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Making Sense of the Marine Environment ™

Kyle Rhea Overhead Cable Replacement: Marine Environmental Assessment Report

Scottish & Southern Electricity Networks

TRANSMISSION

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Non-Technical Summary

Scottish Hydro Electric Transmission plc, operating and known as Scottish and Southern Electricity Networks Transmission (SSEN Transmission) is applying for consent under section 37 of the Electricity Act 1989, to construct and operate approximately 110 kilometres (km) of new double circuit steel structure 132 kV overhead transmission line (OHL) between Fort Augustus Substation and Edinbane Substation, and approximately 27 km of new single circuit trident wood pole OHL between Edinbane Substation and Ardmore Substation in the north of Skye. This electricity transmission project would also comprise approximately 24 km of underground cable. In total, the transmission connection extends over a distance of approximately 160 km. This electricity transmission project is known as the Skye Reinforcement Project.

The Skye Reinforcement Project has been developed to replace an existing single circuit 132 kV overhead line between Fort Augustus Substation and Ardmore Substation (the existing line). The existing line crosses the Kyle Rhea strait at a location to the north of Kylerhea, and it is proposed that the existing towers are retained and, potentially, strengthened to support the conductors required for the Skye Replacement Project.

In the context of the application being made by SSEN Transmission to Marine Scotland under the Marine (Scotland) Act 2010, the proposed works for which consent is sought are those to replace the six conductor cables and one earth cable, in so far as they cross the Kyle Rhea strait (the proposed works). The planned methodology for replacement of the OHL utilises running out wheels, and a puller/tensioner system. The existing conductor is placed into the running out wheels on both crossing towers and both anchor towers, and the existing conductor is used to pull the new conductor.

MarineSpace Ltd has conducted an environmental assessment on behalf of SSEN Transmission, in order to understand the impacts of the proposed works upon receptors within the vicinity of the Kyle Rhea strait. This Marine Environmental Assessment (MEA) has, therefore, been prepared to support the Marine Licence Application (MLA), to Marine Scotland, for the section of OHL crossing the marine water across Kyle Rhea. This MEA includes a scoping exercise to screen in the receptors that have impact pathways. In addition, a Habitats Regulations Assessment (HRA) screening exercise has been conducted, to assess any potential effects upon designated sites within the region.

The scoping exercise screened in marine mammals, ornithology, commercial fisheries, and shipping and navigation to be considered within the environmental assessment. The environmental assessment concluded there would be no significant effects on any of the receptors assessed. The HRA screening did not identify any designated sites to be screened in for Appropriate Assessment. Therefore, it was concluded that there will be no likely significant effect on designated sites, as a result of the project methodology assessed.

1. Introduction

1.1. Project Background

Scottish and Southern Electricity Networks (SSEN) Transmission is planning to replace the existing electricity transmission powerline that runs from Fort Augustus to Ardmore in the north of Skye. The existing line was constructed in three distinct sections, between 1956 and 1989, and is now reaching the end of its operational life. The Skye Reinforcement project is essential to maintain security of supply to homes and businesses along its route, as well as to the Western Isles, which are supplied by two subsea cables from Ardmore Point, at the north end of Skye.

During the project development phase of the Skye Reinforcement Project, consideration was given to sub-sea cable alternatives at certain locations, and these were assessed through a Desktop Route Selection Study, undertaken by MarineSpace Ltd (MarineSpace) in 2021. The initial study area and indicative landfall locations were provided by SSEN Transmission, and included a replacement for the OHL between Kyle Rhea (Isle of Skye) and the mainland. The main limitation to laying a subsea cable in this location was the extremely high tidal current velocity present (peak flows of 8 knots), as well as the Inner Hebrides and Minches Special Area of Conservation (SAC) (designated for harbour porpoise *Phocoena phocoena*), and the Lochs Duich, Long and Alsh Reefs SAC (designated for Annex I reef habitat). The combination of extreme tidal currents and protected areas with sensitive habitats meant that this route option was assessed as having low suitability for a subsea cable and, as such, an overhead transmission line (OHL) solution was selected.

MarineSpace has been appointed by SSEN Transmission to prepare a Marine Environmental Assessment (MEA) in support of the Marine Licence Application (MLA) to Marine Scotland for the section of OHL crossing the marine water between Kyle Rhea (Isle of Skye) and Fort Augustus (Mainland) (see Figure 1-1).

1.2. Purpose of this Report

This MEA addresses the potential environmental effects associated with the licensable activities required for the replacement of the Kyle Rhea OHL. It provides the environmental information and assessment required to support the MLA, and demonstrates how the environment has been considered throughout project design.

1.3. Structure of this Report

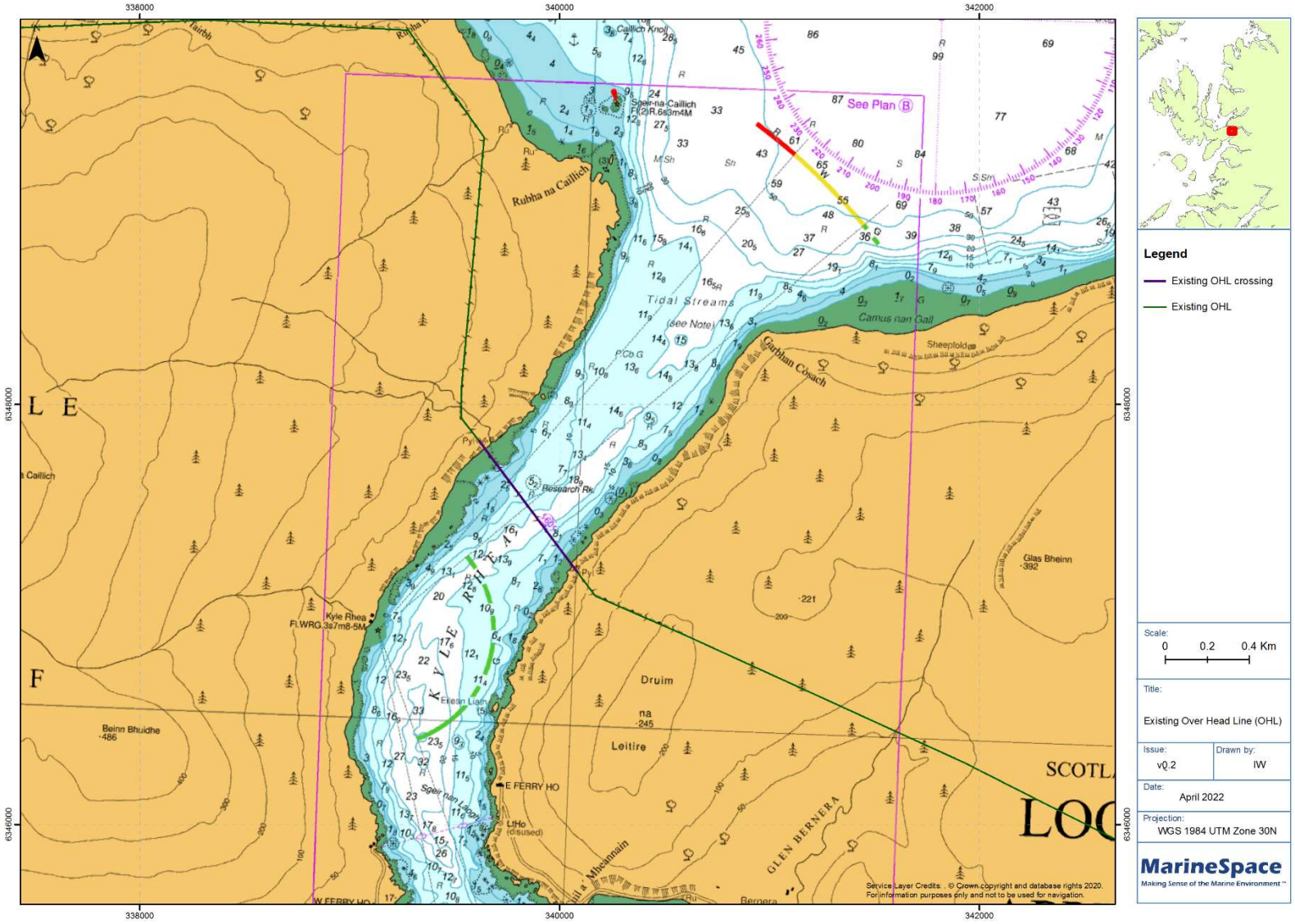
The remainder of this report is structured as follows:

- Section 2: Legislation, Policy and Statutory Consent Procedure;
- Section 3: Consultation;
- Section 4: Project Description;
- Section 5: Project Alternatives;
- Section 6: Environmental Assessment Methodology;
- Section 7: Environmental Assessment;
- Section 8: Summary and Conclusions.

Supporting information is provided in the following appendices:

- Appendix A: Cable Inspection Methodology;
- Appendix B: Scoping Exercise.

Figure 1-1: Location of the Kyle Rhea overhead line



2. Legislation, Policy and Statutory Consent Procedure

2.1. Overview

This section provides an overview of the legislation and policy applicable to the project and, where applicable, how these have been addressed in the MLA. It also lists the consents that will be obtained for the project in the UK.

2.2. Legislation

2.2.1. Marine (Scotland) Act 2010

The Marine (Scotland) Act 2010 provides the legal instrument for management and protection of the marine and coastal environment in Scotland. The Marine (Scotland) Act provides a framework which will help balance competing demands on Scotland's seas, and introduces a duty to protect and enhance the marine environment, and includes measures to help boost economic investment and growth in areas such as marine renewables.

Scottish Government (2014) summarises the main measures of the Marine (Scotland) Act as:

- "*Marine planning: a new statutory marine planning system to sustainably manage the increasing, and often conflicting, demands on our seas;*
- *Marine licensing: a simpler licensing system, minimising the number of licences required for development in the marine environment to cut bureaucracy and encourage economic investment;*
- *Marine conservation: improved marine nature and historic conservation with new powers to protect and manage areas of importance for marine wildlife, habitats and historic monuments;*
- *Seal conservation: much improved protection for seals and a new comprehensive licence system to ensure appropriate management when necessary;*
- *Enforcement: a range of enhanced powers of marine conservation and licensing*."

The Marine Scotland Directorate was established in 2009, and is a directorate of the Scottish Government. Marine Scotland manages Scotland's seas and freshwater fisheries, along with delivery partners NatureScot and the Scottish Environment Protection Agency; and provides management and research of devolved responsibilities such as:

- Licensing of marine activities;
- Sea fisheries;
- Salmon and recreational fishing;
- Marine renewable energy;
- Marine conservation;
- Marine spatial planning;
- Scientific research including sea and freshwater fisheries;
- Enforcement of marine and fisheries law.

Under Part 4 of the Marine (Scotland) Act 2010, a Marine Licence is required for projects that "*construct, alter or improve any works within the Scottish marine area […] over the sea*". Marine Scotland has confirmed that a Marine Licence is required for the Project (email from Dr Anni Mäkelä, Marine Licensing Group Leader, Marine Scotland to Nicholas Moore, Marine Consents Manager, SSEN Transmission; dated 16 February 2022).

In addition, it should be noted that it is considered that there is no requirement for a Project Environmental Impact Assessment (EIA) – the Project does not meet the criteria for EIA under the Marine Scotland regulations, the size of works is limited, and a like for like replacement is being installed. Marine Scotland has confirmed that both an EIA, and pre-application consultation (PAC), are not applicable to this Project (email from Dr Anni Mäkelä, Marine Licensing Group Leader, Marine Scotland to Nicholas Moore, Marine Consents Manager, SSEN Transmission; dated 16 February 2022).

This MEA, therefore, provides Marine Scotland with the environmental information and assessment required to support the MLA, and demonstrates how the environment has been considered throughout project design.

2.2.2. Other Legislative Requirements

2.2.2.1. The Habitats Directive (Council Directive 92/43/EEC)

The Habitats Directive (Council Directive 92/43/EEC) is translated into specific legal obligations, in Scotland, by the Conservation (Natural Habitats, &c.) Regulations 1994, commonly known as the Habitats Regulations. The Habitats Regulations provide requirements for:

- Protecting sites that are internationally important for threatened habitats and species – i.e. European sites;
- A legal framework for species requiring strict protection – i.e. European protected species.

Under the Habitats Regulations a project must investigate the potential for Likely Significant Effects (LSEs). Where there is potential for the project to have an adverse effect on a site within the Natural Sites Network (SAC, or Special Protection Area (SPA); including proposed or candidate sites (e.g. pSPAs or cSACs)), an Appropriate Assessment is required.

This requirement is satisfied within Section 7.3 of this MEA.

2.2.2.2. The Wildlife and Countryside Act 1981 (as amended)

The Wildlife and Countryside Act 1981 (as amended), prohibits the killing, injuring or taking of any wild animal listed in Schedule 5, which includes basking sharks. Before granting a marine licence, Marine Scotland will assess the likely impacts of the proposed Project, and actions will not be authorised if they will be detrimental to the maintenance of the population of the species concerned, at a favourable conservation status, in their natural range.

Potential impacts on protected species have been considered in the Project scoping (included as Appendix A of this report), and in the Appropriate Assessment (Section 7.3.2).

2.2.2.3. The Protection of Seals (Designated Sea Haul-out Sites) (Scotland) Order 2014

The Protection of Seals (Designated Sea Haul-out Sites) (Scotland) Order 2014 (made in exercise of the power conferred by section 117 of the Marine (Scotland) Act 2010) made it an offence to harass a seal (intentionally or recklessly) at a designated haul-out site. Seal haul-outs are locations on land where seals come ashore to rest, moult or breed; and in 2011, Marine Scotland, working with the Sea Mammal Research Unit (SMRU), identified an initial list of potential seal haul-out sites. The original list was subsequently revised and, as a result, a list of haul-out sites, including key breeding sites, and a number of additional specific sites were designated through The Protection of Seals (Designation of Haul-Out Sites) (Scotland) Order 2014.

Potential impacts on seals have been considered in the Project scoping (included as Appendix B of this report), and in the Appropriate Assessment (Section 7.3.2).

2.2.2.4. Water Framework Directive

The main aims of the Water Framework Directive (WFD) are to:

- Prevent deterioration and enhance status of aquatic ecosystems, including groundwater;
- Promote sustainable water use;
- Reduce pollution;
- Contribute to the mitigation of floods and droughts.

In Scotland, the WFD regulatory regime is administered through the Water Environment (Controlled Activities) (Scotland) Regulations 2011 (and further amendments), which enable controls over activities that can affect the water environment. The Controlled Activities Regime (CAR) is a risk-based regulatory approach, which applies different levels of authorisation according to the risk to the water environment presented by an activity (Nature Scotland, 2022).

A WFD assessment can have up to 3 stages, not all of which need to be completed (depending on the outcomes):

- Screening – excludes any activities that do not need to go through the scoping or impact assessment stages;
- Scoping – identifies the receptors that are potentially at risk from the activity and need impact assessment;
- Impact assessment – considers the potential impacts of the activity, identifies ways to avoid or minimise impacts, and shows whether activities may cause deterioration or jeopardise the water body achieving good status.

The scoping stage is not required if the activity is low risk (GOV.UK, 2017), and low risk activities include "*over water replacement or repairs … if bank or bed disturbance is minimised*". Works assessed under this assessment meet this criterion; therefore no WFD assessment will be undertaken for this MEA.

2.3. Marine Planning Policy

2.3.1. Scottish National Marine Plan

The Scottish Government adopted the National Marine Plan in early 2015. The Plan provides an overarching framework for marine activity in Scottish waters. The Plan is designed to enable sustainable development, whilst preserving and protecting the natural marine environment and its resources and allowing existing and emerging industries to co-exist. The Scottish National Marine Plan details 21 general policies that are applicable to all future developments and uses within Scottish waters. Key policies that align with the Project assessed in this report are detailed in Table 2-1.

Table 2-1: Relevant Scottish Marine Plan policies

Code	Project Alignment
GEN 1 – General Planning Principle There is a presumption in favour of sustainable development and use of the marine environment when consistent with the policies and objectives of this Plan.	The Project will enable future development of renewables generation around the island of Skye, which requires increased capacity of the current overhead line. It will also reinforce the electricity connection between Skye and the mainland.
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.	The current overhead line was built between 1956 and 1989 and has reached the end of its operational capabilities. Replacement is essential to maintain security of supply to Skye and the Western Isles. The Project will enable future development of renewables generation around the island of Skye, which requires increased capacity of the current overhead line, which would result in increased economic activity through investment and local spending. The project will unlock skilled jobs throughout the construction phase and many more through the supply chain and wider economy, providing a boost to local and national economies.
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.	The Project will enable future development of renewables generation around the island of Skye, which requires increased capacity of the current overhead line, which would result in increased economic activity through investment and local spending.
GEN 18 – Engagement Early and effective engagement should be undertaken with the general public and all interested stakeholders to facilitate planning and consenting processes.	The Project will adhere to all relevant engagement policies, through public notices of the Project and has engaged with relevant bodies, including Marine Scotland, the Maritime and Coastguard Agency, and the Ministry of Defence British Underwater Test and Evaluation Centre (MOD BUTEC), at an early stage of the Project.

As might be expected, overhead electricity cables are not specifically noted within the Scottish National Marine Plan, however submarine cables are detailed in Section 14 of the Plan, and the underlying planning policy objectives for submarine cables are also relevant for the overhead line assessed within this report, including the following:

- Protect submarine cables whilst achieving successful seabed user co-existence;
- Achieve the highest possible quality and safety standards and reduce risks to all seabed users and the marine environment;
- Support the development of a Digital Fibre Network, connecting Scotland's rural and island communities and contributing to world-class connectivity across Scotland;
- Safeguard and promote the global communications network;
- Support the generation, distribution and optimisation of electricity from traditional and renewable sources to Scotland, UK and beyond.

The Project will adhere to objectives and policies set out in the Scottish National Marine Plan.

2.3.2. Sectoral Marine Plan: Regional Locational Guidance

The Project assessed within this report sits within the area covered by the Sectoral Marine Plan: West region. The key risk factors to development within the West region are indicated as:

- Potential visual impacts and landscape/seascape character impacts;
- Potential impacts on marine mammal receptors;
- Potential impacts on commercial shipping;
- Risks to bird species, including collision risk and displacement, as well as potential impacts to birds on migratory pathways;
- Potential impacts on benthic habitats and species;
- Potential impacts on migratory fish species;
- Potential impacts on commercial fishing;
- Potential impacts on recreational angling;
- Potential cost impacts and associated navigational risk from diverting key commercial shipping routes.

Power interconnectors make up Section 3.3.12 of the Sectoral Marine Plan: West. They make up infrastructure which connects island communities with mainland electricity and will allow for the development of island renewables by allowing increased capacity. The existing OHL is the sole connection to Skye and the Western Isles and has reached the end of its operational capabilities. Replacement of the OHL at Kyle Rhea is, therefore, essential to maintain security of energy supply to Skye and the Western Isles, and meet the demand for connection for new renewables generation on Skye, which requires increased capacity in the OHL.

3. Consultation

A number of stakeholders have been consulted at an early stage of this Project. Table 3-1 provides a summary of this consultation, the key issues and concerns raised by the stakeholders, and how these concerns have been addressed by the Project.

Table 3-1: Consultation summary

Stakeholder	Consultation Type and Date	Summary of Consultation
Marine Scotland	Early consultation February 2022	SSEN Transmission will be submitting a Marine Licence application to Marine Scotland (MS) as part of its consents process for the crossings works. MS confirms Project not considered EIA or PAC applicable due to size of works being undertaken and like for like replacement being required (other than slight reduction in height). MEA should focus on Navigation/Safety/Other Sea User with robust justifications why other receptors are 'scoped out'. Vessel traffic study and initial engagement undertaken with MOD BUTEC/MCA welcomed, but further discussions should be undertaken on reconductoring methodology and how these might impact marine users, in particular emergency use (e.g. RNLI). No additional MS consents are required for shore access to more remote areas of the wider Skye Reinforcement works; however, if shoreline modifications are required e.g. slipways, harbour etc., then these would require consent.
Maritime and Coastguard Agency (MCA)	Early consultation February 2022	Key topics discussed included potential change in vessel air draft impacting on navigation of vessels. MCA was content that SSEN Transmission had engaged the relevant stakeholders early on. Confirmed that there was no port authority in this area, and therefore MCA takes lead on navigation and safety. Reminder that robust justification must be submitted to what other options were considered, and why air draft clearance is being lowered.
MCA	w/c 21/03/2022	No major concerns raised, recommended that guard vessels utilized to ensure safety of navigations
MCA	18/04/2023	Meeting to provide project update. No major concerns were raised by MCA. The guard vessel positioning and entrance and exit of the channel to enforce closure was discussed.

Stakeholder	Consultation Type and Date	Summary of Consultation
Ministry of Defence British Underwater Test and Evaluation Centre (MOD BUTEC)	Early consultation January 2022	Key topics discussed included potential change in vessel air draft impacting on MOD vessels. BUTEC does not have any objections with the potential lowering of the Kyle Rhea Crossing height by c. 5 m. SSEN Transmission will continue to periodically engage BUTEC regarding progression of the project design and development of the works schedule.
RNLI	Early consultation w/c 14/02/2022	Confirmed that unlikely to impact their work if enough engagement is undertaken prior to any closures, with other stations being allocated areas adjacent to the crossing, however, emergency use of crossing would still be useful.

4. Project Description

4.1. Project Location and Overview

The replacement of the OHL at Kyle Rhea (Figure 1-1) is part of works, known as the Skye Reinforcement Project, between Ardmore and Fort Augustus (approximately 140 km). The existing 132 kV OHL is the sole connection to Skye and the Western Isles. The current line was built between 1956 and 1989, and has reached the end of its operational capabilities. Replacement is essential to maintain security of supply to Skye and the Western Isles. There is also a demand to connect new renewables generation on Skye, which requires increased capacity of the OHL. Figure 4-1 provides an image of the OHL from the Kyle Rhea ferry crossing point, looking north.

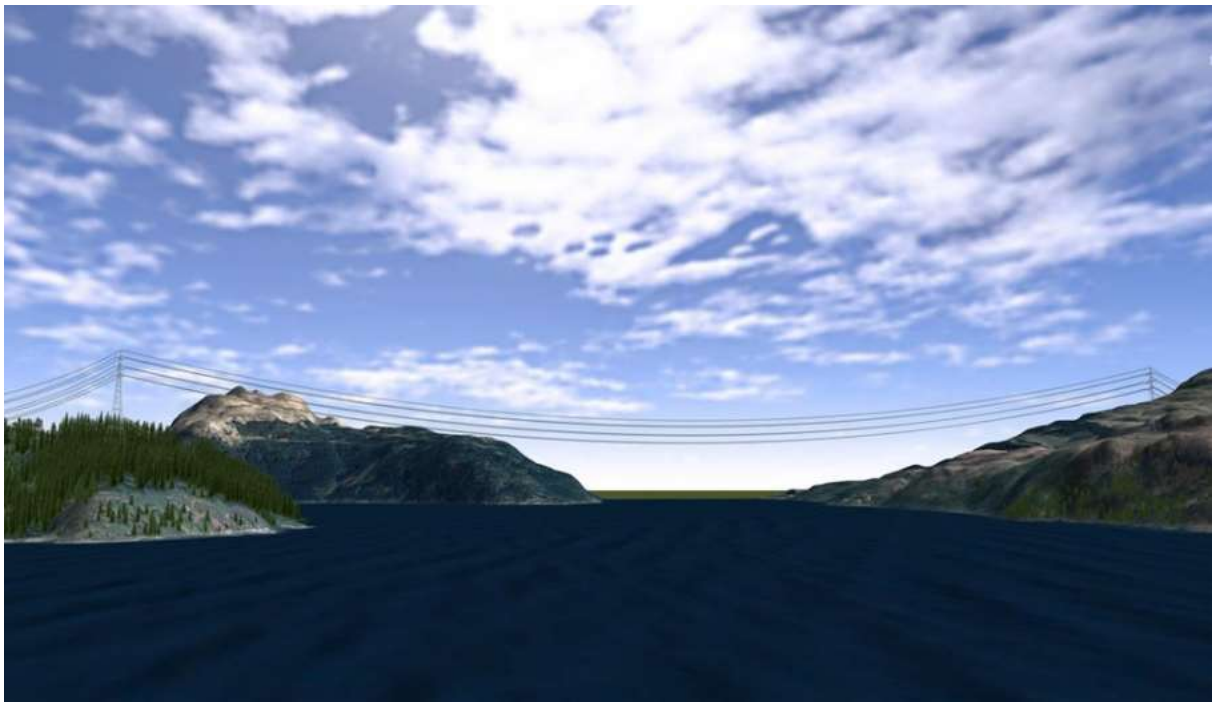
It is proposed that the Kyle Rhea crossing will be re-conductored, with the existing towers retained and potentially strengthened. The proposed works are seeking, therefore, to replace only the six conductor cables and one earth cable; the existing crossing structures will be re-utilised.

Figure 4-1: View of the overhead line spanning Kyle Rhea, from the ferry crossing

4.2. Cable Specification

The existing cable is expected to be replaced with like for like cable equipment. The existing line is a 132 kV OHL, with six conductors and one earth wire. The cable has a total span of 1,062 m (780 m of which is over water). There are two crossing towers (approximately 95 m tall), with two onshore anchor towers, as illustrated in Figure 4-2.

Figure 4-2: Kyle Rhea overhead line crossing illustration



The existing cable has a crossing clearance of 62.87 m. The proposed replacement cable would reduce the current ship air draft to 57.69 m, with the proposed air draft variations summarised in Table 4-1.

Table 4-1: Crossing air draft variations after proposed re-conductoring

UKHO Charted (m)	60.0			
Conductor Option	**Ship Air Draft Available from Highest Astronomical Tide (m)**		**Difference from Existing (m)**	
	Max Temp (m)	**High-Ice (m)**	**Max Temp (m)**	**High-Ice (m)**
Current	62.87	50.54	N/A	N/A
New	57.69	52.65	5.18	-2.11

Table 4-1 shows a maximum air draft difference of 5.18 m, from the existing height; with the new cables having an air draft of 57.69 m. It is also worth noting that while this represents a difference of 5.18m from the existing cable, it only represents a lowering of 2.58 m from the current UKHO charted air draft height. It should also be noted that the "*High-Ice*" air draft of the proposed reconductor cables will be approximately 2 m greater (i.e. higher/greater clearance) than the "*High-Ice*" height of the current cables.

As previously noted, the proposed works are seeking to replace only the six conductor and one earth cable, existing crossing structures will be re-utilised.

