The Farr Point Wave Farm Development

Request for Scoping Opinion

Prepared by Aquatera on behalf of Pelamis Wave Power

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Contents

List of figures and tables

1 Introduction

In September 2009 The Crown Estate announced the first marine energy leasing round in the UK for the Pentland Firth and Orkney Waters Strategic Area. This established a competitive process for lease applications which PWP entered into. In March 2010, the Crown Estate announced that a series of 'Agreements for Lease[1]' (AFLs) had been awarded to wave and tidal developers. The leases were awarded to nine companies, covering eleven sites, to develop up to 1.6 GW of marine energy.

Pelamis Wave Power (PWP) was successful in securing an AFL for the phased development of a wave energy project off Farr Point on the north coast of Sutherland. Phase 1 of the Farr Point Wave Farm project could connect up to 15MW of capacity by 2014 and constitute an early major milestone for the marine energy sector. Achieving such a timescale would place the UK, Scotland and Sutherland at the forefront of this emerging global industry.

PWP is aiming for this to be the first phase of a larger project, which will see the installation of up to 50MW capacity by 2020. This is the maximum amount covered by the existing AfL. However, such future phases, beyond the initial 15MW will be subject to separate planning applications, as and when required and are not included within this Scoping Report.

This Scoping Report has been produced to provide an overview of the technology and proposals to develop Phase 1 at Farr Point. This document also provides an initial high-level screening of the potential key impacts and opportunities likely to be associated with the development along with proposed methods for assessing these impacts and opportunities. The regulatory context is outlined along with PWP's proposed Environmental Impact Assessment (EIA) method and community and stakeholder engagement and communication strategy. A Preliminary Hazard Analysis (PHA) is also presented which will inform the structure and scope of the project Navigational Risk Assessment (NRA) which will be undertaken in parallel with the wider EIA work (refer to Appendix I). Additionally, a preliminary screening of the potential effects upon Natura Interests is included (refer to Appendix II) which will be developed throughout the EIA process.

This Scoping Report has been informed by the responses received following the issue of an initial Project Description Document[2] to key stakeholders along with a series of preliminary stakeholder meetings (refer to Appendix III). The following stakeholders received the Project Briefing Document last year (those highlighted submitted a response):

[1] The AFL enables PWP to undertake development activities; including environmental assessment, geotechnical survey and resource investigation.
[2] A Project Description Document was circulated to a number of stakeholders during 2010. Feedback to this has helped to inform the structure and content of this Scoping Report.

- **Scottish Natural Heritage**
- Marine Scotland
- **Scottish Fishermen's Federation (meeting held)**
- **Highland Council (response via Pre-Application Process for Major Development)**
- UK Department of Energy and Climate Change
- Crown Estate
- The Highland Council Harbour Authority
- **Scottish Environment Protection Agency** (response via Pre-Application Process for Major Development)
- **Ministry of Defence**
- **Marine Coastguard Agency**
- Northern Lighthouse Board
- Department for Transport
- **Health and Safety Executive**
- Historic Scotland
- **The Fisheries Committee**
- Joint Nature Conservation Committee
- Chamber of Shipping

PWP plans to hold a number of similar stakeholder meetings in the coming months to discuss the results of this Scoping Process and to gather further information regarding the proposed plans and the potential interactions with the receiving environment.

2 Company Background

Pelamis Wave Power (PWP) was founded in Scotland in 1998, under its former name of Ocean Power Delivery. The company was established to develop and commercialise the Pelamis wave energy converter with the overall aim being to provide a new way of harnessing wave energy in response to an increasing global demand for renewable energy generation[3].

In the twelve years since its inception, the company has achieved the following unrivalled key milestones:

- World's first export of electricity from an offshore wave energy converter into an onshore grid network, achieved with the full-scale prototype Pelamis at the European Marine Energy Centre (EMEC) in August, 2004.
- World's first commercial order for wave energy machines when Portuguese utility Enersis ordered three Pelamis units for a wave farm off Portugal in 2005.
- Supply and commissioning of the World's first wave farm and export of power from array to Portuguese electricity network in 2008.
- The UK's first commercial order for a wave energy converter by E.ON for a Pelamis machine in 2008.

Figure 2.1 Full scale Pelamis prototype under test at EMEC, 2004.

- A concerted expansion of the engineering, manufacturing and operations team; PWP currently directly employs over 70 staff[4] making it one of the largest UK based renewable energy technology manufacturers.
- Establishment of a suitable office and manufacturing facility in Edinburgh that will enable PWP to de-risk the delivery of the technology to supply the next commercial contracts before facilitating a wider engagement of the supply chain.

[3] Wave energy is estimated to be capable of displacing 2 billion tonnes of carbon dioxide emissions per year from conventional thermal generation.
[4] Staff are currently located in Edinburgh and Portugal.

- Raising further private funding; in the second half of 2008 PWP closed a further funding round where the company raised £5m funding, bringing cumulative private investment into Pelamis Wave Power to over £50m.
- First developer to achieve 'Official Saltire Prize Applicant' status for the proposed development at Farr Point.

This sustained success in the wave energy sector has been built upon a growing investment in the technology and team delivering the technology to the market place. For example, PWP has established an in-house Project Development team incorporating engineering, hydrodynamics, resource assessment and environmental expertise. The Project Development team is independently developing a portfolio of Scottish sites. In addition it supports PWP customers in delivering fully consented sites to ensure a secure foundation for the sector. Current technology deployment and project development activity is summarised in Table 2.1.

Table 2.1 Summary of current activity in the UK

Partners	Location	Project	Deployment Date
E.ON	EMEC	750kW	Summer 2010
SPR[5]	EMEC	750kW	Expected summer 2011
Vattenfall	Shetland	10 MW	Expected summer 2014
N/A	Bernera, Lewis	10-20MW	Expected summer 2014
N/A	**Farr Point, Sutherland**	**15MW (Phase 1)**	**Expected summer 2014**

In addition, Pelamis technology has been selected as the preferred technology for two further sites awarded under the Pentland Firth and Orkney Waters Leasing Round. Scottish Power Renewables (SPR) and E.ON have secured 49.5MW and 50MW sites respectively; both of which are located off the west coast of Orkney. Ongoing technology development activities are being led by the customer in both cases.

Testing at EMEC is based on the first of the Pelamis 'P2' generation of machine design, led by EON at EMEC in Orkney (see Section 3 of this document for design details). The new P2 machine is a commercial evolution from the prototype machine developed and tested at EMEC in 2004. The new 'P2' retains proven systems whilst introducing design enhancements, which are mainly structural, to improve performance and help reduce overall generation costs.

[5] Scottish Power Renewables

3 Project Description

PWP is proposing to install up to 20 P2 machines off Farr Point, near Bettyhill in Sutherland. The following section provides details regarding the proposed development under the following topics:

- Proposed project location
- Technical overview of all relevant project components:
    - Technology; Pelamis P2
    - Pelamis mooring system
    - Pelamis array configuration
    - Export cable and landfall
    - Other associated offshore infrastructure
    - Onshore works and associated infrastructure
- Summary of the key activities that will be undertaken over the project's lifetime
    - Installation
        - Mooring system installation
        - Interconnector cable installation
        - Pelamis installation and connection to the mooring system
    - Operation and maintenance
        - Operations
        - Maintenance
    - Decommissioning

More detailed technical information regarding the technology and associated components is presented in Appendix IV of this report.

3.1 Proposed Project Location

Figure 3.1 shows the 'area of search'[6] within which PWP is proposing to locate the Farr Point Wave Farm. Details of indicative site layouts are shown in Figures 5.3 and 5.4. The coordinates for the corners of the area of search are:

- 58º 40' 00", 4º 12' 15"
- 58º 34' 45", 4º 12' 15"
- 58º 34' 45", 4º 22' 30"
- 58º 40' 00", 4º 22' 30"

The area has been identified as a potential development site through initial site investigation and analysis based on a number of key technical, operational and environmental criteria, including:

[6] The 'Area of Search' is approximately 100 km^2; the maximum area a 20 machine array would occupy is approximately 3 km^2 which is under 3% of the 'Area of Search'. The boundary shown is not indicative of the size of the wave farm; instead showing an area of exclusivity and wider survey area which will be investigated by PWP. The final size, design and location of the farm will be defined through an iterative process with inputs from consultation, technical survey and assessment of environmental constraints.

- Exposure to predominant North Atlantic swell directions
- Sufficient water depth for Pelamis moorings (greater than 50m)
- Proximity to shore, SW corner lies approximately 3km off the mainland coast
- Close proximity to several cable landfalls making offshore cables as short as possible
- Proximity to existing onshore electrical network infrastructure, including possible grid connection points
- Sheltered waters located close-by making routine maintenance interventions and transits to site as quick as possible
- Limited geotechnical information suggests that sufficient sediment cover is available for embedment anchors to be used
- Area lies outside main shipping routes
- Preliminary review of other sea users
- Preliminary review of designated areas and areas of ecological sensitivity

Figure 3.1 Project area of search.

This area of search will be further refined during the EIA process and defined within the Environmental Statement (ES).

3.2 The Technology: Pelamis P2

The Pelamis machines which will be deployed at the Farr Point Wave Farm will be P2 generation models (see Figure 3.2), the first of which has been built for E.ON's supply for testing at EMEC[7]. The design is an evolution of what PWP have previously built and operated at EMEC and in Portugal; offering improved future-proofing for performance and operations as well as numerous design advances to facilitate volume manufacturing.

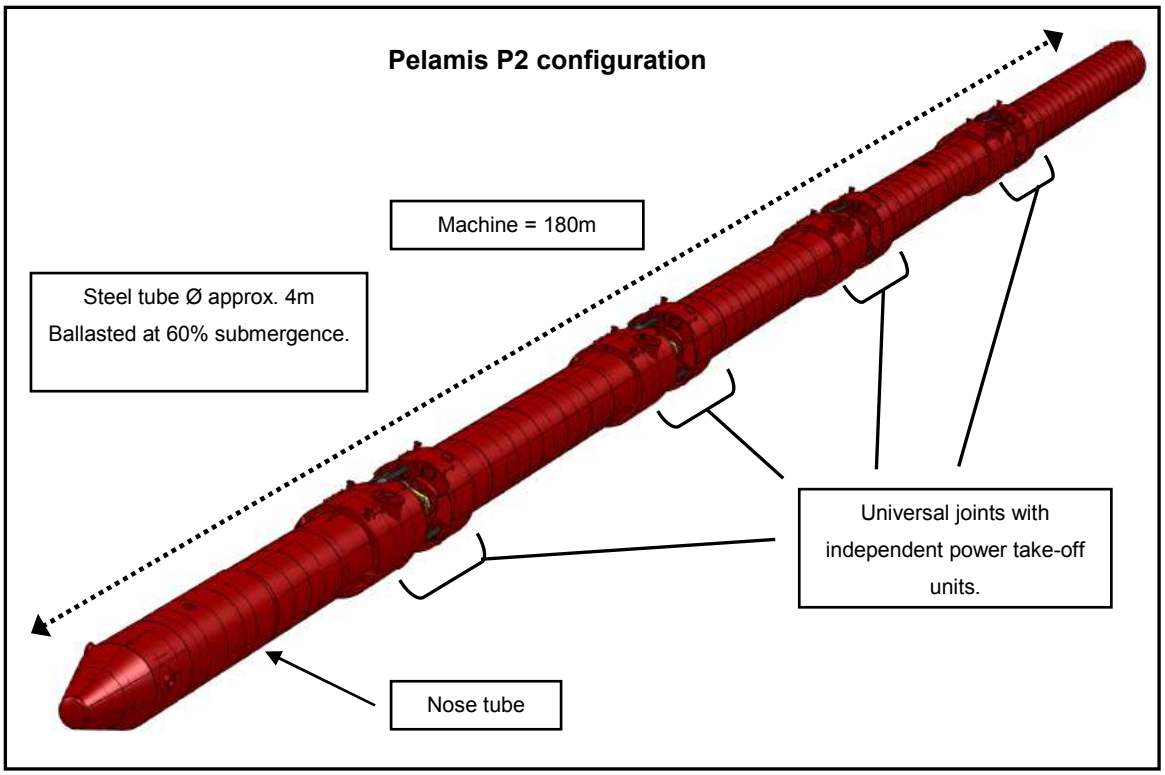


Figure 3.2 Pelamis P2

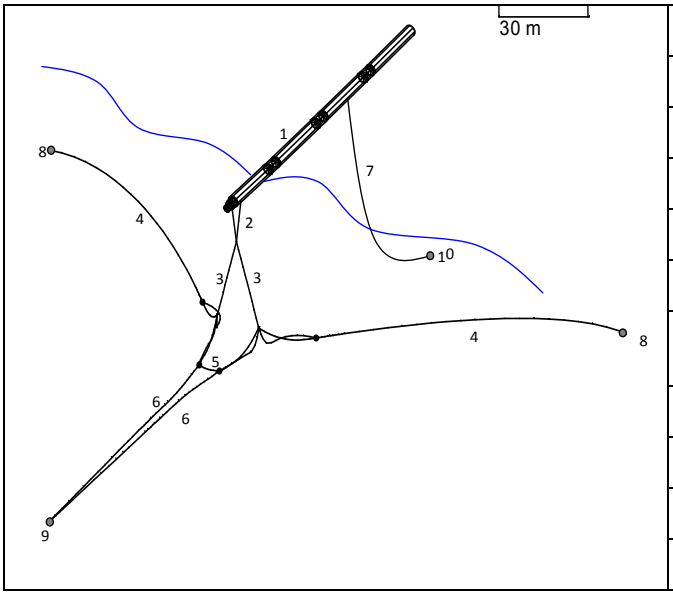
The general P2 concept is the same as in previous designs. The power take-off is through hydraulic rams which resist the bending moments between adjacent cylindrical tube sections. The rams generate high pressure hydraulic fluid which is used to drive generators distributed in power modules located within the tubes of the machine.

The electricity which is generated along the machine is fed back to the shore via a flexible cable from the nose of the machine which connects the floating machine to the fixed export cable on the seabed which takes the electricity back to shore. The electricity connection cables are integrated with fibre optic lines thus also providing the primary route for communications with the machine.

[7] PWP are currently in the process of manufacture and supplying the first P2 machine for clients E.ON UK. The machine is due to be installed at EMEC during 2010 for the start of a testing/demonstration programme.

3.3 The Pelamis Mooring System

Pelamis is held on station by a catenary mooring spread consisting mainly of steel chain and synthetic tethers, with the connection point to the machine being near the nose via a yoke attachment structure, as shown in Figure 3.3. The mooring system allows the machine to weathervane and orientate itself into the predominant swell direction by rotating around the forward central mooring point. The mooring system is designed for water depths greater than 50m. The primary choice for anchors is embedment anchors (the same as used for floating oil rigs), which require sites with sedimentary cover. If site conditions are not conducive for embedment equipment; PWP may employ alternatives such as gravity, or suction anchors.



Component	Description
1	Pelamis P2 – 180m
2	Yoke
3	Tether lines
4	Rear lines – studlink chain, 130m long
5	Front connection line
6	Front lines – studlink chain, 140m long
7	Yaw restraint Line
8	Rear embedment anchors – 4T
9	Front embedment anchor – 7.5T
10	1 or 2 x 20T clump weight anchor

Figure 3.3 Pelamis mooring system.

In order to reduce the sea space required for wave farms, the footprint of the mooring system has been designed to occupy as small a space as possible; whilst still fulfilling station-keeping requirements. The plan view of individual mooring system dimensions and excursions are shown in Figure 3.4.

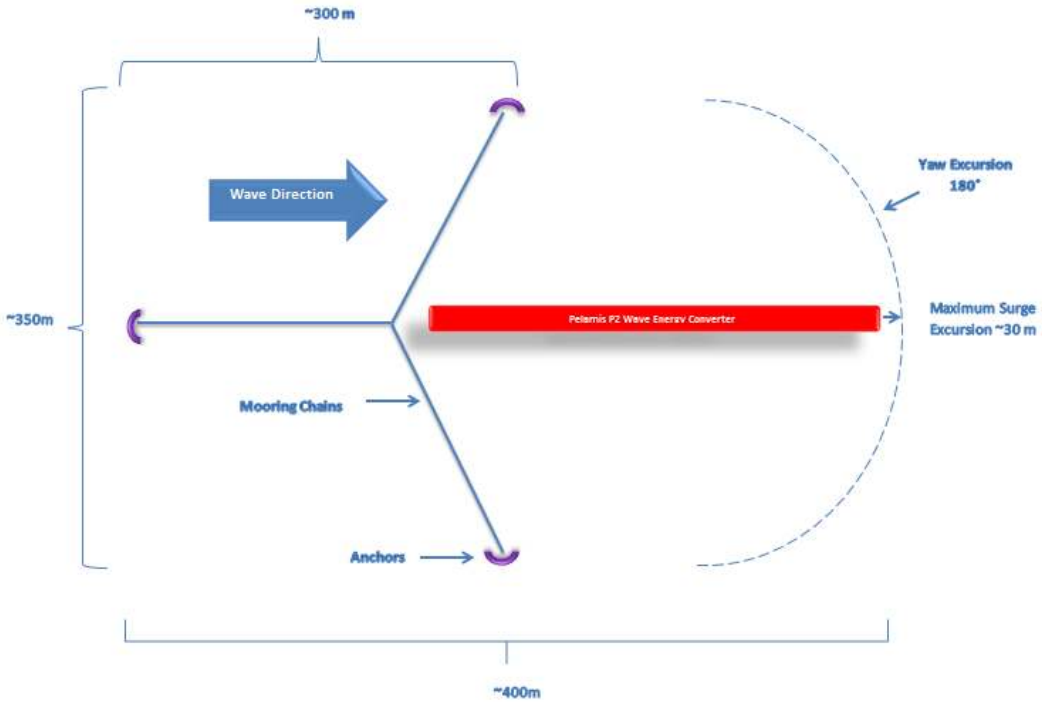


Figure 3.4 Mooring system footprint

3.4 Pelamis Array Configuration

Each machine within an array has its own discrete mooring system, as described and shown in the previous section, with mooring spreads installed facing into the predominant swell direction and avoiding overlap with neighbouring mooring systems.

Although the final wave farm configuration will be dependent upon the results of detailed site geophysical survey work, it is envisioned that machines will be installed in rows, with rows facing the predominant wave direction. Currently there is limited data on interaction effects of upstream rows on subsequent, lee-ward rows, and as such PWP would aim to limit the number of rows to three or less. Figure 3.5 shows a possible scenario for the mooring configuration of a 20 machine wave farm array.

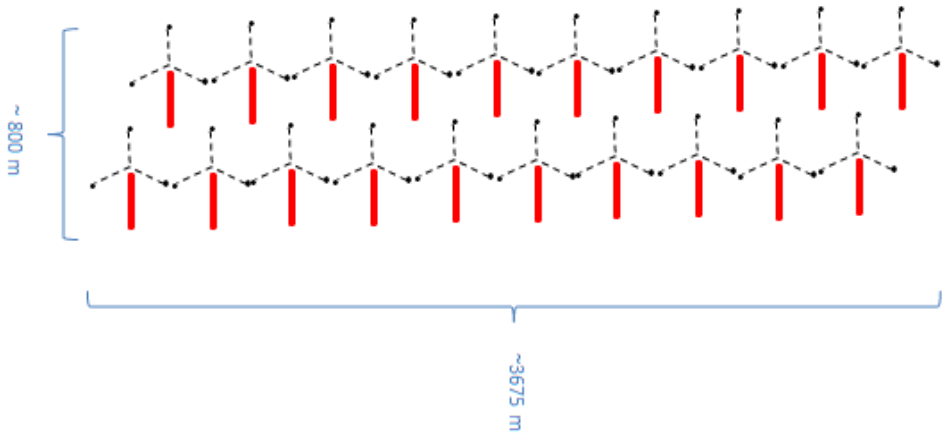


Figure 3.5 A 20 machine array – potential configuration

Machines within a row are electrically interconnected, in series, to other machines within the same row via flexible umbilical “interconnectors”. Interconnectors are installed mid water column (~15-20m depth) with the use of cable buoys and small weights, and have significant slack within their lines to allow for movement of machines relative to their individual moorings as well as one another. A single row of machines is connected to the static export cable (on the seabed) by a dynamic umbilical “downfeeder” cable which is spliced to the static cable. The graphics in Figure 3.6 show the electrical cable layout for a 3 machine row.

