impulsive Noise (NMFS, 2018; Southall et al., 2019)

MARINE MAMMAL HEARING GROUP	IMPULSIVE NOISE		NON-IMPULSIVE NOISE
	SPL_{PEAK} (dB re 1 µPA)	CUMULATIVE SEL (dB re 1 μPA^2S)	CUMULATIVE SEL (dB re 1 μPA^2S)
Low-frequency (LF) cetaceans	219	183	199
High-frequency (HF) cetaceans	230	185	198
Very high-frequency (VHF) cetaceans	202	155	173
Phocid pinnipeds (underwater)	218	185	201

A.1.2 Disturbance

There are currently no disturbance criteria which have been adopted or recommended by UK regulators or statutory nature conservation bodies. NatureScot have recently advised that the Effective Deterrent Range (EDR) of 5 km should be used as a proxy for disturbance range for Sub-Bottom Profiler (SBP) operations, however this is not considered appropriate for USBL, given that USBL is a significantly less powerful sound source than an SBP. As such auditory thresholds for disturbance, as defined by NMFS (2014), coupled with behavioural response criteria detailed in Southall *et al.*, (2007) have been adopted for the assessment of potential marine mammal disturbance from USBL. These thresholds, which utilise the behavioural response severity scale detailed in Southall *et al.*, (2007) for grading the strength of behavioural responses, are provided in Table 13-2.

Table 13-2 Disturbance Threshold Criteria for Impulsive Sound (Southall et al., 2007; NMFS, 2014)

BEHAVIOURAL EFFECT	THRESHOLD CRITERIA (SPL_{RMS})
Potential strong behavioural reaction (6 or more on the severity scale)	160

A.2 Sound Propagation Modelling

A.2.1 Approach

Modelling to identify the potential range (i.e. the straight-line distance from the source) in which sound impacts to marine mammals could occur was undertaken using Xposure, a semi-empirical propagation model developed by Xodus. Modelling was conducted at water depths bookending those expected in the survey area. The dual-metric modelling approach recommended by NMFS (2018) has been used to identify impacts from: (1) the peak Sound Pressure Level (SPL_{PEAK}); and (2) the cumulative SEL. The SEL represents the total energy produced by a sound-generating activity (i.e. USBL) standardised to a one-second interval. This enables comparison of the total energy attributed to different activities with different inter-pulse intervals. As described above, empirically-derived weighting functions (NMFS, 2018; Southall *et al.*, 2019) have been applied to the modelling outputs to account for peak hearing sensitivity for the respective marine mammal hearing groups

The following assumptions have been applied to the models:

- Maximum SPL_{PEAK} has been used for all calculations;
- Maximum pulse length and minimum turn around has been used where provided;
- Where source frequencies occur across a range of frequencies, a flat 1/3 octave spectrum has been used;
- Where data is unavailable, the time between pulses has been calculated as 1.5 times the ping length;
- Mammals swim at seabed depths (this represents the worst-case);
- Vessels are moving at slow speeds; and
- Survey equipment (i.e. USBL) likely to be used in the nearshore shallow water environment (i.e. < 10 m) will likely operate at a very high frequency to provide better resolution and will operate at a lower SPL, and so does not constitute a worst-case scenario.

The directional characteristics of sound are also an important factor affecting the received sound pressure levels from sound-generating activities. Sound source arrays are designed so that the majority of acoustic energy is directed downwards towards the ocean floor for data collection purposes. As such, the amount of energy emitted across the horizontal plane is significantly less (≥ 20 dB) than the amount of energy emitted downwards.

Due to the frequency-dependent nature of sound, the loss of pressure on the horizontal plane is more pronounced at higher frequencies than at lower frequencies. Directional corrections can be applied to the model outputs, which provide broadband normalised amplitudes at varying angles of azimuth[17] and dip angle[18]. Directivity corrections have been applied to the modelling outputs under the assumption that the animal is directly in-line with the vessel (i.e. at the 0° azimuth).