4.3. Installation Methodology

4.3.1. Aerial Reconductoring

4.3.1.1. Methodology

The planned methodology for replacement of the cables utilises Running Out Wheels (ROW) and a puller/tensioner system. The system involves setting up Equipotential Zones/pulling sites (EPZ), that are set up adjacent to the anchor towers, behind the crossing towers. The existing conductor is placed into the ROW on both crossing towers, and both anchor towers, in preparation for 'continuous tension stringing' works. The existing conductor is used to pull the new conductor, the conductors are connected to each other using a system of stockings/pre-forms and swivels. Works cannot be carried out in wind speeds greater than 20 mph. A closure corridor of 200 m will be required. In an emergency, e.g. RNLI Lifeboat needing access across the safety corridor, all conductor works will cease and the conductor will be made safe. The ROW and puller/tensioner are presented in Figure 4-3.

Figure 4-3: Running Out Wheels (ROW) and puller/tensioner

This process is repeated along each of the conductor and earth cables until all cables have been replaced. The system allows recovery and redeployment of broken conductors, without the need to significantly affect the marine environment within the Kyle Rhea Strait.

4.3.1.2. Duration of Works

It is anticipated that replacement of the cables, utilising the aerial methodology, will take 20 days in total – three days for each conductor and two days for the earth wire. Works will be carried out during a six hour window on each day. It is possible that works will be undertaken as a single block, or as a number of blocks over a period between April – September. Aerial works would be conducted during daylight hours only, with the likely work periods being between 1000 and 1600 daily.

It is proposed that the Kyle Rhea Strait be closed to vessel traffic while aerial works are being

undertaken, due to the risk to vessels of travelling beneath the span while overhead works are conducted. It is proposed, therefore, that guard vessels be used during the Project. Guard vessels will be mobile, and will not deploy anchors except if required in an emergency.

Closure will only be required during normal working hours, when the conductor system is being installed and the new conductor cable is being pulled through. At the end of each working day, the cables would be re-tensioned so full clearance height is reinstated.

Currently, the programme of works is anticipated to commence in Q3 of 2026.

4.4. Operation and Maintenance

Once in place the new OHL will be left *in situ*, operating as normal, with limited maintenance scheduled unless reports of a fault. The cable is intended to be in operation for 40years.

4.5. Decommissioning

The case for cable recovery will be subject to an environmental and economic assessment in the years leading up to decommissioning, and will follow industry best practice at the time.

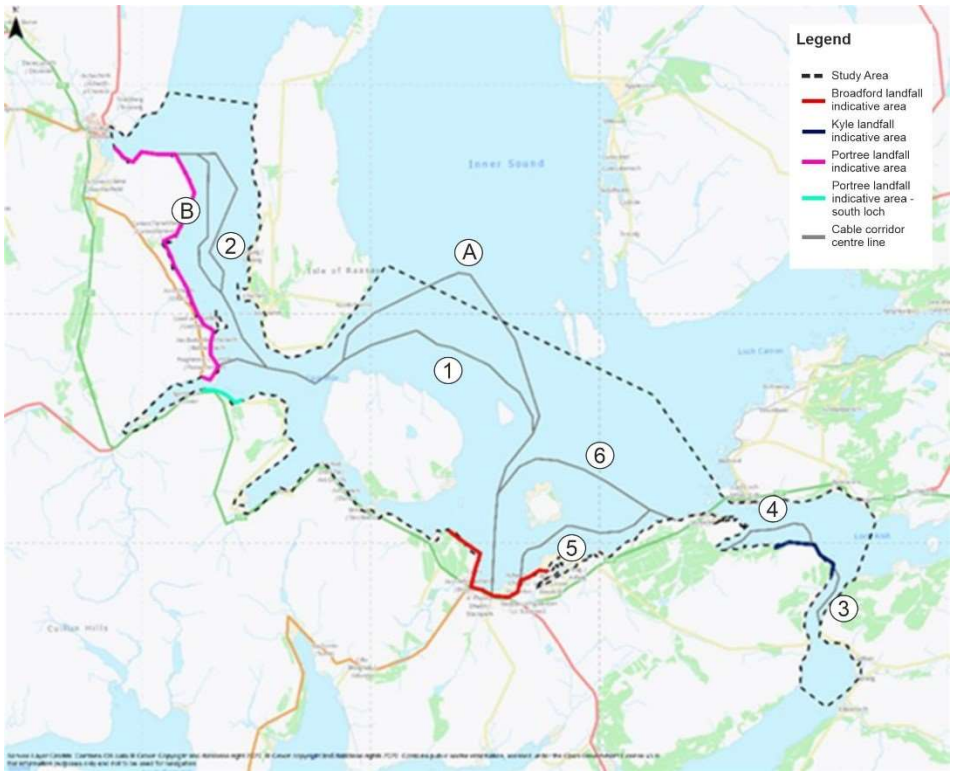
5. Consideration of Alternatives

5.1. Introduction

In support of the Skye Reinforcement Project, MarineSpace was appointed to undertake a desktop study of potential alternatives to an OHL, in the form of a subsea cable route options study (MarineSpace, 2021).

A full discussion of the alternatives considered is contained within Appendix V1-4.1 of the EIA Report for the Skye Reinforcement Project (Scottish Hydro-Electric Transmission plc. 2023), and it is not proposed to duplicate the findings in so far as it relates to the wider options considered in that context, or the methodology utilised. However, in relation to options studied in the Kyle Rhea area, Options 3 and 4, shown on Plate 1.4 of Appendix V1-4.1 (reproduced as Figure 5-1 below) were considered in the desktop study.

Figure 5-1: Reproduction of Plate 1.4 of EIAR Appendix V1-4.1 (From: Scottish Hydro-Electric Transmission plc. 2023)



Option 3 involved approximately 3 km of cable from the existing OHL on the Scottish mainland to the Kyle landfall indicative area, and Option 4 involved approximately 4.7 km of cable from the Kyle landfall indicative area to Loch na Beiste.

The results of the study indicated that subsea cable installation would likely involve substantial technical challenges. Option 3 involved extremely high tidal current velocities, meaning dynamic positioning was precluded and anchor positioning would be required, with associated impacts on the seabed. This underscored the ecological challenges, as Option 3 was located entirely within two

marine SACs (one of which was primarily designated for its Annex I reef habitat), and in close proximity to a nature conservation Marine Protected Area (MPA). Option 4 also involved high tidal current velocities that precluded the use of dynamic positioning vessels to lay the cable. Additional technical challenges for Option 4 included slopes descending to the middle of Loch na Beiste, with steep gradients of over 20°, together with the need to avoid a number of wrecks and an existing distribution cable. As well as being located within the two marine SACs, Option 4 was also within the nature conservation MPA. The study noted that the reason for designation of the MPA had been flame shell beds, which are a priority marine feature; extensive flame shell beds such as at the MPA are considered rare. The study therefore considered Options 3 and 4 as unsuitable.

In addition to the factors mentioned above, further consideration was given by SSEN Transmission to subsea installation, but it was concluded there was no reason to depart from the desktop study's conclusion that it was unsuitable (Euan Mackenzie, pers. Comms., 2023). The significant tidal current velocity, both in isolation, and when combined with the relatively shallow depths and the geological features of the seabed, presented substantial technical and engineering challenges, such that SSEN Transmission concluded that a subsea cable was not a feasible alternative (Euan Mackenzie, pers. Comms., 2023). SSEN Transmission's conclusions included that:

- Remotely operated vehicles (ROVs), which are often required to support the surveying and safe installation of subsea cables, would also have difficulty operating in the strong currents;
- The cable would likely be exposed to higher levels of strain during installation, increasing the likelihood of damage during installation;
- The cable would require significant engineering works to ensure it remained in position. Seabed conditions in Kyle Rhea are typical of those found in high energy environments with the seabed morphology suggesting exposed bedrock and hard substrates, which in SSEN Transmission's view are not suitable for cable burial. Cable would therefore require additional protections, for example rock berm installation, and given the high tidal current velocities, it is reasonable to assume the rock berm installation would need to be larger than usual. The relatively shallow waters mean that a higher than usual rock berm installation may be expected to have an effect on the local hydrodynamics, i.e. by installing rock berm because of the already high current velocity, the velocity over the berm may be expected to further increase;
- Even if it were possible to overcome the technical challenges at reasonable cost, SSEN Transmission considered that the consequence of the engineering works likely required to ensure the cable remain in position is that standard cable repair (i.e. replacing only the damaged element of the cable) is not likely to be possible and, instead, it would likely be necessary to replace the whole cable. Replacement would take months to organise and deploy, particularly given the difficult sea conditions. Accordingly, the objective to maintain security of supply of electricity to the residents of Skye and the Western Isles would not be met by subsea cable installation.

While the reasons for discounting the use of subsea cable as an alternative are primarily technical, the challenges of installation in an ecologically sensitive environment, and the disproportionately high cost of the subsea cable installation in such circumstances, compared with the cost of the overhead line, were also taken into account by SSEN Transmission. SSEN Transmission, therefore,

concluded that subsea cabling was not technically or financially feasible and, in any event, would not meet the project objective of security of supply.

6. Environmental Assessment Methodology

6.1. Introduction

This Chapter sets out the methodology that has been used to undertake the Environmental Assessment for the Project (Section 7 of this report). The assessment methodology is based on the environmental risk of the proposed activity, using a standardised methodology developed previously by MarineSpace for its environmental assessments. The process follows the application of best practice rationale and underpinning principles for EIA:

- Avoidance: seek options that avoid harm to ecological features;
- Potential environmental impacts: identify likely significant effects which could result from development of the Project;
- Mitigation: avoid or minimise likely significant adverse effects through mitigation measures, either through the design of the Project or subsequent measures that can be guaranteed, either by themselves, or in combination with other impacts;
- Assessment of the level of significance of residual effects: in relation to likely significant adverse effects only, taking account of committed mitigation measures;
- Compensation: where there are residual likely significant adverse effects, despite the mitigation proposed, these should be offset by appropriate compensatory measures.

These elements have been incorporated into the methodology that has been applied to the risk assessment. The methods applied to developing the risk assessment of significance of an effect utilise the best available evidence of environmental/impact receptor sensitivity (including tolerance and recoverability metrics) and the best available evidence of the nature, spatial scale and extent, and duration and frequency (magnitude) of impacts resulting from the proposals, to determine the severity of the risk. The results of this process are inherently subjective but professional competent expert judgement will be used to determine impact significance.

6.2. Methodology for Assessment Based on Effects and Impacts

The environmental assessment process followed in this MEA follows the systematic process of an Environmental Assessment, which evaluates the impact of change or effect that the Project might have and the subsequent importance of this effect or change on the receiving environment.

6.2.1. Effects and Impacts

Effects and impacts are often used interchangeably, but for the purpose of environmental assessment they are not the same. An effect is a physical change resulting from the proposed activity, whilst an impact is the resultant measurable change in the environment. Therefore, an effect does not necessarily result in an impact if the environment is not sensitive to it. Impacts can be positive or negative.

To assess the level of potential impact from effects a methodology has been developed to establish the level of environmental risk which takes account of the sensitivity of a receptor, the exposure of the receptor to effects and the magnitude of the effects over and above the baseline condition.

More information on the criteria considered when determining levels of sensitivity, exposure and magnitude is provided below. In all cases, the assessment will consider impacts, over and above those that may have already occurred, to determine whether the proposals constitute a significant risk.

It should be borne in mind that in this assessment, that the baseline condition of the environment within and surrounding the Project has already been modified by the presence of the current OHL. As such, the risk assessment will consider impacts over and above those that may have already occurred, to determine whether the dredging proposals constitute a significant risk to the physical and biological environment or the socio-economic activities/resources in the vicinity of the Project.

6.2.2. Criteria Employed to Determine Levels of Sensitivity, Exposure and Magnitude

6.2.2.1. Sensitivity

The sensitivity of a receptor feature is defined in terms of the receptor's value (importance, quality, and rarity), and as a product of tolerance, adaptability and recoverability to a pressure/effect, where:

- Tolerance: the susceptibility (ability to be affected or unaffected) of a receptor from an external factor;
- Adaptability: the ability of the receptor to adapt to, or avoid, an external factor;
- Recoverability: the ability of a receptor to return to a state close to that which existed before the activity or event caused change within a specified period of time.

For each receptor, consideration is given to each of these component parts of the sensitivity assessment, with overall sensitivity being governed by the combined scores for each part. The scores for each element range from 0-3 (with a higher score meaning the receptor is more 'at risk' and has a higher sensitivity) and are determined based on consideration of the available evidence.

6.2.2.2. Exposure

Exposure is defined in terms of how the impacts affect a receptor, including the spatial extent of the impact, its longevity above baseline levels and the frequency at which the impact occurs.

In practice, to determine the exposure of a receptor to a particular impact, each characteristic (spatial extent, longevity, and frequency) is scored from 0-3. The combined scores are then used to determine the level of exposure that a receptor will experience.

6.2.2.3. Magnitude

Magnitude is defined in terms of the level of the impact above background conditions and natural variability by whatever parameters are measurable.

In practice, to determine the magnitude of an impact, each characteristic (level above background, level in the context of natural variability) is scored from 0-3. The combined scores are then used to determine the level of exposure that a receptor will experience.

MarineSpace has developed an environmental risk assessment matrix to determine the risk posed by a range of impacts to a range of receptors. The matrix is illustrated in Figure 6-1: . In practice, to determine the level of risk posed by an impact to a receptor, the scores resulting from the assessment outlined above are multiplied to determine the level of risk. In the example shown in Figure 6-1: , values of Sensitivity: 2; Exposure: 2; and Magnitude: 2, are shown, which lead to an assessment of a Medium level of risk.

Figure 6-1: The risk assessment matrix

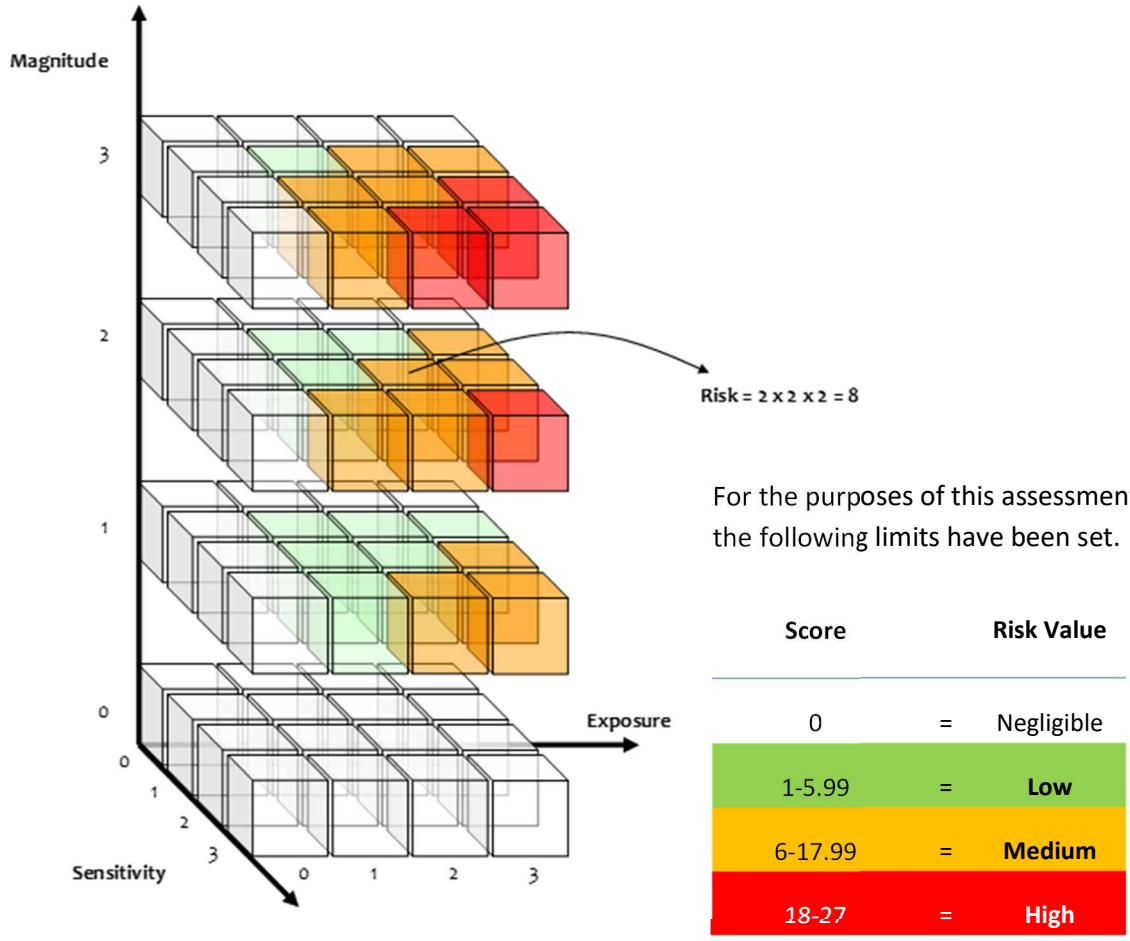


Table 6-1 presents the transposition of the risk assessment values into significance statements.

Table 6-1: Risk assessment values and transposition into significance statements

Risk Assessment	Significance
Negligible	**Not Significant**
Low	**Not Significant**
Medium	**Significant**
High	**Significant**

For the purposes of this assessment, risk scores of <6 (Low or Negligible Risk) are considered insignificant and mitigation is unnecessary.

Risk scores of 6-17.99 (Medium Risk) are considered to result in significant effects. Where mitigation can be applied impacts may be reduced to Low or Negligible Risk resulting in residual effects equating to an insignificant effect. If specific mitigation measures are not applied significant effects will remain.

Risk scores >18 (High Risk) are considered to result in significant effects and impacts are likely to be mitigated only through application of specifically targeted measures and/or acquisition of further environmental information to better determine impact significance. If specific mitigation measures are not applied significant effects will remain.

6.3. Identification of Existing Conditions and Topics Considered in this MEA

As noted in Section 6.2.1, the baseline condition of the environment within and surrounding the Project has already been modified by the presence of the current OHL. The Project Description (Section 4) indicates that the proposals to be assessed in this document relate to a reconductoring of the current crossing, with no infrastructure associated with the works being installed on the seabed, and only minor potential disturbance of the water column and seabed occurring. As such, the risk assessment in this report considers impacts over and above those that may have already occurred as a result of the presence of the current OHL i.e. this assessment considers only the effects and impacts associated with the reconductoring works, and changes to the height of the OHL, not the presence of the OHL itself.

Accordingly, a preliminary scoping exercise was undertaken by MarineSpace as part of this MEA, and guided by the early stakeholder discussions between SSEN Transmission and key stakeholders (as recorded in Section 3). The results of this scoping exercise are provided as Appendix B, where robust justifications will be found for those receptors scoped out of assessment, however the result of the exercise are summarised in Table 6-2.

Table 6-2: Topics to be considered in the environmental assessment

Topic	Scoped in/out of assessment	Justification
Metocean Conditions	Out	No structures will be installed that will change the current wind, wave and climate conditions, therefore there is no pathway for impacts on the metocean conditions.
Geology - Bedrock	Out	No structures will be placed/anchored on the seabed, therefore there is no pathway for impacts on the bedrock geology.
Geology - Seabed Substrate	Out	Any potential disturbance will be in small and localised areas, restricted to the seabed associated with the OHL, where vessels may potentially anchor in an emergency. Seabed sediments are, typically, sandy gravel. Sandy gravels

Topic	Scoped in/out of assessment	Justification
		have a high tolerance associated with temporary direct disturbance due to the fact that they demonstrate rapid recovery periods.
Water and Sediment Quality	Out	Any disturbance to seabed sediments will be temporary and extremely short-term and anchors will only be deployed in an emergency. Seabed sediments are clean, with low contaminant levels. No WFD scoping is required if the activity is low risk, and low risk activities include "*over water replacement or repairs … if bank or bed disturbance is minimised*". There is therefore no pathway for impacts on water and sediment quality.
Benthic Ecology	Out	Any impacts to benthos will be limited to potential anchoring by guard vessels in emergency situations. Given the habitual use of the Kyle Rhea Strait by other vessels, including fishing vessels, the project is unlikely to introduce significant vessel presence above that associated with the existing baseline. Benthic communities will likely be habituated to the level of vessel presence associated with the project, and the anchoring of any vessels is predicted to cause very minimal disruption and will only occur in emergencies. Any potential disturbance will be in small and localised areas, restricted to the seabed associated with the OHL. The benthic habitat associated with the proposed area of works consists of sandy gravels, which have a high tolerance to temporary direct disturbance, due to their rapid recovery periods. No significant impacts are anticipated as a result of the vessel movements associated with the overhead cable works.
Fish Ecology	Out	The Project intends on replacing the conductor cables utilising the existing infrastructure and so minimal impacts on fish species are expected, limited to temporary disturbance from the presence of guard vessels. Vessels will be in the Strait for approximately 20 days. Given the habitual use of the Strait by other navigation and fishing vessels, fish species will likely be habituated to the level of vessel presence associated with the Project. No significant impacts on fish ecology are, therefore, anticipated.
Marine Mammals (inc. Otter)	In	Potential impacts could arise from the following: Disturbance from the guard vessel presence; Noise generated by the guard vessels; Collision risk increase due to vessel presence; Barrier Effects could prohibit transit of the Strait by regular users of the channel due to presence of guard vessels.
Ornithology	In	Following the lack of change in operation, any impacts to seabirds will be limited to the use of guard vessels. Vessels will be in the water for approximately 20 days, during which they have the potential to interact with foraging bird species.

Topic	Scoped in/out of assessment	Justification
Nature Conservation and Habitat Regulations Assessment (HRA)	In	Considering the lack of change in operation, any impacts to the designated habitats and designated or classified populations of species will be limited to the use of guard vessels. Vessels will be in the water for approximately 20 days with anchoring required only in emergencies.
Commercial Fisheries	In	The presence of guard vessels in the Kyle Rhea strait has the potential to interrupt local commercial fishing activity. During the estimated 20-day replacement time, it is recommended transit of the strait will be is prohibited during normal operational working hours. This may cause some displacement of fishing activity.
Shipping and Navigation	In	Potential impacts from the presence of guard vessels in the water include the following: Displacement of vessels through the presence of the guard vessels and periods of time where vessel navigation would be prohibited during conductor replacement (estimated to be 20 days); Collison risk through increased inherently through vessel presence associated with the project; Disturbance to search and rescue through presence of project vessels and potential periods where navigation beneath the conductor would be prohibited.
Tourism and Recreation	Out	No new structures will be installed that will change the current towers and OHL and there is no new impact on visual amenity. Project works will be temporary and short-term, therefore there is no pathway for significant impacts on tourism and recreational receptors.
Aviation and Military	Out	No new structures will be installed that will change the current towers and OHL and there will be no new impact on aviation. Guard vessels may temporarily transit military exercise areas while travelling to and from the work site. Due to the distance of the work site from both military practice areas and the historic munitions disposal site, any effects will be negligible, and no impacts to aviation and military receptors are anticipated.
Marine Archaeology	Out	No structures will be placed/anchored on the seabed, therefore there is no pathway for impacts on either wreck material (if present) or unknown prehistoric receptors.
Seascape and Visual Receptors	Out	No new structures will be installed that will change the current towers and OHL and there is no new impact on seascape and visual amenity. Project works will be temporary and short-term, therefore there is no pathway for significant impacts on receptors.
Other Marine Users	Out	No new structures will be installed that will change the current towers and OHL and there is no new impact on visual amenity. Project works will be temporary and short-

Topic	Scoped in/out of assessment	Justification
		term, therefore there is no pathway for significant impacts on other marine users.

6.4. Marine Environmental Assessment Structure

The following environmental assessment (Section 7) is structured as per the scoping process outlined in Table 6-2. For each topic scoped into the assessment a description of the baseline is provided drawing on published data, then an assessment of the potential impacts is made, mitigation measures defined and residual impacts assessed.

Based upon methodology summarised in Section 4.3, and the receptors scoped in for assessment (Table 6-2 and Appendix B), the worst-case effects for each scoped in receptor are defined within the appropriate sub-sections of Section 7.

7. Environmental Assessment

The environmental assessment process followed in this MEA follows the systematic process of an Environmental Assessment, which evaluates the impact of change or effect that the Project might have, and the subsequent importance of this effect or change on the receiving environment, and the methodology is summarised in Section 6.2. Baseline descriptions for the scoped-out receptors, and a justification for each decision can be found in Appendix B. Sections 7.1-7.5 below provide the environmental assessment for those receptors scoped in for consideration.

7.1. Marine Mammals (including Otter)

7.1.1. Baseline

7.1.1.1. Cetaceans

According to NatureScot over 20 cetacean species are found in Scottish waters, but seven species are relatively common close to the Scottish coasts:

- Bottlenose dolphin *Tursiops truncatus*;
- Harbour porpoise *Phocoena phocoena*;
- Minke whale *Balaenoptera acutorostrata*;
- White-beaked dolphin *Lagenorhynchus albirostris*;
- Risso's dolphin *Grampus griseus*;
- Common dolphin *Delphinus delphis*;
- Orca *Orcinus orca*.