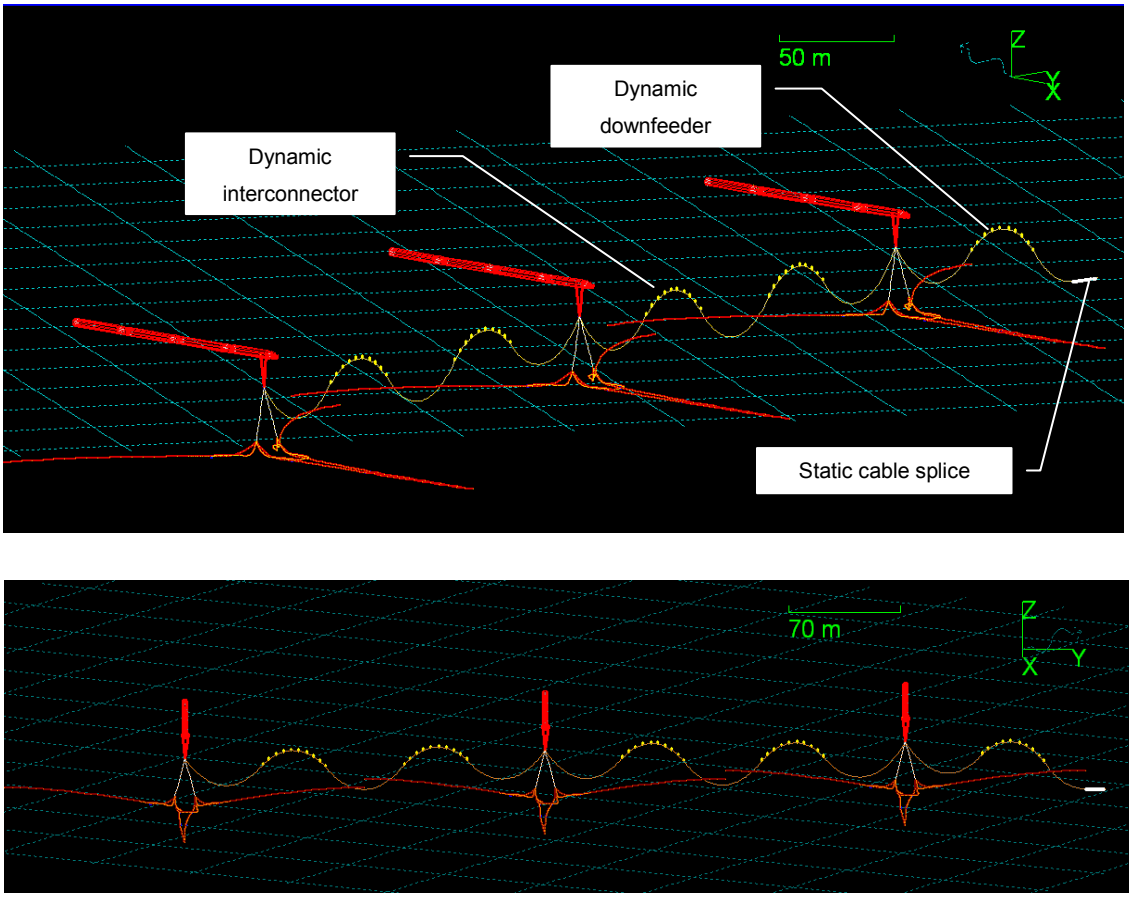


Figure 3.6 Electrical interconnection of machines within a row.

3.5 Export cable and landfall

The options for the route along which the subsea cable(s) connecting the project to onshore facilities takes, as well as the cable protection and shore landings, will be further defined following detailed project design work and the results of site and cable route surveying. This cable will be installed by an external contractor and will require the use of a specialist cable laying vessel.

There are a number of suitable routes and landfall locations for the export cable (refer to Figure 3.7). Initial consultations have provided valuable information regarding suitability these routes and locations; PWP welcomes further views from consultees on potential cable landing points.

The cable(s) will most likely be less than 10 cm in diameter, but will be fully armoured for protection and for mass. They will be laid on the surface and may be subsequently buried or ploughed into the seabed. Where any cable has to cross bedrock additional crushed rock or prefabricated protection systems may be required. In addition to the beach type landfalls shown there is also the possibility for a directionally drilled landfall at a rocky coastline if the overall option evaluation shows this to be advantageous.

A further factor to consider is the number of cables which may need to come ashore. This will depend upon the number of wave energy devices that can be linked to one another out at sea. It is currently anticipated that a single export cable will be required. This will be further defined based on ongoing project design activities.

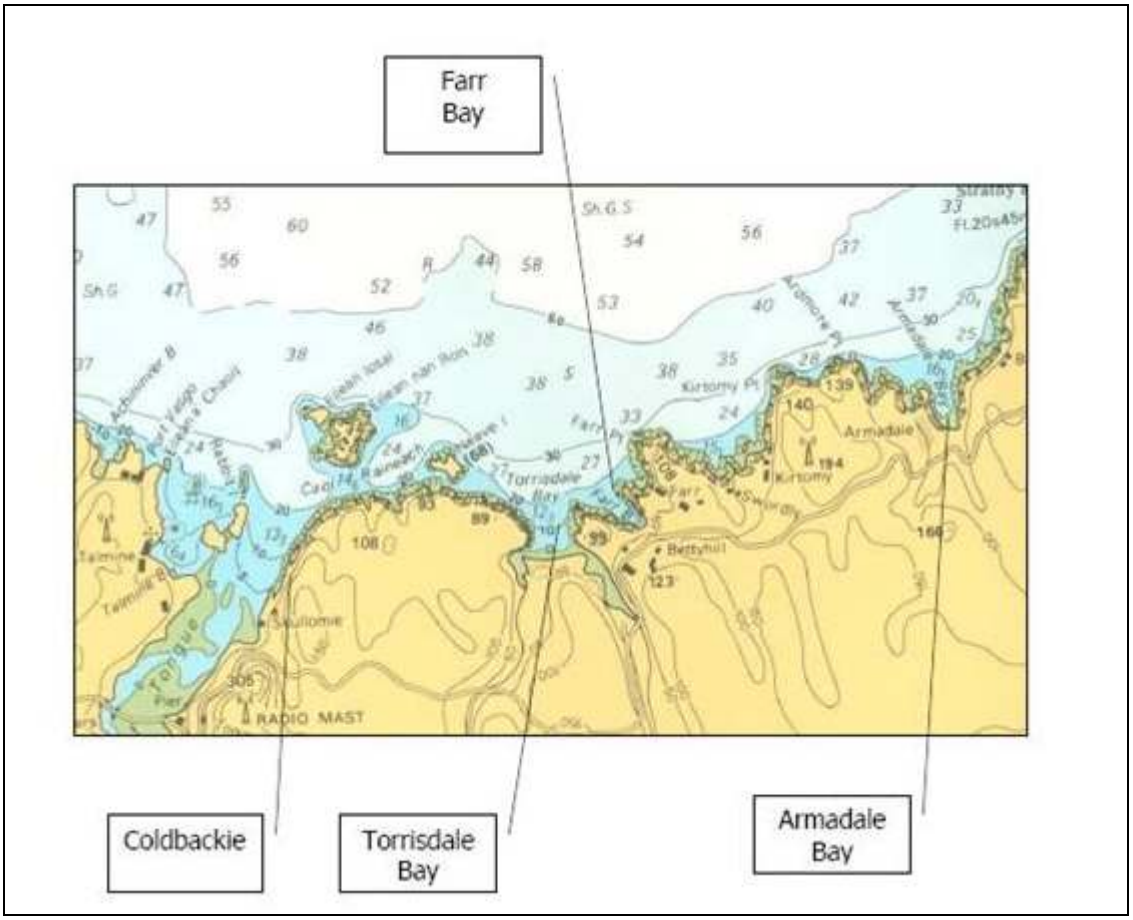


Figure 3.7 Potential landfall locations

In order to define the routes and locations most appropriate for the project an 'optioneering' process will be undertaken. The optioneering process seeks to go through a phased analysis in which the fundamental barriers and imperatives are firstly indentified. The feasible options are then examined on the basis of absolute criteria of good and bad performance against defined performance levels. This establishes which options are acceptable.

The process then goes on the compare the acceptable options against each other on a relative basis. Experience has shown that such a comparative assessment can help differentiate between options that are rather similar. This process provides a ranked list of acceptable options.

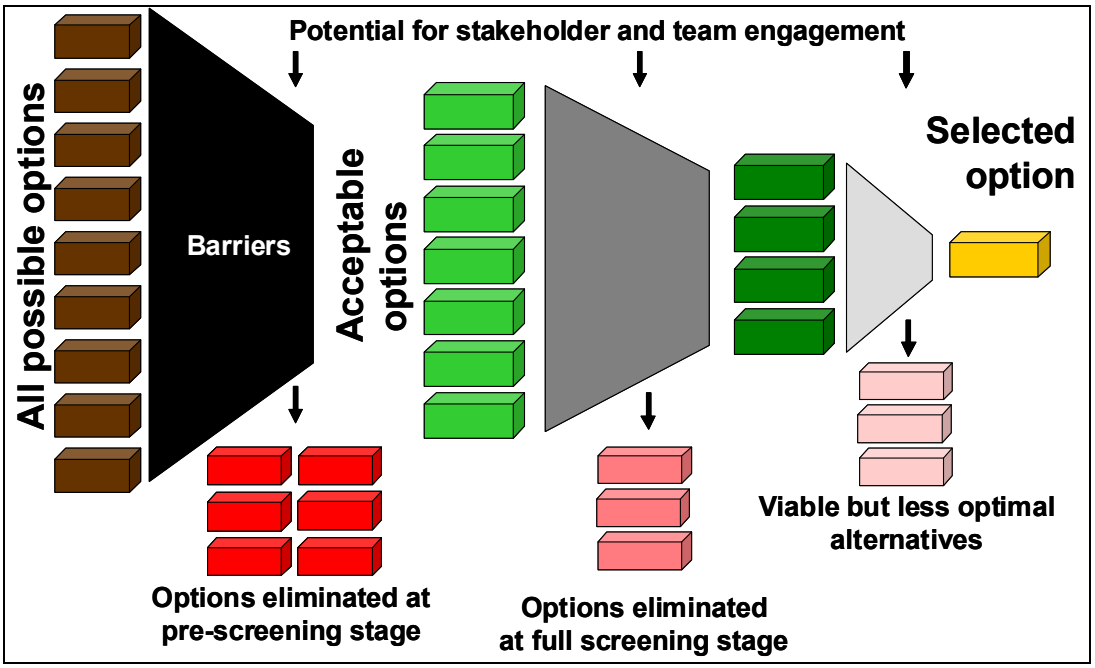


Figure 3.8 Optioneering process

The final stage is to validate the outcomes of the assessment and particularly to ensure that the factors driving the decisions are suitably robust and accurate. If, for example, one key value is responsible for selecting one option over another then it is prudent to ensure that that value is robustly and accurately derived.

3.6 Other associated offshore infrastructure

The site will most likely require cardinal marker buoys to be positioned to identify the site boundaries. This detail will be finalised in co-ordination and consultation with the Northern Lighthouse Board (NLB), Maritime Coastguard Agency (MCA) and other marine stakeholders.

In addition to cardinal markers, the project may have one or two waverider buoys/ADCP systems installed within the site for the duration of both construction and operation stages of the project. These would be consented separately with Marine Scotland.

3.7 Onshore works and associated infrastructure

The power cable(s) from the array will need to connect to the existing onshore grid at a suitable grid connection point. The current grid connection agreement allows for a small upgrade to existing substation and there are existing substations along the north coast which may be appropriate (refer to Figure 3.9). However, there may be a need to establish a small substation compound, depending on

final cable landing point. The footprint of the substation would be around 30m by 20m and track access would be required. The favoured option for linking the landfall to the substation is for the connections to be cabled underground. However, there may be a number of reasons why this is not practical in which case overhead wires would be needed supported on wood poles.

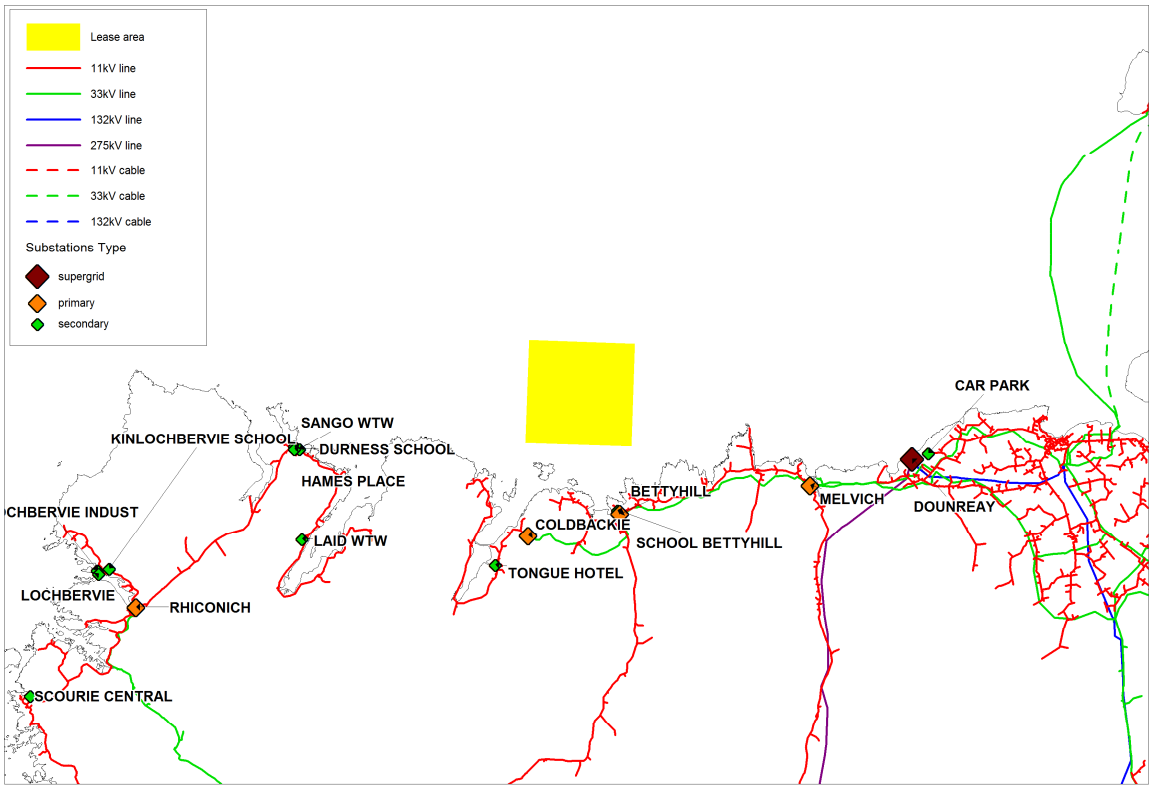


Figure 3.9 Substations along the north coast[8]

There will also likely be a need for a local supply and light maintenance base somewhere along the Sutherland coast, near to the array. Such a facility may be as simple as a storage compound alongside an existing slipway or pier; it may also comprise a small shed type workshop. The purpose of such a facility would be to provide suitable facilities for workers and visitors transiting to and from the site and for maintaining is site equipment such as marker buoys and data gathering devices, underwater inspection etc.

The larger scale maintenance of the devices and the cable may also be undertaken locally at a suitable location in Sutherland or alternatively may be undertaken from PWPs existing support base at Lyness, Orkney.

There are two options for consenting of such facilities, they can be covered under the marine licence arrangements, with The Highland Council key consultee in the process or the facilities may be

[8] Data received from Scottish Hydro Electric Transmission Ltd (SHETL), 2006

covered by separate onshore planning applications. Opinion is being sought as to which planning pathway is preferable.

3.8 Installation

3.8.1 Mooring system installation

PWP has demonstrated the installation of mooring components using a variety of vessels including; 4-point moored barge, multi-cat (multi-category) work boat and anchor handler tugs (AHT), in order to make installation programmes responsive to vessel availability and market conditions. It is likely that PWP would look to use an AHT for the majority of the moorings installation work at Farr Point Wave Farm.

AHT's have integrated GPS dynamic positioning (DP) capabilities and therefore do not require mooring hardware themselves to stay on station whilst installing equipment, but are kept on station by propulsion. AHT's range in size, but a vessel envisioned for Pelamis mooring installations may be >50m length, 16m beam, 6m draft with gross/deadweight tonnage exceeding 2,000 tonnes (Figure 3.10).

It is also likely that PWP will seek to use a multi-cat vessel for lighter parts of the onsite construction and commissioning work. Multi-cat's are highly versatile work vessels used throughout UK waters. A standard multi-cat for use within a Pelamis wave farm would be around 25m in length, 11m in beam, and 3m draft with a gross/deadweight tonnage of approximately 500 tonnes (an example of which is shown in Figure 3.11).

Figure 3.10 Anchor handler tug

Figure 3.11 Multi-cat workboat

Given the positional accuracy required for anchor and component placing within the onsite construction works, in addition to onboard procedures and risk assessments; onsite construction activity will be weather sensitive according to onsite wave conditions. It is likely that AHT's will have larger operating windows, potentially up to 2m wave height for some operations, as well as an ability to be onsite working constantly for a number of days (as they have sleeping quarters). The calmer periods of the summer would be targeted for onsite construction work (typically May – September), and a works programme would be developed to complete all onsite construction activities within this period.

It is likely that the installation vessel will not have sufficient storage space to hold all the anchors, chains and tethers for the entire wave farm. Therefore it is likely that a number of "load-out" trips will be made; where components will be loaded-out onto the installation vessel from a quayside facility/lay-down area in the local vicinity, or potentially transited to site using a barge or multi-cat.

All mooring components are laid on top of the seabed or will float in the water column. Embedment anchors (see Figure 3.12) will be "set" into the seabed at their specified positions; the process whereby the anchor is placed on the seabed and, with the mooring line fixed on the installation vessel; the anchor is pulled by the vessel until the correct tension load is being held by the anchor. The action of doing this, combined with the fluke design of the anchor will fully embed the anchor into the seabed.

Figure 3.12 4t Stevpris embedment anchor

Installation positions are designed and recorded with GPS accuracy (accurate within <1m).

3.8.2 Interconnector cable installation

The cables which link the devices together and the offshore connection points will need to be laid; probably after the moorings but before the devices themselves are installed. Cable laying works will in all likelihood be undertaken by specially adapted workboats with position holding capabilities. Such vessels would also be used to undertake repairs to the interconnector cables if and when faults or damage occur.

3.8.3 Pelamis installation and connection to the mooring system

Fully commissioned machines will be towed to site for installation using anchor handling type vessels or two medium sized multi-cat vessels. Once onsite, Pelamis machines require very little vessel base support to become installed, the operations are undertaken using a removable installation winch combined with a TLA Tether Latch Assembly (TLA) system. This is an "all-in-one" attachment system allows the machine to be fixed to its front moorings by the yoke structure, at the same time as connecting it into the onsite electrical infrastructure. The latching assembly is located at the top of the synthetic mooring tether lines and, when it is not connected to a machine, is held mid-water (approximately 20m depth) by surface or subsurface buoys. TLA's will be installed along with the mooring and electrical infrastructure before the Pelamis machines themselves are installed. They will be buoyed-off with marker buoys until the machines are installed onsite.

Once connection is complete, control of the machine is handed over to the onshore control facility and the machine can start generating electricity. The installation process takes approximately 1 hour to complete from arrival on site.

3.9 Operation and maintenance

3.9.1 Operations

Machines are controlled and operated from an onshore operations centre, where operators can monitor the status of machines and sub-systems as well as plan any required maintenance activities.

The Pelamis control system raises the operator's awareness to a potential fault through an alarm system; this includes station keeping which is monitored for each machine with GPS tracking. Monitoring and control would be carried out, via computer consol interfaces at a local control room, with remote monitoring also possible from PWP's central office in Edinburgh.

Figure 3.13 Access for light maintenance used in Portugal

3.9.2 Maintenance

PWP's maintenance strategy for Pelamis is to have no manned intervention with a machine at sea. This requires machines to be recovered to harbour, or sheltered water facilities, for all inspection, maintenance and repair work. Therefore, the availability of a suitable harbour or sheltered water area in the proximity to the wave farm site for the siting of a service base is of key importance. Details of precise locations will be provided within the ES based on further investigation[9]. Potential impacts and opportunities associated with each option will be addressed within the ES.