[17] *The azimuth is taken as the angle of circumference around the boat which lies parallel to the surface of the water, progressing around the boat from port to starboard.*
[18] *The dip angle is taken as the angle under the boat, progressing from prow to stern.*

A.2.2 Injury Impacts

For the proposed cable installation activities, the expected frequency range for USBL operations overlap with the hearing range of all cetacean hearing groups. Potential injury to cetaceans (i.e. injury which results from a permanent threshold shift in hearing abilities) is limited to impulsive sound sources which exceed the injury thresholds defined in Table 13-1.

Modelling of ranges at which injury impacts are likely to result from deployment of USBL has been undertaken (Table 13-3). Impacts from noise sources which are strictly behavioural in nature (i.e. disturbance impacts) are covered in the subsection below.

Table 13-3 Noise Modelling Results for Injury Impacts from the Impulsive Noise Source (N/E = no exceedance of thresholds)

ACTIVITY	DEPTH (m)[19]	FREQUENCY (kHz)	SOURCE LEVEL SPL_{PEAK} (dB re 1µPA)	INJURY RANGE (m)											
				CUMULATIVE SEL (STATIC MAMMALS)				CUMULATIVE SEL (MOVING MAMMALS)				PEAK SPL			
				VHF	HF	LF	PW	VHF	HF	LF	PW	VHF	HF	LF	PW
USBL	100	24 – 33.5	207	104	98	73	86	104	56	36	44	24	6	11	11
	10	24 – 33.5	207	12	11	11	11	12	11	11	11	36	10	16	17

[19] *Depth refers to below the Project activity, which has been assumed to be hull-mounted or towed at the surface. These depths have been identified as representative of the nearshore and offshore depths in which installation activities are likely to occur across the cable corridor, based on available bathymetry data.*

USBL has the potential to cause injury to EPS and other marine mammals. As such, the operation of USBL associated with the Project may be potentially injurious to EPS species without appropriate mitigations.

Across modelling scenarios and metrics, the injury ranges were generally highest for the VHF hearing group (Table 13-3), which is represented by harbour porpoise in UK waters. Conversely, HF cetaceans seemed to constitute the hearing group with the lowest potential impact ranges for the peak SPL metric, while LF cetaceans had the lowest impact ranges for the cumulative SEL metric, when comparing between activity types (Table 13-3).

High frequency sounds attenuate more quickly than lower frequency sounds such that an animal would need to be much closer to the sound source for it to cause acoustic injury. The deployment of hull-mounted USBL in 100 m depths elevated the potential range of impact to a maximum of 104 m (cumulative SEL) for VHF cetaceans. However, the likelihood of a cetacean being this close to operational equipment is extremely unlikely when considering that the source is deployed from a moving vessel travelling at more than 2 ms-1 (i.e. 4 knots) and, in some cases, is being towed at depth (e.g. a USBL may be mounted on a towed device within a few metres of the seabed).

The majority of injury ranges were slightly reduced when considering animal movement during the cumulative SEL estimation. Swim speeds of the species most likely to be observed in the area have been shown to be several ms^{-1} (e.g. cruising minke whale swim speed is 3.25 ms^{-1} and harbour porpoise may swim up to 4.3 ms^{-1}) (Blix and Folkow, 1995; Otani *et al.*, 2000). Further, NatureScot (2016) has provided standard values for mean swimming speeds of various marine mammal species likely to occur in the vicinity of the proposed cable corridor, including harbour seal / grey seal (1.8 ms-1; Thompson, 2015); and minke whale (2.1 ms^{-1}; Williams, 2009). To offer a representative model of the predicted noise exposure ranges of marine mammals moving away from the sound source, a conservative mean swim speed of 1.5 ms^{-1} has been used in the calculations. Considering that USBL will be deployed while the vessel is moving, the cumulative SELs are expected to be lower than predicted based on the premise that animals are likely to move away from the mobile sound source, opposite to the direction of vessel travel.