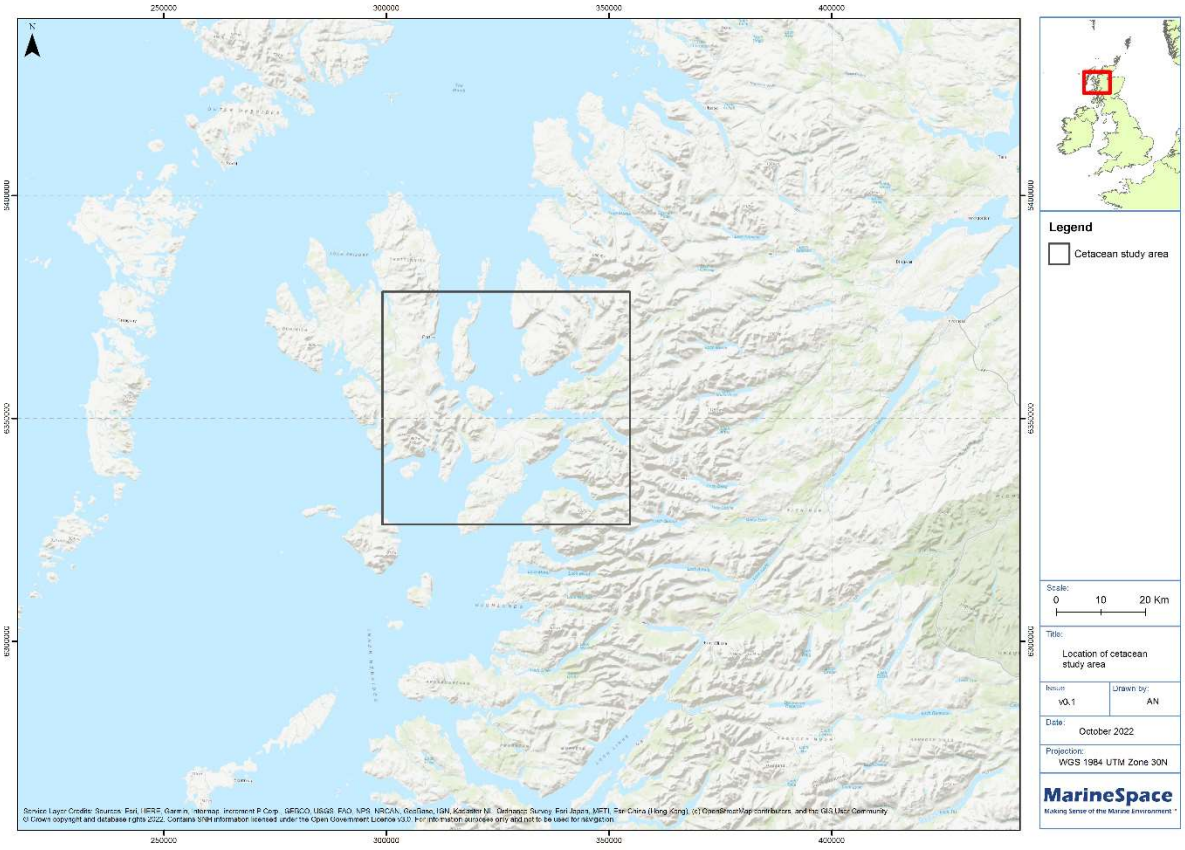
Based on publicly available data provided by the Sea Watch Foundation, Table 7-1 provides an overview of the cetaceans sighted around Skye. The data from the Sea Watch Foundation have been gathered from a sighting scheme running from the mid 1970s, and include data from volunteers, data gathering schemes, as well as the Small Cetacean Abundance in the North Sea (SCANS) I and SCANS II projects. The data summarised in Table 7-1 were gathered from a study area illustrated in Figure 7-1.

Table 7-1: Sea Watch database records of sighting of cetaceans around Skye

Species	No. Records	%	No. of Individual	%
Short-beaked common dolphin *Delphinus delphi*	703	10.3	27,702	55.3
Harbour porpoise *Phocoena phocoena*	3,587	53	16,036	32
Minke whale *Balaenoptera acutorostrata*	1,957	29	2,770	5.5
Bottlenose dolphin (genus *Tursiops*)	165	2.4	1,542	3.1

Species	No. Records	%	No. of Individual	%
Orca *Orcinus orca*	56	0.8	204	0.4
White-beaked dolphin *Lagenorhynchus albirostris*	22	0.3	184	0.4
Risso's dolphin *Grampus griseus*	28	0.4	166	0.3
Atlantic white-sided dolphin *Lagenorhynchus acutus*	12	0.2	148	0.3
Long-finned pilot whale *Globicephala melas*	37	0.5	134	0.2
Northern bottlenose whale *Hyperoodon ampullatus*	31	0.5	60	0.1
Humpback whale *Megaptera novaeangliae*	48	0.7	51	<0.1
Sperm whale *Physeter macrocephalus*	10	0.1	20	<0.1
Striped dolphin *Stenella coeruleoalba*	2	<0.1	11	<0.1
Fin whale *Balaenoptera physalus*	6	<0.1	7	<0.1
Sei whale *Balaenoptera borealis*	3	<0.1	4	<0.1
Cuviers beaked whale *Ziphius cavirostris*	1	<0.1	3	<0.1
Unidentified	148	n/a	1042	n/a

Figure 7-1: Map of the Hebrides with cetacean study area noted



All cetaceans in Northern European waters are listed under Annex IV of the EU Directive 92/43/EEC on the Conservation of natural habitats and of wild fauna and flora (the Habitats Directive), as European Protected Species (EPS) of Community Interest, and in need of strict protection. The harbour porpoise and bottlenose dolphin have protection under Annex II as species of Community Interest whose conservation requires the designation of Special Areas of Conservation (SACs). Potential impacts on nature conservation designations are covered in Section 7.3 of this assessment.

7.1.1.2. Pinnipeds

The harbour seal *Phoca vitulina* and the grey seal *Halichoerus grypus* are commonly found in the northern hemisphere, with Scotland a hub for much of Europe's population. Datasets provided by Marine Scotland, presented in Figure 7-2 and Figure 7-3, show relatively high usage of the Kyle Rhea Strait for both seal species. No designated seal haul out sites are present along the Strait, with the closest, the Pabay and Ardnish Peninsula, lying approximately 10 km west of the project site.

Figure 7-2: Harbour seal total usage 2017. (Source: Marine Scotland, 2021)

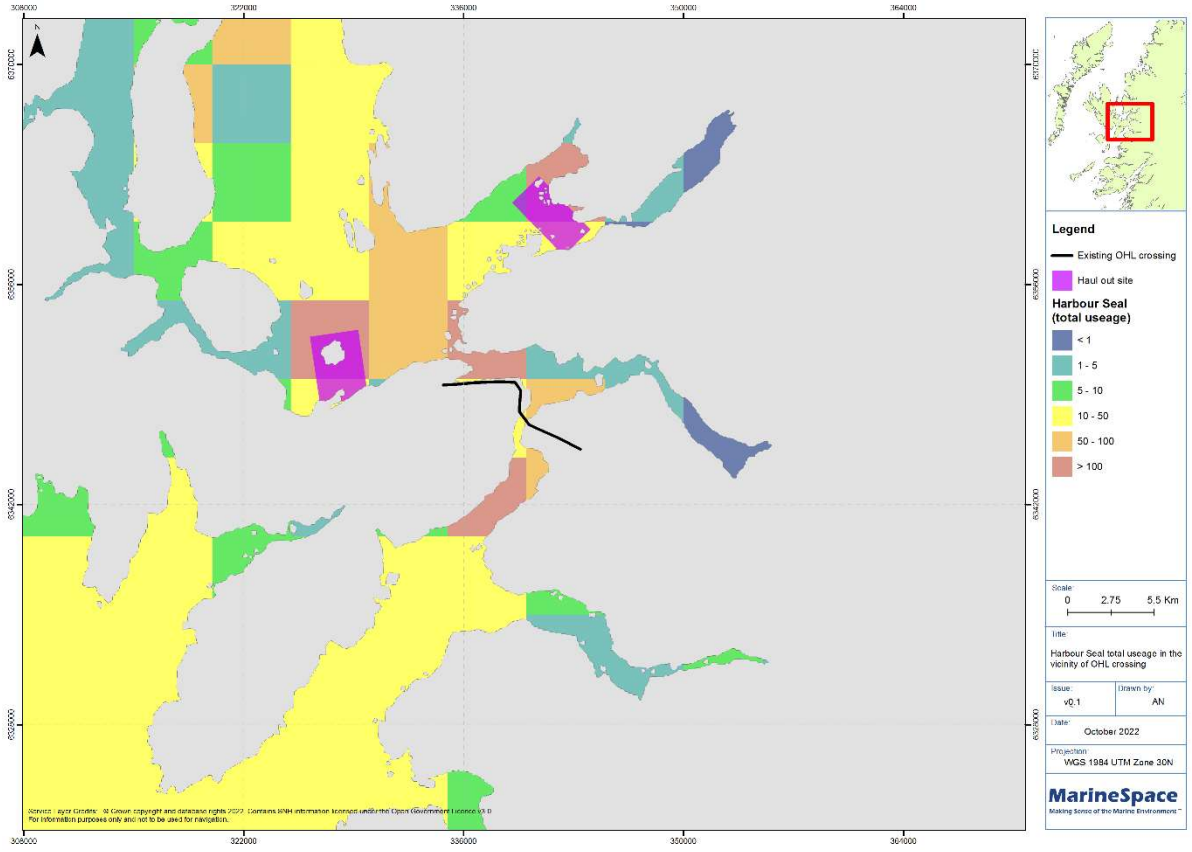
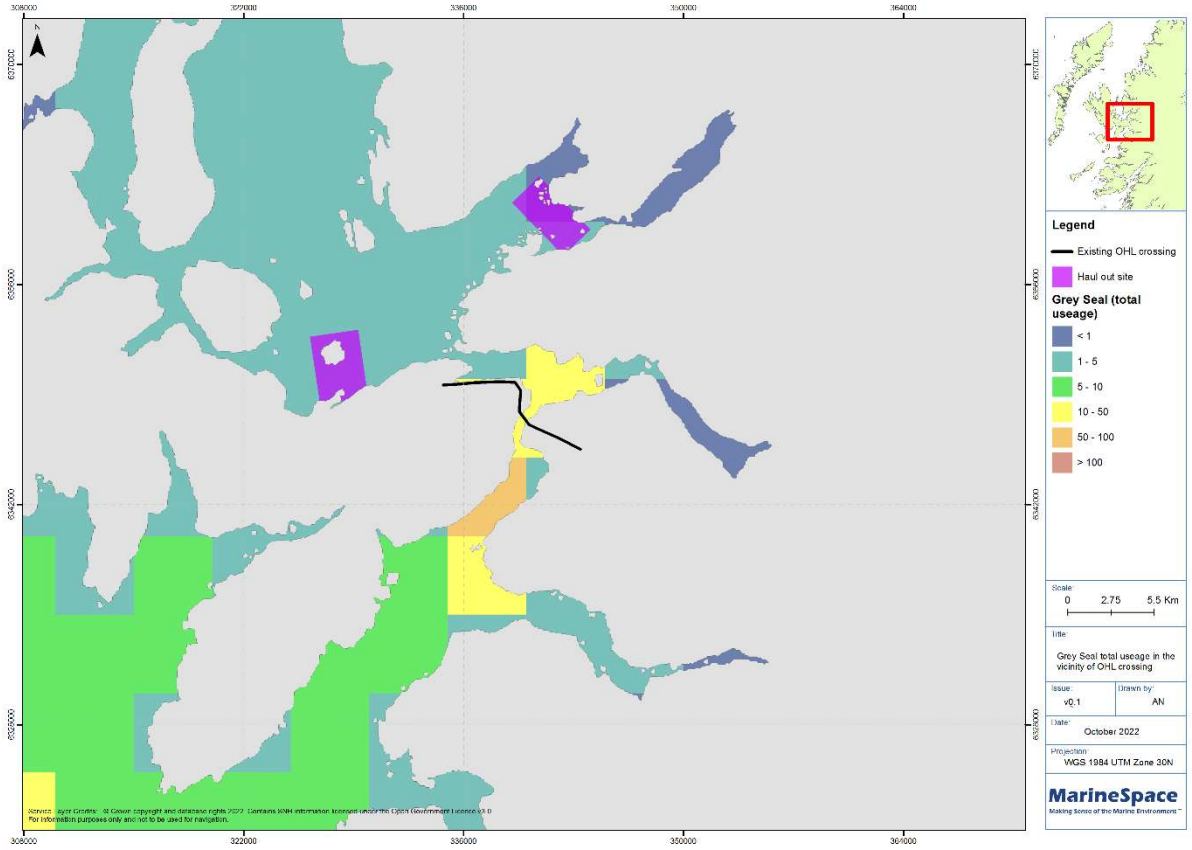


Figure 7-3: Grey seal total usage 2017. (Source: Marine Scotland, 2021)



As with cetaceans, harbour seal and grey seal have protection under Annex II as species of Community Interest whose conservation requires the designation of Special Areas of Conservation (SACs). Both grey seals and harbour seals are also listed under Annex V of the Habitats Directive, which requires any exploitation to be managed. Potential impacts on nature conservation designations are covered in Section 7.3 of this assessment.

7.1.1.3. Otter

Scotland is a principal stronghold for the Eurasian otter *Lutra lutra*, with a high proportion of the population found in the coastal waters of the northwest. Otter is designated, and protected as a European Protected Species (EPS). The Kyle Rhea Strait is important for otter activity on Skye, [Redacted]

7.1.2. Potential Project Impacts

The project intends on conducting the OHL replacement via existing infrastructure as set out in Section 3. No new infrastructure will be installed on the seabed, and no noise impacts associated with marine pile driving or installation will occur. No construction activity will occur in the vicinity of the closest seal haul out, the Pabay and Ardnish Peninsula, which lies approximately 10 km west of the project site, therefore there is no effect pathway for impacts at haul out sites.

However, given the use of guard vessels in the water during replacement there exists some potential for impact to marine mammals (including otter) from the following key effects:

- Disturbance as a result of the presence of guard vessels;
- Noise generated by the guard vessels;
- Collision risk increase due to vessel presence;
- Barrier effects, which could prohibit transit of the Strait by regular users of the channel, due to presence of guard vessels.

Table 7-2 summarises the realistic worst case potential effects on marine mammals (including otter).

Table 7-2: Project parameters relevant to effects on marine mammals (including otter)

Effect	Realistic Worst Case Scenario	Justification
Disturbance from vessels	Two guard vessels are likely to be present during this period. It is anticipated that the replacement would take a total of 20 days.	The maximum numbers of vessels, and associated vessel movements, represents the maximum potential for disturbance, noise and collision risk.
Noise from vessels		
Collision risk with vessels		
Barrier effect and entanglement	Maximum barrier effect will occur where guard vessels are present. Replacement of the cables, utilising will take 20 days in total.	The presence of two guard vessels represents the maximum potential for barrier effects. No guard vessels will be present during weather downtime, therefore barrier effect due to will only occur during work days.

7.1.3. Risk (Impact) Assessment

7.1.3.1. Vessel Disturbance, Displacement through Underwater Noise, and Collision Risk

Shipping activity produces underwater noise with the main processes that contribute to noise associated with engine and propellor noise. Underwater noise can lead to varied direct effects on marine mammals, including mortality, physiological injury, and auditory injury, the latter of which can be classified as permanent threshold shift (PTS) or temporary threshold shift (TTS) (Todd *et al.*, 2009). There is also potential for indirect effects, such as masking of communication signals (Todd *et al.*, 2009). Individuals that are being disturbed by underwater noise may also leave the area of disturbance, which can lead to displacement effects. The level of effect is related to the frequency, sound levels, and duration of the noise, as well as variation in the individual receptor.

The noise produced by general shipping movements is lower than the threshold required to cause mortality or physiological injury effects. Southall *et al.* (2019) recently revised the sound pressure levels for the onset of TTS and PTS in all marine mammals and reported that TTS onset will occur at a

peak SPL (unweighted) of 212 dB re 1 µPa, and PTS onset will occur at a peak SPL (unweighted) of 218 dB re 1 µPa. OSPAR Commission (2009) reports that small vessels, including small work boats produce acoustic signatures with source levels approximately 160-175 dB re 1 µPa, although the output characteristics are highly dependent on speed and other operational characteristics.

There is potential for the shipping operations associated with the Project to mask communications between marine mammals – for example, harbour seal vocalisations typically have a peak frequency of 1.2 kHz (DOSITS, 2020), which is within the frequencies produced by small vessels. OSPAR Commission (2009) indicates that the resonant vibrational frequencies of propeller blades, engines, or gearboxes are approximately 1 kHz, while energy resulting from propeller cavitation extends up to and above 10 kHz. However, it should also be taken into account that a significant amount of marine traffic typically uses the Kyle Rhea Strait, including a regular ferry service, and any additional shipping movements and noise associated with the operations will be small when compared with the overall baseline of other vessels in the area that also occupy this frequency range (see Section 7.5: Shipping and Navigation).

A potential source of impact from vessel activity is collision with a boat or ship, which may cause blunt trauma to the body or injuries consistent with propeller strikes. While there is little information on the frequency of vessel collisions as a source of marine mammal mortality, there is little evidence from marine mammals strandings in the UK that injury from vessel collisions is an important source of mortality. The UK Cetacean Strandings Investigation Programme (CSIP) documents the annual number of reported strandings and the data show that very few strandings have been attributed to vessel collisions. It should also be noted that a significant amount of marine traffic typically uses the Kyle Rhea Strait, and marine mammals will be habituated to this. Any additional shipping movements associated with the operations will be small when compared with the overall baseline of other vessels in the area. In addition, marine mammals are relatively small and highly mobile, and given observed responses to noise, are expected to be able to detect vessels in close proximity and largely avoid collision. Predictability of vessel movement is known to be a key aspect in minimising the potential risks to marine mammals of collision (Nowacek *et al*., 2001; Lusseau 2003, 2006).

Impact Assessment

Marine mammals have a high value as they are listed on Annex IV of the EC Habitats Directive, are priority species under Section 41 of the Natural Environment and Rural Communities (NERC) Act 2006, and protected under the Wildlife and Countryside Act (WCA) 1981. Noise generated by the vessels associated with the operations is outside the threshold for PTS or TTS, and marine mammals are habituated to the level of vessel activity within the Kyle Rhea Strait and, therefore, the overall level of sensitivity is considered **Low**.

Marine mammals will only be affected whilst they are within the area of effect of vessel operations, which will have a short duration (maximum 20 days). Marine mammals are highly mobile and have a wide foraging range available. The area of effect is negligible in the context of the total habitat available to marine mammals in the region. The overall level of exposure is considered **Low**.

While there will be some additional vessel movements associated with the operations, a significant amount of marine traffic typically uses the Kyle Rhea Strait, including a regular ferry service, and any additional shipping movements and noise associated with the operations will be small when compared with the overall baseline. The magnitude of impacts it therefore considered **Low**.

Low sensitivity, combined with low exposure and low magnitude, mean that risk to marine mammals from vessel disturbance, displacement through underwater noise, and collision risk associated with the Kyle Rhea Project is **Low, Not Significant.**

Key Mitigation Measures

Impacts are not significant, therefore mitigation measures are not necessary to reduce significance further. Despite this, embedded standard best-practice operating procedures for vessels will ensure that vessel movements are predictable and travelling speeds will be minimised as far as possible.

7.2. Ornithology

7.2.1. Baseline

The Kyle Rhea Strait supports a wide variety of seabird species and colonies (Kober *et al.*, 2010; Waggitt *et al.*, 2019; also refer to Section 7.3 for information on classified populations of SPAs). Kober *et al.* (2010) and, more recently, Waggitt *et al.* (2019) modelled seabird abundance and usage of the marine area for several species, based on survey data and environmental variables. These studies, along with area-specific, regional, and national studies, have been used to inform the baseline environment and to identify potentially sensitive ornithological receptors. The main data sources reviewed in order to develop an understanding of the baseline environment include:

- Baseline surveys conducted within the Kyle Rhea Strait for the Kyle Rhea Tidal Array project (NRP, 2012; Royal HaskoningDHV, 2013);
- The Royal Society for the Protection of Birds (RSPB)'s future of the Atlantic Marine Environment (FAME) and Seabird Tracking and Research (STAR) seabird tracking study (Wakefield *et al.*, 2017);
- Seabird distribution and abundance modelled using a combination of tracking data and environmental variables (Kober *et al.*, 2010; Waggitt *et al.*, 2019);
- Supporting information and data used for classification of Special Protection Areas (SPAs) in the region.

7.2.1.1. Divers (Gaviidae)

Red-throated diver *Gavia stellata* and black-throated diver *Gavia arctica* are large seabirds, with body lengths and wing spans of approximately 53-73 cm and 106-130 cm, respectively. Weight differs more notably between the species (RSPB, 2022a-b), with red-throated diver being the lighter of the two (1.2-1.6 kg, compared with the 2.3-3.4 kg weight of black-throated diver). Both reside in Scotland for at least part of the year, and western Scotland and the Scottish isles are the only parts of Great Britain where these species are present in the summer (RSPB, 2022a-b). Both species breed in Scotland, although there are no notable breeding colonies within the species-specific foraging range (9 km; Woodward *et al.*, 2019) of the OHL crossing between Kyle Rhea and Fort Augustus.

NRP (2012) recorded very low numbers of both species in the baseline surveys for the Kyle Rhea Tidal Array (1 individual of each species), and, subsequently, Royal HaskoningDHV (2013) determined negligible risk to the species associated with all impacts, including vessel disturbance and displacement.

As such, the OHL crossing area is considered to be of low importance to divers.

7.2.1.2. Petrels and Shearwaters (Procellariiformes)

Northern fulmar *Fulmarus glacialis* and Manx shearwater *Puffinus puffinus* are shown to have modelled hot spots of activity in the wide region (Kober *et al.*, 2010; Waggitt *et al.*, 2019).

Northern fulmar are large seabirds, slightly smaller than red-throated diver (SWT, 2022a). The species nests on cliff edges, feeding overnight on a variety of prey, ranging from zooplankton to small fish. The species is typically more associated with the northern and northwestern offshore islands than the Scottish mainland, with at-sea distribution largely associated with trawl fishing activity (Kober *et al.*, 2010). As such, although individuals may nest within foraging range, the inshore areas of the Kyle Rhea Strait do not represent preferred foraging habitat.

Manx shearwater are small seabirds, with an overall length 30-38 cm, a wingspan between 76-82 cm, and a weight of around 400 g (RSPB, 2022c). The UK breeding population is approximately 300,000 pairs (RSPB, 2022c), however, recent studies suggest this population could be significantly higher, with estimates suggesting almost 500,000 breeding pairs in Wales (Pritchard *et al.*, 2021). Kober *et al.* (2010) identified 3 main areas of Manx shearwater distribution at sea, one of which is the Isle of Rum, located approximately 42 km (in a direct line) to the southwest of the Kyle Rhea Strait. Manx shearwater have an extensive foraging range, of over 2,000 km (Woodward *et al.*, 2019), however, individuals raft (sit on the surface of the water) in the evenings, much closer to the shoreline (McSorley *et al.*, 2008). Individuals from a range of breeding colonies have been found to feed within the Irish Sea (Guilford *et al.*, 2008; JNCC, 2016).

Other petrels and shearwaters are unlikely to have a significant presence in the region.

7.2.1.3. Gannets (Sulidae)

Northern Gannet

Northern gannet *Morus bassanus* are large seabirds, with an overall length of 87-100 cm, a wingspan of 165-180 cm, and a weight of 2,400-3,600 g (RSPB, 2022d). The UK breeding population is around 220,000-300,000 pairs (RSPB, 2022d; JNCC, 2022). Kober et al. (2010) identified that northern gannet distribution at sea is generally widespread, with higher density surrounding St Kilda, Shetland, and southwest Ireland colonies outside of the breeding season, and concentrations around St Kilda, Alisa Craig, Grassholm, Bass Rock, and the southwest of Ireland during the breeding season. The foraging range for northern gannets is also variable, dependent on their individual colony, with a maximum foraging range recorded for Bass Rock individuals at 540 km (Hamer *et al*., 2000). However, the mean foraging range is around 232 km from the colony at Bass Rock (Hamer *et al.*, 2007), and 229 km for northern gannets generally (Woodward *et al*., 2019). The areas of high northern gannet density identified by Kober *et al*. (2010), of most relevance to Kyle Rhea, are St Kilda and Bass Rock, at approximate distances from Kyle Rhea of 187 km and 225 km respectively.

There are colonies within the northern gannet foraging range surrounding Kyle Rhea, represented by SPAs (Flannan Islands, St Kilda, and North Rona and Sula Sgeir), (NRP, 2012).

Despite the aggregation of northern gannets around colonies both during and outside the breeding season, there is a likelihood that gannets will be active in the area surrounding Kyle Rhea and the Isle of Skye.

7.2.1.4. Cormorants and Shags (Phalacrocoracidae)

Great Cormorant

Great cormorants *Phalacrocorax carbo* are large seabirds, with an overall length of 80-100 cm, a wingspan of 130-160 cm, and a weight of 2,100-2,500 g (RSPB, 2022e). The UK breeding population is around 9,000 pairs and the wintering population is around 41,000 individuals (RSPB, 2022e). Kober et al. (2010) identified that great cormorant distribution at sea was generally widespread, but restricted to coastal waters and preferred depths <10 m, and that density increases in Liverpool Bay, Firth of Clyde, and Moray Firth during the winter. The maximum foraging range for great cormorant is 35 km (Thaxter *et al*., 2012) and, therefore, outside the range of SPAs near the kyle Rhea strait, as the nearest is Sheep Island at 235 km. Feeding and roosting great cormorants are, however, regularly present within the Kyle Rhea area (NRP, 2012).

European Shag

European shag *Phalacrocorax aristotelis* are large seabirds, with an overall length of 65-80 cm, a wingspan of 90-105 cm, and a weight of 175-225 g (RSPB, 2022f). The UK breeding population is around 27,000 pairs, and the wintering population is around 110,000 individuals (RSPB,2022f). Kober *et al.* (2010) identified that European shag are found at high densities around Orkney, Shetland, the Moray Firth, the Firth of Forth, and the west coast of Scotland, and that European shag preferred more inshore areas than coastal areas. The maximum foraging distance for European shag is 17 km (Thaxter *et al*., 2012) and, therefore, outside the range of SPAs near the kyle Rhea strait, however feeding and roosting European shag regularly occur within the Kyle Rhea area (NRP, 2013).

7.2.1.5. Skuas (Stercorariidae)

Great Skua

Great skua are moderately sized seabirds, with an overall length of 53-58 cm, a wingspan of 125-140 cm, and a weight of 120-200 g (RSPB, 2022g) The UK breeding population is around 9,634 pairs (RSPB, 2022g). Kober *et al*. (2010) identified that great skua are found at highest densities around Orkney and Shetland during the breeding season. The foraging range of great skua is highly variable, and commonly linked to white-fish fishing vessels, and other seabird species' foraging ranges due to their kleptoparasitism feeding strategy (Kober *et al*., 2010). The likelihood of great skua interacting with the Kyle Rhea area is low, with only a single observation made during the NRP survey (NRP, 2012).

Arctic Skua

Arctic skua *Stercorarius parasiticus* are moderately sized seabirds, with an overall length of 41-46 cm, a wingspan of 110-125 cm, and a weight of 330-570 g (RSPB, 2022h). The UK breeding population is around 2,136 pairs (RSPB, 2022h). Kober *et al*. (2010) identified that Arctic skua are widely distributed around the UK's coastline, with no specific areas that support high density colonies. This is likely due to the general solitary nature of the species. The foraging range of Arctic skua is highly variable, and commonly linked to white-fish fishing vessels, and other seabird species' foraging ranges due to their kleptoparasitism feeding strategy (Kober *et al*., 2010). The likelihood of Arctic skua interacting with the Kyle Rhea area is low, with no observations recorded during the NRP survey (NRP, 2012).