The removal of a machine from site is largely the reversal of the installation process outlined in the previous section, and can be carried out by a single vessel. From arrival onsite to having a machine ready to tow takes approximately 30 minutes. Given the need for a suitable vessel(s) for maintenance activities; it is envisioned that the project would have a permanent local vessel presence, with a strategy to off hire vessels locally when not required.

[9] Alternatively, onshore requirements may be consented separately under terrestrial planning legislation.

Figure 3.14 Boat-based maintenance used in Portugal

Maintenance work may be conducted all year round by a locally based maintenance team, though where possible any work would be scheduled outwith the winter months. Standard maintenance operations do not require significant infrastructure and can even be serviced suitably from temporary floating pontoons. This is similar to the maintenance facilities which PWP has utilised previously (see Figure 3.13 and Figure 3.14), and removes the requirement for extensive quayside facilities.

3.10 Decommissioning

Decommissioning of a Pelamis machine and associated onsite infrastructure is both relatively simple and low cost. The machines themselves are removed from site under normal maintenance intervention protocol and will be taken to a suitable facility for decommissioning where materials and components will be recovered for scrap, reuse or disposal. The moorings systems and electrical infrastructure can be recovered from the seabed and removed in their entirety using a wide variety of readily available vessels (See Section 4.4.2 for anchoring technology). It is likely that certain mooring components will be able to be refurbished and reused in future projects.

PWP have already successfully demonstrated the complete removal of a mooring spread and decommissioning of a machine when they replaced the full-scale prototype's mooring system at EMEC in 2007 over several days. A Decommissioning Plan will be provided based on the guidance for decommissioning of offshore renewable energy installations under the Energy Act 2004, and submitted to DECC[10]. The detailed schedule, methodology and necessary financial arrangements for the decommissioning programme will be determined closer to the end of the life of the project. It is expected that decommissioning would take place at the end of a standard project life of 20-25 years.

[10] Department of Energy and Climate Change

4 Key legal and policy requirements

A development of this type must meet the requirements of a number of regulations. These regulations, their relevance to marine energy developers and any actions required within the context of PWP's proposed development are summarised in this section.

Act/Legislation	Relevant Authority	Relevance to developers	Actions Required
Marine Act 2010	Marine Scotland	MS-LOT is a core regulatory group whose members are responsible for the assessment of applications, ensuring compliance with all relevant legislation and related permissions (FEPA, CPA, EPS, Section 36) MS-LOT also has access to some detailed site specific information. Marine Scotland's Science team has expertise in a range of topics that are key to understanding the marine environment and is developing the application of this expertise in regards to renewable development. MS-Science has an important advisory role to play in relation to MS-LOT, and may be called upon for scientific and technical advice.	Marine Scotland is the regulator for the marine environment and responsible for decision making on the key consents. Scoping report to be issued and meeting with Marine Facilitators Group to be held following during scoping period.
Crown Estate Act 1961	The Crown Estate	The Crown Estate, as owner of virtually all the seabed out to the 12nm limit, plays a vital role in the cables and pipelines business, offshore aggregate dredging and the development of offshore renewable energy. The Energy Act 2004 vested rights to The Crown Estate to license the generation of renewable energy on the continental shelf within the Renewable Energy Zone out to 200nm. Those wishing to deploy a wave or tidal energy device or small array of up to 20 devices with an aggregate capacity of less than 10 MW in UK waters or the Renewable Energy Zone (REZ) beyond 12 nautical miles need to obtain permission from The Crown Estate (as owners of the seabed out to the 12 nautical mile territorial limit and with renewable energy rights in the REZ) in the form of a seabed lease or site option agreement.	**Pentland Firth and Orkney Waters Leasing Round (Round 1)** Pelamis has already secured an Agreement for Lease with the Crown Estate as a result the Pentland Firth and Orkney Waters Leasing Round. The AFL provides PWP with exclusivity over an area to undertake survey and feasibility assessments. A lease which enables the developer to actually go ahead with construction works will only be granted by The Crown Estate once the developer has conducted a site specific Environmental Impact Assessment (EIA) and obtained statutory consents and permissions from the Scottish Government.

Act/Legislation	Relevant Authority	Relevance to developers	Actions Required
Section 36 of the Electricity Act 1989 - Consent required for construction etc. of generating stations The Electricity (Applications for Consent) Regulations 1990 The Electricity Act 1989 (Requirement of Consent for Offshore Generating Stations) (Scotland) Order 2002 The Electricity (Applications for Consent) Amendment (Scotland) Regulations 2006	Scottish Ministers administered by Energy Consents Unit within the Scottish Governments' Energy Division	Applications to construct and operate power stations of a certain capacity are made to Scottish Ministers under section 36 of the Electricity Act 1989. Applications for powerlines and necessary wayleaves are made under section 37 of the Electricity Act 1989. Developers proposing the construction, extension or operation of a marine based generating station within Scottish territorial waters or the Scottish Renewable Energy Zone (REZ) will require Scottish Ministers consent under section 36 of the Electricity Act 1989. Consent under section 36 and section 37 of the Electricity Act 1989 usually carries with it deemed planning permission from the Scottish Ministers under section 57 of the Town and Country Planning (Scotland) Act 1997. Consent under section 36 of the Electricity Act 1989 is required for generating stations in excess of 50MW. The 2002 regulations decreased the threshold above which Consent under section 36 of the Electricity Act 1989 is required for generating stations to 1MW for generating stations situated in the territorial sea and wholly or mainly driven by water or wind. The 2006 regulations set out the new application fees payable for consent applications in Scotland under section 36 and section 37 of The Electricity Act 1989. On 1 April 2010, Marine Scotland - Licensing Operations Team (MS-LOT) became responsible for a range of statutory controls in waters adjacent to Scotland. MS-LOT manages work that was previously carried out in a number of areas within the Scottish Government including applications for consent under section 36.	This development is in excess of 1MW therefore requires consent under section 36 of the Electricity Act 1989. Application and environmental statement required. (Applications packs, guidance and a guide to the fees available on the Scottish Government website[11]. The application fees payable for consent applications for Construction or construction and operation of a generating station of megawatt capacity– exceeding 10 but not exceeding 100 is £15,000.00. Where s36 applications are located in areas where Gaelic is spoken, developers are encouraged to adopt best practice by publicising the project details in both English and Gaelic.

[11] www.scotland.gov.uk/Topics/marine/Licensing/marine/Applications

Act/Legislation	Relevant Authority	Relevance to developers	Actions Required
Section 37 of the Electricity Act 1989 - Consent required for overhead lines.	Scottish Ministers administered by Energy Consents Unit within the Scottish Governments' Energy Division	Consent under section 37 of the Electricity Act 1989 is required to install an electric line above ground.	No action required since this development is unlikely to require any additional overhead lines.
The Electricity Works (Environmental Impact Assessment) (Scotland) Regulations 2000 And The Electricity Works (Environmental Impact Assessment) (Scotland) Amendment Regulations 2008	Scottish Ministers administered by Energy Consents Unit within the Scottish Governments' Energy Division	These Regulations apply in the case of • any application under section 36 of the Electricity Act 1989[2] for consent to construct, extend or operate a generating station; or • any application under section 37 of the Electricity Act 1989 for consent to install or keep installed an electric line above ground. The regulations set out when the production of an environmental statement is required, the procedure for screening and scoping opinions by the Scottish Ministers, the content of an environmental statement, as well as the publicity and procedures for the completed environmental statement.	**Scoping opinion** Applicants minded to apply for Section 36 consent or Section 37 consent for a development that is or may be one which requires the production of an environmental statement under these regulations may ask the Scottish Ministers to state in writing their opinion as to the information to be provided in the environmental statement (a "scoping opinion"). A request for a scoping opinion shall be accompanied by- (a) a plan sufficient to identify the site which is the subject of the proposed development; (b) a brief description of the nature and purpose of the proposed development and of its possible effects on the environment; and (c) such further information or representations as the person making the request may wish to provide or make. **Preparation of an Environmental Statement** If deemed necessary under these regulations the applicant must prepare an environmental statement in line with these regulations.
Town and Country Planning Act (Scotland) 1997	Local Authorities	If any onshore works are required such as a small substation then planning permission may be required.	No action required - Consent under section 36 of the Electricity Act 1989 usually carries with it deemed planning permission from the Scottish Ministers under section 57 of the Town and Country Planning (Scotland) Regulations 1997.

Act/Legislation	Relevant Authority	Relevance to developers	Actions Required
Town and Country Planning (Fees for Applications and Deemed Applications) (Scotland) Regulations 2004	Local Authorities	All applications 50 MW and below for onshore development are made to the local authorities and they are able to charge a range of fees under the Town and Country Planning (Fees for Applications and Deemed Applications) (Scotland) Regulations 2004. Applications that require the approval of Scottish Ministers incur a fee under The Electricity (Applications for Consent) Amendment (Scotland) Regulations 2006.	No action required since the application is made and the fee is incurred under the Electricity Act.
Coast Protection Act 1949 Section 34 (Provisions for Safety of Navigation)	Scottish Ministers administered by the Scottish Executive, Ports and Harbours Branch	Under the Coast Protection Act 1949 Section 34 (Provisions for Safety of Navigation) developers require prior written consent of the Scottish Ministers to carry out any of the following around the coast of Scotland: (a)the construction, alteration or improvement of any works on, under or over any part of the seashore lying below the level of mean high water springs;(b)the deposit of any object or materials on any part of the seashore lying below the level of mean high water springs; or (c) the removal of any object or materials from the seashore below the level of mean low water springs, e.g. the dredging of minerals; where obstruction or danger to navigation is caused or is likely to result. On 1 April 2010, Marine Scotland - Licensing Operations Team (MS-LOT) became responsible for a range of statutory controls in waters adjacent to Scotland. MS-LOT manages work that was previously carried out in a number of areas within the Scottish Government including applications for consent under the Coastal Protection Act.	Application and environmental statement required. (see also Marine Works (Environmental Impact Assessment) Regulations 2007) Applications packs and guidance available on the Scottish Government website[12].

[12] www.scotland.gov.uk/Topics/marine/Licensing/marine/Applications

Act/Legislation	Relevant Authority	Relevance to developers	Actions Required
Food & Environmental Protection Act legislation	Scottish Ministers administered by Fisheries Research Services	Under the Food and Environment Protection Act 1985 a license is required from Scottish Ministers to undertake the following works: the placing of materials in the marine environment during construction, and related actions; the disposal of waste at sea; and the introduction of tracers and biocides and certain other activities in the marine environment. FEPA applies, amongst other things, to the deposit or placement of substances or articles and materials that it is proposed to use during construction. In the context of regulatory controls, the term construction applies widely to the use of materials for a broad range of works including, for example: marine construction works such as new harbours and marinas, marine structures / piers, outfalls, pontoons and jetties, offshore windfarms / energy facilities, flood defences sea walls. On 1 April 2010, Marine Scotland - Licensing Operations Team (MS-LOT) became responsible for a range of statutory controls in waters adjacent to Scotland. MS-LOT manages work that was previously carried out in a number of areas within the Scottish Government including applications for consent under the Food and Environment Protection Act 1985.	Application and environmental statement required. (see also Marine Works (Environmental Impact Assessment) Regulations 2007) Applications packs and guidance available on the Scottish Government website[13].
Harbours Act 1964 and any Harbour Revision Orders conferred under section 14 of this Act.	Local Authority	An approval or consent required for works inside harbour limits.	No action required as no works will be within any harbour limits.
Marine Works (Environmental Impact Assessment) Regulations 2007	N.A.	Scottish Ministers must also assess an application under the Marine Works (Environmental Impact Assessment) Regulations 2007 where the application relates to a regulated activity. Depending on the type and scale of the works the applicant may be required to produce an Environmental Statement in support of their application.	Inclusion of Environmental Statement as part of CPA, FEPA and Harbour works consenting process

[13] www.scotland.gov.uk/Topics/marine/Licensing/marine/Applications

Act/Legislation	Relevant Authority	Relevance to developers	Actions Required
The Energy Act 2004 (Part 2) - Chapter 2 (Marine Safety Zones) And The Electricity (Offshore Generating Stations) (Safety Zones) (Application Procedures and Control of Access) Regulations 2007	Secretary of State	Section 95 and Schedule 16 of the Energy Act 2004 set out the basic requirements for applying to the Secretary of State (for Business, Enterprise and Regulatory Reform) for a safety zone to be placed around or adjacent to an offshore renewable energy installation (OREI). Following public consultation, new regulations – 'The Electricity (Offshore Generating Stations) (Safety Zones) (Applications Procedures and Control of Access) Regulations 2007 (SI No 2007/1948) - were introduced in August 2007 clarifying these requirements so that applicants and other interested parties would fully understand the processes for applying for a safety zone and advertising such applications.	Where the Secretary of State, in consultation with the MCA, takes the view on the basis of the information provided in the section 36 applications that a safety zone should be established, the applicant will be expected to submit a formal application to BERR and serve notice of application on the Navigation Safety Branch of the Maritime and Coastguard Agency in Southampton (see Annex B for full address). For applications for safety zones around installations in Scottish or Welsh waters, the applicant will also be required to serve notice of application on the Scottish Executive or the Welsh National Assembly respectively.
The Energy Act 2004 (Part 2) - Chapter 2 (Renewable Energy Zones)	The Crown Estate	The Energy Act 2004 establishes a comprehensive legal framework to support renewable energy developments beyond territorial waters. The Energy Act 2004 also vested rights to The Crown Estate to license the generation of renewable energy and grant leases for development sites on the continental shelf within the REZ out to 200nm.	No action required since this development will be within territorial waters.
The Energy Act 2004 (Part 2) - Chapter 3 (Decommissioning of Offshore Installations)	DECC	Sections 105 to 114 of the Energy Act 2004 introduce a decommissioning scheme for offshore wind and marine energy installations. Under the terms of the Act, the Secretary of State may require a person who is responsible for one of these installations to submit (and eventually carry out) a decommissioning programme for the installation.	Decommissioning of marine renewable devices should be completed in line with the current regulations and policy (as detailed in the Department of Environment and Climate Change's "Decommissioning of offshore renewable energy installations under the Energy Act 2004").

5 Establishing the baseline environment

The following section provides an outline of the key environmental features within and surrounding the proposed area of search and the anticipated key data/information gaps.

During the pre-scoping process, PWP collated a substantial metadata catalogue which detailed all known available data and information sources with regards to the relevant environmental sensitivities within the proposed receiving area. This information broadly included:

- Bathymetry
- Geology, Seabed Sediments and Sediment Transport
- Weather and Climate
- Marine and Coastal Processes
- Seabed Contamination and Water Quality
- Benthic Ecology
- Fish and Shellfish
- Marine Mammals
- Marine Birds
- Protected Sites and Species
- Marine and Coastal Historic Environment
- Seascape Assessment
- Commercial Fisheries and Mariculture
- Shipping and Navigation
- Onshore Grid
- Cables and Pipelines
- Military Activities
- Disposal Sites
- Tourism and Recreation
- Ports locations and Facilities
- Noise Metadata Catalogue
- Electric and Magnetic Fields
- General Datasets
- Additional datasets and Data Sources
- Projects currently ongoing (data available in near future)

Datasets were identified for the area of search and the wider geographic region. The process also helped to identify data and information gaps which will be addressed in an appropriate manner during future EIA activities; be it through data acquisition or direct survey etc. All appropriate available data was mapped and collated into an 'Environment Information Atlas'[14] for the area. These maps were used to identify key features within the area and will be presented and refined with updated information within the ES. Several maps are reproduced within this section to highlight the locations of key features in the area.

5.1 Protected sites and species

There are no sites designated for nature conservation interests of European or national importance within the offshore area of search, although there are a number of sites adjacent to potential onshore infrastructure and within the wider area. These sites, qualifying interests and locations are outlined in the following sections. There are a number of species likely to be present within the area of search

which are protected under international and national legislation outwith designated conservation sites. These species, their distribution and status are outlined in this section. Please note that potential links between these sites and the proposed development are considered within a preliminary Habitats Regulations Assessment (HRA) Screening in Appendix II of this report.

5.1.1 Special Protection Areas (SPAs)

SPAs within 50km of the area of search that have qualifying features that could be present within the marine or coastal environment are shown in Figure 5.1. The corresponding qualifying features for each site, along with population estimates and the relative importance of these populations in a national context are shown in Table 5.1. There are several important seabird breeding colonies within 50km of the area of search including Sule Skerry and Sule Stack SPA, Handa SPA, Cape Wrath SPA, North Caithness Cliffs SPA and Hoy SPA. The Caithness and Sutherland Peatlands SPA is designated for several species including its breeding populations of common scoter, red-throated diver and black-throated diver; all marine species that breed at inland locations.

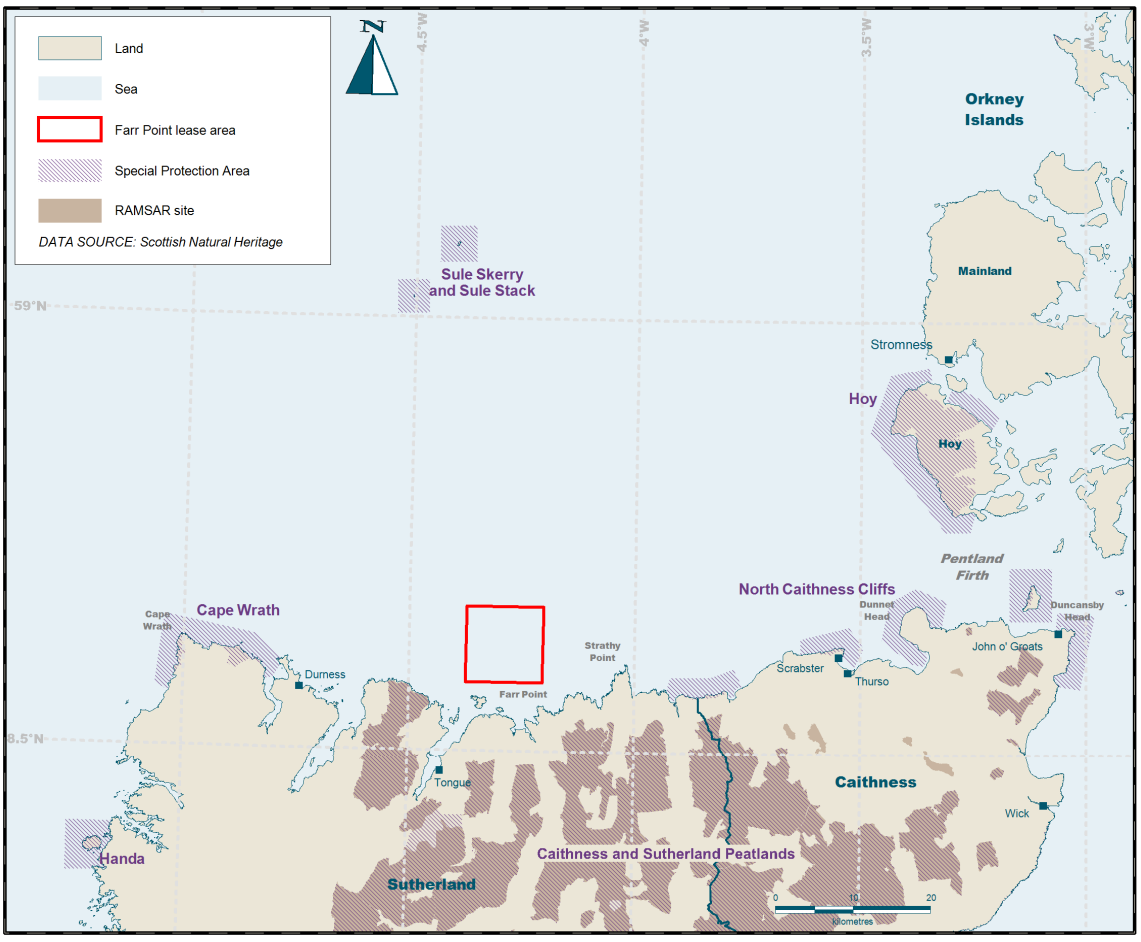


Figure 5.1 SPAs relevant to the project

[14] Farr Point Wave Farm Development – Environmental Information Atlas (Aquatera, 2010)

Table 5.1 SPAs within 50km of the area of search with qualifying features that could be present within the marine/coastal environment15. *part of seabird assemblage

SPA	Qualifying features (marine/coastal)	Number	Relative importance in a national context
North Caithness cliffs	Seabird assemblage, common guillemot, fulmar*, kittiwake*, puffin*, razorbill* peregrine	Seabird assemblage: 110,000 birds Common guillemot: 26,994 pairs	4.6% of Scottish breeding population (584,000 pairs)
Cape Wrath	Seabird assemblage, fulmar*, common guillemot*, kittiwake*, puffin*, razorbill*	Seabird assemblage: 50,000 birds	
Handa	Seabird assemblage, common guillemot, razorbill, kittiwake*, fulmar*, great skua	Seabird assemblage: 200,000 birds Common guillemot: 76,105 pairs Razorbill: 10,432 pairs	13% of Scottish breeding population (584,000 pairs) 7.5% of Scottish breeding population (139,186 pairs)
Sule Skerry & Sule Stack	Seabird assemblage, gannet, Leach's petrel, puffin, storm petrel, common guillemot*, shag*	Seabird assemblage: 100,000 birds Gannet: 4,890 pairs Leach's petrel: 5 pairs Puffin: 43,380 pairs Storm petrel: 1,000 pairs	2.6% of Scottish breeding population (187,363 AON[16]) 8.8% of Scottish breeding population (493,042 AOB[17]) 4.7% of Scottish breeding population (21,370 AOS[18])
Hoy	Seabird assemblage, red-throated diver, fulmar*, great black-backed gull*, guillemot*, kittiwake*, puffin*, arctic skua*, great skua*, peregrine	Seabird assemblage: 120,000 birds Red-throated diver: 56 pairs	4.5% of Scottish breeding population (1,255 pairs)
Caithness and Sutherland Peatlands	Common scoter Red-throated diver Black-throated diver	27 pairs 89 pairs 26 pairs	28% of Scottish breeding population (95 pairs) 7% of Scottish breeding

[15] As listed in the relevant Site Citations (http://www.snh.org.uk/snhi/)
[16] Apparently Occupied Nests
[17] Apparently Occupied Burrows
[18] Apparently Occupied Sites

SPA	Qualifying features (marine/coastal)	Number	Relative importance in a national context
			population (1,255 pairs) 13% of Scottish breeding population (200 pairs)

5.1.2 Special Areas of Conservation (SACs)

SACs within 50km of the area of search that have qualifying features with marine or coastal elements are shown in Figure 5.2. Table 5.2 lists the corresponding qualifying features for each site. Interest features include otters, migratory Atlantic salmon, freshwater pearl mussels and coastal habitats. Only those coastal habitats present within or near to any onshore infrastructure would be relevant to this project. There are no sites of European importance designated for marine mammal interests anywhere within the wider area (refer to Section 10).