It should also be noted that the modelling scenarios presented as part of this assessment are meant to define the worst-case injury ranges associated with the deployment of USBL. The *in situ* deployment of USBL will most frequently occur in waters of intermediate depths (i.e. between 10 to 100 m). Moreover, the source levels modelled constitute the lowest frequency and highest SPL that are likely to be used, meaning that the actual sound propagation in the marine environment is also likely to be less than those defined by the modelled outputs, thereby this assessment constitutes a conservative estimate.

As such, the assessment concludes that there is no realistic risk of injury to EPS which may result from the use of USBL with SPL_{PEAK} source levels of up to 207 dB re 1µPa.

A.2.3 Disturbance Impacts

In addition to physical injury, sound emissions have the potential to result in behavioural disturbance of cetacean species within the vicinity of the sound source. Significant or strong disturbance (see Table 13-2; Southall *et al.*, 2007) may occur when an animal is at risk of a sustained of chronic disruption of behaviour or habitat use, which could result in a population-level effect. An assessment of potential disturbance impacts as a result of USBL operations impulsive and non-impulsive sound is provided in the sections below. The outputs of the noise modelling assessment against cetacean disturbance thresholds are provided in Table 13-4.

Table 13-4 Noise Modelling Results for Disturbance Impacts from Impulsive Noise Sources

ACTIVITY	DEPTH (m)	FREQUENCY (kHz)	SPL_{RMS} (dB re 1 µPA)	RANGE OF BEHAVIOURAL CHANGE (m)
USBL	100	24 – 33.5	200	182
	10	24 – 33.5	200	207

The USBL activities have the potential to generate a strong disturbance event (i.e. a disturbance offence). The sound generated by the USBL has the potential to generate disturbance impacts on the order of a couple hundred metres (Table 13-4).

The number of individuals which may experience disturbance from the worst-case scenario for USBL has been calculated in Table 13-5 below, based on the population parameters supplied in Table 7-1 (see Section 7). In these calculations, the impact range serves as a radius with which to calculate the total area of coverage for a potential disturbance event associated with each survey activity.

Table 13-5 Number of Individual Cetaceans and Proportion of the MU Which May Experience a Disturbance from the Proposed Cable Installation Activities, Based on Known Population Parameters of the Most Frequently Occurring Species

SPECIES	NUMBER OF INDIVIDUALS WHICH MAY INCUR A STRONG DISTURBANCE USBL (0.13 km^2 AREA)	MAXIMUM PROPORTION OF THE MU POTENTIALLY AFFECTED BY THE INSTALLATION ACTIVITIES
Harbour porpoise	< 0.1	< 0.1 %
Bottlenose dolphin	<0.01	< 0.1 %
Risso's dolphin	< 0.01	< 0.1 %
Common dolphin	<0.01	< 0.1 %
Minke whale	< 0.01	< 0.1 %

The source levels associated with USBL have the potential to elicit a strong behavioural response in EPS which could be classed as a disturbance offence as defined under Regulations 39(1) or 39(2). However, for the relevant biogeographical population MU for harbour porpoise, bottlenose dolphin, Risso's dolphin, common dolphin and minke whale which all regularly occur in the area, this will not incur significant impacts. For these species, less than 0.1% of the biogeographic population will be impacted by noise-related disturbance (Table 13-5). Moreover, less than a tenth of any cetacean will be potentially disturbed by USBL deployment at any given time, making potential disturbance impacts from this survey equipment negligible.

Given the transient and short-term nature of the survey and vessel activities, it is highly unlikely that any disturbance offences from the use of USBL would negatively impact upon the FCS of any of the cetacean or seal species which

may be present in the survey area. This is on the basis that the modelled level of disturbance is unlikely to affect the ability of any individual animal to survive or reproduce and will not have significant population-level impacts to any EPS. Regardless, it is possible that a small number of animals may experience some level of disturbance for the short period that they encounter the proposed survey activities.