7.2.1.6. Gulls (Laridae)

Black-headed Gull

Black-headed gull *Chroicocephalus ridibundus* are moderately sized seabirds, with an overall length of 34-37 cm, a wingspan of 100-110 cm, and a weight of 200-400 g (RSPB, 2022i). The UK breeding population is around 140,000 pairs, with a wintering population of 2.2 million individuals (RSPB, 2022i). Kober *et al*. (2010) identified that black-headed gulls exhibit a smaller distribution at sea, in comparison with other species, and are commonly found at medium densities around the Liverpool Bay and English Channel regions. The likelihood of black-headed gulls interacting with the Kyle Rhea area is low, with only 3 individual observations recorded during the NRP survey (NRP, 2012).

Common (Mew) Gull

Common (Mew) gull *Larus canus* are small seabirds, with an overall length of 40-43 cm, a wingspan of 110-130 cm, and a weight of 300-480 g (RSPB, 2022j). The UK breeding population is around 49,000 pairs, with a wintering population of 710,000 individuals (RSPB, 2022j). Kober *et al*. (2010) identified that common gull exhibit a smaller distribution at sea than other species, and are commonly found at medium densities along the west coast of Scotland, in particular the Inner Hebrides, Rhins of Galloway, the English Channel, and the Outer Thames. Common gull observations were recorded in small numbers, with seasonal patterns of abundance, during the NRP survey, and are likely to interact with the Kyle Rhea area.

Mediterranean Gull

Mediterranean gull *Larus melanocephalus* are small seabirds, with an overall length of 36-38 cm, a wingspan of 92-100 cm, and a weight of 230-280 g (RSPB, 2022k). The UK breeding population is around 600-630 pairs, with a wintering population of 1,800 individuals (RSPB, 2022k).
Kober *et al*. (2010) identified that Mediterranean gull are not distributed along the west coast of Scotland, and that the species is primarily distributed in high densities within the English Channel, particularly around the Isle of Wight. The likelihood of Mediterranean gull being present in the Kyle Rhea area is very low due to the limited distribution of this species along the west coast of Scotland.

European Herring Gull

Herring gull *Larus argentatus* are large seabirds, with a length of 54-60 cm, a wingspan of 130-150 cm, and a weight of 640-1,440 g (RSPB, 2022l). The UK breeding population is around 140,000 pairs, with a wintering population of 740,000 individuals (RSPB, 2022l). Kober *et al*. (2010) identified that European herring gull are widely distributed around the UK coastlines, with areas of high density between the Rhins of Galloway and the Isle of Arran on the west coast of Scotland, and areas of medium density around the Inner Hebrides and the south coast of Wales. European herring gull are highly tolerant of human activity, and are likely to occur within the Kyle Rhea area, based on the numerous observations (47 in total) recorded during the NRP survey (NRP, 2012).

Great Black-backed Gull

Great black-backed gull *Larus marinus* are large seabirds, with a length of 64-78 cm, a wingspan of 150-165 cm, and a weight of 1,000-2,000 g (RSPB, 2022m). The UK breeding population is 17,000 pairs, with a wintering population of 76,000 individuals (RSPB, 2022m). The Kyle Rhea area is in close proximity to the Isle of Skye and Lochalsh, which supports 151 known breeding pairs (Mitchell *et al*., 2004), and the NRP survey recorded up to 60 individuals on a regular basis (NRP, 2012).

Lesser Black-backed Gull

Lesser black-backed gull *Larus fuscus* are large seabirds, with a length of 52-64 cm, a wingspan of 135-150 cm, and a weight of 620-1,000 g (RSPB, 2022n). The UK breeding population is 110,000 pairs, with a wintering population of 130,000 individuals (RSPB, 2022n). Lesser black-backed gull resemble small European herring gull in appearance, but not in abundance, with concern over future population decline (RSPB,2022n) despite an overall rise in population during the 20th century (Kober *et al*., 2010). Kober *et al*. (2010) identified that lesser black-backed gull have an uneven distribution in the Irish and Celtic Seas, and the Southwest Approaches, with the highest densities located in the Celtic Sea off the coast of Cornwall and Pembrokeshire. The likelihood of lesser black-backed gull interacting with the Kyle Rhea region is limited, supported by only 2 observations of adult lesser black-backed gull during the NRP survey (NRP, 2012).

Black-legged Kittiwake

Black-legged kittiwake *Rissa tridactyla* are moderately sized seabirds, with a length of 38-40 cm, a wingspan of 95-110 cm, and a weight of 300-500 g (RSPB, 2022o). The UK breeding population is 380,000 pairs (RSPB, 2022o). Kober *et al*. (2010) identified that the maximum foraging range of black-legged kittiwake is 83 km, and their distribution at sea is concentrated around the coastlines of Scotland, Orkney, and northeast England, with medium individual density modelled around the west coast of Scotland, and within the Kyle Rhea area. There is seasonal variation in predicted densities of black-legged kittiwake, with greater densities close to shore in July compared with January (Kober *et al*., 2010; Waggitt *et al*., 2019). Black-legged kittiwake observations were recorded during the NRP survey, with small groups (1-4 individuals) the most commonly occurring observation, and one observation of a flock of 32 individuals (NRP, 2012).

7.2.1.7. Terns (Sternidae)

Little Tern

Little tern *Sternula albifrons* are small seabirds, with a length of 22-24 cm, a wingspan of 48-55 cm, and a weight of 49-63 g (RSPB, 2022p). The UK breeding population is 1,900 pairs (RSPB, 2022p). The UK distribution of little tern is sporadic, with most individuals documented in east Anglia, outer Thames, and English Channel regions; and limited recorded individuals in the Outer Hebrides and the Isles of Coll and Tiree (Mitchell *et al*., 2004). No little terns were recorded during the NRP survey (NRP, 2012), therefore there is very limited likelihood of little tern interacting with the Kyle Rhea area.

Common Tern

Common tern *Sterna hirundo* are small seabirds, with a length of 31-35 cm, a wingspan of 77-98 cm, and a weight of 90-150 g (RSPB, 2022q). The UK breeding population is 12,000 pairs (RSPB, 2022q). Kober *et al*. (2010) identified that the UK distribution of common tern is sporadic, with the highest density of individuals modelled in the outer Thames and English Channel regions. There is some evidence for common terns being present in the Kyle Rhea area, but only in transit between foraging grounds and breeding colonies, and in low numbers (NRP, 2012).

Arctic Tern

Arctic tern S*terna paradisaea* are small seabirds, with a length of 33-35 cm, a wingspan of 75-85 cm, and a weight of 95-120 g (RSPB, 2022r). The UK breeding population is 53,000 pairs, with a wintering population of 500,000-900,000 individuals (RSPB, 2022r). Kober *et al*. (2010) identified that the UK distribution of Arctic tern is patchy, but wider than common tern, with the highest density of individuals modelled around Orkney, Shetland, and discrete locations along the east coast of England. The likelihood of Arctic tern being present in the Kyle Rhea area is limited, with no observations recorded during the NRP survey (NRP, 2012).

Roseate Tern

Roseate tern *Sterna dougallii* are small seabirds, with a length of 33-38 cm, a wingspan of 72-80 cm, and a weight of 95-130 g (RSPB, 2022s). The UK breeding population is very limited at only 111 pairs, making the roseate tern one of the UK's rarest seabird species (RSPB, 2022s). As a result of this rarity, the distribution of roseate tern is extremely limited, with the largest colonies situated on the east coast of Ireland (Mitchell *et al*., 2004), Coquet Island, Cemlyn Bay, and the Firth of Forth (The Wildlife Trusts, 2022).

Sandwich Tern

Sandwich tern *Thalasseus sandvicensis* are small seabirds with a length of 36-41 cm, a wingspan of 95-105 cm, and a weight of 210-260 g (RSPB, 2022t). The UK breeding population is 11,000 pairs (RSPB, 2022t). Kober *et al*. (2010) identified numerous discrete areas of high Sandwich tern density, in which the majority of individuals appear to show site fidelity to their colonies.

These areas were most frequent along the east coast of Scotland and England, the Dover Straight, the English Channel (between Plymouth and Portsmouth), Anglesey, Liverpool Bay, and the Rhins of Galloway (Kober *et al*., 2010). The likelihood that Sandwich terns are present within the Kyle Rhea area is limited, based on the Seabird Census 2000 (Mitchell *et al*., 2004) or the NRP survey (NRP, 2012).

7.2.1.8. Auks (Alcidae)

Black Guillemot

Black guillemot *Cepphus grylle* are moderately sized seabirds with a length of 30-32 cm, a wingspan of 52-58 cm, and a weight of 300-460 g (RSPB, 2022u). The UK breeding population is 19,000 pairs, with a wintering population of 58,000-80,000 individuals (RSPB, 2022u). Mitchell *et al*. (2004) identified a relatively even distribution of black guillemot along the northern and western coast of Scotland, the Outer Hebrides, and most coastlines of Northern Ireland and the Republic of Ireland. The greatest concentrations of black guillemot were around Orkney, Shetland, the Outer Hebrides, and the Isle of Rum (Mitchell *et al*., 2004). Few black guillemot observations were recorded in the NRP survey (NRP, 2012), however the proximity of the Rum colony indicates a likely presence of black guillemot in the Kyle Rhea area.

Common Guillemot

Common guillemot *Uria aalge* are a moderate size seabird with a length of 38-45 cm, a wingspan of 64-73 cm, and a weight of 850-1,130g (RSPB, 2022v). The UK breeding population is 950,000 pairs (RSPB, 2022v). Kober *et al*. (2010) identified a wide distribution of common guillemot that exhibited seasonal fluctuation; however, the highest densities of individuals were consistent year-round at the Firth of Forth, Moray Firth, and Orkney (Kober *et al.*, 2010; Waggitt *et al.*, 2019). During the winter, the distribution of common guillemot increases into the North Sea, where the species exploits foraging grounds such as Dogger Bank (Royal HaskoningDHV, 2014). Common guillemot observations were infrequent in the NRP survey.

Atlantic Razorbill

Atlantic razorbill *Alca torda* are a moderately sized seabird, with a length of 37-39 cm, a wingspan of 63-67 cm, and a weight of 590-730 g (RSPB, 2022w). The UK breeding population is 130,000 pairs (RSPB, 2022w). Kober *et al.* (2010) determined that Atlantic razorbill have a similar distribution of high-density areas as common guillemot, however the general Atlantic razorbill distribution at sea is slightly more restricted. Waggitt *et al.* (2019) identified a greater seasonal difference in distribution of Atlantic razorbill than Kober *et al.* (2010), with populations retreating to core colonies along north and western coasts of Scotland and the Outer Hebrides. Few razorbill were recorded during the NRP survey, of which the majority of observations occurred during the summer (NRP, 2012).

Atlantic Puffin

Atlantic puffin *Fratercula arctica* are small seabirds with a length of 26-29 cm, a wingspan of 47-63 cm, and a weight of 320-480 g (RSPB, 2022x). The UK breeding population is 580,000 pairs (RSPB, 2022x). Kober *et al.* (2010) determined that Atlantic puffin have a relatively wide distribution in the northeast of England, east and northwest coasts of Scotland, and the Isles of Scilly.

The density of individuals is concentrated in the waters off Moray Firth, and the Inner and Outer Hebrides (Kober *et al.*, 2010; Waggitt *et al.*, 2019). Despite the high density of Atlantic puffin in the wider area, the NRP survey did not record any observations (NRP, 2012).

7.2.1.9. Coastal and Terrestrial Birds

Wildfowl

Red-breasted merganser *Mergus serrator*, goosander *Mergus merganser*, Eurasian wigeon *Anas penelope*, and mallard *Anas platyrhynchos* are moderate to large sized ducks with a general length of 45-66 cm, a general wingspan of 70-98 cm, and a general weight of 500-2,800 g; dependent on the species (RSPB 2022y-ab). The UK breeding population for ducks varies, dependent on the species, and is around: 2,800-3,800 breeding pairs and 9,000-12,000 wintering individuals for red-breasted merganser and goosander (RSPB, 2022y-z); 400 breeding pairs and 440,000 wintering individuals for Eurasian wigeon (RSPB, 2022aa); and 61,000-146,000 breeding pairs and 710,000 wintering individuals for mallard (RSPB, 2022ab). Red-breasted merganser are widely distributed around northwestern Scottish coastlines, and 3 individuals were occasionally recorded during the NRP survey (NRP, 2012). Goosander are not widely distributed around northwestern Scottish coastlines, however the population is growing and 3 individuals were recorded infrequently during the NRP survey (NRP, 2012). Eurasian wigeon are widely distributed around northwestern Scottish coastlines, and a flock of 10 individuals was regularly seen over winter during the NRP survey (NRP, 2012). Mallard are widely distributed around western Scotland, and 4 individuals were occasionally recorded along shorelines during the NRP survey (NRP, 2012).

Common eider *Somateria mollissima* are a moderately sized, but heavy, 'true' seaduck, with high fidelity to coastlines (RSPB, 2022ac). Common eider have a length of 50-71 cm, a wingspan of 80-108 cm, and a weight of 1,200-2,800 g (RSPB, 2022ac). The UK breeding population is 26,000 pairs, with a wintering population of 60,000 individuals (RSPB, 2022ac). Common eider were infrequently recoded in the NRP survey, with a small number of individuals (1-4) observed transiting through the study area in spring and autumn (NRP, 2012).

Waders

Oystercatcher *Haematopus ostralegus* are relatively large wading birds, with a length of 40-45 cm, a wingspan of 80-86 cm, and a weight of 430-650 g (RSPB, 2022ad). The UK breeding population is 110,000 pairs, with a wintering population of 340,000 individuals (RSPB, 2022ad). Oystercatcher are a commonly occurring species in west Scotland, and 6-13 individuals were commonly seen during the summer sampling period of the NRP survey (NRP, 2012).

Curlew *Numenius arquata*, whimbrel *Numenius phaeopus*, turnstone *Arenaria interpres*, and common sandpiper *Actitis hypoleucos*, are all members of the 'sandpipers, snipes, and phalaropes' family. Curlews are the largest European wading bird, with a length of 50-60 cm, a wingspan of 80-100 cm, and a weight of 575-1,000 g (RSPB, 2022ae). The UK curlew breeding population is 66,000 pairs, with a wintering population of 140,000 individuals (RSPB, 2022ae). Whimbrel are similar looking, but smaller, and much rarer, compared with curlew, with a length of 40-46 cm, a wingspan of 71-81 cm, and a weight of 270-450 g (RSPB, 2022af). The UK whimbrel breeding population is 400-500 pairs, with a wintering population of just 30 individuals.

Turnstone are much smaller and lack the curved beak of the previous species, looking more similar to common sandpipers. Turnstone have a length of 21-24 cm, a wingspan of 50-57 cm, and a weight of 85-150 g (RSPB, 2022ag). The UK wintering population is 48,000 individuals (RSPB, 2022ag). Common sandpiper, the smallest of the aforementioned species in the 'sandpipers, snipes and phalaropes' family, has a length of 19-21 cm, a wingspan of 32-35 cm, and a weight of 40-60 g (RSPB, 2022ah). The UK breeding population is 15,000 pairs, with a wintering population of just 73 individuals.

Ringed plover *Charadrius hiaticula* are the smallest species of wading birds in this list, with a length of 18-20 cm, a wingspan of 48-57 cm, and a weight of 55-75 g (RSPB, 2022ai). The UK breeding population is 5,400 pairs, with a wintering population of 34,000 individuals (RSPB, 2022ai).

Wading birds, in general, were not regularly observed during the NRP survey (NRP, 2012). Oystercatcher, curlew, and common sandpiper are common throughout western Scotland and observations of small groups within the study area were recorded occasionally; whereas whimbrel, turnstone and ringed plover are less common, and observations of 1-2 individuals, per species, were recorded once each during the NRP survey (NRP, 2012).

Grey Heron

Grey heron *Ardea cinerea* are large predatory birds, with a length of 90-98 cm, a wingspan of 175-195 cm, and a weight of 1,500-2,000 g (RSPB, 2022aj). The UK breeding population is determined by the number of nests as opposed to the number of pairs, which for grey heron is 13,000 nests, with a wintering population of 63,000 individuals (RSPB, 2022aj). The distribution of Scottish grey heron is widespread but low in density (Forrester and Andrews, 2007), with Scandinavian grey heron migrating to Scotland supplementing the population over winter. A heronry was identified during the NRP survey in the Kyle Rhea survey area, and observations of up to 8 individuals were recorded throughout the survey period (NRP, 2012). Due to the presence of the heronry, grey herons were identified as likely to be disturbed by installation operations (Royal HaskoningDHV, 2013).

Eagles

White-tailed eagle *Haliaeetus albicilla* are the largest bird of prey in the UK, with a length of 70-90 cm, a wingspan of 200-240 cm, and a weight of 3,500-5,000 g (RSPB, 2022ak). The UK breeding population is limited, and around 150 pairs, as of 2020 (RSPB, 2022ak). White-tailed eagles are listed on Annex 1 of the Birds Directive, and on Schedule 1 of the Wildlife and Countryside Act, [Redacted]

Golden eagle *Aquila chrysaetos* are the second largest bird of prey in the UK, with a length of 75-88 cm, a wingspan of 204-220 cm, and a weight of 2,800-4,500 g (RSPB, 2022al). The UK breeding population is slightly larger than white-tailed eagles, at 440 pairs (RSPB, 2022al). Golden eagles are also listed on Annex 1 of the Birds Directive, and on Schedule 1 of the Wildlife and Countryside Act, however no breeding pairs have been identified in the Kyle Rhea area.

1 individual was observed, hunting on a neighbouring hill, on 3 occasions, but was not seen interacting with the Kyle Rhea strait (NRP, 2012).

7.2.2. Potential Project Impacts

The project intends on conducting the OHL replacement via existing infrastructure, as set out in Section 3. No new infrastructure will be installed on the seabed, and no noise impacts associated with marine pile driving or installation will occur. No construction activity will occur in the vicinity of the closest seal haul out, the Pabay and Ardnish Peninsula, which lies approximately 10 km west of the project site, therefore there is no effect pathway for impacts at haul out sites.

However, given the use of guard vessels in the water during replacement there exists some potential for impact to birds from disturbance due to the presence of vessels.

Table 7-3 summarises the realistic worst case potential effects of vessels on birds.

Table 7-3: Project parameters relevant to effects on birds

Effect	Realistic Worst Case Scenario	Justification
Disturbance from vessels	Two guard vessels are likely to be present during this period. It is anticipated that the replacement would take a total of 20 days.	The maximum numbers of vessels, and associated vessel movements, represents the maximum potential for disturbance and collision risk.
Collision risk with vessels		

7.2.3. Risk (Impact) Assessment

Due to the nature of the operation being carried out, the impacts associated with the project are limited to direct impacts of vessel activity. There is no likelihood of impact pathways comparable to those identified within the installation and operation phases of the Kyle Rhea tidal device (Royal HaskoningDHV, 2013) such as habitat loss, permanent displacement, and reduced prey availability, that is applicable to the repair of an overhead cable. The main impact pathway for birds arises from vessel disturbance and collision risk, as most bird species exhibit avoidance behaviour in response to large moving objects, whilst some seabird species such as gulls and petrels are known to be attracted to large sea-going vessels in the pursuit of discarded fish.

7.2.3.1. Vessel Disturbance and Collision Risk

Vessel disturbance by ship traffic was assessed by Furness *et al*. (2013), who identified that species of diver were the most sensitive group to disturbance, followed by auks and terns. As expected, gulls and petrels were the least sensitive groups to disturbance. Continuous disturbance can become problematic for species with specific foraging habitat requirements, which temporarily reduces access to potential foraging grounds in close proximity to vessels. Disturbance has been shown to cause birds that are holding fresh prey to swallow their catch, which in turn may impact the feeding regime of both adults and chicks during the breeding season, (Speckman *et al*., 2004).

Vessel collisions are an impact pathway normally associated with marine mammals; however, birds that are attracted to vessels, such as gulls and petrels, have an increased risk of colliding with any part of the vessel. There is little research on the causes of collisions during daylight hours, with some research conducted on light-induced bird strikes at night (Merkel and Johansen, 2011).

It should also be noted that a significant amount of marine traffic typically uses the Kyle Rhea Strait, and birds will be habituated to this. Any additional shipping movements associated with the operations will be small when compared with the overall baseline of other vessels in the area. In addition, birds are relatively small and highly mobile, and given observed avoidance behaviour in many species, are expected to be able to detect vessels in close proximity and largely avoid collision.

Impact Assessment

Birds have a high value as many species are red-listed as Birds of Conservation Concern, and some species are listed under Annex 1 of the Wildlife and Countryside Act. Species differ in their sensitivity to disturbance as identified in Furness et al. (2013). Royal HaskoningDHV (2013) determined (based on the NRP (2012) survey) that the sensitivity to disturbance of all birds, including sensitive groups such as divers, was low at the operational phase, therefore the sensitivity of birds to disturbance during this maintenance phase is **Low**.

Birds will only be affected whilst they are within the area of effect of vessel operations, which will have a short duration (maximum 20 days). Birds are highly mobile and have a wide foraging range available both during and between vessel operations. The area of effect is negligible in the context of the total habitat available to birds in the region, as many species transit through the area from external colonies and feeding grounds. The overall level of exposure is considered **Negligible**.

Collision risk is considered unlikely during daylight hours and in good weather, in which all operations will take place. While there will be some additional vessel movements associated with the operations, a significant amount of marine traffic typically uses the Kyle Rhea Strait, including a regular ferry service, and any additional shipping movements and the disturbance and collision risk associated with the operations will be small when compared with the overall baseline. The magnitude of impacts it therefore considered **Negligible**.

Low sensitivity, combined with negligible exposure and negligible magnitude, mean that risk to birds from vessel disturbance and collision risk associated with the Kyle Rhea Project is **Negligible, Not Significant.**

Key Mitigation Measures

Impacts are not significant, therefore mitigation measures are not necessary to reduce significance further. Despite this, embedded standard best-practice operating procedures for vessels will ensure that vessel movements are predictable and travelling speeds will be minimised as far as possible.

7.3. Nature Conservation and HRA

There are a total of 34 designated nature conservation sites within 100 km of the proposed works. Several designated Special Protected Areas (SPAs) are situated within proximity of the proposed works in the Kyle Rhea strait. The closest site is Cuillins SPA, located approximately 13.9 km from the strait, on the Isle of Skye. This site is designated for the protection of the golden eagle *Aquila chrysaetos*. Last updated in 2002, this site supports 8 breeding pairs of golden eagle, comprising approximately 1.9% of the population in Great Britain.

Rum SPA is located approximately 37.6 km from the Kyle Rhea strait, featuring rocky coasts and cliffs alongside the adjacent coastal waters which act as a nursery area for multiple fish species. The abundant food source and habitat mean Rum SPA is designated for supporting multiple bird species and approximately 130,000 seabirds each year. These species include Annex 1 red-throated diver *Gavia stellata* (13-18 pairs representing 1% of the Great Britain population); golden eagle *Aquila chrysaetos* (4 pairs representing 1% of the Great Britain population); Manx shearwater *Puffinus puffinus* (61,000 pairs representing 23% of the world population); black-legged kittiwake *Rissa tridactyla* (1,500 pairs representing 0.3% of the Great Britain population); and common guillemot *Uria aalge* (4,000 individuals representing 0.4% of the Great Britain population).

Shiant Isles SPA is located approximately 78.3 km from Kyle Rhea, situated in the Minch. Despite this greater distance, due to large foraging ranges, certain species have the potential to overlap with the area of proposed works (see Section 7.2). This SPA is designated for a large number of species. These include Annex 1 Greenland barnacle goose *Branta leucopsis* (490 individuals representing 2% of the Great Britain population); European shag *Phalacrocorax aristotelis* (1,780 pairs representing 1.5% of the western European population); razorbill *Alca torda* (10,950 individuals representing 5.9% of the UK population); Atlantic puffin *Fratercula arctica* (77,000 pairs representing 13.3% of the UK population); northern fulmar *Fulmaris glacialis* (6,820 pairs representing 1% of the Great Britain population); common guillemot (18,380 individuals representing 2% of the Great Britain population); and black-legged kittiwake (1,800 pairs representing 0.4% of the Great Britain population).

In addition to the designated SPAs, areas in the locality of Kyle Rhea act as nesting areas for seabirds. Information on these nesting areas is sourced from the Seabirds 2000 census, collected between 1999 and 2003. In the local area (within 10 km) black guillemot *Cepphus grylle* have multiple known nesting sites including Eilean Dubh with 20 recorded individuals, Kyleakin channel with 19 recorded individuals, and Sandaig Isles with 7 recorded individuals. Additional species with nesting sites in the locality include herring gull *Larus argentatus* with 2 individuals recorded in the Kyle of Loch Alsh, and common gull *Larus canus* with 12 individuals recorded in Loch Alsh.

Further to these local sites, there are areas within foraging distance that act as nesting areas for multiple species. The Sound of Pabbay, located approximately 12.5 km away from the proposed works, has reportedly supported nesting sites of northern fulmar (892 individuals), European shag (42 individuals), common gull (5 individuals), lesser black-backed gull *Larus fuscus* (5 individuals), herring gull (6 individuals), great black-backed gull *L. marinus* (4 individuals), Arctic tern *Sterna paradisaea* (1 individual), and razorbill (24 individuals).

Longay is also an important nesting site. Located approximately 15.8 km from the area of proposed works, nesting species include black guillemot (36 individuals), northern fulmar (26 individuals), great cormorant *Phalacrocorax carbo* (46 individuals), and European shag (65 individuals). Due to the proximity of these areas to Kyle Rhea, the nesting species have the potential to overlap with the area of proposed works.

The more recent FAME and STAR seabird tracking project from the RSPB (2010-2014) undertook seabird tracking of black-legged kittiwake, European shag, black guillemot, and razorbill colonies across the UK coast. The distributions identified by this project for the assessed species broadly align with the nesting sites identified by the Seabird 2000 census in Scotland, and are all in close proximity to the Kyle Rhea Strait.

Table 7-4 outlines the qualifying features in all designated and notified sites within 100 km of the Kyle Rhea Strait. Due to the nature of the proposed works, impacts will be limited to the marine mammal and ornithology receptor groups, as per the screening in Section **Error! Reference source not found.**. The scoping of receptor groups is outlined in Appendix B.