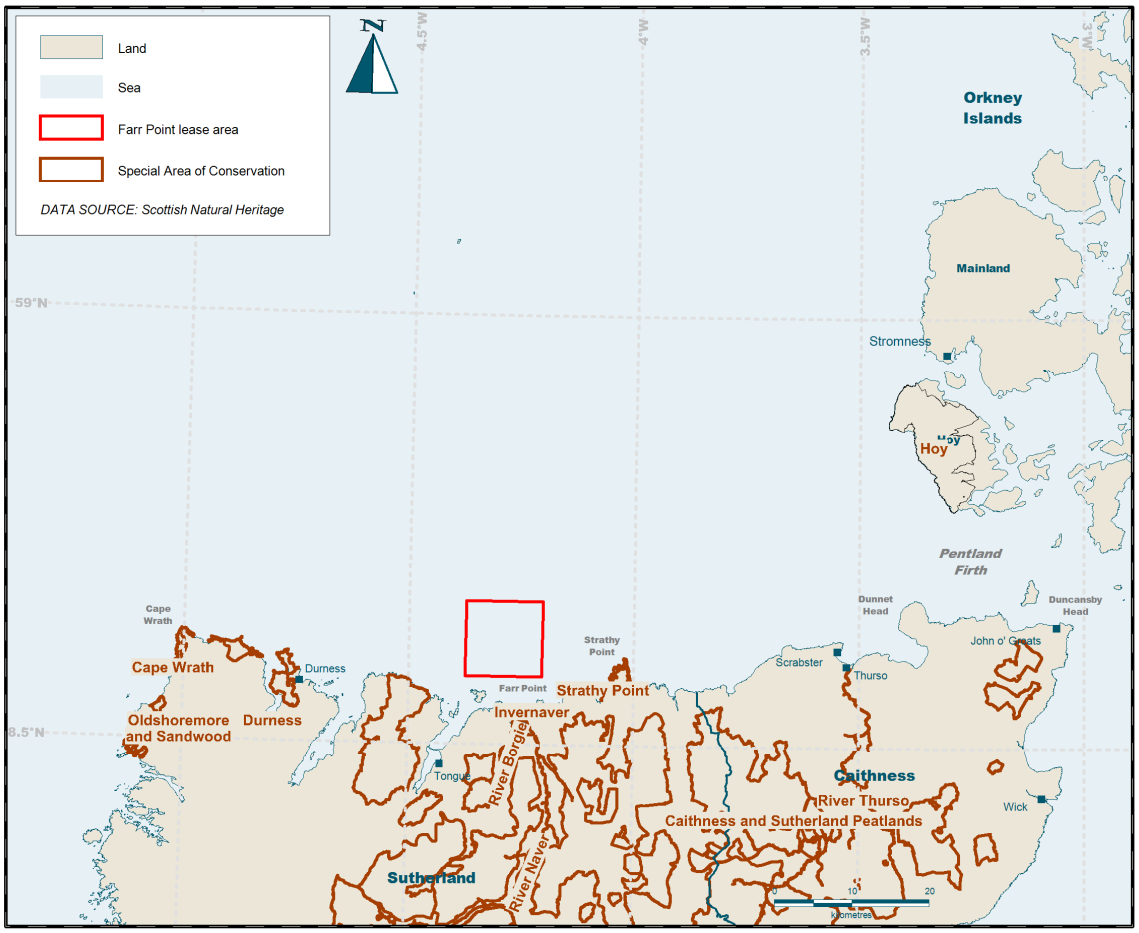


Figure 5.2 SACs relevant to the project

Table 5.2 SACs considered relevant to the proposed project

SAC	Qualifying features (marine/coastal)
Caithness and Sutherland Peatlands	Otter
Durness	Otter Fixed dunes with herbaceous vegetation ('grey dunes')* Priority feature Shifting dunes along the shoreline with *Ammophila arenaria* ('white dunes') Humid dune slacks
River Borgie	Otter Atlantic salmon Freshwater pearl mussel
River Naver	Atlantic salmon Freshwater pearl mussel
River Thurso	Atlantic salmon
Strathy Point	Vegetated sea cliffs of the Atlantic and Baltic coasts
Cape Wrath	Vegetated sea cliffs of the Atlantic and Baltic coasts
Hoy	Vegetated sea cliffs of the Atlantic and Baltic coasts
Invernaver	Fixed dunes with herbaceous vegetation ('grey dunes')* Priority feature Atlantic decalcified fixed dunes (*Calluno-Ulicetea*) * Priority feature Dunes with Salix repens ssp. argentea (*Salicion arenariae*) Coastal dunes with *Juniperus* spp. *Priority feature Shifting dunes along the shoreline with *Ammophila arenaria* ('white dunes')
Oldshoremore and Sandwood	Fixed dunes with herbaceous vegetation ('grey dunes')* Priority feature Shifting dunes along the shoreline with *Ammophila arenaria* ('white dunes')

5.1.3 Ramsar sites

The Caithness and Sutherland Peatlands is also designated as a Ramsar site for its populations of moorland breeding birds which include common scoter, red-throated diver and black-throated diver; all of which are marine species that breed at inland sites.

5.1.4 Designated sites of national importance

There are no designated sites of national importance that overlap with the offshore area of search however; there are a number of sites along the north coast of Scotland that need to be taken into consideration during the EIA (Figure 5.3). The only National Nature Reserve (NNR) in the region is The Flows, an extensive site that encompasses a large area of peatland throughout Caithness and Sutherland, much of which is also otherwise designated as an SPA, SAC and Ramsar site and also as a Site of Special Scientific Interest (SSSI). There are several SSSIs in the wider area, of which the majority are also designated as SPAs and SACs. Loch Eriboll which lies to the southwest of the area

of search is designated as a Marine Consultation Area (MCA) a non-statutory designation that recognises high quality and sensitive marine environments.

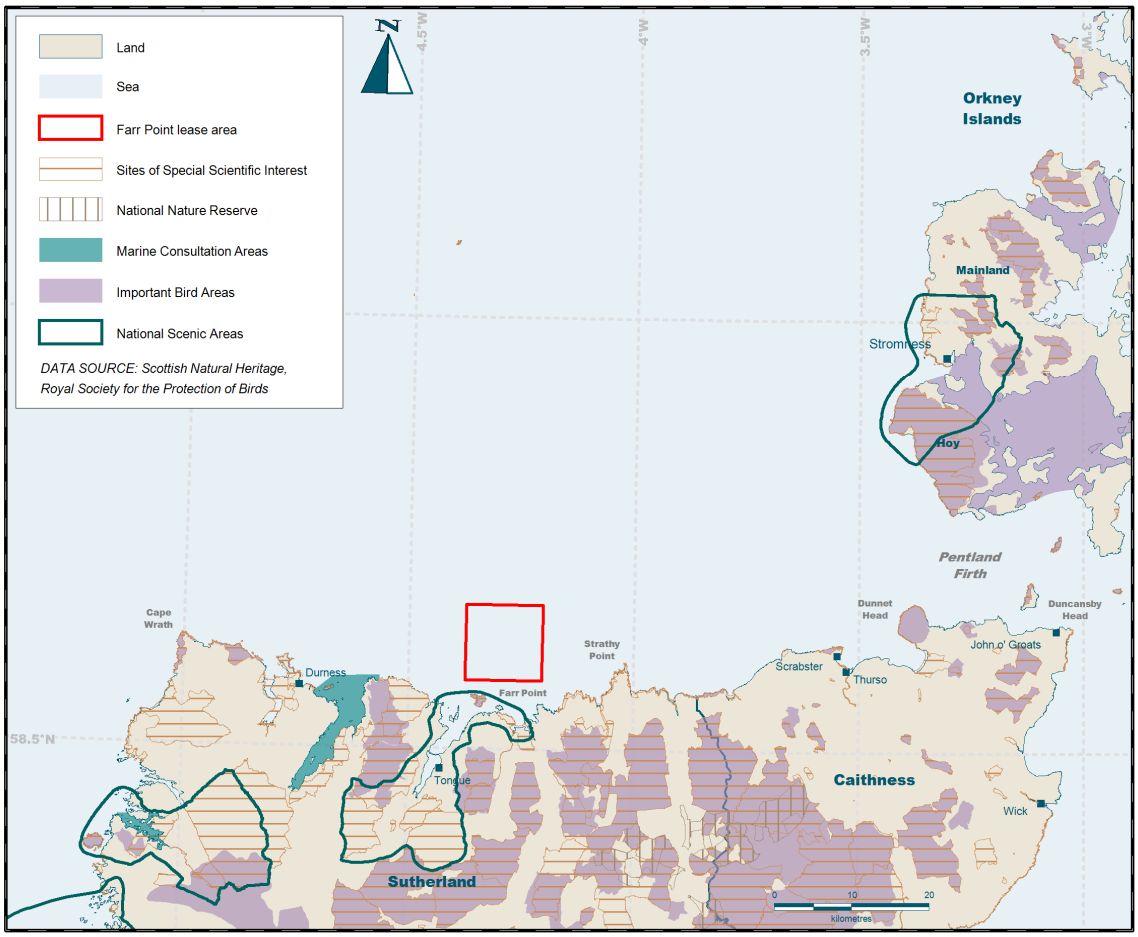


Figure 5.3 Designated sites of national importance

5.1.5 Marine mammals – outwith designated sites

5.1.5.1 Cetaceans

The JNCC Atlas of Cetaceans[19] indicated that the following cetaceans have been recorded within and around the proposed development area, including:

- Harbour porpoises
- Killer whale
- Risso's dolphin
- Atlantic white-sided dolphin
- White-beaked dolphin
- Short-beaked dolphin
- Bottlenose dolphin

[19] Atlas of Cetacean distribution in north-west European waters (Reid, J.B., Evans, P.G.H., & Northridge, S.P., 2003). JNCC Commissioned report.

The abundance, frequency and distribution of these species in and around the proposed development area are uncertain.

5.1.5.2 Seals

It is likely that both harbour (common) and grey seals are present at various locations along the North Coast of Scotland. There are no protected sites within the vicinity but the presence of any haul outs and breeding sites will be determined during the EIA.

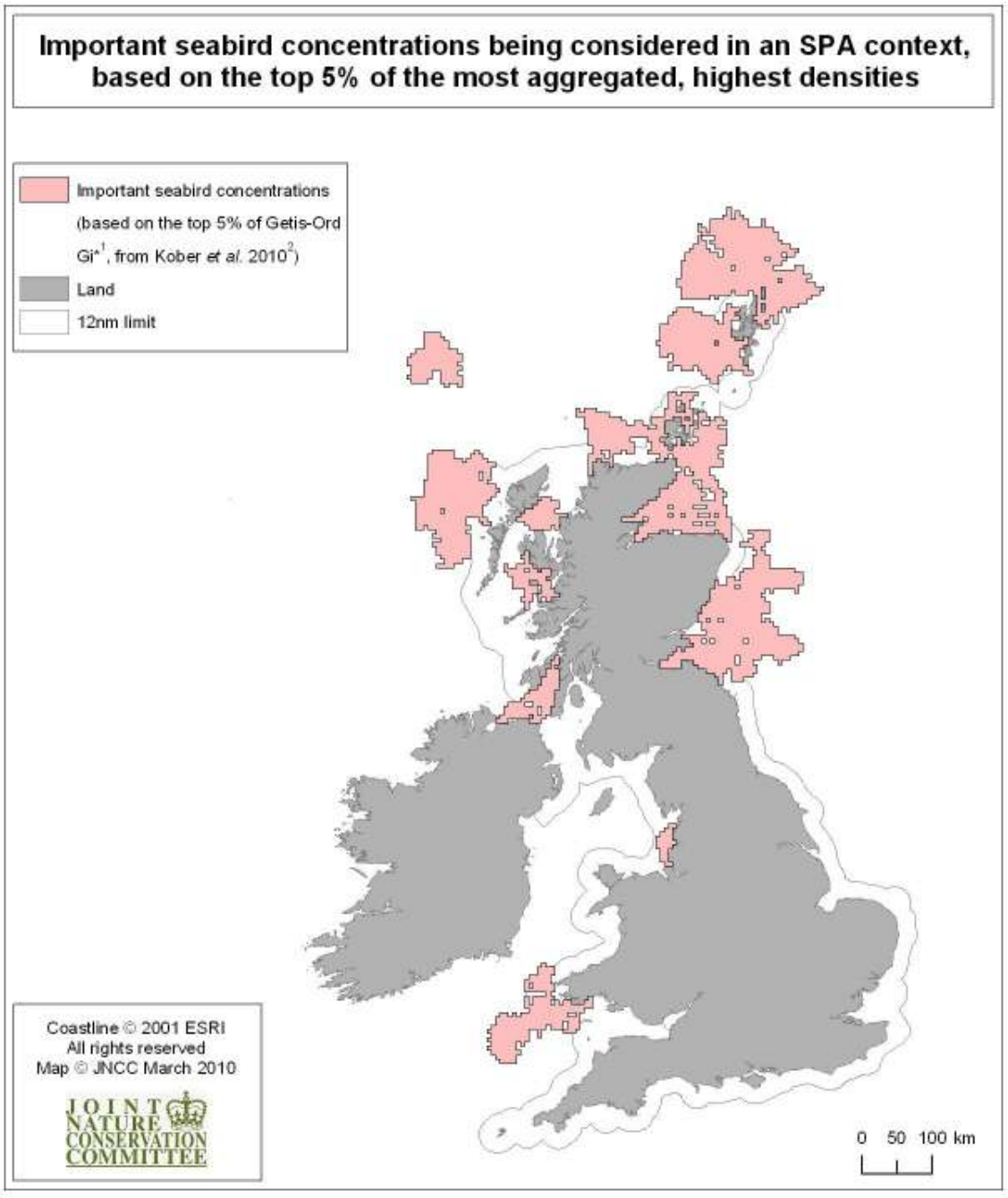
5.1.5.3 Otters

There are likely to be otters along the coast adjacent to the proposed development. There is limited information available and this issue will be fully addressed during the EIA.

5.1.6 Birds – outwith designated sites

JNCC have produced maps using European Seabirds at Sea (ESAS) data which indicate that the offshore area of search does not overlap with areas holding key seabird concentrations currently being considered in a marine SPA context (refer to the following two maps).

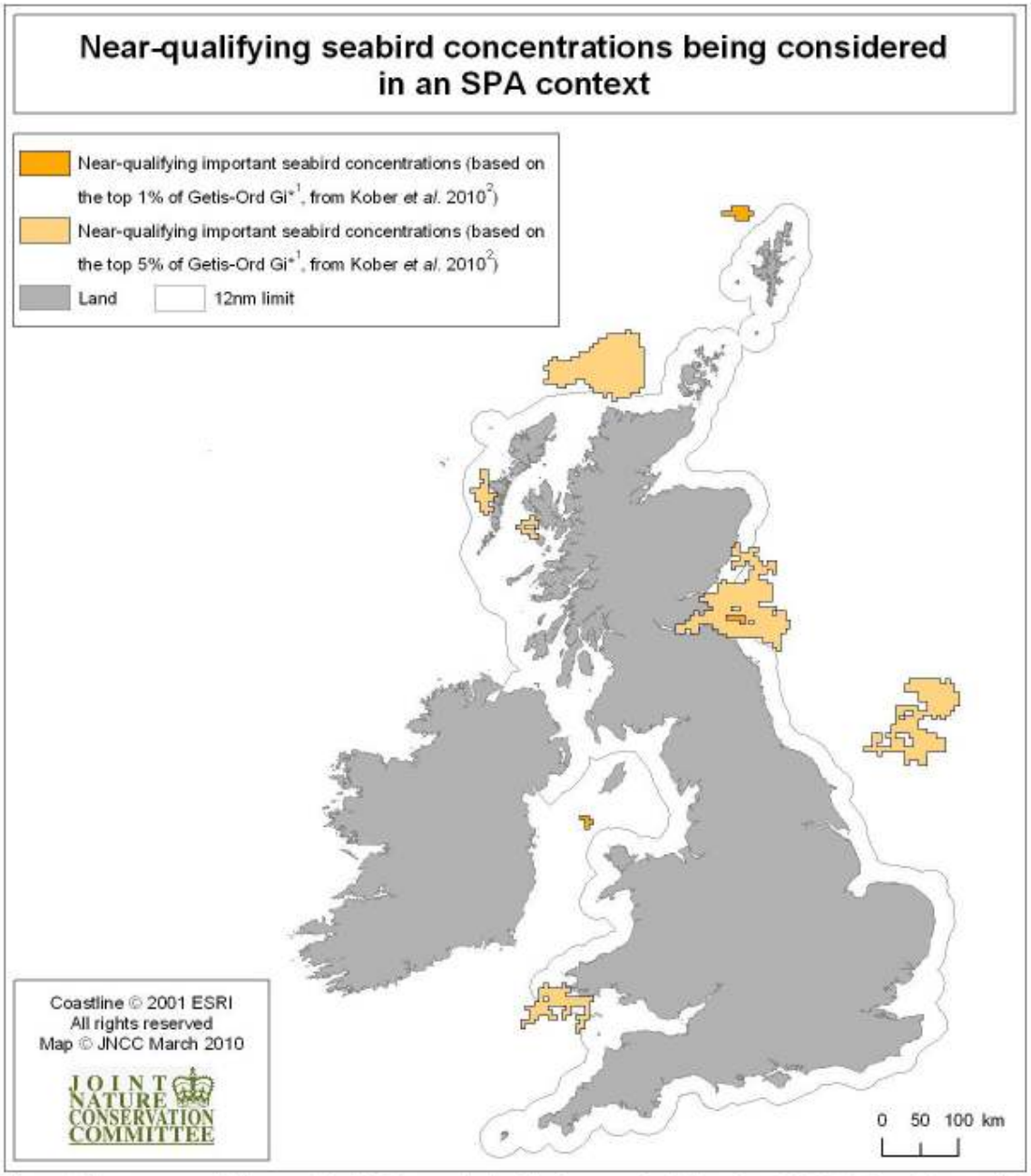
No data is currently held regarding which marine bird species use the area of search or adjacent coastal waters. The importance of the area of search for wintering birds or foraging breeding birds is unknown. The coastline directly to the south of the area of search is likely to hold comparatively low densities of cliff-nesting seabirds. This data gap will be addressed during the EIA and accordingly within the subsequent ES through desk-based and direct surveys where required.