Table 7-4: Designated and notified sites within 100 km of the Kyle Rhea Strait

Type	Site Name	PA Code	Distance (km)	Qualifying Features
MPA	Lochs Duich, Long and Alsh	10416	1.3	Burrowed mud; Flame shell beds.
MPA	Loch Carron	10543	6.8	Flame Shell Bed; Maerl Beds.
MPA	Red Rocks and Longay (Urgent ncMPA)	10584	14.8	Flapper Skate *Dipturus intermedius*.
MPA	Small Isles	10422	33	Black guillemot *Cepphus grylle*; Northern feather star aggregations on mixed substrata; White cluster anemones *Parazoanthus anguicomus*; Northern sea fan and sponge communities; Burrowed mud; Circalittoral sand and mud communities; Fan mussel aggregations; Horse mussel beds; Quaternary of Scotland – glaciated channels/troughs, glacial lineations, meltwater channels, moraines and streamlined bedforms.
MPA	Sea of the Hebrides	10474	33	Basking Shark *Cetorhinus maximus*; Minke Whale *Balaenoptera acutorostrata*; Marine geomorphology of the Scottish shelf seabed - Inner Hebrides Carbonate Production Area.

Type	Site Name	PA Code	Distance (km)	Qualifying Features
MPA	Loch Sunart	10417	66	Northern feather star aggregations on mixed substrata; Flame shell beds; Serpulid aggregations.
MPA	Loch Sunart to the Sound of Jura	10418	68	Flapper Skate *Dipturus intermedius*; Quaternary of Scotland – glaciated channels/troughs.
MPA	Wester Ross	10421	69	Burrowed mud; Circalittoral muddy sand communities; Flame shell beds; Kelp and seaweed communities on sublittoral sediment; Maerl beds; Maerl or coarse shell gravel with burrowing sea cucumbers; Northern feather star aggregations on mixed substrata; Marine Geomorphology of the Scottish Shelf Seabed – banks of unknown substrate; Quaternary of Scotland – glaciated channels/troughs, megascale glacial lineations, moraines; Seabed Fluid and Gas Seep - pockmarks; Submarine Mass Movement – slide scars.
MPA	Shiant East Bank	10475	76	Circalittoral sands and mixed sediment communities; Northern sea fan and sponge communities; Shelf banks and mounds; Geodiversity Quaternary of Scotland (drumlinoid forms, glacial lineations, iceberg ploughmarks, streamlined bedrock).

Type	Site Name	PA Code	Distance (km)	Qualifying Features
MPA	Loch Creran	10415	80	Flame shell beds; Quaternary of Scotland.
SAC	Lochs Duich, Long and Alsh Reefs	UK0017077	0	Reefs.
SAC	Kinloch and Kyleakin Hills	UK0030176	0	Eurasian otter *Lutra lutra*.
SAC	Inner Hebrides and the Minches	UK0030393	0	Harbour Porpoise *Phocoena phocoena*.
SAC	Glen Beasdale	UK0030154	39	Eurasian otter *Lutra lutra*; Freshwater pearl mussel *Margaritifera margaritifera*.
SAC	Rum	UK0012594	43	Eurasian otter *Lutra lutra*.
SAC	Sound of Arisaig (Loch Ailort to Loch Ceann Traigh)	UK0019802	50	Sandbanks which are slightly covered by sea water all the time.
SAC	Loch Moidart and Loch Shiel Woods	UK0030209	50	Eurasian otter *Lutra lutra*.
SAC	Ascrib, Isay and Dunvegan	UK0030230	64	Harbour seal *Phoca vitulina*.
SAC	Sunart	UK0019803	66	Eurasian otter *Lutra lutra*; Reefs.
SAC	Loch Creran	UK0030190	80	Reefs.
SAC	Eileanan agus Sgeiran Lios mor	UK0030182	83	Harbour seal *Phoca vitulina*.
SAC	Mull Oakwoods	UK0030219	90	Eurasian otter *Lutra lutra*.

Type	Site Name	PA Code	Distance (km)	Qualifying Features
SAC	Treshnish Isles	UK0030289	91	Grey seal *Halichoerus grypus*; Reefs.
SAC	Inverpolly	UK0030171	94	Eurasian otter *Lutra lutra*.
SAC	Loch nam Madadh	UK0017070	95	Eurasian otter *Lutra lutra*; Coastal lagoons; Large shallow inlets and bays.
cSAC/SCI	Sound of Barra	UK0012705	96	Harbour seal *Phoca vitulina*; Sandbanks which are slightly covered by sea water all the time; Reefs.
SAC	Obain Loch Euphoirt	UK0017101	97	Coastal lagoons.
SAC	South Uist Machair	UK0012713	100	Slender naiad *Najas flexilis*; Eurasian otter *Lutra lutra*; Coastal lagoons
SPA	Rum	UK9001341	37	Golden eagle *Aquila chrysaetos*; Red-throated diver *Gavia stellata*; Manx shearwater *Puffinus puffinus*; Black-legged kittiwake *Rissa tridactyla*; Common guillemot *Uria aalge*.

Type	Site Name	PA Code	Distance (km)	Qualifying Features
SPA	Canna and Sanday	UK9001431	51	Atlantic puffin *Fratercula arctica*; European herring gull *Larus argentatus*; European shag *Phalacrocorax aristotelis*; Black-legged kittiwake *Rissa tridactyla*; Common guillemot *Uria aalge*.
SPA	Coll and Tiree	UK9020310	71	Great northern diver *Gavia immer*; Common eider *Somateria mollissima*.
SPA	Shiant Isles	UK9001041	78	Razorbill *Alca torda*; Barnacle goose *Branta leucopsis*; Atlantic puffin *Fratercula arctica*; Northern fulmar *Fulmarus glacialis*; European shag *Phalacrocorax aristotelis*; Black-legged kittiwake *Rissa tridactyla*; Common guillemot *Uria aalge*.
SPA	West Coast of the Outer Hebrides	UK9020319	95	Great northern diver *Gavia immer*; Red-throated diver *Gavia stellata*; Black-throated diver *Gavia arctica*; Slavonian grebe *Podiceps auritus*; Common eider *Somateria mollissima*; Long-tailed duck *Clangula hyemalis*; Red-breasted merganser *Mergus serrator*.

Type	Site Name	PA Code	Distance (km)	Qualifying Features
SPA	South Uist Machair and Lochs	UK9001082	99	Corncrake *Crex crex*; Dunlin *Calidris alpina schinzii*; Little tern *Sternula albifrons*; Oystercatcher *Haematopus ostralegus*; Redshank *Tringa totanus*; Ringed plover *Charadrius hiaticula*; Sanderling *Calidris alba*.

7.3.1. HRA screening for Likely Significant Effect

This section assesses the impacts identified in Sections **Error! Reference source not found.** and **Error! Reference source not found.** for each designated site (outlined in Table 7-4) in which an impact pathway is likely. The baseline sections for the marine mammals and ornithology receptor groups (Sections 7.1.1 and 7.2.1) identified that the impact pathways likely to occur due to the proposed works will be of a limited exposure and magnitude. Therefore, designated sites in which qualifying features are unlikely to overlap with the Kyle Rhea Strait have been screened out. Seals that are known to interact with the Kyle Rhea Strait have been screened in, on the basis that seals have haul out points along the Kyle Rhea coastline and transit through the Kyle Rhea Strait on a regular (daily) basis. The overhead cable crossing point is identified as an area of high density of harbour seals (Thompson, 2014), however the nearest harbour seal SAC is >60 km from the Kyle Rhea Strait.

Table 7-5 identifies the designated sites relevant to the Kyle Rhea Strait, that have been screened in. Each relevant designated site will subsequently be assessed for any likely significant effects separately within the following tables (Table 7-6 to Table 7-11).

Table 7-5: Designated sites that have been screened in due to overlap between the ranges of qualifying feature(s)/sub-feature(s) and the Kyle Rhea Strait

Designation	Site Name	Proximity to the Kyle Rhea Strait (km)	Qualifying Feature(s) or Sub-feature(s)
Grade D site (JNCC, 2022)	Kyle Rhea	0	Harbour seal *Phoca vitulina;* Grey seal *Halichoerus grypus*.
SAC	Kinloch and Kyleakin Hills	0	Eurasian otter *Lutra lutra*.
SAC	Inner Hebrides and the Minches	0	Harbour Porpoise *Phocoena phocoena*.
SPA	Rum	37	Golden eagle *Aquila chrysaetos*; Manx shearwater *Puffinus puffinus*; Black-legged kittiwake *Rissa tridactyla*; Common guillemot *Uria aalge*.
SPA	Canna and Sanday	51	Atlantic puffin *Fratercula arctica*; Black-legged kittiwake *Rissa tridactyla*; Common guillemot *Uria aalge*.
SPA	Shaint Isles	78	Razorbill *Alca torda*; Atlantic puffin *Fratercula arctica*; Northern fulmar *Fulmarus glacialis*; Black-legged kittiwake *Rissa tridactyla*; Common guillemot *Uria aalge*.

Table 7-6: Screening for likely significant effect on The Kyle Rhea seal populations

Pressure(s)	Qualifying Feature(s) or Sub-feature(s)	Conclusion	Justification
Disturbance from presence and noise from vessels; Collision risk increase due to vessel presence; Barrier effects, which could prohibit transit of the Strait by regular users of the channel, due to presence of guard vessels.	Harbour seals *Phoca vitulina;* Grey seal *Halichoerus grypus*.	**No Likely Significant Effect**	**Disturbance from presence and noise of vessels:** Boat traffic frequently passes through the Kyle Rhea Strait, as such the additive effect of the presence and noise generated by the guard vessels would not be significantly above baseline conditions if the Kyle Rhea Strait was not closed to boat traffic during the proposed works. As the Kyle Rhea Strait will be closed to boat traffic during the proposed works, disturbance and noise will be lower than baseline conditions. Therefore, **No Likely Significant Effect** is determined for this pressure. **Collision risk increase due to vessel presence:** Seals are relatively small marine mammals and will be habituated to frequent boat traffic in the Kyle Rhea channel. In addition, vessel collisions are generally not a significant factor in the deaths of small marine mammals, due to their high mobility and acute awareness of the surrounding environment. In addition, the section of the Kyle Rhea Strait in which the overhead cables are located will be closed to boat traffic, as such only the guard vessels will be present. Therefore, **No Likely Significant Effect** is determined for this pressure. **Barrier effects due to the presence of guard vessels:** Guard vessels will be present at all times during the proposed works. However, the barrier effect is restricted to the cross-sectional area of the guard vessels. As seals are capable of diving beneath the water's surface, there will be **No Likely Significant Effect** for this pressure.

Table 7-7: Screening for likely significant effect on The Kinloch and Kyleakin Hills Special Area of Conservation

Pressure(s)	Qualifying Feature(s) or Sub-feature(s)	Conclusion	Justification
Disturbance from presence and noise from vessels; Collision risk increase due to vessel presence; Barrier effects, which could prohibit transit of the Strait by regular users of the channel, due to presence of guard vessels.	Eurasian otter *Lutra lutra*.	**No Likely Significant Effect**	**Disturbance from presence and noise of vessels:** Boat traffic frequently passes through the Kyle Rhea Strait, as such the additive effect of the presence and noise generated by the guard vessels would not be significantly above baseline conditions if the Kyle Rhea Strait was not closed to boat traffic during the proposed works. As the Kyle Rhea Strait will be closed to boat traffic during the proposed works, disturbance and noise will be lower than baseline conditions. Therefore, **No Likely Significant Effect** is determined for this pressure. **Collision risk increase due to vessel presence:** Eurasian otters are small marine mammals and will be habituated to frequent boat traffic in the Kyle Rhea channel. In addition, vessel collisions are generally not a significant factor in the deaths of small marine mammals, due to their high mobility and acute awareness of the surrounding environment. In addition, the section of the Kyle Rhea Strait in which the overhead cables are located will be closed to boat traffic, as such only the guard vessels will be present. Therefore, **No Likely Significant Effect** is determined for this pressure. **Barrier effects due to the presence of guard vessels:** Guard vessels will be present at all times during the proposed works. However, the barrier effect is restricted to the cross-sectional area of the guard vessel. As Eurasian otters are capable of diving beneath the water's surface, there will be **No Likely Significant Effect** for this pressure.

Table 7-8: Screening for likely significant effect on The Inner Hebrides and the Minches Special Area of Conservation

Pressure	Qualifying Feature(s) or Sub-feature(s)	Conclusion	Justification
Disturbance from vessels; Noise from vessels; Collision risk increase due to vessel presence; Barrier effects, which could prohibit transit of the Strait by regular users of the channel, due to presence of guard vessels.	Harbour Porpoise *Phocoena phocoena*.	**No Likely Significant Effect**	**Disturbance from presence and noise of vessels:** Boat traffic frequently passes through the Kyle Rhea Strait, as such the additive effect of the presence and noise generated by the guard vessels would not be significantly above baseline conditions if the Kyle Rhea Strait was not closed to boat traffic during the proposed works. As the Kyle Rhea Strait will be closed to boat traffic during the proposed works, disturbance and noise will be lower than baseline conditions. Therefore, **No Likely Significant Effect** is determined for this pressure. **Collision risk increase due to vessel presence:** Harbour porpoises will be habituated to frequent boat traffic in the Kyle Rhea channel. In addition, vessel collisions are unlikely, due to their high mobility and awareness of the surrounding environment. In addition, the section of the Kyle Rhea Strait in which the overhead cables are located will be closed to boat traffic, as such only the guard vessels will be present. Therefore, **No Likely Significant Effect** is determined for this pressure. **Barrier effects due to the presence of guard vessels:** Guard vessels will be present at all times during the proposed works. However, the barrier effect is restricted to the cross-sectional area of the guard vessels. As Harbour porpoises are unlikely to interact with the vessels and that this area represents a small extent of their natural range, there will be **No Likely Significant Effect** for this pressure.

Table 7-9: Screening for likely significant effect on The Rum Special Protected Area

Pressure	Qualifying Feature(s) or Sub-feature(s)	Conclusion	Justification
Disturbance from vessels; Collision risk increase due to vessel presence.	Golden eagle *Aquila chrysaetos*; Manx shearwater *Puffinus puffinus*; Black-legged kittiwake *Rissa tridactyla*; Common guillemot *Uria aalge*.	**No Likely Significant Effect**	**Disturbance from presence and noise of vessels:** Boat traffic frequently passes through the Kyle Rhea Strait, as such the additive effect of the presence and noise generated by the guard vessels would not be significantly above baseline conditions if the Kyle Rhea Strait was not closed to boat traffic during the proposed works. As the Kyle Rhea Strait will be closed to boat traffic during the proposed works, disturbance within the area of the proposed works will be lower than baseline conditions. There is potential that the boat traffic may be displaced and therefore have an increased density in other areas around the Isle of Skye, however these areas are much wider than the Kyle Rhea Strait (resulting in a marginal increase in boat density in those areas) and will not present significant additional disturbance pressure within the wider Isle of Skye waters. Therefore, **No Likely Significant Effect** is determined for this pressure. **Collision risk increase due to vessel presence:** Most bird species will be habituated to frequent boat traffic in the Kyle Rhea channel. Whilst some species are positively attracted to vessels (such as Gulls), most species will avoid them. Individuals being struck by vessels on the water is highly unlikely due to flushing. Bird strikes are uncommon and primarily occur during the night, whereas the proposed works will be conducted during daylight hours. In addition, the section of the Kyle Rhea Strait in which the overhead cables are located will be closed to boat traffic, as such only the guard vessels will be present. Therefore, **No Likely Significant Effect** is determined for this pressure.

Table 7-10: Screening for likely significant effect on The Canna and Sanday Special Protected Area

Pressure	Qualifying Feature(s) or Sub-feature(s)	Conclusion	Justification
Disturbance from vessels; Collision risk increase due to vessel presence.	Atlantic puffin *Fratercula arctica*; Black-legged kittiwake *Rissa tridactyla*; Common guillemot *Uria aalge*.	**No Likely Significant Effect**	**Disturbance from presence and noise of vessels:** Boat traffic frequently passes through the Kyle Rhea Strait, as such the additive effect of the presence and noise generated by the guard vessels would not be significantly above baseline conditions if the Kyle Rhea Strait was not closed to boat traffic during the proposed works. As the Kyle Rhea Strait will be closed to boat traffic during the proposed works, disturbance within the area of the proposed works will be lower than baseline conditions. There is potential that the boat traffic may be displaced and therefore have an increased density in other areas around the Isle of Skye, however these areas are much wider than the Kyle Rhea Strait (resulting in a marginal increase in boat density in those areas) and will not present significant additional disturbance pressure within the wider Isle of Skye waters. Therefore, **No Likely Significant Effect** is determined for this pressure. **Collision risk increase due to vessel presence:** Most bird species will be habituated to frequent boat traffic in the Kyle Rhea channel. Whilst some species are positively attracted to vessels (such as Gulls), most species will avoid them. Individuals being struck by vessels on the water is highly unlikely due to flushing. Bird strikes are uncommon and primarily occur during the night, whereas the proposed works will be conducted during daylight hours. In addition, the section of the Kyle Rhea Strait in which the overhead cables are located will be closed to boat traffic, as such only the guard vessels will be present. Therefore, **No Likely Significant Effect** is determined for this pressure.

Table 7-11: Screening for likely significant effect on The Shaint Isles Special Protected Area

Pressure	Qualifying Feature(s) or Sub-feature(s)	Conclusion	Justification
Disturbance from vessels; Collision risk increase due to vessel presence.	Razorbill *Alca torda*; Atlantic puffin *Fratercula arctica*; Northern fulmar *Fulmarus glacialis*; Black-legged kittiwake *Rissa tridactyla*; Common guillemot *Uria aalge*.	**No Likely Significant Effect**	**Disturbance from presence and noise of vessels:** Boat traffic frequently passes through the Kyle Rhea Strait, as such the additive effect of the presence and noise generated by the guard vessels would not be significantly above baseline conditions if the Kyle Rhea Strait was not closed to boat traffic during the proposed works. As the Kyle Rhea Strait will be closed to boat traffic during the proposed works, disturbance within the area of the proposed works will be lower than baseline conditions. There is potential that the boat traffic may be displaced and therefore have an increased density in other areas around the Isle of Skye, however these areas are much wider than the Kyle Rhea Strait (resulting in a marginal increase in boat density in those areas) and will not present significant additional disturbance pressure within the wider Isle of Skye waters. Therefore, **No Likely Significant Effect** is determined for this pressure. **Collision risk increase due to vessel presence:** Most bird species will be habituated to frequent boat traffic in the Kyle Rhea channel. Whilst some species are positively attracted to vessels (such as Gulls), most species will avoid them. Individuals being struck by vessels on the water is highly unlikely due to flushing. Bird strikes are uncommon and primarily occur during the night, whereas the proposed works will be conducted during daylight hours. In addition, the section of the Kyle Rhea Strait in which the overhead cables are located will be closed to boat traffic, as such only the guard vessels will be present. Therefore, **No Likely Significant Effect** is determined for this pressure.

7.3.2. Report to Inform Appropriate Assessment

The HRA screening assessment conducted within Section 7.3.1 resulted in **No Likely Significant Effect** for any of the designated sites with qualifying features that overlap with the Kyle Rhea Strait. Therefore, no designated sites are screened in for Appropriate Assessment.

7.3.3. Likely Significant Effect Conclusions

The project intends on replacing the conductor cables utilising the existing infrastructure. As the OHLs will follow the same route as the existing cables, their operation will be the same as prior to replacement. Following the lack of change in operation, any impacts to seabirds will be limited to the use of guard vessels. Vessels will be in the water for approximately 20 days, during which they have the potential to interact with foraging bird species. However, given the habitual use of the Strait by other vessels, including fishing vessels, the project is unlikely to introduce significant vessel presence above that associated with the existing baseline. Any foraging bird species or small marine mammal will likely be habituated to the level of vessel presence associated with the project with **No Likely Significant Effect** anticipated.

7.4. Commercial Fisheries

7.4.1. Baseline

According to the vessel traffic study by NASH Maritime (2021) the most common vessel type transiting to the Kyle Rhea strait in 2019 were fishing industry vessels with a total of 1,493 fishing vessels recorded. However, the overall fishing industry occurring in the strait is considered to be low when compared with the surrounding region.

The Kyle Rhea strait falls within the ICES rectangle 43E4. Based on VMS fishing data on the NMPi interactive map from 2010–2020, the strait appears to be a relatively quiet area of commercial fishing intensity, with some dredging activity in the areas immediately to the north and south. Analysis of MMO data on fisheries value for the area also shows that while the Kyle Rhea strait area does have some value to commercial fisheries for crab and lobster pots, and nephrops trawls, the value is much lower in comparison to other areas within the same ICES rectangle.

Figure 7-4: Value of Marine Fisheries in ICES Rectangle 43E4 (Source: Kafas *et al.*, 2014)

Based on fishing data from the Marine Scotland Sea fisheries statistics site (Marine Scotland, 2020), in 2020, the most commonly fished catch type in ICES Rectangle 43E4 was Nephrops, which dominated the catch tonnage, followed by crab, scallop and sprat. Table 7-12 provides an overview of the catch tonnage and economical value for ICES Rectangle 43E4 in 2020.

Table 7-12: Fishing Type Value and Tonnage in ICES Rectangle 43E4 in 2020

Catch Type	Value	Tonnage
Nephrops (Norway Lobster)	£1,937,364.69	272
Crabs (C.P.Mixed Sexes)	£133,062.62	67
Scallops	£100,303.57	37
Ballan Wrasse	£84,091.4	1
Lobsters	£55,357.72	4
Razor Clam	£32,713.23	4
Velvet Swimmer Crab	£8,493.34	4
Goldsinny – Wrasse	£5642.63	0.06

Catch Type	Value	Tonnage
Other	£13,370.00	8

According to Marine Scotland (2020) the total value of fisheries for ICES Rectangle 43E4 was £4,762,700 and 1,276 tonnes. This is lower than the values for the surrounding ICES Rectangles, which are shown below:

- 43E3 £6,825,447 and 2950 tonnes;
- 44E3 £5,259,715 and 1475 tonnes;
- 44E4 £4,913,680 and 1284 tonnes.

7.4.2. Potential Project Impacts

The project intends on conducting the OHL replacement via existing infrastructure as set out in Section 3. No new infrastructure will be installed on the seabed.

However, given the use of guard vessels in the water during replacement, there exists some potential for impact to commercial fisheries from the following key effects:

- Vessel displacement;
- Loss of sea space and fisheries value.

Table 7-13 summarises the realistic worst case potential effects on commercial fisheries.

Table 7-13: Project parameters relevant to effects on commercial fisheries

Effect	Realistic Worst Case Scenario	Justification
Vessel displacement	Two guard vessels are likely to be present during this period. It is anticipated that the replacement would take a total of 20 days; however, as the methodology is sensitive to weather disruption, a total duration of works of approximately 4 weeks (including weather downtime) is possible.	The maximum numbers of vessels, and associated vessel movements, represents the maximum potential for displacement.
Loss of sea space and fisheries value		

7.4.3. Risk (Impact) Assessment

7.4.3.1. Vessel Displacement

Impact Assessment

The Kyle Rhea strait, that falls within ICES rectangle 43E4, appears to be a relatively quiet area for commercial fishing intensity, with some dredging activity occurring immediately to the north and south. However, some fishing activity does occur in the region, with nephrops being the most common catch type. Therefore, there is potential for spatial conflicts to occur due to temporary exclusion of these fishing vessels. However, due to the relatively low level of use of this area and the availability of other fisheries area both to the north and south the overall level sensitivity is considered **Low**.

Fishing vessels will only be affected by this impact for a short duration (maximum 20 days). In addition, there is availability of alternative fishing areas both to the north and south of the project area. As fishing vessels are mobile and are capable of both avoiding other vessels and changing fishing locations, generally speaking the fishing fleet is tolerant to displacement. Therefore, the overall level of exposure is considered **Low**.

While there will be some level of vessel displacement for the fishing industry the duration will be for a short period and vessels will be able to return to fish in the area following the end of project operations. The magnitude of impacts is therefore considered **Low**.

Low sensitivity, combined with low exposure and low magnitude, mean that risk to fisheries from vessel displacement caused by the Kyle Rhea project is **Low, Not Significant.**

Key Mitigation Measures

Impacts are not significant, therefore mitigation measures are not necessary to reduce significance further.

7.4.3.2. Loss of Sea Space and Fisheries Value

Impact Assessment

Project works at Kyle Rhea strait could result in the reduction in landings for the ICES Rectangle in which it is located in 43E4. Fishing vessels are mobile and capable of changing fishing locations. As such, they are considered to be tolerant of displacement. Vessels are limited in their choice of fishing location through presence of stocks, byelaws, other marine activities etc., and as such, are considered slightly adaptable. Fishing grounds will be open to vessels immediately following cessation of activities which will occur for a maximum of 20 days and as such overall sensitivity of commercial fisheries to loss of earnings through reduction in available sea space is considered **Low**.

Although Rectangle 43E4 has value to regional fisheries, Vessel Monitoring System (VMS) data indicate that the Kyle Rhea strait area is not situated in a part of these areas where fishing effort is high. The proposed works at the Kyle Rhea Strait will be temporary and short term. Therefore, exposure is determined to be **Low**.

Impacts of loss of space and therefore a loss of earnings to commercial and recreational fisheries may increase marginally above baseline conditions; therefore, magnitude of impacts is **Low**.

Low sensitivity, combined with low exposure and low magnitude, mean that risk to fisheries from loss of sea space and fisheries value caused by the Kyle Rhea project is **Low, Not Significant.**

Key Mitigation Measures

Impacts are not significant, therefore mitigation measures are not necessary to reduce significance further.

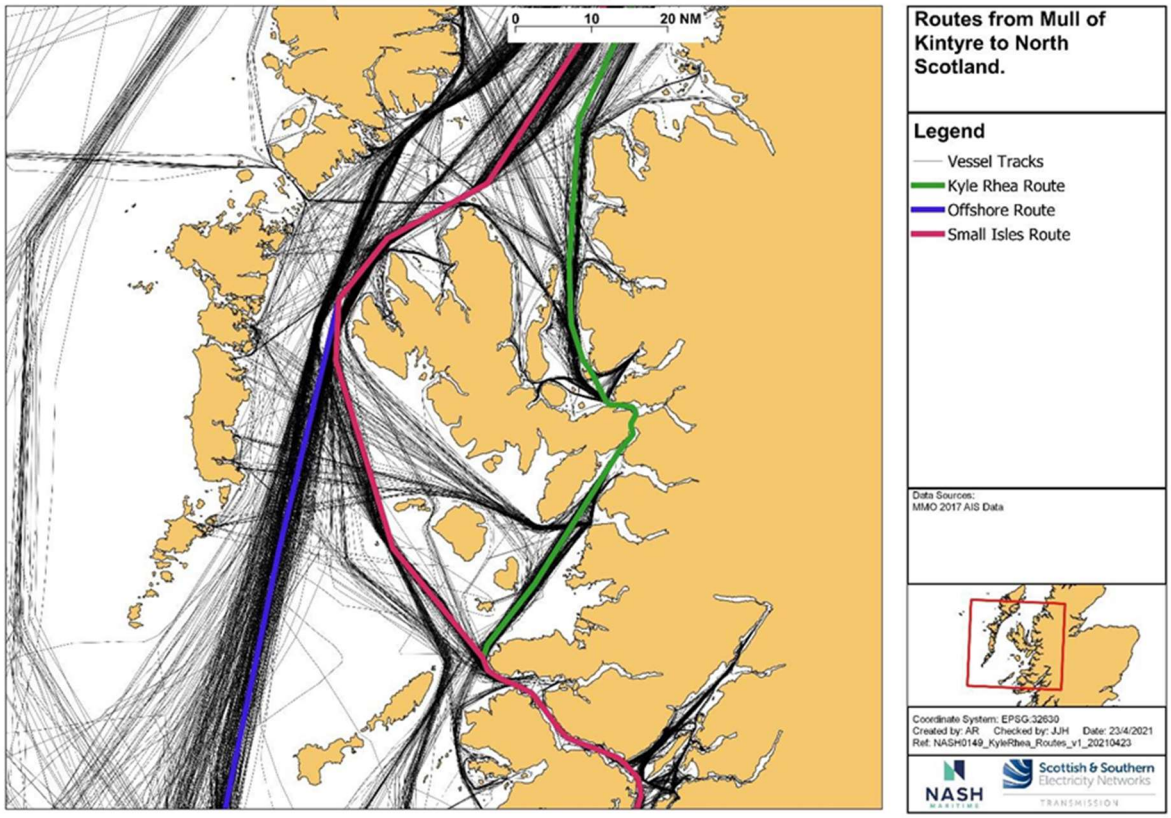
7.5. Shipping and Navigation

7.5.1. Baseline

In 2021 NASH Maritime was commissioned by SSE Networks to conduct a Vessel Traffic Study (VTS). The VTS assessed one full year of Automatic Identification System (AIS) data collected by MarineTraffic between Skye Bridge and the Sandaig Islands. The AIS data was collected for a full year from 01 January 2019 to 31 December 2019.

The Kyle Rhea strait falls within an important inshore route for the west of Scotland which connects the Mull of Kintyre with the North Minch and North Scotland. Figure 7-5 shows the vessel routes surrounding the Kyle Rhea strait; it shows 3 routes from the Mull of Kintyre and North Channel between Scotland and Ireland, the route that goes via the Kyle Rhea strait is approximately 10 nm shorter (237.7 nm as opposed to 247.3 nm) and is also more sheltered (NASH Maritime, 2020).

Figure 7-5: Vessel routes within the Kyle Rhea Strait area (From: NASH Maritime, 2020)



The following key ports, harbours, jetties and marinas are located in the study area:

- Allt-An-Avaig Pier: utilised by the fish farm industry, cargo vessels, small coastal tankers, and small workboats and landing craft;
- Kyleakin: utilised by local fisheries and leisure craft;
- Kyle of Lochalsh: utilised by cargo vessels, small cruise ships, fishing vessels, and recreational craft. In addition, the British Underwater Test and Evaluation Centre (Ministry of Defence (MOD) BUTEC) is located here and Serco tugs are also based here (NASH Maritime (2021).

There are a number of other sea users that utilise the area around the Kyle Rhea strait. Within the region of the Kyle Rhea strait there is a Royal National Lifeboat Institution (RNLI) lifeboat station at Kyle of Lochalsh with a B Class inshore lifeboat. Additionally, there are a number of fish farms located within Loch Alsh that are serviced from facilities located near Skye Bridge.

During 2019 there were a total of 3,347 transits through Kyle Rhea (an average of 9.2 per day). The AIS data can be subdivided into vessel categories. These include:

- 266 cargo vessels;
- 1,493 fishing industry vessels (see Section 7.4);
- 101 passenger vessels;
- 658 recreational craft;
- 29 tug and other service vessels.

Of these 3,347 vessel transits, only a small number we considered to be 'Regular Runners' (defined as doing more than 6 transits a year), of which there are 78 (NASH Maritime, 2021).

7.5.2. Potential Project Impacts

Following the screening exercise (see Appendix A) the potential project impacts that require further consideration are listed in Table 7-14.

Table 7-14: Potential project impacts

Effect	Realistic Worst Case Scenario	Justification
Vessel displacement	Two guard vessels are likely to be present during this period. It is anticipated that the replacement would take a total of 20 days..	The maximum numbers of vessels, and associated vessel movements, represents the maximum potential for vessel displacement.
Reduction of air draft	A maximum air draft difference, from the existing height, of 4.08 m; with the new cables having a worst-case air draft of 57.69 m. It is also worth noting that while this represents a difference of 5.18 m from the current cable, it only represents a lowering of 2.31 m from the current UKHO charted air draft height.	The proposed works are seeking to replace only the six conductor and one earth cable, existing crossing structures will be re-utilised

7.5.3. Risk (Impact) Assessment

7.5.3.1. Vessel Displacement

Impact Assessment

The Kyle Rhea Strait is used by a number of vessels and falls within an important inshore route for the west of Scotland which connects the Mull of Kintyre with the North Minch and North Scotland. The most common vessels that utilise the area are fisheries vessels, this has been assess in Section 7.4. Other vessels that utilise the area are RNLI vessels, cargo vessels, passenger vessels, and recreational vessels. Therefore, there is potential for spatial conflicts to occur due to temporary exclusion of these vessels. Once the works have ceased, after a maximum of 20 days, the route will be able to be used immediately. Therefore, the overall sensitivity is considered **Low**.

Vessels will only be affected by this impact for a short duration (maximum 20 days). In addition, there is availability of alternative travel routes outside of the Kyle Rhea Strait. There are 2 alternative routes that run between the Mull of Kintyre and North Minch, as vessels are mobile they are able to utilise a different route option, although emergency vessels such as RNLI lifeboats may require access. As vessels are mobile and are capable of both avoiding other vessels and changing transit routes, generally speaking most vessels are tolerant to displacement. Therefore, the overall level of exposure is considered **Low**.

While there will be some level of vessel displacement local shipping the duration will be for a short period and vessels will be able to return area immediately following the end of project operations. The magnitude of impacts is therefore considered **Low**.

Low sensitivity, combined with low exposure and low magnitude, mean that risk to shipping and navigation from vessel displacement caused by the Kyle Rhea project is **Low, Not Significant.**

Key Mitigation Measures

The marine corridor shall be maintained/policed by guard vessels during the conductor stringing works, in the event of an emergency vessel (e.g., RNLI lifeboat) needing access, all works will stop, the conductor will be secured, and the corridor will be opened to allow the vessel to pass. However, best practice measures such as the issue of Notice to Mariners and the presence of guard vessels will be in place.

7.5.3.2. Reduction of Air Draft

Impact Assessment

A maximum air draft difference, from the existing height, of 4.08 m; with the new cables having a worst-case air draft of 57.69 m (under Option – 783). It is also worth noting that while this represents a difference of 4.91 m from the current cable, it only represents a lowering of 2.31 m from the current UKHO charted air draft height. According to NASH Maritime (2021) the tallest vessels that transit through the Kyle Rhea strait are a maximum height of 29 m. The Skye Bridge, which has an air draught of 29 m, is a major constraint on vessels transiting through this route. Therefore, even for the largest vessels that pass through the Kyle Rhea strait there will still be a clearance of 29.2 m between the overhead cables and the vessel. As such, a reduction of air draft of 4.08 m will not affect the vessels that transit through the Kyle Rhea strait. Therefore, the overall sensitivity is considered to be **Negligible**.

The impact of the reduction of air draft will be permanent following the works. However, as the vessels that transit through the Kyle Rhea strait have a maximum height of 29 m, there will be no interaction between the vessels and the overhead cables, which will have an air draft of 57.69 m. Therefore, the overall level of exposure is considered **Negligible**.

Whilst there will be a reduction in air draft as a result of the project works, there will be no interaction with the vessels that transit through the Kyle Rhea strait. The magnitude of impacts is therefore considered **Negligible**.

Negligible sensitivity, combined with negligible exposure and negligible magnitude, mean that risk to fisheries from vessel displacement caused by the Kyle Rhea project is **Negligible, Not Significant.**

Key Mitigation Measures

Impacts are not significant, therefore mitigation measures are not necessary to reduce significance further. However, best practice measures such as the issue of Notice to Mariners and the presence of guard vessels will be in place.

8. Summary and Conclusions

The Kyle Rhea replacement of the OHL is part of the wider Skye Reinforcement Project. It is proposed that the Kyle Rhea crossing will be reconductored, with current towers retained and potentially strengthened. The proposed works are seeking, therefore, to replace only the 6 conductor cables and 1 earth cable; the existing crossing structures will be re-utilised. The planned methodology for replacement of the cables utilises ROW and a puller/tensioner system. The existing conductor is placed into the ROW on both crossing towers and both anchor towers and the existing conductor is used to pull the new conductor.

An environmental assessment has been completed in order to understand the impacts of the Kyle Rhea replacement of the OHL on the physical, biological and human environment. Following a scoping exercise, the receptors that were screened in to be assessed were marine mammals, ornithology, commercial fisheries, and shipping and navigation. Assessment of the impact pathways for each of the receptors found impacts to be not significant.

A HRA screening exercise was also completed, to understand the impacts of the Kyle Rhea replacement project on designated sites within the area. The HRA screening did not identify any designated sites to be screened in for Appropriate Assessment. Therefore, there will be no likely significant effect on designated sites as a result of the project.

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Appendix A. Scoping Exercise

The following section outlines the environmental assessment topics to be considered at the pseudo scoping phase, prior to the Marine Environmental Assessment (MEA). The following sections are set out in the structure:

- Baseline;
- Potential project Impacts;
- Key Mitigation Measures (where appropriate).

Physical Environment

Metocean Conditions

Baseline

Bathymetry

To the north, the Kyle Rhea strait reaches depths of 16 m; deepening through the central channel where depths reach a maximum of 36 m; shallowing towards the southern end of the strait, where depths of approximately 11 m are measured.

Tides and Currents

The tides around Scotland are strongly semi-diurnal and can be described by the principal semi-diurnal lunar (M2) and semi-diurnal solar (S2) constituents (Neill *et al.,* 2017). The tidal flow propagates northward along the Scottish coastline. According to Proctor (1997) the tidal range to the north of Skye is approximately 5 m.

Maximum tidal currents during mean spring tides in the region around the east of Skye are generally between 0.75-1.25 m/s, these are approximate average values for tidal currents in the UK. They are typical for water bodies around Skye, with typical tidal currents exceeding these values in channels (Barne *et al.*, 1997).

Waves

The wave heights across the Kyle Rhea strait are likely to be less than those of the surrounding water bodies, with protection from North Atlantic driven waves by the Skye land mass to the west. Significant wave heights in the area are less than 1 m for 75% of the time, and only during 10% of the year do they exceed 2.0 m (Barne *et al.*, 1997). These values are in accordance with data on the National Marine Plan Interactive (NMPi) maps, which have typical annual average significant wave heights for waters to the south of Skye of 1.16 m.

Wind

The Kyle Rhea strait is largely sheltered from the prevailing westerly winds by the southern Skye landmass. There exists a dominant southwesterly wind, with average speeds exceeding 3 m/s for 75% of the time (Barne *et al.*, 1997).

Salinity and Temperature

Based on the data provided in the Marine Scotland NMPi maps, the annual surface mean salinity towards to the south of the strait is approximately 34 psu. Typical average seawater salinity is approximately 35 psu, and it is likely that potential river water run off influences local salinity levels.

Annual mean surface temperature in the Kyle Rhea strait is approximately 10°C, with minimum values falling in February (approximately 7°C) and highs in September of 13°C (NMPi 2022a).

Potential Project Impacts

No structures will be installed that have the potential to change or alter the currents, wind, wave and climate conditions in the Kyle Rhea strait. The cable replacement methodology will utilise the use of running out wheels, and all works will be done via the existing conductor infrastructure and conductor cables. Any presence of vessels in the Strait would be temporary, and have no effect on metocean conditions.

There is, therefore, no pathway for effects associated with the Kyle Rhea reconductoring to impact metocean conditions. Assessment of impacts to metocean conditions has, therefore, been scoped out of this MEA.

Geology

Bedrock

Baseline

The predominant geological marine bedrock in the Kyle Rhea strait, over which the OHL will span, is predominantly sandstone and siltstone, which forms part of the Torridonian Group, with areas of gneiss and metasandstone to the south (NMPi 2022b).

Potential Project Impacts

The project is seeking to replace the 7 cables spanning the existing OHL. Anchor deployment from guard vessels or construction vessels will not penetrate bedrock, and no drilling or piling of the bedrock will occur.

There is, therefore, no pathway for effects on bedrock in the region, and so impacts to bedrock resulting from the project have been scoped out of the MEA.

Seabed Substrate

Baseline

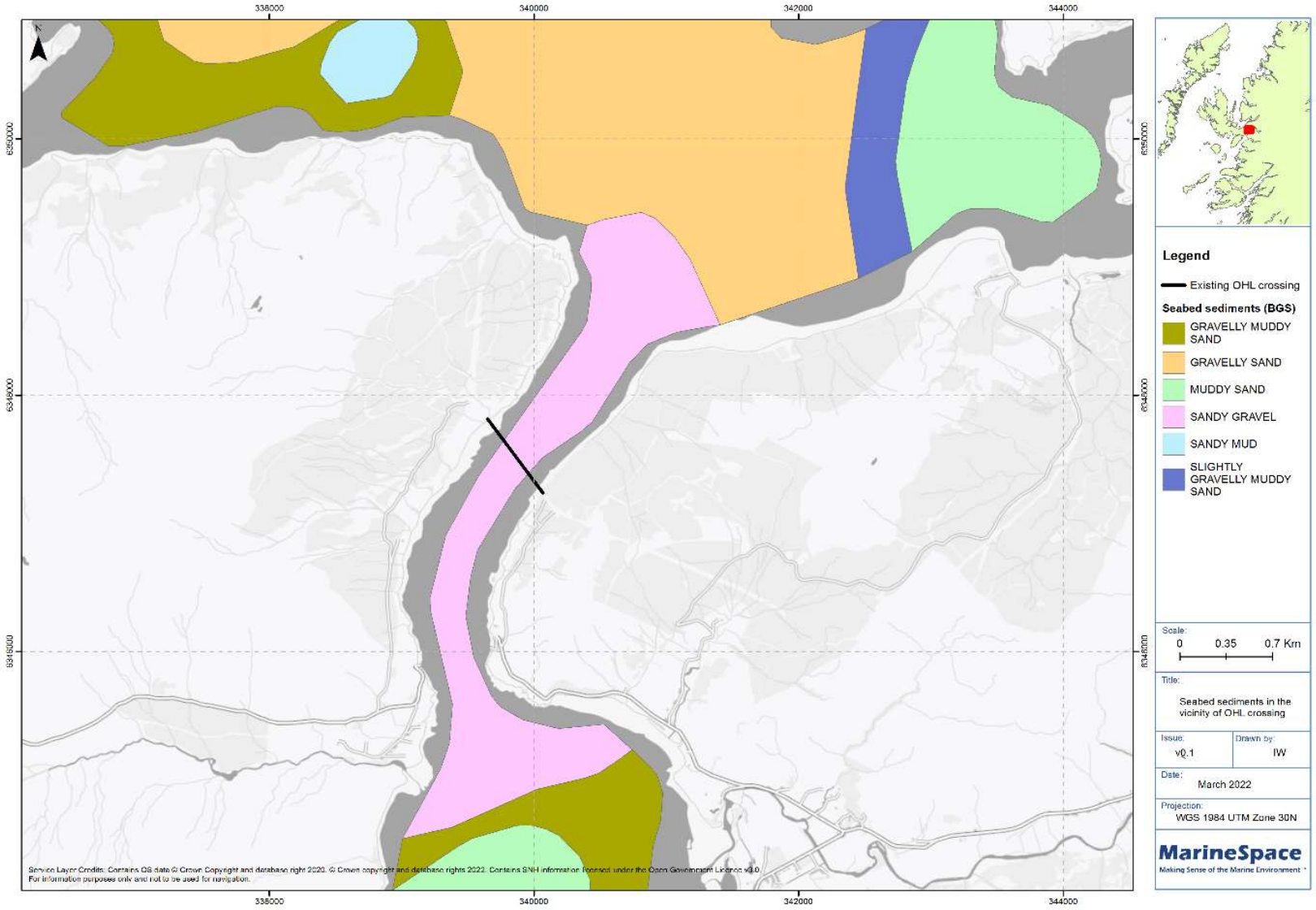
The predominant Holocene seabed sediment in the project area is classified as sandy gravel, under the Folk (1954) classification scheme.

Figure A-1 **Error! Reference source not found.Error! Reference source not found.Error! Reference source not found.**presents the regional seabed sediment in and around the project area. While the predominant seabed sediment within the strait is sandy gravel, surveys have also shown that the areas that are swept by the tide, particularly in the southern entrance to the strait, consist of uneven cobbles and boulders, overlaying coarse gravel, with areas of outcropping bedrock.

Potential Project Impacts

Conductor replacement will have no direct impact pathway to disturb seabed sediment, however the use of potential guard vessels may disturb the seabed due to the potential for emergency anchoring in the Strait. The use of guard vessels as part of this project will not increase vessel presence in the region above typical numbers and so impacts due to seabed disturbance will not be above normal levels. Any potential disturbance will be in small and localised areas, restricted to the seabed associated with the OHL, where vessels may potentially anchor. Seabed sediments are, typically, sandy gravel which typically have a high tolerance associated with temporary direct disturbance due to the fact that they demonstrate rapid recovery periods. Potential impacts to seabed substrate have been scoped out of the MEA.

Figure A-1: Seabed sediment in the Project area



Water and Sediment Quality

Baseline

Water quality is regulated at EU level through a range of environmental directives. The most relevant for Kyle Rhea is the Water Framework Directive (WFD) (2000/60/EC). Marine water bodies within the vicinity of the Project are all considered by the Scottish Environment Protection Agency (SEPA) to be in good condition. The Kyle Rhea strait, which the OHL will cross, forms part of the Loch Alsh water body and, as of 2018, had a good water body classification.

Unlike water quality, there are no formal quantitative scoring systems for sediment quality. Based on maps on the NMPI website there are no registered dredging or disposal sites within the Kyle Rhea strait, this is includes chemical and munitions disposal sites. There are no significant urban areas within the region, so there is unlikely to be inputs associated with large urban areas that will change the sediment quality. As the water body in the region is classified as being in good condition it suggests that there is limited input from agriculture or other inputs. Given the physical nature of the strait, and its relatively large hydrodynamic features, as well as coarse seabed sediment, it is unlikely there exists significant contamination.

Potential Project Impacts

The conductor replacement methodology will have limited impact pathways on water quality. As part of all vessel deployment the inherent use of anchors may disturb seabed sediment. There is anticipated to be minimal impacts on water and sediment quality from the project, therefore their potential impacts have been scoped out.

Biological Environment

Benthic Ecology

Baseline

As shown in Figure A-2, the predominant seabed sediment constituting the Kyle Rhea strait is sandy gravel. However, surveys have shown the tide-swept areas – particularly in the southern entrance to the strait, consist of uneven cobbles and boulders overlaying coarse gravel, with areas of outcropping bedrock (Moore and Roberts, 2011). Wilding *et al.* (2005) recognised that the narrow strait is typically wave-sheltered, and can experience tidal streams greater than 8 knots on spring tides, contributing to the differing sediment in these tide-swept areas.

Moore and Roberts (2011) identified the shallow tide-swept areas in the southern region of Kyle Rhea (12-17 m) to be characterised by the dominant biotopes:

- CR.HCR.FaT.CTub.Adig, *Alcyonium digitatum* with dense *Tubularia indivisa* and anemones on strongly tide-swept circalittoral rock;
- IR.MIR.KR.LhypT.Pk, *Laminaria hyperborea* park with hydroids, bryozoans and sponges on tide-swept lower infralittoral rock;
- IR.MIR.KR.LhypTX.Pk, *Laminaria hyperborea* forest and foliose red seaweeds on tide-swept upper infralittoral mixed substrata.

In areas of outcropping bedrock in the deeper waters of the southern region (9-22 m), Wilding *et al.* (2005) identified *Alaria esculenta* to be the dominant kelp species. Fauna using this dense foliage as a habitat include *Balanus crenatus*, the anemone *Urticina felina*, and bryozoans including *Alcyonidium diaphanum*. In the deeper waters of the southern Kyle Rhea strait, *Tubularia senile* and *Serularia argentea* inhabit the area, alongside the sponges *Pachymatisma johnstoni*, *Myxilla incrustans*, and the anemone *Metridium senile*.

In the northern region of Kyle Rhea, small cobbles and pebbles can be found overlaying the sandy gravel sediment. In these areas of mixed substrate, the community appears impoverished, and sparse communities of bryozoans and coralline algae can be found encrusting the boulders and cobbles that are present (Moore and Roberts, 2011). Where bed rock is present, however, more diverse communities characterise the environment.

Kyle Rhea is also part of the Lochs Duich, Long and Alsh Reefs SAC. The Annex I habitat 'Reefs' is a primary reason for selection of this site. Due to the strong tidal streams through the strait, these reefs are subject to strong water movements. The bedrock across the Kyle Rhea strait supports diverse communities that constitute these reefs. These are typically dominated by the hydroids *Tubularia indivisa* and *Serularia argentea*. Also abundant in the shallower areas are the barnacle *Balanus crenatus*, a diverse community of sponges including *Halichondria panicea* and *Pachymatisma johnstoni (*Moore and Roberts, 2011), anemones, and ascidians (JNCC 2022).

Potential Project Impacts

The project intends on replacing the conductor cables utilising the existing infrastructure and so minimal impacts on the benthic communities are expected. Any impacts will be limited to the use of guard vessels. Vessels will be in the water for approximately 20 days during which there may be a need for emergency anchorage in the strait; which introduces the potential pressure pathway for physical damage to the benthos. However, given the habitual use of the strait by other vessels, including fishing vessels, the project is unlikely to introduce significant vessel presence above what is associated with the existing baseline. Benthic communities will likely be habituated to the level of vessel presence associated with the project, and the anchoring of any vessels is predicted to cause minimal disruption. Any potential disturbance will be in small and localised areas, restricted to the seabed associated with the OHL. As previously stated, the benthic habitat associated with the proposed area of works consists of sandy gravel. Sandy gravels have a high tolerance associated with temporary direct disturbance, due to the fact that they demonstrate rapid recovery periods (Newell and Woodcock, 2013). Therefore, no significant impacts are anticipated as a result of the vessel movements associated with the overhead cable works, and therefore impacts on benthos have been scoped out.

Fish Ecology

Baseline

An estimated 250 species of fish occur in Scottish territorial waters (within 12 nautical miles of the coast) (NatureScot 2022). Commercial fish catch can often be an indicator of the common species in a region. Kyle Rhea sits within ICES Rectangle 43E4. Table A-1 **Error! Reference source not**

found.Error! Reference source not found.provides a list of all fish species caught in the ICES area in 2019 (Marine Scotland 2022a).

2019 was chosen as the sample year for fish catch data to be more reflective of regular fishing efforts and, therefore, a wider abundance and accurate representation of catch.

Table A-1: Fish species caught in ICES rectangle 43E4 in 2019

Demersal and Pelagic Fish and Elasmobranch		Shellfish
Monk or Anglers	Turbot *Scophthalmus maximus*	Nephrops (Norway Lobster)
Haddock *Melanogrammus aeglefinus*	Red gurnard *Chelidonichthys cuculus*	Crabs (C.P.Mixed Sexes)
Ballan wrasse *Labrus bergylta*	Saithe *Pollachius virens*	Scallops (family *Pectinidae*)
Squid (family *Decapodiformes*)	Whiting *Merlangius merlangus*	Sprats (genus *Sprattus*)
Witch flounder *Glyptocephalus cynoglossus*	John Dory (genus *Zues*)	Crabs - velvet (swim) *Necora puber*
Corkwing wrasse *Symphodus melops*	Halibut (genera *Hippoglossus* and *Reinhardtius*)	Green crab *Carcinus maenas*
Goldsinny wrasse *Ctenolabrus rupestris*	Brill *Scophthalmus rhombus*	Lobsters (family *Nephropidae*)
Hake *Merluccius merluccius*	Mixed Squid and Octopi	Razor clam *Siliqua patula*
Megrim *Lepidorhombus whiffiagonis*	Pollack (family *Gadidae*)	Whelk *Buccinum undatum*
Wrasses (family *Labridae*)	Gurnard and Latchet *Pterygotrigla polyommata*	Brown shrimp *Crangon crangon*
Rock cook *Centrolabrus exoletus*	Nursehound *Scyliorhinus stellaris*	
Cod *Gadus morhua*	Skates and Rays	
Ling *Molva molva*	Unidentified Dogfish	
Lemon sole *Microstomus kitt*	Spotted ray *Raja montagui*	
Octopus (order *Octopoda*)	Lesser spotted dogfish *Scyliorhinus canicular*	
Plaice *Pleuronectes platessa*	Cuckoo ray *Leucoraja naevus*	
Gurnards – grey *Eutrigla gurnardus*	Blonde ray *Raja brachyura*	

Sole (family *Soleidae*)		

Spawning and Nursery Grounds

Fish sensitivity maps were produced in 1998 by Fisheries Agencies with support from a consortium including United Kingdom Offshore Operator's Association (UKOOA), the Scottish Fishermen's Federation (SFF) and the National Federation of Fishermen's Organisations (NFFO). The maps are presently used on the NMPi maps for Scotland (Marine Scotland 2022b) with the spawning and nursery ground records presented in Table A-2.