This map indicates areas identified as being important for seabirds from analysis of the European Seabirds at Sea (ESAS) database. These areas could potentially help in deciding where Special Protection Areas (SPAs) for seabirds might be placed. **Not all of these areas may be classified, and additional areas not shown on the map may also be considered.** At this stage (March 2010) JNCC is not in a position to confirm which areas will be further considered for SPA status or classified. JNCC advises the statutory nature conservation agencies on options for SPAs and the location of their boundaries, as well as the science underpinning that advice. The agencies (and JNCC beyond 12nm) then advise government on which areas might be further considered for classification.

[1] Getis-Ord Gi* is a statistic which describes spatial patterns. The greater its magnitude at a given location, the higher and the more aggregated seabird numbers are at this location.

[2] Kober, K., Webb, A., Win, I., Lewis, M., O'Brien, S., Wilson, L.J., Reid, J.B. (2010). An analysis of the numbers and distribution of seabirds within the British Fishery Limit aimed at identifying areas that qualify as possible marine SPAs. JNCC Report, No. 431.



This map indicates near-qualifying areas identified from analysis of the European Seabirds at Sea (ESAS) database. Near-qualifying areas are defined in Kober *et al.* (2010)[2] as meeting the criterion of minimum numbers but failing narrowly to meet the criterion of regularity. These areas could potentially help in deciding where Special Protection Areas (SPAs) for seabirds might be placed. **Not all of these areas may be classified, and additional areas not shown on the map may also be considered.** At this stage (March 2010) JNCC is not in a position to confirm which areas will be further considered for SPA status or classified. JNCC advises the statutory nature conservation agencies on options for SPAs and the location of their boundaries, as well as the science underpinning that advice. The agencies (and JNCC beyond 12nm) then advise government on which areas might be further considered for classification.

[1] Getis-Ord Gi* is a statistic which describes spatial patterns. The greater its magnitude at a given location, the higher and the more aggregated seabird numbers are at this location.

[2] Kober, K., Webb, A., Win, I., Lewis, M., O'Brien, S., Wilson, L.J., Reid, J.B. (2010). An analysis of the numbers and distribution of seabirds within the British Fishery Limit aimed at identifying areas that qualify as possible marine SPAs. JNCC Report, No. 431.

Figure 5.4 Seabird Concentrations

5.1.7 Other protected species

5.1.7.1 Salmon

As shown in Figure 5.2, there are a number of rivers designated as SACs due to the presence of Atlantic salmon along the north coast. The status of these rivers and potential interactions with migrating salmon through the development area will be investigated fully during the EIA; largely through close consultation with relevant stakeholders.

5.1.7.2 Basking sharks

Basking sharks have been observed along the north coast of Scotland[20] although the area is not recognised as particularly important for the species.

5.1.8 Built heritage

Designated Garden and Designed Landscapes in the vicinity of the area of search include Tongue House on the shores of Tongue Bay. Much further to the east between Dunnet Head and Duncansby Head is the Castle of Mey. There are many Scheduled Ancient Monuments (SAMs) dotted along the coastline.

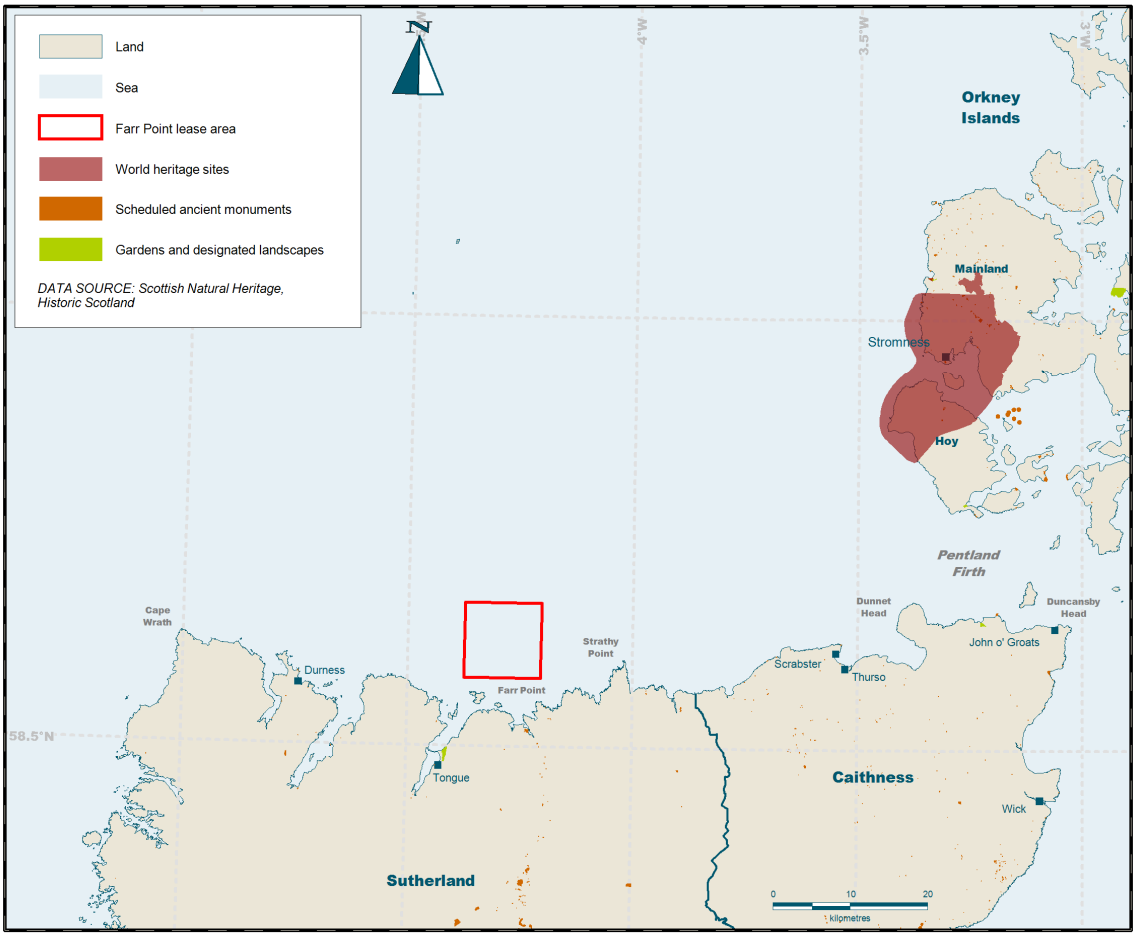


Figure 5.5 Built heritage interests

[20] The Marine Conservation Society: Basking Shark Watch - 20 year report (1987-2006), Bloomfield and Solandt, 2006.

5.2 Physical environment

5.2.1 Bathymetry

The majority of the offshore area of search lies within 50 - 90m water depth. Detailed bathymetry is not currently available. Recent surveys of the Strategic Area were conducted by Marine Scotland but did not cover Farr Point. 50m resolution bathymetric data is available for the area from SeaZone.

5.2.2 Seabed character

The predicated European Nature Information System (EUNIS) indicates that habitats in the area are circalittoral (nearshore) coarse sediments towards the landward side of the area of search, with a patch of circalittoral fine sand or circalittoral muddy sand in the centre of the area of search, deep circalittoral coarse sediment towards the northern part of the area of search and deep circalittoral sand at the very northwest corner of the area of search.

The seabed has also been classified according to the National Marine Landscapes. The classifications given are as follows: 'shallow coarse sediment plain – weak tide stress' towards the landward side of the area of search, with a patch of 'shallow sand plain' in the centre of the area of search, 'shelf coarse sediment plain – weak tide stress' towards the northern part of the area of search and 'shelf sand plain' at the very northwest corner of the area of search.

Detailed sedimentology, seabed gradient and associated habitat information is not currently available.

5.2.3 Hydrography

The annual mean spring tidal range in the area is 3.5-4.0m and the annual mean neap tidal range is 1.5-2.0m.

The peak tidal current flow during mean spring tides is 0.5-0.75m/s for the northern part of the site and 0.25-0.5m/s for the landward side of the site. Peak flow during mean neap tides is 0.25-0.5m/s and 0.1-0.25m/s for the landward side of the site.

The wave climate of the north of Sutherland is favourable for wave energy with an annual mean significant wave height (H_s) of 1.25-1.5m.

5.2.4 Climate

The average mean wind speed is 8-9m/s at a height of 100m. Other climate data will be gathered to inform project design throughout the EIA process.

5.2.5 Landscape character and land use

Landscape character is a result of interaction between physical factors, natural processes and human influence. Scottish Natural Heritage (SNH) has published a series of Landscape Character

Assessments, covering the whole of Scotland. One of their aims is to help all involved in a development to understand the character of the landscapes that may be affected.

The landscape in Sutherland is predominantly moorland with a few large mountains within the centre of the region. The following table is adapted from Stanton's (1998) 'Caithness and Sutherland landscape character assessment'[21].

[21] Stanton, C. 1998. Caithness and Sutherland landscape character assessment. Scottish Natural Heritage Review No. 103.

Table 5.3 Landscape character assessment (LCA) and land uses

LCA type	Key characteristics (as described in the Caithness and Sutherland landscape character assessment)	Land use
Lone Mountain	This landscape character type comprises individual mountains which lie isolated within and open 'sea' of moorland, like upward pinches in a sheet of fabric. They possess distinctive profiles which are visible far beyond the edge of the character type, often appearing by surprise on the distant horizon of Caithness and Sutherland landscapes.	Grazing, Hillwalking, Mountaineering, Sport
Irregular Massif	This landscape character type consists of high, rugged mountains, interlocked by a range of rocky crags, steep slopes and summits. It mainly occurs along the Moine Thrust Zone in the west of Sutherland, resulting from an uplift of mountains during the closure of the Iapetus Ocean bout 420 million years ago	Grazing, Sport, Hillwalking, Mountaineering
Moorland Slopes and Hills	This character type occurs throughout Sutherland- often acting as a transition between low lying sweeping moorland and higher mountains. The appearance of different areas of this landscape varies; however, they are invariably linked by their overall openness, subtle mix of sloping landforms and ground cover and the forces of change which prevail.	Grazing, Peat Cutting, Fishing , Sport
Sweeping moorland	This landscape character type forms extensive areas, mainly within the interior of Sutherland and Caithness. It appears stunning on account of its simple composition of landscape characteristics and vast scale. Transitions between different areas and with neighbouring landscape character types to tend to be extremely subtle.	Peat-cutting
Flat Peatland	This landscape forms a subtype of the sweeping moorland landscape character type previously discussed. This means that it shares the same key characteristics as sweeping moorland; however some of these slightly differ in their nature and emphasis, mainly determined by a subtle difference of landform.	
Cnocan	This landscape character type occupies a large part of west Sutherland. It comprises an extensive, rough and convoluted surface of extremely old and hard rock called Lewisian gneiss, which is abruptly separated from the eastern moorland and mountain exterior by the Moine Thrust Zone, The landscape consists of a concoction of different land form and ground cover.	Crofting

LCA type	Key characteristics (as described in the Caithness and Sutherland landscape character assessment)	Land use
Coniferous Woodland Plantation	NA	Forestry, Recreation
Straths	Straths act as channels which pass through surrounding landscapes character types. The dominance of their characteristics may subtly vary along their length; however, they are invariably linked by their enclosure and the distinct composition of a strath floor with contrasting slopes.	Crofting, Estate
Small Farms and Crofts	This landscape character type mainly occurs along the coast and straths of Caithness and Sutherland. In its simplest form, it represents a traditional form of croft in and farming and use, closely tied to the intrinsic qualities of the landscape, with integration of people, settlements, land and sea.	Crofting, Agriculture, Grazing
High Cliffs and Sheltered Bays	This character type runs along the north and north-eastern coast of Caithness and Sutherland. It forms long narrow strips of land and sea, divided by a defining edge of cliffs or beaches; the experience of this landscape is overwhelmingly influenced by its open exposure to 'the elements'. Although high cliffs and sheltered bays occur as isolated features within other character types they form the dominant characteristic within this landscape.	Crofting, Grazing
Long Beaches Dunes and Links	This landscape character type extends along stretches of east Caithness and Sutherland coasts. This character type tends to occur in narrow strips running along the coast, its variable landform and slopes tending to forma soft linear edge to the sea.	Grazing, Recreation Sport Industrial, Airfield
Coastal Island	N.A.	Undefined
Coastal Shelf	This landscape character type runs along sections of the eastern coastal edge of Caithness and Sutherland. It comprises a narrow corridor of level land, tightly squeezed between inland hills on one side, and the open sea on the other, this broad composition overlays a complexity of land use characteristics.	
Mixed Agricultural Settlement	This landscape covers much of north and east Caithness. It is vast and open – a simple landform covered by a confusion of characteristics – physical, cultural and experiential. The landscape is highly influenced by the activity of the people and the extreme nature of the weather and the unique light	Estate, Agriculture, Grazing, Crofting

LCA type	Key characteristics (as described in the Caithness and Sutherland landscape character assessment)	Land use
	conditions. It is a landscape in constant change.	
Open Intensive Farmland	This landscape character type is found in only a few areas in Caithness; here, the scene is dominated by a wide plain of rich agricultural land, lying beneath an immense expanse of open sky. Despite this landscape being simple and ordered in composition, its experience constantly changes in response to different weather and light conditions.	Agricultural, Estate
Inland Loch	N.A.	Fishing, Leisure, Recreation Tourism, transport, Water sports
Loch Island	N.A.	Grazing-rough Wilderness

This information is summarised for the relevant area in Figure 5.6.

The proposed site is adjacent to Kyle of Tongue National Scenic Area (NSA) and a Special Landscape Area (Formerly Areas of Great Landscape Value) from Farr Bay to Strathy and Portskerra. A zone of theoretical visibility analysis will be undertaken. This will be carried out for the offshore site, service vessel routes and any new coastal infrastructure.

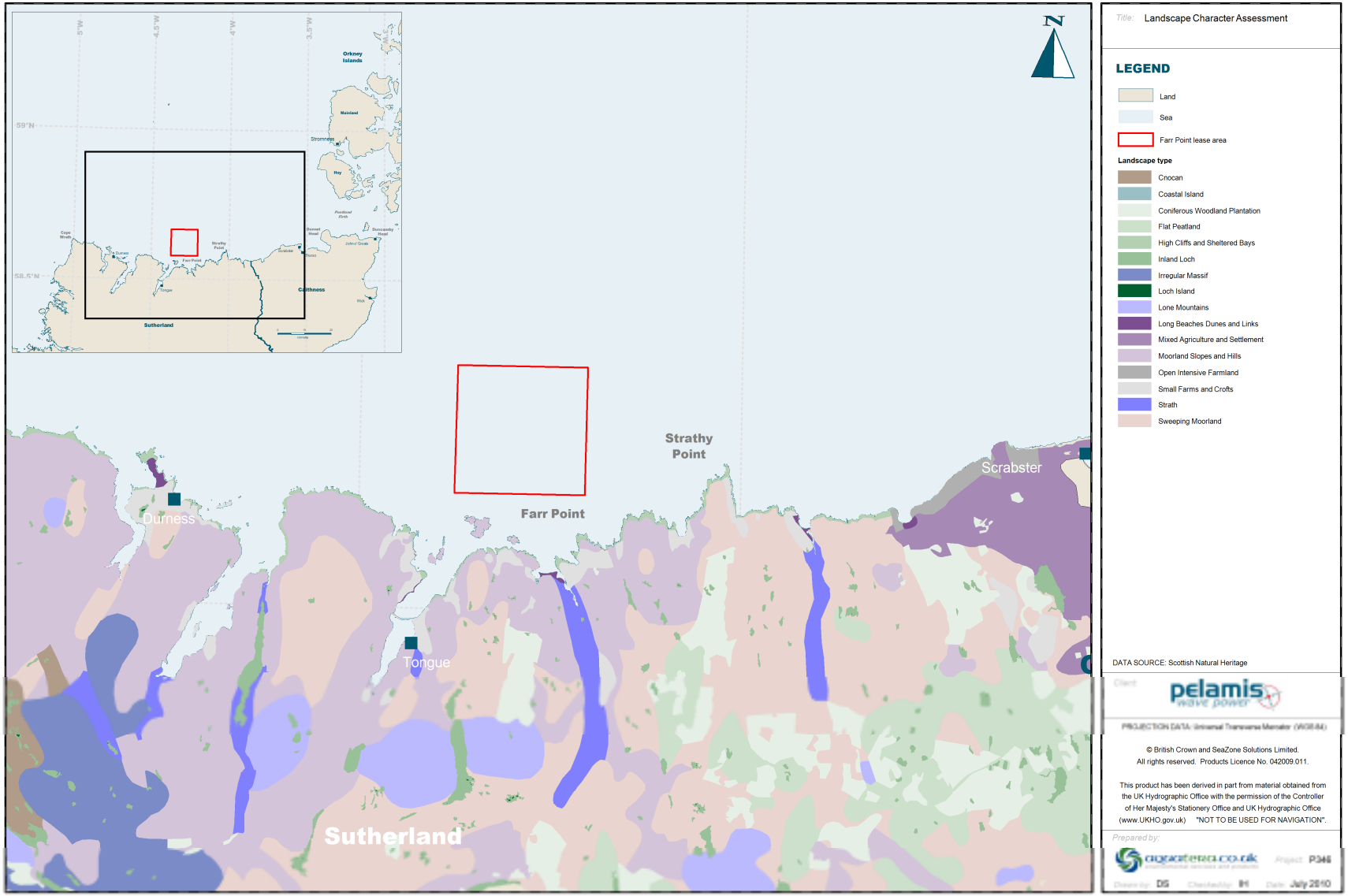


Figure 5.6 Landscape character assessment

5.3 Ecological environment

The following section outlines the ecological features within the area; however, all protected habitats and species are dealt with in Section 5.1.

5.3.1 Benthic ecology

There have been no surveys of the marine and sublittoral habitats in the area of search to date. The available sediment maps and bathymetry suggest that the seabed will be typical of nearshore exposed area around Scotland. The sediments will be sandy, relatively mobile and will probably hold species typical of such habitats. A typical community type is a venus/amphiura community.

5.3.2 Coastline communities

There is currently no detailed information held regarding coastline communities for the wider area. However, the mixture of exposed rocky shores and coarse sand beaches with finer sand in the deeper inlets is typical of the Scottish coastline. There are not anticipated to be any particularly rare of vulnerable species in the intertidal zone. There may be sites of interest for certain coastal plants just above the HWM and these will be checked through the local biological records service once possible landfall sites have been more fully defined.

5.3.3 Commercial fish stocks

Fisheries Research Services (FRS) data indicates that the proposed development area intersects with spawning areas for sprat, sandeel, lemon sole, and herring. These spawning grounds also cover most of the surrounding region. Spawning grounds for whiting also overlap with the area of search and extend westwards with nursery grounds to the west of Cape Wrath. A spawning and nursery area for Norway Pout overlaps the site and extends westwards. Spawning grounds for Plaice occur just to the south of the area of search, along most of the north coast and there are nursery grounds to the west of Kinlochbervie. Cod spawning grounds do not overlap with the area of search but spawning and nursery areas occur to the west of Cape Wrath. Spawning and nursery areas for Norway lobster also do not overlap with the area of search but occur to the west of the Scottish mainland and to the north west of the Orkney Islands. Spawning and nursery areas for blue whiting also do not occur in the vicinity of the proposed development but there is a nursery area far to the northwest. This information was however, produced some time ago and may not reflect the current situation; particularly when investigating small areas.

No information is currently held regarding other shellfish stocks in the area. It is anticipated that crab, lobster and scallops will all be present in the area. This information will be gathered during the EIA process and considered within the ES.