Table A-2: Fish spawning and nursery grounds overlapping Project area

Species	Spawning	Nursery
Whiting	Yes	No
Sprat	Yes	No
Sandeel	No	No
Sole	No	No
Saithe	No	Yes
Plaice	No	No
Norway Pout	No	No
Nephrops	Yes	Yes
Mackerel	No	No
Lemon Sole	No	No
Herring	No	Yes
Haddock	No	No
Cod	No	Yes
Blue Whiting	No	No

Potential Project Impacts

The project intends on replacing the conductor cables utilising the existing infrastructure and so minimal impacts on fish species are expected, with interaction limited to the use of guard and vessels. Vessels will be in the water for approximately 20 days and, given the habitual use of the strait by other navigation and fishing vessels, the project is unlikely to be significantly above regular

use. Fish species will likely be habituated to the level of vessel presence associated with the project with no significant impacts anticipated, and so impacts have been scoped out of this MEA.

Marine mammals (including otters)

Baseline

Cetaceans

According to NatureScot over 20 cetacean species are found in Scottish waters, with seven species are relatively common close to the Scottish coasts (NatureScot 2022b):

- Bottlenose dolphin *Tursiops truncatus*;
- Harbour porpoise *Phocoena phocoena*;
- Minke whale *Balaenoptera acutorostrata*;
- White-beaked dolphin *Lagenorhynchus albirostris*;
- Risso's dolphin *Grampus griseus*;
- Common dolphin *Delphinus delphis*;
- Orca *Orcinus orca*.

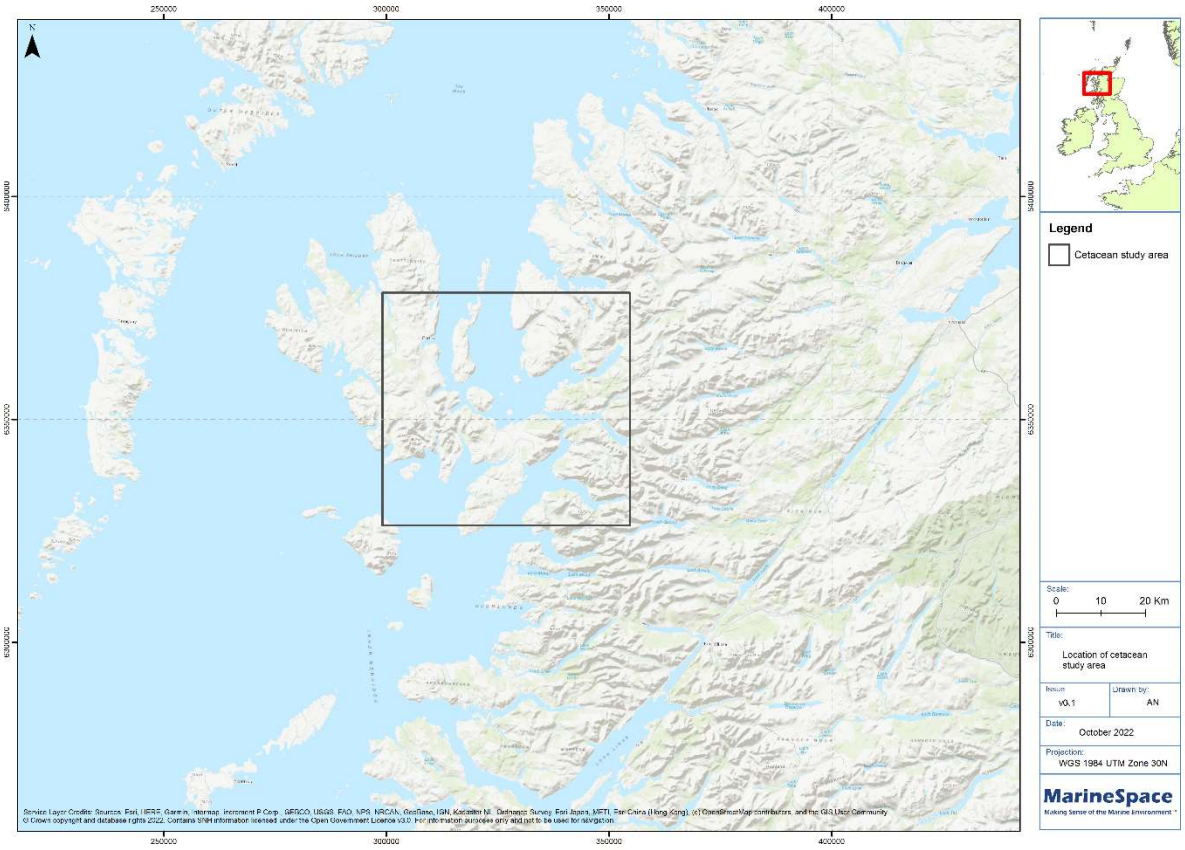
Based on data publicly available from the Sea Watch Foundation, **Error! Reference source not found.**provides an overview of cetaceans sighted around Skye. The Sea Watch Foundation has been running a sighting scheme from the mid 1970s, and includes data from volunteers, data gathering schemes as well as SCANS I and SCANS II (Evans and James, undated). The data provided in **Error! Reference source not found.**are gathered from the study area denoted by the box in Table A-3.

Table A-3: Seawatch data base record sighting of cetaceans around Skye

Species	No. Records	%	No. of Individual	%
Short-beaked common dolphin (*Delphinus delphi*)	703	10.3	27,702	55.3
Harbour porpoise (*Phocoena phocoena*)	3,587	53	16,036	32
Minke Whale (*Balaenoptera acutorostrata*)	1,957	29	2,770	5.5
Bottlenose dolphin (genus *Tursiops*)	165	2.4	1,542	3.1
Orca (*Orcinus oirca*)	56	0.8	204	0.4
White-beaked dolphin (*Lagenorhynchus albirostris*)	22	0.3	184	0.4
Risso's dolphin (*Grampus griseus*)	28	0.4	166	0.3
Atlantic White-sided dolphin	12	0.2	148	0.3

Species	No. Records	%	No. of Individual	%
(*Lagenorhynchus acutus*)				
Long-finned pilot whale (*Globicephala melas*)	37	0.5	134	0.2
Northern bottlenose whale (*Hyperoodon ampullatus*)	31	0.5	60	0.1
Humpback whale (*Megaptera novaeangliae*)	48	0.7	51	<0.1
Sperm whale (*Physeter macrocephalus*)	10	0.1	20	<0.1
Striped dolphin (*Stenella coeruleoalba*)	2	<0.1	11	<0.1
Fin whale (*Balaenoptera physalus*)	6	<0.1	7	<0.1
Sei whale (*Balaenoptera borealis*)	3	<0.1	4	<0.1
Cuviers beaked whale (*Ziphius cavirostris*)	1	<0.1	3	<0.1
Unidentified	148	n/a	1042	n/a

Figure A-2: Map of Hebrides with main study area boxed



Pinnipeds

The harbour seal *Phoca vitulina* and the grey seal *Halichoerus grypusare*, are commonly found in the northern hemisphere, with Scotland a hub for much of Europe's population (NatureScot 2022c). Datasets provided by Marine Scotland, presented in Figure A-3 and Figure A-4, show relatively high usage of the Kyle Rhea strait of both seal families. No designated seal haul sites are present along the Strait, with the closest, the Pabay and Ardnish Peninsula, approximately 10 km west of the project site.

Figure A-3: Harbour seal density maps 2017 (Source: SMRU, 2017)

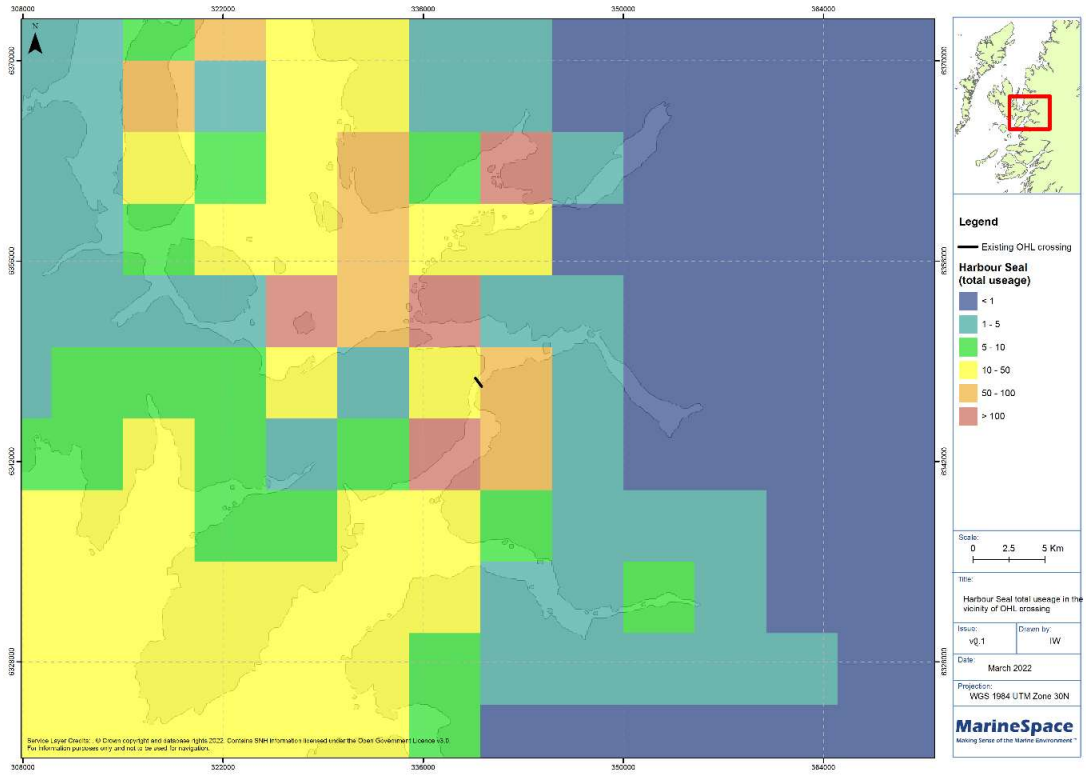
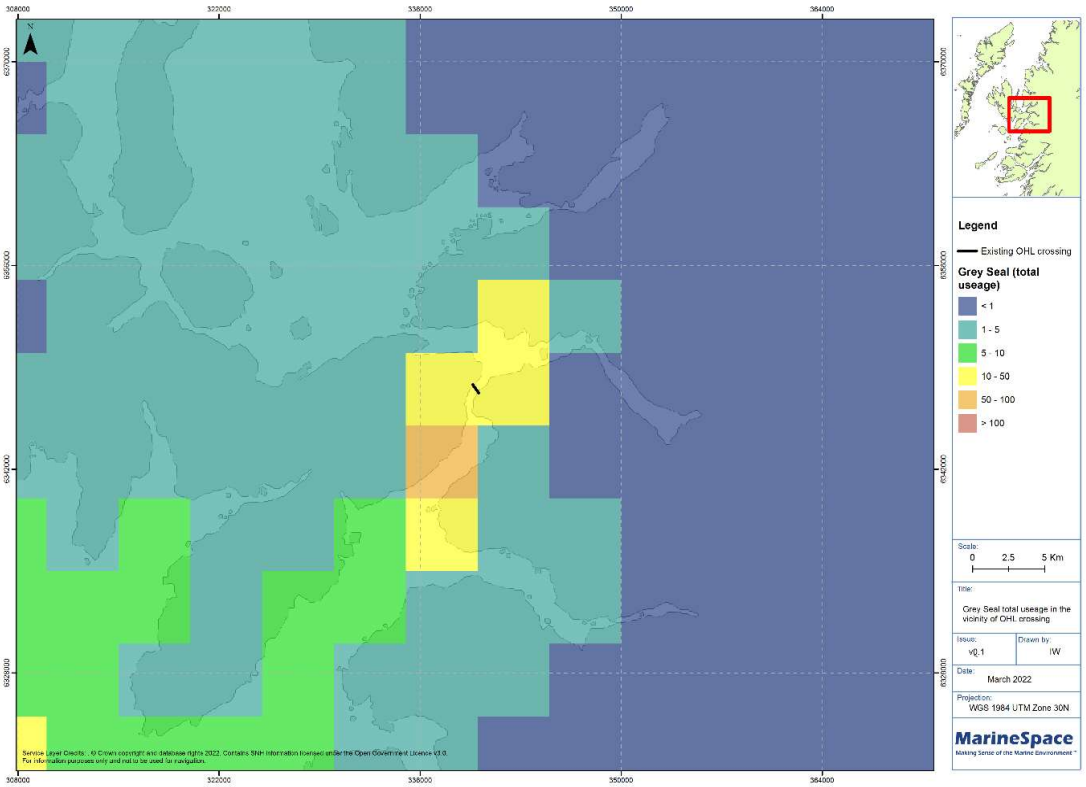


Figure A-4: Grey seal density maps 2017 (Source: SMRU, 2017)



Otter

Scotland is a considered a stronghold for the Eurasian otter *Lutra lutra*, with a high number of the population found in the coastal water of the northwest. Otters are designated and protected as European protected species (EPS) (NatureScot 2022d). The Kyle Rhea Strait has a high amount of otter activity with an otter hide located on the Skye side of the strait, approximately 200 m inland of the Glenelg to Kyle Rhea ferry port (Isle of Skye 2022).

Potential Project Impacts

The project intends on conducting the OHL replacement via existing infrastructure as set out in Section 4. However, given the use of guard vessels in the water during replacement (estimated to be 20 days), there exists the potential for impact to cetaceans from the following key pathways:

- Disturbance from the guard vessel presence;
- Noise generated by the guard vessels;
- Collision risk increase due to vessel presence;
- Barrier Effects could prohibit transit of the Strait by regular users of the channel due to presence of guard vessels.

Ornithology

Baseline

Several designated Special Protected Areas (SPAs) are situated within proximity of the proposed works in the Kyle Rhea strait.

The closest site is Cuillins SPA, located approximately 13.9 km from the Strait on the Isle of Skye. This site is designated for the protection of the golden eagle *Aquila chrysaetos.* Last updated in 2002, this site supports 8 breeding pairs of golden eagle, comprising approximately 1.9% of the population in Great Britain (SNH 2002).

The Rum SPA is located approximately 37.6 km from the Kyle Rhea strait and features rocky coasts and cliffs alongside the adjacent coastal waters which act as a nursery area for multiple fish species. The abundant food source and habitat mean the Rum SPA is designated for supporting multiple bird species and approximately 130,000 seabirds each year.

These species include several Annex 1 species including the red-throated diver *Gavia stellata* (13-18 pairs representing 1% of the Great Britain population); Manx shearwater *Puffinus puffinus* (61,000 pairs representing 23% of the world population); black-legged kittiwake *Rissa tridactyla* (1,500 pairs representing 0.3% of the Great Britain population); golden eagle *Aquila chrysaetos* (4 pairs representing 1% of the Great Britain population); and common guillemot *Uria aalge* (4,000 individuals representing 0.4% of the Great Britain population) (NatureScot, 2020).

Shiant Isles SPA is located approximately 78.3 from Kyle Rhea, situated in the Minch. Despite this greater distance, due to large foraging ranges, certain species have the potential to overlap with the area of proposed works.

This SPA is designated for a large number of species including Annex 1 Greenland barnacle goose *Branta leucopsis* (490 individuals representing 2% of the Great Britain population); razorbill *Alca torda* (10,950 individuals representing 5.9% of the UK population); Atlantic puffin *Fratercula arctica* (77,000 pairs representing 13.3% of the UK population); common guillemot (18,380 individuals representing 2% of the Great Britain population); northern fulmar *Fulmaris glacialis* (6,820 pairs representing 1% of the Great Britain population); European shag *Phalacrocorax aristotelis* (1,780 pairs representing 1.5% of the western European population); and black-legged kittiwake (1,800 pairs representing 0.4% of the Great Britain population) (SNH 2009).

In addition to the designated SPAs, areas in the locality of Kyle Rhea act as nesting areas for seabirds. Information on these nesting areas is sourced from the Seabirds 2000 census collected between 1999 and 2003 (JNCC 2004). In the local area (within 10 km) black guillemot *Cepphus grylle* have multiple known nesting sites including Eilean Dubh with 20 recorded individuals, Kyleakin channel with 19 recorded individuals, and Sandaig Isles with 7 recorded individuals. Additional species with nesting sites in the locality include herring gull *Larus argentatus* with 2 individuals recorded in the Kyle of Loch Alsh, and common gull *Larus canus* with 12 individuals recorded in Loch Alsh.

Further to these local sites, there are areas within foraging distance that act as nesting areas for multiple species. The Sound of Pabbay, located approximately 12.5 km away from the proposed Project area, has reportedly supported nesting sites of northern fulmar (892 individuals), European shag (42 individuals), common gull (5 individuals), lesser black-backed gull *Larus fuscus* (5 individuals), herring gull (6 individuals), great black-backed gull *L. marinus* (4 individuals), Arctic tern *Sterna paradisaea* (1 individual), and razorbill (24 individuals).

Longay is also important nesting site. Located approximately 15.8 km from the area of proposed works, nesting species include black guillemot (36 individuals), northern fulmar (26 individuals), great cormorant *Phalacrocorax carbo* (46 individuals), and European shag (65 individuals). Due to the proximity of these areas to Kyle Rhea, the nesting species have the potential to overlap with the area of proposed works.

The more recent FAME and STAR seabird tracking project from the RSPB (2010-2014) undertook seabird tracking of black-legged kittiwake, European shag, black guillemot, and razorbill colonies across the UK coast (RSPB 2019). The distributions identified by this project for the assessed species broadly align with the nesting sites identified by the Seabird 2000 census in Scotland, and are all in close proximity to the Kyle Rhea Strait.

Potential Project Impacts

The project intends on replacing the conductor cables utilising the existing infrastructure. As the OHLs will follow the same route as the existing cables, their operation will be the same as prior to replacement. Following the lack of change in operation, any impacts to seabirds will be limited to the use of guard vessels. Vessels will be in the water for approximately 20 days, during which they have the potential to interact with foraging bird species. However, given the habitual use of the strait by other vessels, including fishing vessels, the project is unlikely to introduce significant vessel presence above that associated with the existing baseline. Any foraging bird species will likely be habituated to the level of vessel presence associated with the project with no significant impacts anticipated.

Habitats Regulations Assessment

Baseline

There are 8 designated sites in close proximity to the area of works in the Kyle Rhea strait (presented in Figure A-5). Of these sites, 4 directly overlap with the strait including Kinloch and Kyleakin Hills Sites of Special Scientific Interest (SSSI), Kinloch and Kyleakin Hills SAC, Lochs Duich, Long and Alsh Reefs SAC, and the Inner Hebrides and the Minches SAC. **Error! Reference source not found.**provides an overview of the designated sites and their qualifying features.

Three SPAs have also been included for consideration for the OHL replacement works. Despite their greater distance from the strait, several of the qualifying bird species for these SPAs have overlapping foraging ranges with the works (Woodward *et al.*, 2019) (see **Error! Reference source not found.**).

Figure A-5: Location of designated sites in proximity to the Kyle Rhea Strait

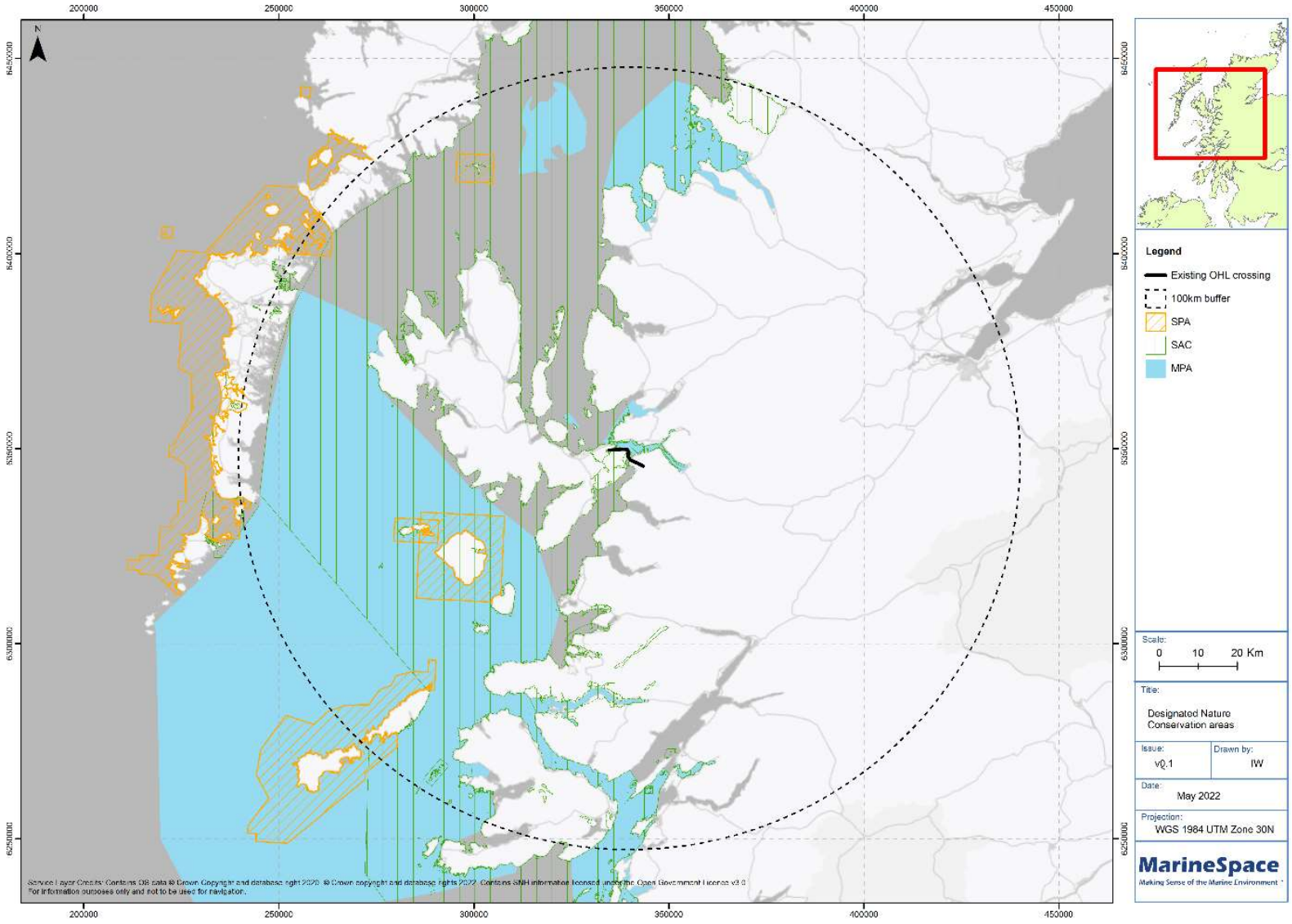


Table A-4: Designated and notified sites within 100 km of the Kyle Rhea strait and their qualifying features (NatureScot, 2022; JNCC, 2022)

Type	Site Name	PA Code	Distance (km)	Qualifying Features
MPA	Lochs Duich, Long and Alsh	10416	1.3	Burrowed mud; Flame shell beds.
MPA	Loch Carron	10543	6.8	Flame Shell Bed; Maerl Beds.
MPA	Red Rocks and Longay (Urgent ncMPA)	10584	14.8	Flapper Skate *Dipturus intermedius*.
MPA	Small Isles	10422	33	Black guillemot *Cepphus grylle*; Northern feather star aggregations on mixed substrata; White cluster anemones *Parazoanthus anguicomus*; Northern sea fan and sponge communities; Burrowed mud; Circalittoral sand and mud communities; Fan mussel aggregations; Horse mussel beds; Quaternary of Scotland – glaciated channels/troughs, glacial lineations, meltwater channels, moraines and streamlined bedforms.

Type	Site Name	PA Code	Distance (km)	Qualifying Features
MPA	Sea of the Hebrides	10474	33	Basking Shark *Cetorhinus maximus*; Minke Whale *Balaenoptera acutorostrata*; Marine geomorphology of the Scottish shelf seabed - Inner Hebrides Carbonate Production Area.
MPA	Loch Sunart	10417	66	Northern feather star aggregations on mixed substrata; Flame shell beds; Serpulid aggregations.
MPA	Loch Sunart to the Sound of Jura	10418	68	Flapper Skate *Dipturus intermedius*; Quaternary of Scotland – glaciated channels/troughs.
MPA	Wester Ross	10421	69	Burrowed mud; Circalittoral muddy sand communities; Flame shell beds; Kelp and seaweed communities on sublittoral sediment; Maerl beds; Maerl or coarse shell gravel with burrowing sea cucumbers; Northern feather star aggregations on mixed substrata; Marine Geomorphology of the Scottish Shelf Seabed – banks of unknown substrate;

Type	Site Name	PA Code	Distance (km)	Qualifying Features
				Quaternary of Scotland – glaciated channels/troughs, megascale glacial lineations, moraines; Seabed Fluid and Gas Seep - pockmarks; Submarine Mass Movement – slide scars.
MPA	Shiant East Bank	10475	76	Circalittoral sands and mixed sediment communities; Northern sea fan and sponge communities; Shelf banks and mounds; Geodiversity Quaternary of Scotland (drumlinoid forms, glacial lineations, iceberg ploughmarks, streamlined bedrock).
MPA	Loch Creran	10415	80	Flame shell beds; Quaternary of Scotland.
SAC	Lochs Duich, Long and Alsh Reefs	UK0017077	0	Reefs.
SAC	Kinloch and Kyleakin Hills	UK0030176	0	Eurasian otter *Lutra lutra*.

Type	Site Name	PA Code	Distance (km)	Qualifying Features
SAC	Inner Hebrides and the Minches	UK0030393	0	Harbour Porpoise *Phocoena phocoena*.
SAC	Glen Beasdale	UK0030154	39	Eurasian otter *Lutra lutra*; Freshwater pearl mussel *Margaritifera margaritifera*.
SAC	Rum	UK0012594	43	Eurasian otter *Lutra lutra*.
SAC	Sound of Arisaig (Loch Ailort to Loch Ceann Traigh)	UK0019802	50	Sandbanks which are slightly covered by sea water all the time.
SAC	Loch Moidart and Loch Shiel Woods	UK0030209	50	Eurasian otter *Lutra lutra*.
SAC	Ascrib, Isay and Dunvegan	UK0030230	64	Harbour seal *Phoca vitulina*.
SAC	Sunart	UK0019803	66	Eurasian otter *Lutra lutra*; Reefs.
SAC	Loch Creran	UK0030190	80	Reefs.
SAC	Eileanan agus Sgeiran Lios mor	UK0030182	83	Harbour seal *Phoca vitulina*.
SAC	Mull Oakwoods	UK0030219	90	Eurasian otter *Lutra lutra*.
SAC	Treshnish Isles	UK0030289	91	Grey seal *Halichoerus grypus*; Reefs.
SAC	Inverpolly	UK0030171	94	Eurasian otter *Lutra lutra*.

Type	Site Name	PA Code	Distance (km)	Qualifying Features
SAC	Loch nam Madadh	UK0017070	95	Eurasian otter *Lutra lutra*; Coastal lagoons; Large shallow inlets and bays.
cSAC/SCI	Sound of Barra	UK0012705	96	Harbour seal *Phoca vitulina*; Sandbanks which are slightly covered by sea water all the time; Reefs.
SAC	Obain Loch Euphoirt	UK0017101	97	Coastal lagoons.
SAC	South Uist Machair	UK0012713	100	Slender naiad *Najas flexilis*; Eurasian otter *Lutra lutra*; Coastal lagoons
SPA	Rum	UK9001341	37	Golden eagle *Aquila chrysaetos*; Red-throated diver *Gavia stellata*; Manx shearwater *Puffinus puffinus*; Black-legged kittiwake *Rissa tridactyla*; Common guillemot *Uria aalge*.

Type	Site Name	PA Code	Distance (km)	Qualifying Features
SPA	Canna and Sanday	UK9001431	51	Atlantic puffin *Fratercula arctica*; European herring gull *Larus argentatus*; European shag *Phalacrocorax aristotelis*; Black-legged kittiwake *Rissa tridactyla*; Common guillemot *Uria aalge*.
SPA	Coll and Tiree	UK9020310	71	Great northern diver *Gavia immer*; Common eider *Somateria mollissima*.
SPA	Shiant Isles	UK9001041	78	Razorbill *Alca torda*; Barnacle goose *Branta leucopsis*; Atlantic puffin *Fratercula arctica*; Northern fulmar *Fulmarus glacialis*; European shag *Phalacrocorax aristotelis*; Black-legged kittiwake *Rissa tridactyla*; Common guillemot *Uria aalge*.
SPA	West Coast of the Outer Hebrides	UK9020319	95	Great northern diver *Gavia immer*; Red-throated diver *Gavia stellata*; Black-throated diver *Gavia arctica*; Slavonian grebe *Podiceps auritus*; Common eider *Somateria mollissima*; Long-tailed duck *Clangula hyemalis*; Red-breasted merganser *Mergus serrator*.

Type	Site Name	PA Code	Distance (km)	Qualifying Features
SPA	South Uist Machair and Lochs	UK9001082	99	Corncrake *Crex crex*; Dunlin *Calidris alpina schinzii*; Little tern *Sternula albifrons*; Oystercatcher *Haematopus ostralegus*; Redshank *Tringa totanus*; Ringed plover *Charadrius hiaticula*; Sanderling *Calidris alba*.

Potential Project Impacts

The project intends on replacing the conductor cables utilising the existing infrastructure. As the overhead cables will follow the same route as the existing cables, their operation will be the same as prior to replacement.

Considering the lack of change in operation, any impacts to the designated habitats and designated or classified populations of species will be limited to the use of guard vessels. Vessels will be in the water for approximately 20 days with occasional anchoring required. Whilst the proposed works are located within the Lochs Duich, Long and Alsh SAC, the OHL route does not extend over any of the designated Annex I reef habitat feature. Therefore, any use of anchors associated with the guard vessels has no mechanism to cause direct effects on the features of the site. As such, there is no pathway for impact for the designated Annex I reef habitat of the Lochs Duich, Long and Alsh SAC in relation to:

- Abrasion/disturbance of the substrate on the surface of the seabed;
- Penetration and/or disturbance of the substratum below the surface of the seabed, including abrasion;
- Physical change (to another seabed type).

Regarding indirect effects, the use of anchors will be intermittent and short-scale both in the time any one anchor is present on the seabed plus the total duration of the works proposed i.e. 20 days, that any mobilisation of the sediment will be undetectable. Given the distance and tidal excursion velocities any sediment liberated into the nearbed water column will be rapidly dispersed. Therefore, there is no pathway for impact for the designated Annex I reef habitat of the Lochs Duich, Long and Alsh SAC in relation to:

- Changes in suspended solids (water clarity);
- Physical change (to another sediment type);
- Smothering and siltation rate changes (light).

Vessels do have the potential to interact with foraging bird species. Based on Woodward *et al.* (2019) classified populations of birds from nearby SPAs with foraging distances (mean maximum + 1 Standard Deviation) that overlap the Strait include:

- Manx shearwater: 136.1+88.7;
- Black-legged kittiwake: 54.7+50.4;
- Common guillemot: 33.1+36.5;
- Northern fulmar: 134.6+90.1;
- Atlantic Puffin: 62.4+34.4;
- Razorbill: 61.3+33.4.

However, interaction with foraging birds during construction is expected to be minimal. However, given the habitual use of the Strait by other vessels, including fishing vessels, the project is unlikely to introduce significant vessel presence above that associated with the existing baseline.

As the infrastructure of the OHLs will follow the same route as the existing cables, their operation will be the same as prior to replacement. Therefore, for both construction and operation, no LSE is determined. However, given the designated status of the sites and their proximity to the works potential impacts have been scoped into the MEA.

Human Environment

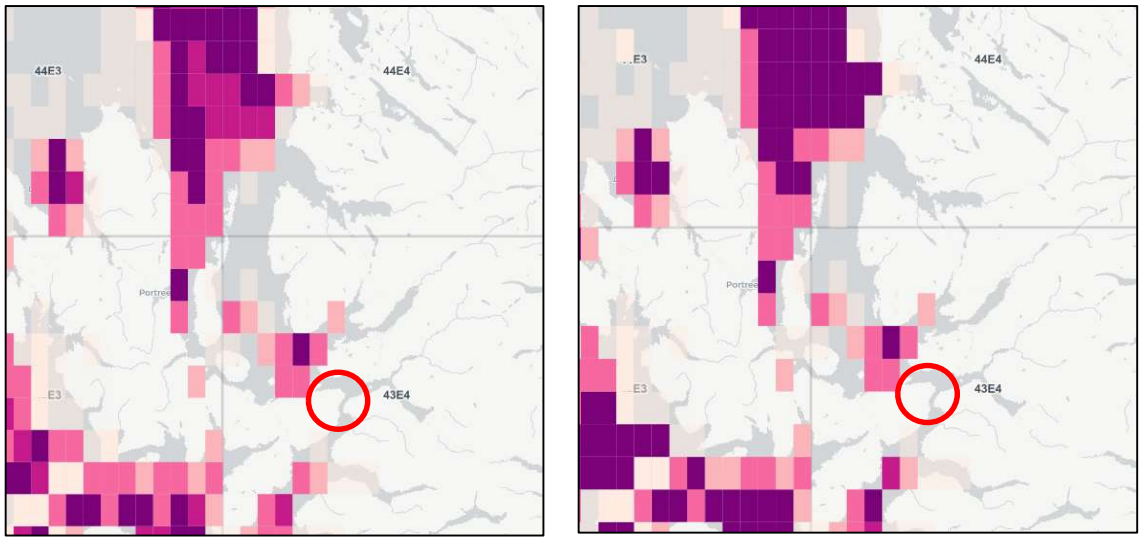
Commercial Fisheries

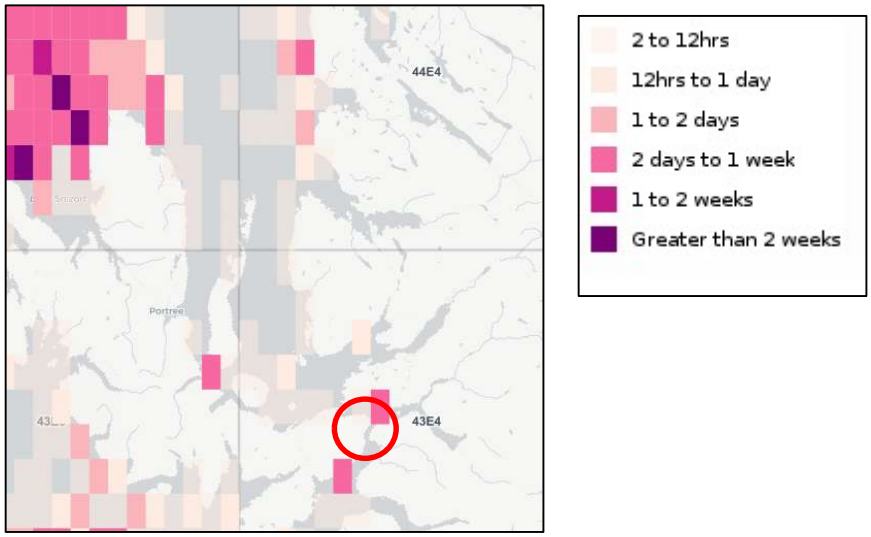
Baseline

As further discussed in the Shipping and Navigation section, 1,493 vessels transited the Kyle Rhea strait in 2019 that were engaged in the fishing industry. This number makes up the highest vessel type transiting the strait, however as discussed below, the fishing activity in the strait is considered low, compared with the surrounding region.

The Kyle Rhea strait falls within the ICES rectangle 43E4. Based on VMS fishing data on the NMPi interactive map from 2010–2020, the strait appears to be a relatively low intensity area of commercial fishing, with some dredge fishing activity in the areas immediately to the north and south, presented in Figure A-6.

Figure A-6: VMS fishing intensity average hours (top left: Nephrops and bottom trawls, top right: bottom trawls, bottom left: dredges) (MarineScotland 2022d)





Note: Red circle denotes Kyle Rhea Strait

Based on fishing data from the Marine Scotland Sea fisheries statistics site (MarineScotland), in 2019, the most commonly fished catch type in ICES Rectangle 43E4 was Nephrops, which dominated the catch tonnage, followed by crab, scallop and sprat. Figure A-5 provides an overview of the catch tonnage and economical value for ICES Rectangle 43E4.

Table A-5: Fishing type value and tonnage in ICES rectangle 43E4 in 2019

Catch Type	Value	Tonnage	Percent (Qty)
Nephrops (Norway Lobster)	£3,603,493.05	669.94	57.47%
Crabs (C.P.Mixed Sexes)	£417,101.12	192.92	16.55%
Scallops	£300,028.65	131.37	11.27%
Sprats	£14,415.00	55.61	4.77%
Crabs - Velvet (Swim)	£71,288.16	22.05	1.89%
Green Crab	£16,162.80	17.34	1.49%
Thornback Ray	£14,365.70	16.90	1.45%
Lobsters	£227,445.35	15.35	1.32%
Monks or Anglers	£36,781.43	14.89	1.28%
Other	£653,960.37	29.31	2.51%

Potential Project Impacts

The presence of guard vessels in the Kyle Rhea strait has the potential to interrupt local commercial fishing activity. During the estimated 20 day replacement time, transit of the strait will be prohibited during operational working hours. This may cause some displacement of fishing activity, therefore potential impacts have been scoped into the MEA.

Shipping and Navigation

Baseline

In 2021 NASH Maritime was commissioned by SSE Networks to conduct a Vessel Traffic Study (VTS). The VTS assessed one full year of Automatic Identification System (AIS) data collected by MarineTraffic between Skye Bridge and the Sandaig Islands. The AIS data was collected for a full year from 01 January 2019 to 31 December 2019.

During 2019 there were a total of 3,347 transits through Kyle Rhea (an average of 9.2 per day). The AIS data can be subdivided into vessel categories. These include:

- 266 cargo vessels;
- 101 passenger vessels;
- 658 recreational craft;
- 29 tug and other service vessels.

Of these 3,347 vessel transits only a small number were considered to be 'Regular Runners' (defined as more than 6 transits a year), of which there were 78.

Potential Project Impacts

Conductor replacement will be conducted predominantly via the existing cables, with the potential use of guard vessels in the Strait during periods of replacement. This could include up to 20 days of guard vessel presence in the strait. Potential impacts from the presence of vessels in the water include the following:

- Displacement of vessels through the presence of the guard vessels and periods of time where vessel navigation would be prohibited during conductor replacement (estimated to be 20 days);
- Collison risk through increased inherently through vessel presence associated with the project;
- Disturbance to search and rescue through presence of project vessels and potential periods where navigation beneath the conductor would be prohibited.

Given the potential impacts identified above, shipping and navigation has been scoped into the MEA.

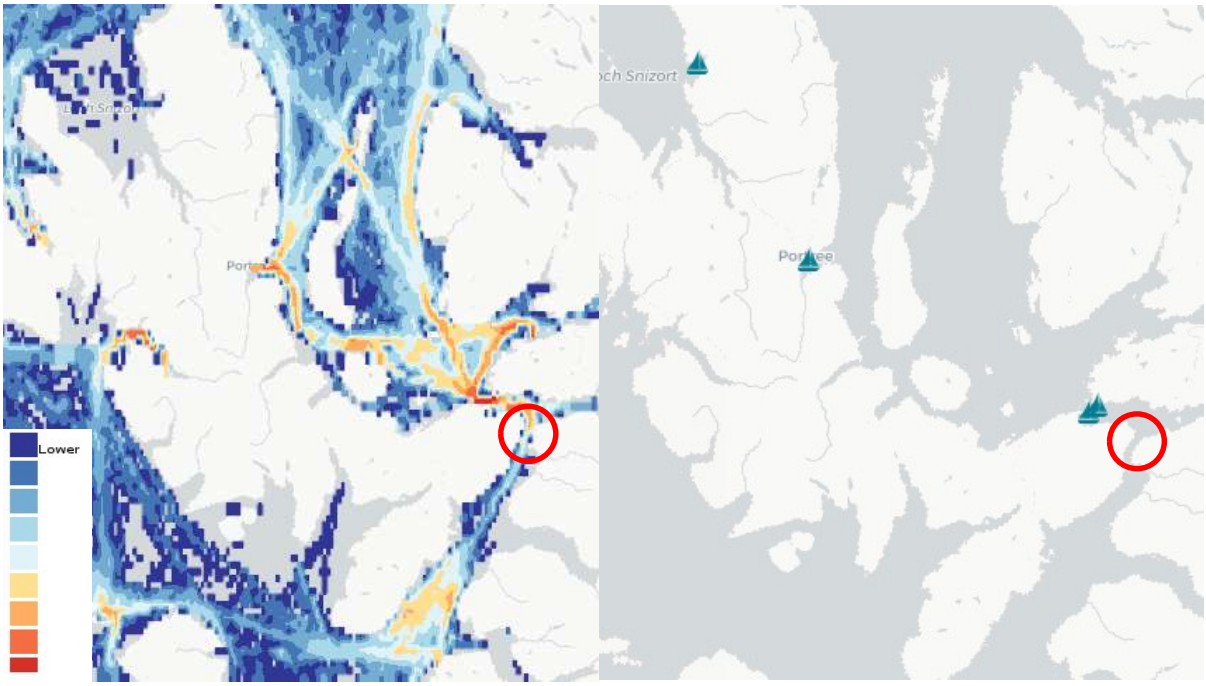
Tourism and Recreation

Baseline

Sailing

The inland waters of the west coast of Scotland are popular with sailors and other recreational craft users. Figure A-7 presents intensity data for Royal Yachting Association (RYA) UK sailing boats presented in the left-hand plate. Sailing appears to be popular, with clear routes leading from the RYA designated marinas of Kyleakin and Kyle Harbour approximately 10 km northwest of the project site (Figure A-7 right hand plate). There are, however, no RYA Sailing Clubs, designated sailing areas or RYA Training Centres within 10 km of the project site.

Figure A-7: AIS RYA leisure boat density (left) and RYA marinas (right)



Dive Sites

The waters surrounding Skye are popular amongst divers, given its clear water and high ecological activity. Based on dive hot spot data presented on the Marine Scotland interactive mapper it is understood recreational drift diving occurs around Skye, with a higher density along Kyle Rhea strait.

Sea Kayaking

Sea kayaking and canoeing is popular around western Scotland and Skye, and the Kyle Rhea strait is particular popular, given the high tidal flow of the channel.

Nature Tourism

The isle of Skye is a hub for wildlife and attracts wildlife watchers from a wide outreach. The following wildlife can be observed on Skye (Isle of Skye 2022a):

- Dolphin;
- Golden eagle;
- Otters (Hide);
- Pine marten;
- Red deer;
- Sea eagle;
- Whales.

The Kyle Rhea strait has an otter hide on the western (Skye) side of the channel, approximately 200m inland of the Glenelg to Kyle Rhea ferry port, which is often used by tourists for viewing wildlife including otters and seals (Isle of Skye 2022b).

Potential Project Impacts

The project has the potential to disturb recreational marine users, such as sailors, kayakers and divers, as well disturbance to wildlife tourists and their observational targets (otters and seal). The potential for collision is also increased during operation due to presence of guard vessels. This will however be a temporary disturbance and increase collision risk for only approximately 20 days during conductor replacement operations. Similarly notice to mariners through appropriate channels will be issued prior to start of the project. There are anticipated to be no significant impacts resulting from the project on tourism and recreation and so further assessment has been scoped out of the MEA.

Aviation and Military

Baseline

Aviation

Approximately 15 km east of Kyle Rhea is Broadford airport. It is possible air traffic could be present at low heights close to the project area. However, given that the peaks between Kyle Rhea and the airport (Sgurr na Coinnich) reach over 700 m, it is unlikely there will be aviation activity at a height which could interact with the conductor replacement.

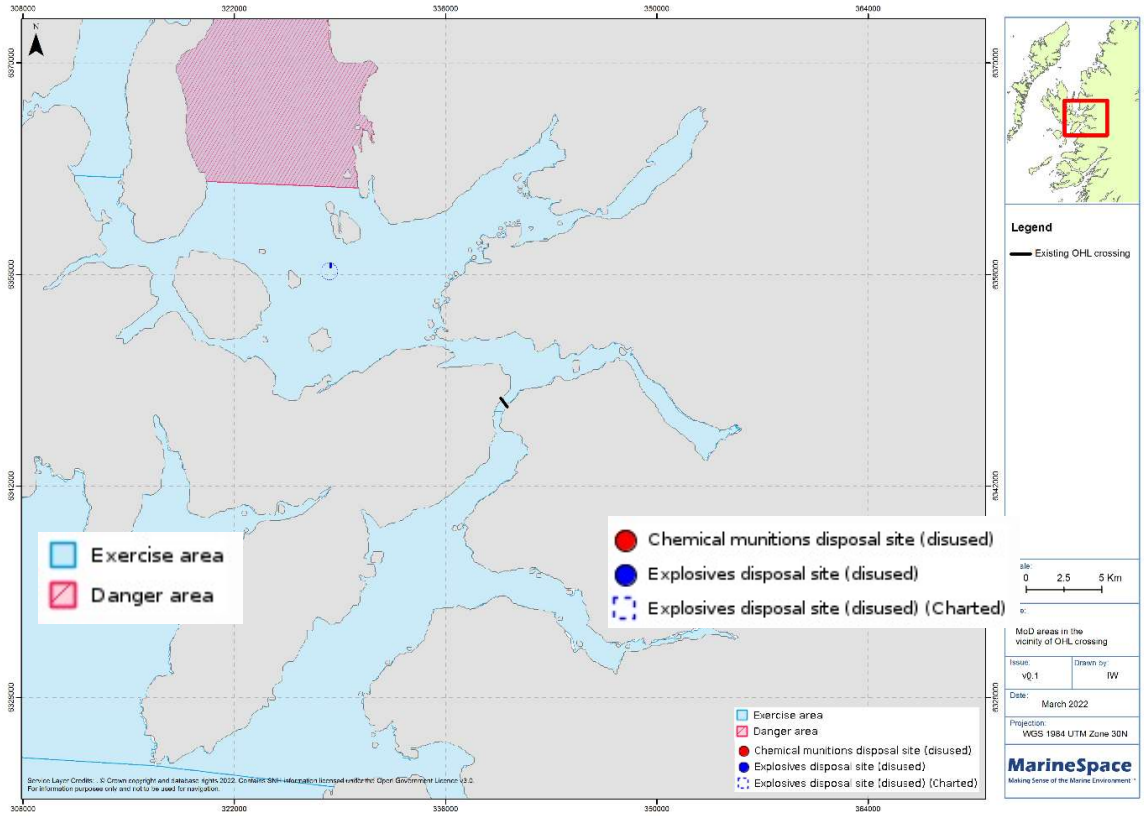
Military

The Kyle Rhea strait and surrounding marine areas are designated as military exercise areas (X5706), however most of the east coast of Scotland is designated as an exercise area. An area approximately 18 km northwest of the project area, between Raasay and mainland Scotland, is designated as a military Danger Area (D710) and presented in the Figure A-8.

As is presented in Figure A-8, a historic munitions disposal site is positioned between Skye and the mainland, approximately 15 km northwest of the project site.

The Royal Navy's British Underwater testing and Evaluation Centre (BUTEC) is located in the Kyle of Lochalsh and military activities, including military diving are carried out in the area.

Figure A-8: Designate military exercise and danger areas and areas of historic munition disposal sites



Potential Project Impacts

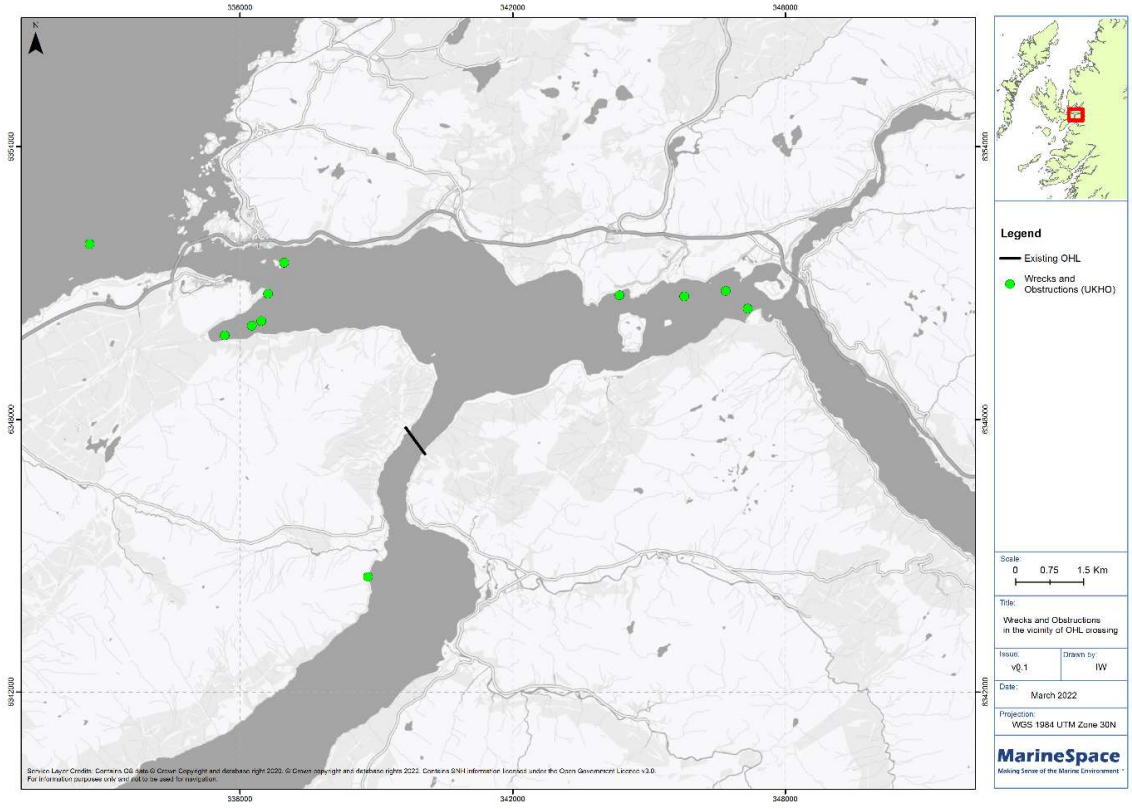
Movement of guard vessels may transit military exercise areas, however due to distance from military danger areas and the historic munitions site as well all relevant notice to mariners no impacts are anticipated.

Marine Archaeology and Cultural Heritage

Baseline

Several wrecks and incidents are listed on NMPi under the Historic Environment (Canmore) data set in Kyle Rhea, with registered wrecks according to the UKHO presented in Figure A-9, although none is known to be protected.

Figure A-9: National record of the historic environment: wrecks, losses and obstructions



The Bernera Barracks on the mainland is a scheduled Monument, approximately 3 km southeast of the OHL at its closest point over Kyle Rhea.

The following sites are registered on Historic Environment Scotland (HES) as listed buildings and are all within 1-2 km from the project works at their closest point (Historic Environment Scotland 2022):

- Glenelg Slipway is a Category B listed building on the mainland;
- Kyle Rhea Old Ferry Inn is a Category B listed building on the mainland;
- Kyle Rhea Old Inn is a Category B listed building on Skye;
- Kyle Rhea Slipway is a Category B listed building on Skye.

Potential Project Impacts

Given the project methodology is for conductor replacement via the existing infrastructure, there are limited impact pathways for interaction with known wrecks, or other coastal archaeology or cultural heritage receptors and, therefore, no significant impacts are anticipated and marine archaeology and cultural heritage has been scoped out of the MEA.

Seascape and Visual Receptors

Baseline

The Kyle Rhea strait is characterised by a long linear channel, enclosed steep valleys on both the mainland and Skye sides of the Strait. The area, in general, is a highly scenic landscape as is common on Skye and northwestern Scotland.

The Knoydart National Scenic Area (NSA), is approximately 8 km south of the OHL at its nearest point, has outstanding scenic value derived from the combination of sea lochs and rugged mountains (Nature Scot 2022e). To the north of the site exists a Local Landscape Area, in the Inner Sound, to the northeast of Skye. The seascape of the west coast of Scotland is characterised by views of long, narrow stretches of water between land masses creating highly scenic landscape with a variety of views experienced with the backdrop of the sea. The visual aspect of the Kyle Rhea strait includes ferry crossings within this stretch of water.

Potential Project Impacts

The installation of an OHL to the area has the potential to interact with the local scenic value of the area, however given the project intends on replacing only the conductor cables in a like for like replacement there will be no long-term change to the current visual baseline. Guard vessels will be present for the duration of the works, however these will be of temporary duration. In addition, the Kyle Rhea strait is currently the site of shipping activity, therefore additional vessel movements will not change the current seascape character. Impacts are not anticipated, and seascape and visual impacts have been scoped out of the MEA.

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