5.3.4 Migratory fish

Migratory fish (e.g. salmonids and eels) are known to be present within a number of north coastal rivers. There have been no substantive studies on the migratory behaviour in migratory fish in the

Scottish environment. Migratory fish will traverse the area and its approaches, although no detailed information is currently held. This issue will be considered fully during the EIA.

5.3.5 Birds

Refer to Section 5.1.1 on Special Protection Areas and Section 5.1.6 on Birds outwith designated sites.

5.3.6 Marine mammals

Refer to Section 5.1.2 on Special Areas of Conservation and 5.1.5 on marine mammals outwith designated sites.

5.3.7 Marine reptiles

No information is currently held regarding the distribution, abundance and frequency of any marine reptiles within/passing through the area of search. However, sea turtles may occasionally traverse the area.

5.4 Human environment

5.4.1 Fishing activity within the area of search

VMS[22] fishing vessel location data from 2006 and 2007 shows that the area of search is located within areas of moderate fishing vessel activity (Figure 5.7). Slightly denser fishing vessel activity is seen to the west and north of the area of search. Maps showing the vessel speed for each of the locations indicate that there is a range of fishing activities underway as well as vessels travelling to and from fishing grounds. The fishing activity, usually indicated by vessels moving at slower speeds (lighter dots on the map in Figure 5.7) is seen towards the southern half of the area of search whereas faster moving vessels are seen towards the northern half of the area of search coinciding with the transit route from Cape Wrath to the Pentland Firth as seen in Figure 5.8 and Figure 5.9.

Further information regarding fishing effort within and around the area of search, exiting routes and port use etc. will be gathered during the EIA through close consultation with the fishing community and representative organisations.

[22] Vessel Monitoring System

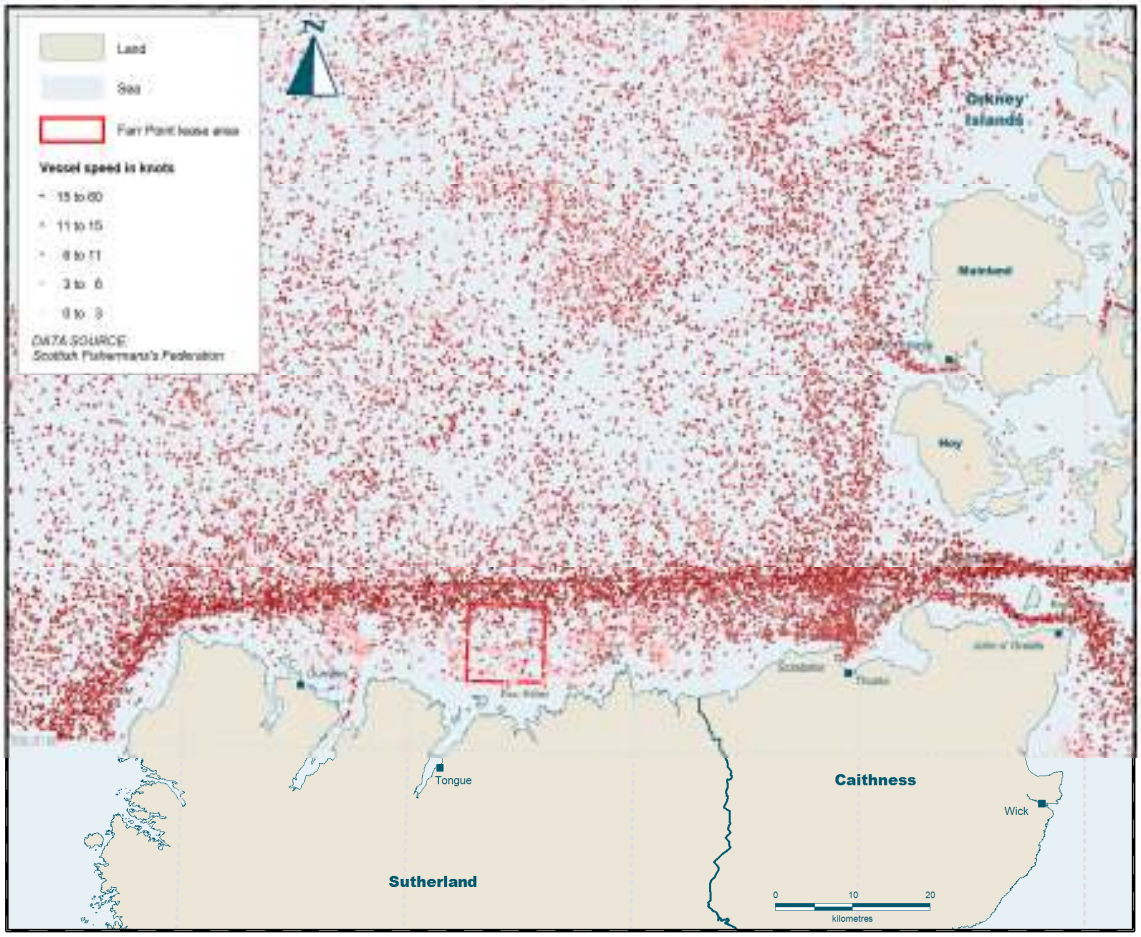


Figure 5.7 VMS fishing vessel data

5.4.2 Aquaculture

Finfish and shellfish farms as well as shellfish harvesting areas exist in Loch Eriboll and the Kyle of Tongue. The current status and type of each fishfarm will be established during the EIA process through close consultation with relevant stakeholders.

5.4.3 Infrastructure

There are no cables or pipelines to be avoided in the area of search. The nearest underwater electrical and telecommunications cables extend north from Dunnet Bay. This will be validated again during the EIA process.

5.4.4 Ports and navigation features

The nearest large industrial/fishing ports are Scrabster, Stromness and Lyness to the east and Kinlochbervie to the west. There are also an abundance of small slipways along the north coast including:

- Durness and Cape Wrath: Keoldale West, Kelodale East, Portnancon, Rispond, Ard Neakie, around Tongue and Bettyhill: Talmine, Skerray, Bettyhill and Kirtomy
- Strath Point to Thurso: Port Grant, Portskerra, Sandside, Scrabster, Thurso,

No navigational channels are marked on admiralty charts for this region but shipping density records for August 2006 and January 2006 shows a high density of shipping to the north of the area of search most of which will be on a course from Cape Wrath to the middle of the Pentland Firth between Stroma and Swona.

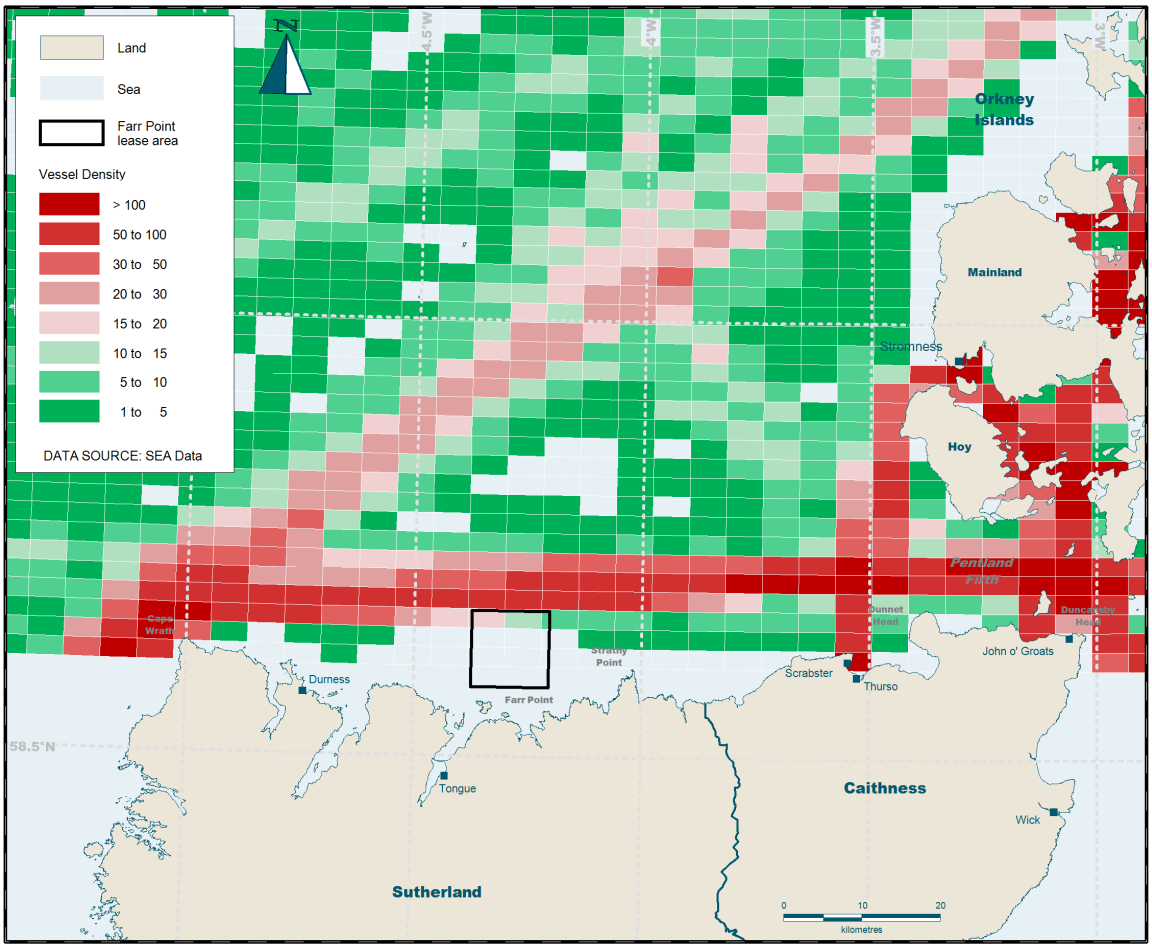


Figure 5.8 Shipping density (Jan 2006)

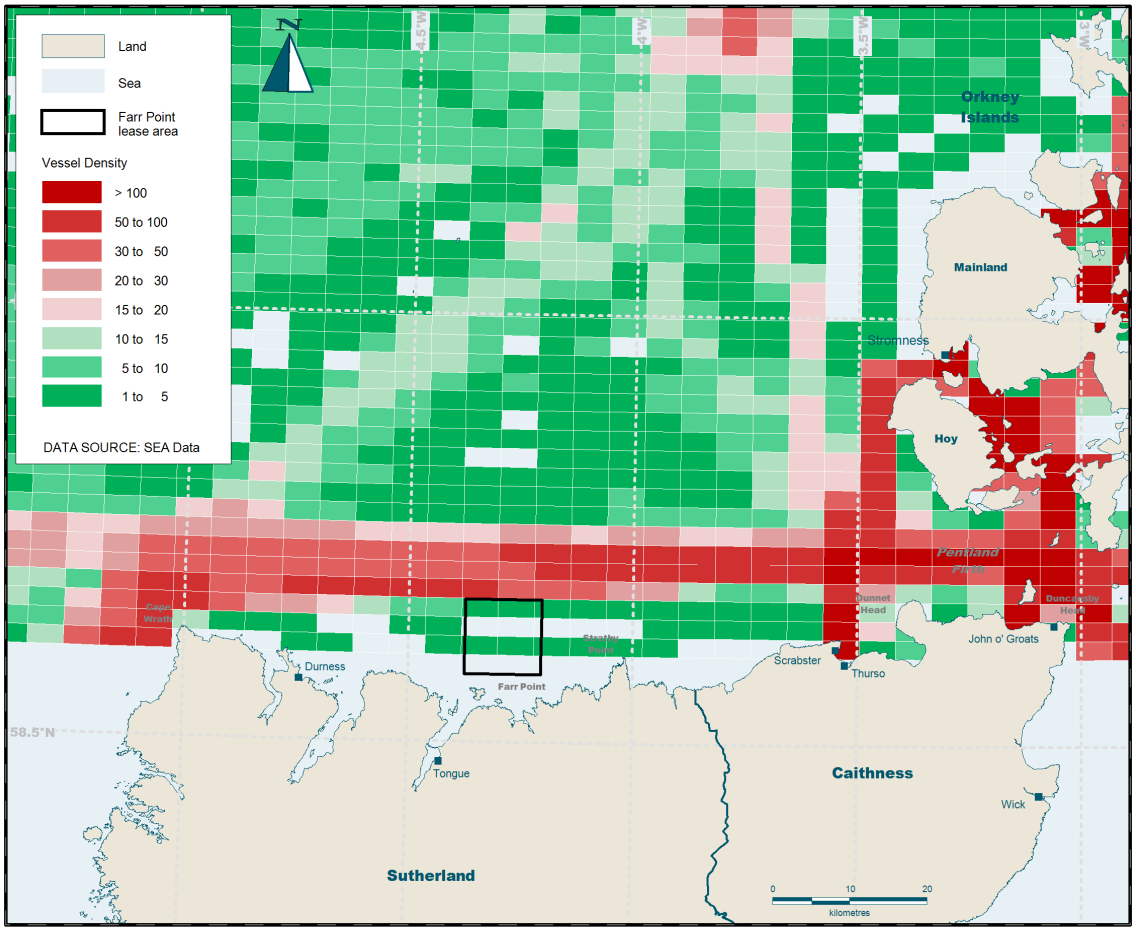


Figure 5.9 Shipping density (Aug 2006)

5.4.5 Transmission grid

A 33kV overhead cable runs along the north coast as far as Tongue Bay which connects back to higher voltage transmission lines at Dounreay/Thurso. Locations of existing substations are shown in Figure 3.9.

5.4.6 Disposal sites

The depositing of material into and under the seabed is regulated and requires a license under the Food and Environment Protection Act (FEPA) 1985. The only disposal sites along the north coast are north of Thurso Bay, for sand, silt gravel or rock[23].

5.4.7 Ministry of Defence (MOD) areas

The only MOD area in the vicinity is the Cape Wrath firing range (refer to Figure 5.10).

[23] Marine Renewables SEA (2007) Scottish Executive

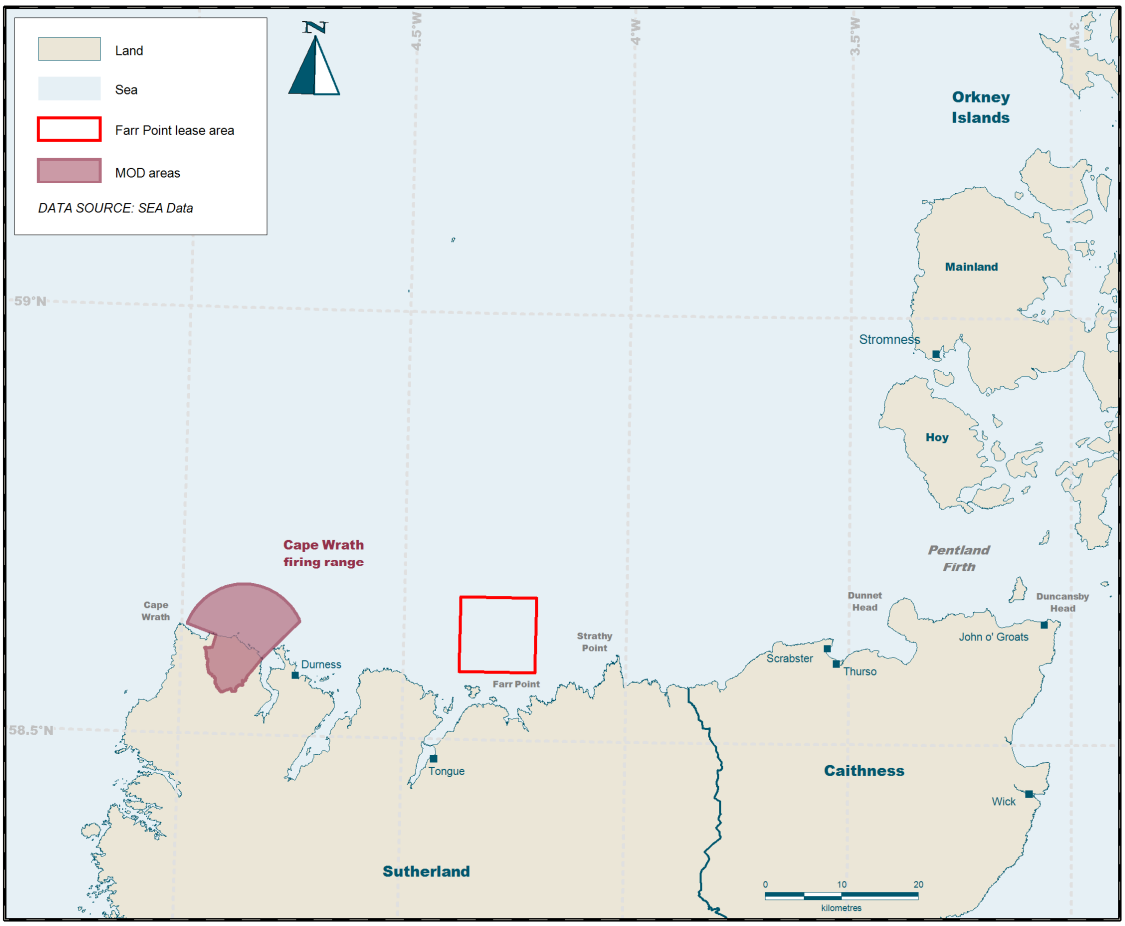


Figure 5.10 MOD areas

5.4.8 Land use

Land use in the area is summarised in Figure 5.11.

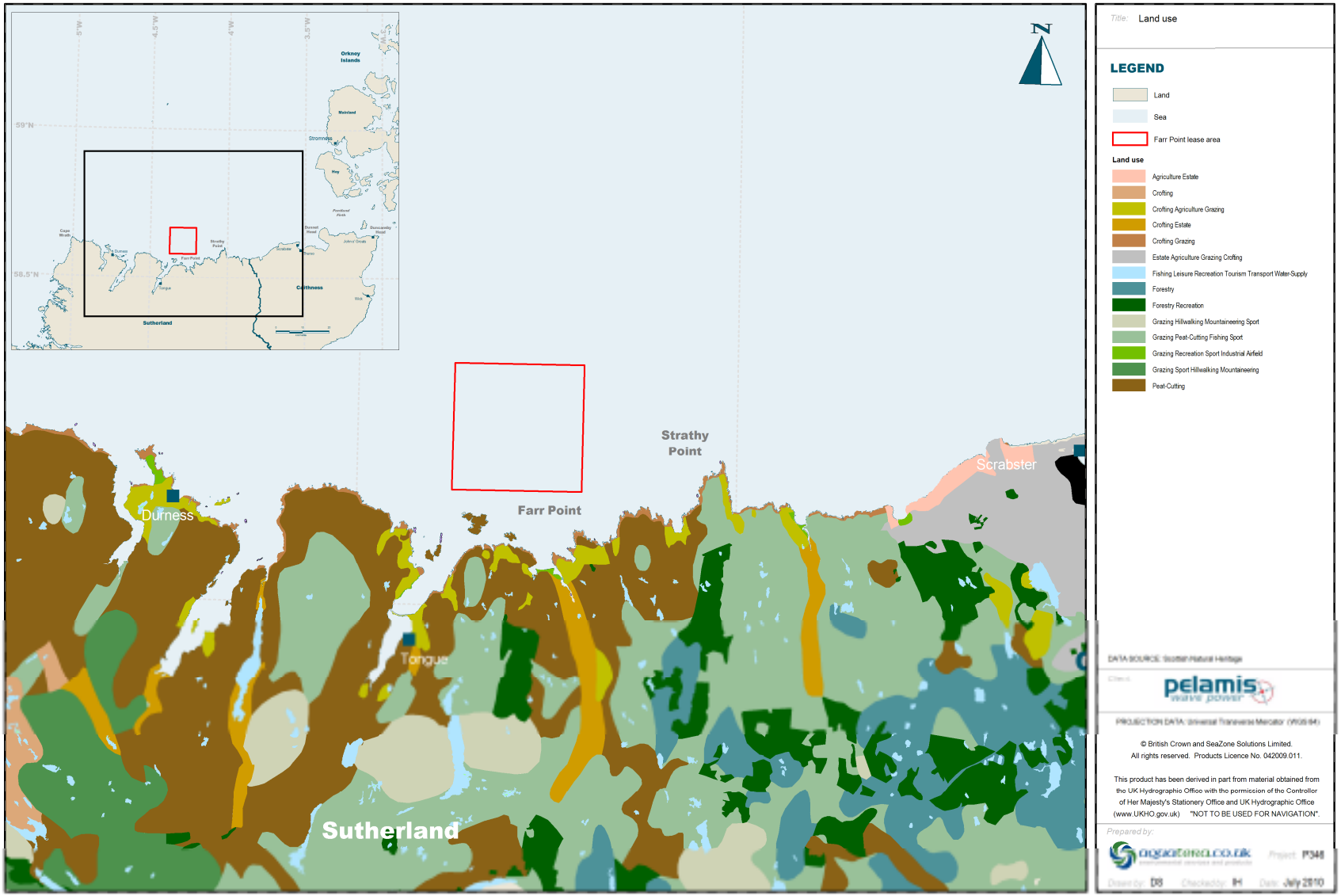


Figure 5.11 Land use

1.1 Key data gaps

To summarise, a number of key data gaps relating to the proposed baseline environment will be addressed in the initial stages of the ongoing EIA and ES preparation. These gaps are listed below along with potential data sources which have been identified to date:

Data gap	Potential data / information source
Detailed bathymetry	British Geological Survey (BGS) DigBath250 Version 2.0
	SeaZone Digital Survey Bathymetry
	United Kingdom Hydrographic Office (UKHO)
	Digital Charted Bathymetry
	Interpolated bathymetry Olex 3D Chart System
	General Bathymetric Chart of the Oceans (GEBCO) Digital Atlas
Seabed character and benthic ecology	Seabed Sediments around the UK DigSBS250 dataset
	UK Offshore Bedrock Geology DigRock250 dataset
	BGS Quaternary 1:250 000.
Coastline character and intertidal ecology	Marine Nature Conservation Review (MNCR) database of benthic samples around UK
	Combined EUNIS Habitats
	Predicted EUNIS habitats
	National Marine Landscapes
	MNCR Area Summaries: Sealochs in North-West Scotland
	MESH webGIS and Metadata Catalogue
	Identification of seabed indicator species to support implementation of the EU Habitats and Water Framework Directives
	SeaSearch Marine Surveys
Fish and shellfish	Fish Spawning and Nursery grounds - Fisheries Research Services
	Fisheries sensitivity maps in British waters (UKOOA)
	International Atlantic Salmon Research Board
	Salmon at Sea (SALSEA) research programme
	Economically significant species - Scottish Environment Protection Agency (SEPA)
Marine mammals	European Seabirds at Sea (ESAS) database – Cetaceans records
	Small Cetaceans in the European Atlantic and North Sea (SCANS) and (SCANS II) data
	Special Committee on Seals (SCOS) Reports
	Grey and Harbour Seal at-sea usage Maps
	SMRU Ltd Data Gateway
	Surveys of harbour seals on the west and east coasts of Scotland. (SMRU)
	National Survey of otter distribution in Scotland 2003-04
	JNCC Scotland Otter Survey Database
Marine reptiles	None identified to date
Marine birds and shore birds	Seabird 2000
	Seabird Colony Register Census
	Seabird Colony Register database
	European Seabirds at Sea (ESAS) database - seabirds records
	Seabird Numbers and Breeding Success in Britain and Ireland
	Surveillance of wintering sea ducks, divers and grebes in UK inshore areas: Aerial surveys and shore-based counts.[24]
Shipping and navigation	Admiralty Charts - Raster coverage
	The provision of additional studies in relation to the SEA marine renewables - Study 3 Shipping & Navigation (Marico, 2007)
	AIS vessel traffic data
	BERR's Maritime data database
	Marico's DatShip database
	North Coast of Scotland Pilot

[24] Survey areas do not cover the offshore area of search

Data gap	Potential data / information source
Commercial fishing	Charting Progress- an Integrated Assessment of the State of UK Seas
	FRS Fish and Nephrops Stock Information
	Development of spatial information layers for commercial fishing and shellfishing in UK waters to support strategic siting of offshore windfarms (COWRIE)
	FRS Salmon and Sea trout catches
	Scottish Fisheries Protection Agency
	VMS Surveillance monitoring
	Scottish Sea Fisheries Statistics
	ICES Working Groups Catch data
	FRS Scottish Shellfish farm production survey
Aquaculture	None identified to date
Recreation	Royal Yachting Association (RYA) UK Atlas of Recreational Boating
	A Review of Marine & Coastal Recreation. SNH Commissioned Report No. 247 (Land Use Consultants, 2007)
Search and rescue	None identified to date
Seascape	Seascape capacity study for windfarm development in Scotland: commissioned report for SNH
Archaeology – submerged landscapes and wrecks	UK Hydrographics Office Wrecks database

Each of these gaps will be addressed fully within the Environmental Statement (ES) based on best practice and a strategy which, where necessary, has been developed in conjunction with relevant stakeholders. Where sources of information are not available relating to potentially key issues, information will be gathered directly as and when necessary (refer to Section 8).

6 Identification of potential key issues

A high level screening of potential interactions between the proposed development and the anticipated receiving environment was undertaken in order to help define the likely 'key issues'' associated with the planned development thus helping to define the scope and focus of the EIA.

The following table outlines the anticipated key issues associated with this type of development along with proposed strategies for addressing each within the ES (much of this is based on feedback from the pre-scoping process and standard EIA practices relevant to wave energy development). Suggested mitigation and optimising measures; both inherent to the project and those which can be applied during the project development, have also been outlined.

Potential key issue/opportunity	Strategy for evaluation	Possible mitigation and optimisation strategies
Socio-economic issues		
Increased vessel traffic and associated activities at site and in transit areas	A Navigational Risk Assessment (NRA) will be completed as part of the EIA. The NRA will be completed in line with MGN371 (M+F), MGN372 and DTI 'Guidance on the Assessment of the Impacts on Offshore Wind Farms" and in close consultation with Marine Scotland, MCA and NLB. This will include an assessment of vessel traffic levels firstly using existing published data, supplemented if required by project specific AIS data gathered from a new shore station. This data will be used to determine current levels of activity in line with MCA guidelines. This information will also be used alongside projected vessel use within the project to determine the scale of increase in vessel activity. Any significant changes / issues / opportunities will then be addressed within the ES including noise and disturbance for wildlife, multiuse of vessels etc.	The development site will be selected to avoid high density shipping routes and fishing activity. Pelamis technology already incorporates a number of navigational safety measures agreed with the NLB and MCA including marking. However guidance on routes for vessels, procedures for notification of mariners and marking of the site will also be confirmed. All activities will be complete in line with relevant MGNs and in consultation with the relevant authorities and stakeholders.
Sustained presence of devices, moorings and cables at sea creating additional navigational obstacles at sea	See above. This issue will be addressed explicitly within the NRA process using the information gathered during the vessel traffic survey and the proposed layout options for the field. Scenario based quantitative risk assessment will predict any significant outcomes such as vessel to vessel, vessel to device, collision risks, grounding risks etc. Less significant issues will be dealt with qualitatively.	Location of site will be selected to avoid key shipping routes. In addition, early and clear charting and marking of the site. Stakeholder engagement and consultation will play a key role in mitigating and managing any foreseeable issues

Potential key issue/opportunity	Strategy for evaluation	Possible mitigation and optimisation strategies
Change in local landscape and seascape through increased activity and incorporation of new features/structures into local setting	A Seascape, Landscape and Visual Impact Assessment (SLVIA) will be undertaken to examine the landscape and visual impacts of the development to establish the nature of the existing landscape and its potential sensitivity to change or additional maritime/coastal activity. The assessment will also generate a zone of theoretical visibility to consider the locations and aesthetics of specific valued views from dwellings, viewpoints, local attractions and historical sites. This will be carried out for the offshore site, service vessel routes and any new coastal infrastructure. The strategy will make reference to the relevant seascape guidance published by SNH. Impacts on seascape / landscape will be undertaken in line with the Highland Structure Plan, Sutherland Local Plan Highland Coastal Development Strategy and a Sustainable Design Statement will be prepared for onshore elements if new infrastructure is necessary.	The device is low lying in water (<2 m protrusion above sea surface), the Area of Search lies 3.4 km from shore at the closest point and 11.9 km from shore at the furthest point. Coastal project facilities will be selected so as not to be overlooked by valued historical sites (SAMS) as far as possible.

Potential key issue/opportunity	Strategy for evaluation	Possible mitigation and optimisation strategies
Space-use conflict with fisheries interests	Conflicts will be identified through consultation with appropriate organisations and individuals, discussions held with any other sea users and in line with the FLOW guidelines. If appropriate, a dedicated commercial sea fisheries liaison group or representative will be established to ensure information exchange between fisheries interests and PWP to ensure data exchange. Engagement with fishing community may be undertaken through joint working with The Crown Estate and other developers in the PFOW area. The potential for future sea users to have interests in the development area and along supply routes will also be established. Positive opportunities with other sea users will also be considered including the use of new coastal facilities, opportunities for new business activities etc.	The site will be defined to avoid areas sensitive in terms of existing sea use through data gathering and targeted consultation with key stakeholders. Any displacement or disturbance arising from aspects of the development will be addressed in line with FLOW guidance or alternative strategy with agreement from fishing community.
Promotion of the marine renewables sector in Sutherland and north Scotland	This project has the potential to project the north coast of Scotland to the forefront of the world's wave energy industry. If this project and others planned in the Highlands and Islands region go ahead, there could be a number of new employment opportunities. There will also have been significant expansion in grid capacity and the success of these projects will almost certainly lead to other projects being put forward.	This project will help to establish wave energy's potential as a key opportunity for the region.

Potential key issue/opportunity	Strategy for evaluation	Possible mitigation and optimisation strategies
Employment/contract opportunities for local residents and companies	The needs for staff, facilities, services and advice during the lifecycle of the project will be established as will the capacity and resources of the local and surrounding communities. Where possible opportunities exist these will be identified. Likewise, where significant gaps exist these will be identified and discussions held with local economic development and business leaders to identify which of these could be filled locally and where outside help is required. Lifecycle monetary values will be generated where possible to help quantify these opportunities. Consideration will also be given to the pressures that the project may put upon a relatively restricted pool of possible workers and other resources. Any areas where a shortfall could be critical to the project or to existing business/public sector activity will be identified.	The skills assessment and gap analysis will enable full use to be made of local resources where appropriate; maximising local opportunities.
Physical environment		
Generation of onshore noise and vibration from cable installation	The Highland Council will be consulted with respect to sensitive noise and vibration receptors. Following selection of terrestrial cable installation method and cable landing point, an onshore noise and vibration assessment may be required.	Avoidance of sensitive noise and potentially vibration receptors along terrestrial cable route.

Potential key issue/opportunity	Strategy for evaluation	Possible mitigation and optimisation strategies
Effects on onshore hydrology regime from cable installation	A baseline hydrology survey may be required to identify hydrological, hydrogeological and geological conditions and potential impacts on the cable route, in addition to impacts related to flooding.	Avoidance of sensitive hydrological pathways or receptors.
Changes to hydrographic conditions resulting from physical presence of moorings and devices	The predicted wave shadow from the devices will be established and its possible consequence upon wave related hydrographic processes considered. This will include nearby effects such as reduced mixing in the water column and any potential for changes to processes along adjacent coastlines.	Sensitive hydrographic areas will be avoided during site selection.
Ecological environment		

Potential key issue/opportunity	Strategy for evaluation	Possible mitigation and optimisation strategies
Effects on marine wildlife from the presence and operation of devices	Desk-based assessment will be conducted to identify any vulnerable habitats and species (also see proposed monitoring strategies below). Any specific issues will be addressed within the ES. Short breeding season surveys may be required to establish whether any further survey work is necessary. Survey results will be communicated to relevant stakeholders to determine the scope of the final ES. A project to assess key potential interactions at EMEC is currently under development, and outputs are hoped to contribute to understanding potential effects on wildlife. The potential for interactions between local wildlife and the technology associated with the project will be considered. Where potential for significant impacts is anticipated, analysis will be undertaken to consider the consequences of such interactions. Special attention will be paid to any habitats and species covered by the Habitats and Species Directive; including species away from designated sites. Where less or non significant interactions are deemed possible they will be briefly described and any potential for escalation addressed.	The key design feature is that the site is selected outside particularly sensitive areas and away from internationally designated sites for marine mammal populations. No SACs relevant to the proposed development for seals and cetaceans are located within 100km of the proposed development area. Development is located in a low tidal flow area[25].

[25] The report - Wilson B. Batty R. S Daunt F & Carter C (2007) Collision risks between Marine renewable energy devices and mammals fish and diving birds. Report to the Scottish Executive. Scottish Association for Marine Science, Oban, Scotland, indicates that risks are considered greater in high flow areas where flows can combine with swimming speeds to produce high velocity approaches with reduced avoidance or evasion responses.

Potential key issue/opportunity	Strategy for evaluation	Possible mitigation and optimisation strategies
Potential for displacement, collision and entanglement between marine mammals and large fish and WECs, mooring lines and cables	The following process will be followed to investigate this issue: • Aerial surveys - collate data from the baseline abundance assessment currently underway by The Crown Estate and Marine Scotland based on 2 km grid intersections over 12 months[26]. • Incorporate a synthesis of large-scale data gathering initiatives through the Joint cetacean database (includes SCANS) and SCOS and relevant outputs from other initiatives (SMRU, SNH, HEBOG, SAMS) • Consultation - consultation with MS-LOT, Sea Mammal Research Unit, Marine Conservation Society, Whale and Dolphin Conservation Society, and local wildlife groups. • Desk-based risk assessment of collision potential. • Desk based risk assessment - undertake a desk-based entanglement assessment based on physical characteristics of subsea umbilical interconnectors (i.e. bend radius) and moorings (mooring tensions) to quantify the theoretical risk of entanglement.	The key design feature is that the site is selected outside particularly sensitive areas and away from internationally designated sites for marine mammal populations. No SACs relevant to the proposed development for seals and cetaceans are located within 100km of the proposed development area. Development is located in a low tidal flow area. Furthermore the mooring arrays used for securing the Pelamis devices and the devices themselves are not considered to pose a serious threat to marine mammals. The lines in the moorings are substantial and tensioned; they cannot therefore become entangled with animals. The device itself is large and not prone to rapid or extensive movement and again should not pose a threat to large marine life. Noise impacts The one remaining issue is the possibility of marine life becoming trapped between mooring elements. The design of the mooring limits the potential for such entrapment to occur.

[26] Recent research (Approaches to Marine Mammal monitoring at marine renewable energy developments, SMRU 2010) indicates that monitoring for marine mammals needs to take place over very large scales to have sufficient statistical power to identify population impacts. Large scale monitoring is likely to be the only feasible way to detect, monitor and manage large scale impacts. The type and quality of data that could be gathered through further baseline cetacean surveys is not therefore considered to offer further insight into the potential risk or significance of a single collision event or identify displacement.

Potential key issue/opportunity	Strategy for evaluation	Possible mitigation and optimisation strategies
Disruption of seabed communities during installation, operation and decommissioning of moorings and marine cable	A seabed habitat characterisation survey will be completed prior to site selection and micrositing for deployment area and cable route. Field survey using underwater photography will be combined with geotechnical / geophysical survey and potentially hydrodynamic analysis. The possible vulnerability of the community to additional disturbance will also be addressed. Particular attention will be paid to seabed effects, the timing and duration of disturbance and the influence of secondary effects such as scour around seabed anchors. The effects of any anchoring of support vessels and the operations to lay the cables will also be addressed.	The project site will be selected to avoid high sensitivity seabed communities, works will be planned to minimise seabed disturbance in sensitive areas, for example laying power cables on surface of seabed.
Effects on marine mammals and fish resulting from the generation of underwater noise	Initially the potential for the Pelamis devices, associated support vessels and infrastructure to generate noise will be determined. If evidence from other deployments is available this will be used. This possible noise spectrum will then be compared with existing ambient noise spectra to identify levels of frequency and loudness that could significantly different from existing conditions. The implications of any areas of difference will then be assessed in relation to the presence of any noise sensitive species for the changed noise spectra that have been identified.	If evidence of noise levels during operations is still not available then a noise monitoring programme will be developed for implementation after installation in close consultation with the relevant stakeholders. Noise generation will be minimised within the operation of the device. Avoid close proximity (<1 km) to areas which may be sensitive to noise disturbance such as coastal seal breeding sites.

Potential key issue/opportunity	Strategy for evaluation	Possible mitigation and optimisation strategies
Effects on marine mammals from increased vessel activity and installation and decommissioning activities.	The number and types of vessels proposed for use at each stage of development will be established along with the anticipated timescales. This information will be used to determine the potential zone of effect for species of concern arising from the proposed activities relative to existing vessel activity within and around the area. This task will be linked to the earlier NRA process, and outputs of acoustic monitoring to help quantify any impacts that could arise. Vessel movements and activities undertaken by these vessels will be assessed.	Works will be similar to existing vessel operations associated with fishing, and nearby merchant shipping. Methods of vessel operation on site will seek to avoid excessive speed or other factors that may lead to enhanced impacts.

Potential key issue/opportunity	Strategy for evaluation	Possible mitigation and optimisation strategies
Effects on migratory fish	PWP aims for a phased approach to evaluating potential impacts. • Establish routes for communication with key interest groups. • Collate existing baseline data on eel and salmonids populations, fishing rights, netting and catches on the north coast (Marine Scotland, Northern District Salmon Fisheries Board). • Collate available information from research initiatives regarding physical and non-physical impacts on salmonids and eels (Marine Scotland, SNH, COWRIE etc.) • Investigate the potential for cumulative effects. • Determine needs and priorities for monitoring and assessment if necessary. If any reasonable hypothesis for effect is identified then the likely distribution and behaviour of the affected species will be determined. If this assessment shows that there is a possible significant pathway for interaction, more specific investigations into the use of the proposed development site by migratory species may be undertaken during wider baseline survey activity. However, the consequences of existing fishing practices and other influences, such as fish farming, upon migratory species will also be considered.	Mitigation and optimisation strategies, if necessary will be agreed with relevant organisations (Northern District Salmon Fisheries Group and any other relevant interested groups / individuals including river superintendents, ghillies, landowners, Fisheries Commission etc).

Potential key issue/opportunity	Strategy for evaluation	Possible mitigation and optimisation strategies
Potential displacement of seabirds from increased vessel activity and sustained presence of structures	This issue will be investigated as follows: Baseline aerial surveys to determine distribution and abundance at a regional level have been initiated by the Crown Estate and Marine Scotland. The assessment commenced in October 2010 based on 2 km Grid intersections to encompass bird breeding and non-breeding seasons. Determine potential mechanisms for likely significant effects upon seabirds. This will include direct effects such as collision risk to foraging birds and disturbance and displacement from foraging/breeding areas. Indirect effects such as barrier effects to movement will also be considered. Positive as well as negative effects will be considered. A potential project to characterise interactions of the Pelamis machine with marine birds at EMEC is under development. The EIA will incorporate the outputs of several other data gathering initiatives underway, which will generate outcomes relevant to a Pelamis wave array (SNH / RPS).	The deployment site will lie away from key seabird aggregations. The Pelamis device is not considered to pose a high risk to birds.
Conservation		

Potential key issue/opportunity	Strategy for evaluation	Possible mitigation and optimisation strategies
Effects on historic sites, archaeology and other built heritage from the installation of moorings, cable and onshore infrastructure	Undertake a desk-based assessment in line with Institute for Archaeologists (IfA) methodology. The baseline field survey will be centred on combining relevant survey with site geophysical / geotechnical survey on shore and offshore. Locations will then be compared to proposed development locations. Where there is co-location of interests possible avoidance measures will be considered. Where there is not co-location but there is a close affinity, or where a site has a particular relationship with its setting then an assessment of the degree of intrusion arising from the proposed facilities of activities will be undertaken. This assessment will take into account existing landscape character and pressures as well as the likely impact of the new feature(s). It is suggested that clear significance criteria be allied to this assessment, so that focus can be given to the more significant interactions, if they exist, rather than trying to consider all possible interactions. Investigate incorporation of Protocol for Archaeological Surveys developed for offshore wind.	Submerged landscapes have become a more valued part of the historical heritage of the country over recent years. However, ancient sea levels were never lower than – 45 m and the water depth at the proposed site would mean that there was no likelihood of direct disturbance to sensitive sites. Cable routes to shore would need to be assessed if the cable were to be buried but there would be no affects from a surface laid cable. Should any relocation of a facility of activity need to take place to reduce or avoid a particularly important interaction then this will be considered.

Potential key issue/opportunity	Strategy for evaluation	Possible mitigation and optimisation strategies
Effects on areas of conservation value and protected species	In general there will be a philosophy of avoiding important conservation sites if there is a significant risk of damage or harm occurring. There are also species of conservation value which move outside designated sites and occurrences of valued habitats that are not protected. The distribution of such interests will also be taken into account during the project design process. This assessment will consider the types of interaction that could occur, where they could occur, their intensity and likely outcome. Potential effects on protected species will also be considered and appropriate mitigation and management strategies developed as necessary. An HRA preliminary screening has been undertaken for this project to inform the Scoping Process (refer to Appendix II). Onshore, baseline survey will identify the need for survey and the scope of EIA studies required. A Phase 1 Habitat Survey should identify the presence of habitats and species of conservation importance, in addition to the need for further specialist surveys (birds, otter, badger or water vole to be agreed with SNH).	Site selection process will avoid/minimise as far as practical any potential for direct disturbance of protected areas and species. It is however noted that such species are already subject to a wide range of sea user pressures.

Potential key issue/opportunity	Strategy for evaluation	Possible mitigation and optimisation strategies
Effects on cultural traditions	The elements of the culture of the local and adjacent communities that could be affected by the development of a Pelamis type wave energy project will be fully considered. In particular the scheduling of works, the potential for flexible working practises and the consequences of observing traditional approaches to business in terms of cost and other factors will be determined.	The challenge of observing traditional patterns of working in an industry that has strong weather window dependency may be a particular issue.

7 Identification of key cumulative and in-combination effects

7.1 Cumulative effects

Cumulative effects can arise in a number of different ways. They can arise from:

- Multiple parameters within one project acting at the same time on a receptor
- Sequences of activities occurring one after the other
- Multiple sources associated with different activities for one impact parameters
- Multiple sources and multiple parameters acting at the same time on a receptor

Cumulative effects can be negative (e.g. noise disturbance) or positive (e.g. protection of the seabed from fishing, economic activity).

The ES for the Farr point project will therefore consider each of these issues.

In most circumstances it is considered very unlikely that significant cumulative effects will arise when they are considering individual impacts that are themselves not significant. The exponential nature of most impact classification schemes provides for orders of magnitude differences between impact classifications (i.e. around 10 cumulative interactions needed to raise impact by one level). However, where significant effects are already indentified from individual sources added impacts vectors may increase this significance.

The analysis described below will therefore serve to highlight whether or not cumulative issues are an issue which needs further consideration and possibly management.

There are numerous interventions that can help to control cumulative effects. These include:

- Controlling the timing or phasing of activities
- Controlling the distribution of activities
- Changing the way activities are undertaken
- Altering the approach to a task
- Altering locations
- Adopting observational monitoring during activities with a means of intervention if a risk of impact arises

Identifying the potential for cumulative effects does not therefore mean that they will necessarily arise.

7.1.1 Multiple vectors from within one project acting at the same time on a receptor

An example of this type of impact could be a receptor (species or person) that was vulnerable to both noise and visual disturbance, or perhaps a supply chain service that could support more than one part of a project. At any one time therefore there could be multiple impact vectors acting on that receptor.

If the major receptor categories are considered against the activities that may affect them then an indication of the potential for cumulativeness can be predicted. This will be completed during the EIA process and the results presented within the ES.

Impact vectors	Relationships	Receptors
Physical disturbance	To be completed during the EIA process	Climate
Noise/vibration/light		Physical
Visual presence/setting		Ecological
Contamination		Conservation
Nuisance/obstacle		Social
Money/jobs		Economic
-		Infrastructure

7.1.2 Sequences of activities occurring one after the other

An example of this type of impact may be a population of sea mammals which regularly use the deployment area. They could be affected sequentially by setting moorings, cable laying, device installation and device operation. Some of these operations may also be undertaken simultaneously in different parts of a site.

If the typical phases of activity are compared to possible receptors that could be affected then again an indication of possible areas for cumulativeness can arise.

Activities	Relationships	Receptors
Manufacture	To be completed during the EIA process	Climate
Port works		Physical
Setting moorings		Ecological
Cable laying		Conservation
Tow out		Social
Connection/disconnection		Economic
Operation		Infrastructure

7.1.3 Multiple sources associated with different activities for one impact vector

This source of cumulative affect relates to the combination of impacts from unrelated activities. Some of these activities may be controlled and regulated, others are not. The combined potential for impact will be experienced by the receptor as discussed in the following table.

Activities	Relationships	Receptors
Wave energy	To be completed during the EIA process	Physical disturbance
Tidal energy		Noise/vibration/light
Shipping		Visual presence/setting
Fishing		Contamination
Fish farming		Nuisance/obstacle
Ports and harbours		Money/jobs
Recreation		-

7.1.4 Multiple sources and multiple vectors acting at the same time on a receptor

Essentially this analysis has the same types of relationships as identified in the first analysis; however the intensity of the relationships will be altered due to the other activities that are taking place in an area.

The level of other, and in many cases existing activity in an area can have a wide range of influences upon the types and intensity of impact that will result. This is particularly the case for behavioural and disturbance type effects where a receptor in a "pristine", or presently undisturbed location may react quite differently to a receptor in an already used and disturbed location. There may however be tipping points where the level of activity reaches a threshold at which the receptor suddenly changes their reaction to the stimulus. Such behavioural traits can be seen in both wildlife and people. They may alter considerably from site to site, location to location.

Impact vectors	Relationships	Receptors
Physical disturbance	To be completed during the EIA process	Climate
Noise/vibration/light		Physical
Visual presence/setting		Ecological
Contamination		Conservation
Nuisance/obstacle		Social
Money/jobs		Economic
-		Infrastructure

Given the high number of unregulated activities that take place in the sea today it is quite possible that impact vectors that from an objective assessment level would appear to be significant, yet they are deemed actively to be acceptable, or passively to be tolerable in terms of sea use management.

This creates a difficulty when addressing the acceptability of otherwise of possible cumulative effects. The assessment will therefore indentify where there is a potential for cumulativeness and will indicate the acceptability of possible impacts through benchmarking with existing activities.

It is important to note that within the contexts of the Habitats Regulations Assessment for this project a different threshold level of acceptability is currently required and may differ from the conclusions drawn in this broader assessment of all cumulative effects.

8 Community engagement, consultation and communications strategy

PWP acknowledges that the success of the proposed development is intrinsically linked to its community and stakeholder engagement activities as well as its communications strategy and its implementation. The development process will ensure that it applies best practice throughout the entire project lifecycle and the following strategy will be maintained as a 'Stakeholder Engagement Plan' and 'Stakeholder Database' (both of which will be live documents) during the project by the Project Manager to incorporate any shift in strategy, amendments to stakeholder roles, contacts etc.

Communication and consultation is an essential component of the Environmental Impact Assessment (EIA) and Navigational Risk Assessment (NRA). This section describes how external communication and consultation will be managed and coordinated as part of the EIA and NRA process. Internal communication will be managed as part of the overall project management.

The purpose of communication and consultation with external organisations is to ensure appropriate and timely engagement is made with the relevant groups and organisations in order that the necessary processes (e.g. licensing/consenting) are undertaken to a satisfactory outcome; but also to help identify any potential conflicts and opportunities and establish the preferred options that present the lowest risk and most benefit for all concerned.

It should be noted that there will be parallel promotional and media related activities regarding the wider Crown Estate Pentland Firth and Orkney Waters Leasing Round which it is hoped will enhance PWP's independent strategy. A number of pre-scoping meetings have been held and others are planned to raise awareness of the project both locally and nationally (refer to Tables 8.1 and 8.2).

Table 8.1 Project specific and wider consultation to date

Date	Meeting	Purpose
17 June 2010	Team Leader, Planning and Development, Wick	To introduce proposals and identify key contacts relevant to the planning process.
4 August 2010	Scrabster Harbour Trust, Scrabster	Introduce proposals, gather information on harbour improvements and formally feed into feasibility process.
21 August 2010	Community Council and Officials Meeting, Strathy Hall, Sutherland	Introduction to proposals at Farr Point Gather initial information relevant to local aspect of proposals (e.g. salmon fisheries) Establishment of Community Liaison Group
23 August 2010	Scottish Fishermen's Federation, PWP Offices, Leith	Introduce proposals for Farr Point and other Scottish Wave Farms Initial fisheries data information and best practice for engagement
21 September 2010	Pre Application Process for Major Developments, Highland Council, Inverness	Formal process for outlining initial proposals and gathering feedback from key Highland Council officials.
9-10 November 2010	Crown Estate Public Exhibitions, Thurso	Pubic exhibition to raising awareness of all developments across the Pentland Firth and Orkney Waters Leasing Round Gather local information and field questions,
11-12 November 2010	Crown Estate Public Exhibitions, Kirkwall	
8 March 2011	Fisheries Liaison Meeting, Scrabster	Group meeting to raise awareness amongst fisheries community and initiate liaison.

8.2 Stakeholder Identification

In order to facilitate the communication and consultation process in a way that meets the needs of the project, and the stakeholders, it is essential that the key stakeholders are defined at an early stage of the process. For the purpose of this project the stakeholders have been grouped into the following categories:

- **Regulator Group** which includes all statutory consultees and is further defined by those who sit on Marine Scotland – Licencing Operations Team's (MS-LOT) **Marine Renewables Facilitators Group (MRFG)** and those which do not (**Other statutory stakeholders**). This list is based on existing legislation and regulations as well as ongoing consultations i.e. EIA (Scotland) Regulations (2010)

- **Non-statutory Stakeholder Group**[27] which includes non-statutory advisory bodies, organisations that will have a direct interest in the project due to their remit/geographical location. MS-LOT has indicated that it will consult directly with a number of these therefore. Please refer to Appendix V for a list of stakeholders within each group.

8.3 Communication and engagement strategy

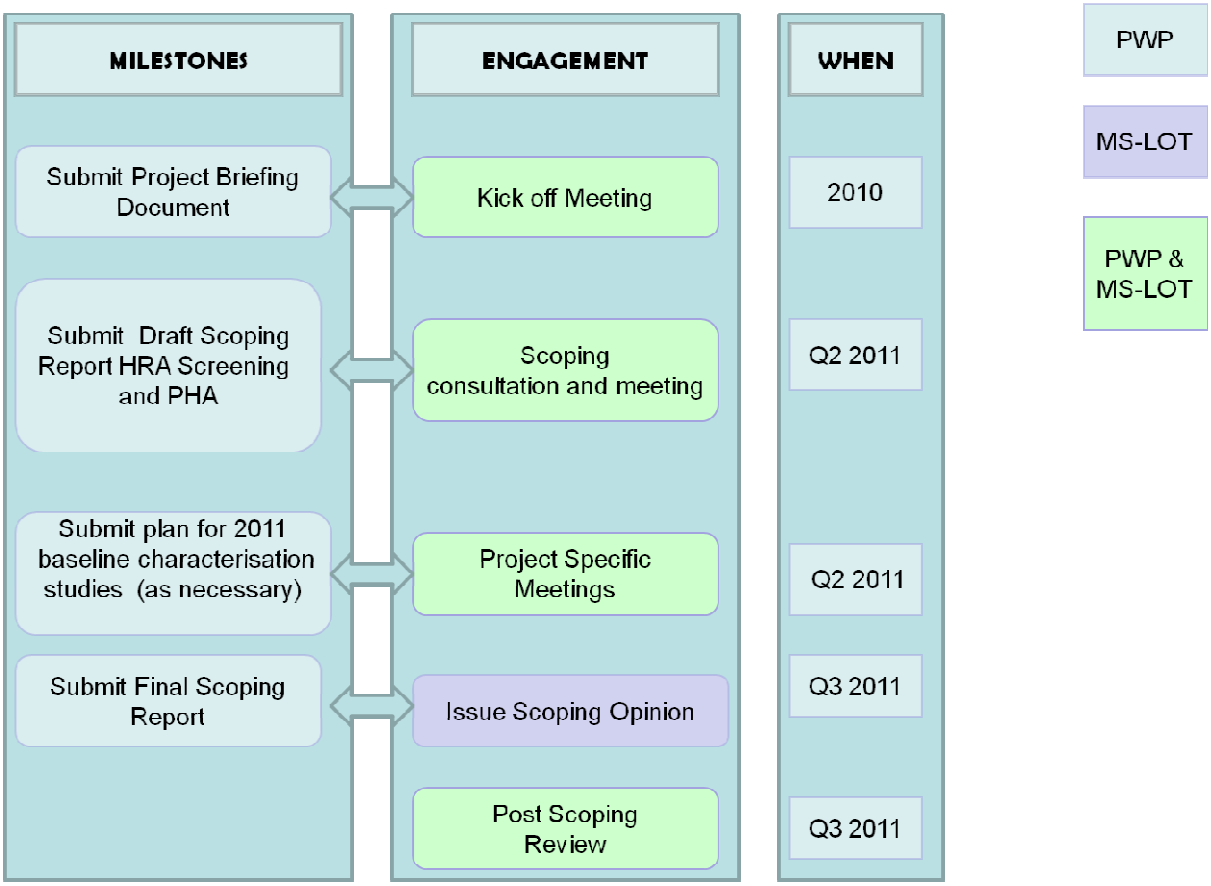
The following section outlines PWP's proposed strategy for engagement throughout the EIA process with each of the stakeholder groups identified above. This strategy is intended to be maintained as a live document through the 'Stakeholder Engagement Plan' and 'Stakeholder Database' (which will also act as a Register of Communication) which can be reviewed and revised as the EIA proceeds.

8.3.1 Engagement with the Regulator Group

PWP recognises the need to work closely with the Regulator Group in an efficient manner as each member is currently managing high workloads with minimal resources. It is essential that a strategy is agreed that not only allows members to fulfil all statutory requirements but also allows the project team to ensure that the information is provided and discussions are held in such a way that maximises output and minimises the pressures on the resources available.

The proposed strategy for engaging the Regulator Group over the next few months is outlined within Figure 8.2.

[27] Please note that it is realised that a number of these organisations/bodies may become 'Statutory Consultees' depending on the permitting strategy adopted by the developer



~~Figure 8.2~~Figure 8.1 Proposed Regulator Group engagement through Scoping Process

Please note that a Project Briefing Document was issued during 2010; refer to Appendix III for summary of the feedback.

It is anticipated that MS-LOT will manage all communications with members of the MRFG and help to distribute information, arrange and facilitate meetings, teleconferences etc. If possible, relevant members will attend the meetings outlined above throughout the Scoping Process. It is also recognised that Marine Scotland is building its advisory remit and this will help to facilitate discussions around specific topics and issues.

8.3.2 Engagement with the Non-Statutory Group

The involvement of the Non-Statutory Stakeholder Group in the EIA and NRA processes is to ensure that all necessary organisations are made aware of the proposals and have an opportunity to provide advice, feedback and relevant data/information. As stated previously, it is anticipated that MS-LOT will handle all official correspondence with certain members of this group (refer to Appendix V - Non-statutory stakeholders (consulted by MS-LOT) in a similar way to that of those sitting on the MRFG. PWP will communicate directly with the other members as and when appropriate.

8.3.3 Public Consultation

Although a number of organisations within the Non-Statutory Group represent the wider community, it is essential that the public are engaged throughout the EIA process. As well as being necessary under law, it is important to ensure that the wider community is aware of the proposals and is confident that the project has followed the correct procedures (e.g. EIA, Navigational Risk Assessment [NRA]) and that they have an opportunity to contribute wherever possible. Public consultation will be undertaken at key stages within the EIA process and meet the requirements of the legislation. Table 8.2 below outlines some of the initial measures planned for this purpose.

Table 8.2 Initial community engagement strategy

What?	When?	Why?
Community Council Meetings	Community Council and Officials Meeting, Strathy Hall, Sutherland Pre Scoping	Introduction to proposals at Farr Point Gather initial information relevant to local aspect of proposals (e.g. salmon fisheries) Establishment of Community Liaison Group
Crown Estate Public meeting/open day	During Scoping Consultation	Direct community engagement Establish community aspirations and potential for direct involvement
Fisheries Meeting	March 2003 (Scoping)	To initiate contact with relevant fisheries groups and individuals as a basis for longer term liaison.
PWP workshop meeting/open day	During Scoping Consultation	Direct community engagement Establish community aspirations and potential for direct involvement
Ongoing liaison with : 1 - Community Group 2 – Sea Users Group or Representatives. 3 – Migratory Fish	At regular intervals through the development of the project	Ensure that important interest groups are integrated into development process and aware of processes.
Ongoing participation in local forums / events etc	Ongoing	Keep the community and stakeholders informed

9 Environmental Impact Assessment methodology and scope

This section of the report describes the proposed approach to undertaking the EIA process leading to the completion of an Environmental Statement report to accompany a future license application. It addresses a number of topics and factors which it is believed will contribute to a successful outcome for this task. These principles will be used to guide the establishment of a suitable scope of work, tender process, and selection of a suitable consultant and in the management of the resulting work.

9.1 Organisation

- Establish a team with the necessary expertise, experience and local understanding to successfully undertake the EIA process and required supporting EIA studies.
- Review the results of the scoping process and establish a detailed execution plan for the EIA process and associated consents, including a detailed weekly schedule and resource plan based upon man hours commitment. This plan would be integrated into the overall project plan.
- Demonstrate that there is capacity within the organisations participating to fulfil the requirements outlined.

9.2 Context

- Establish an understanding of the technical and operational requirements of the project, with particular reference to the areas that may interact with the surrounding environment.
- Establish an understanding of the environmental context for the project. The environment is taken to include physical, ecological, conservation, social & economic components.
- Demonstrate an appreciation of the regulatory framework within which the project will sit and the regulatory hurdles that will need to be crossed to achieve consent.

9.3 Consultation

- Establish an appropriate consultation strategy for the project, integrated with the overall project external communication plan.
- Identify appropriate stakeholders including statutory bodies, advisors and other interested parties (proposed stakeholder lists are presented in Appendix V)
- Undertake three formal consultation stages during the project, the first near the beginning building upon the Scoping Request activities, the second to consider a preliminary draft of EIA findings and the third during the application process (i.e. the statutory required public consultation).
- Maintain a suitable level of informal consultation with agencies and local people to ensure that stakeholders feel engaged in the project development process.
- Ensure that there is a clear record of all consultation communications and how consultation responses have been considered and the outcome that has arisen.

9.4 Baseline information

- Undertake the necessary surveys and investigations to gather baseline information to underpin the assessments, risk assessments and monitoring programmes established later in the EIA process. Specific surveys are expected to include:
  - Marine mammals – cetaceans
  - Marine mammals – otters
  - Marine mammals – seals
  - Seabed character
  - Landscape/seascape
  - Marine birds
  - Terrestrial habitats and wildlife – wildlife
  - Terrestrial habitats and wildlife – terrestrial habitats
  - Archaeology – built heritage
  - Archaeology – submerged landscapes
  - Other sea users
  - Socioeconomic survey.

9.5 Description of the legislative framework, project and baseline environmental conditions

- Information describing the regulatory and policy framework within which it sits.
- Information describing the project.
- Information describing the condition and status of the surrounding environment.

9.6 Screening

- A process of identifying all interactions and establishing which have the potential to be significant should be completed. This needs to be based upon clearly defined criteria and rules, and to have suitable records kept so as to make the process transparent and robust. The outcome of this task will be an agreed list of potentially significant impact mechanisms.

9.7 Assessment of possible impacts

- Investigate the type, range and intensity of impacts that can arise from the significant impact mechanisms identified during screening.
- Undertake any reviews, survey or research work required to reach a suitable conclusion regarding these impact mechanisms.
- Carry out an environmental risk assessment study to understand the range, likelihood and consequences of possible accidental events.
- Consider cumulative impacts and risks taking into account existing and possible future harbour developments.

- Discuss more important impacts with key stakeholders to ensure that concerns are investigated and addressed in the assessment activities.
- Compile written statements discussing the types of impacts that can arise and the ways by which these can be managed to an acceptable conclusion.

9.8 Mitigation

- Prepare a recommended list of mitigation management and optimisation measures and discuss these with the project and other appropriate stakeholders to establish an agreed set of measures to take forward.

9.9 Residual impacts

- Establish given the mitigation management and optimisation measures planned, what the likely residual impacts associated with the project might be.

9.10 Action plan

- On the basis of the mitigation, management and optimisation measures agreed, prepare an action plan showing how these will be implemented including a clear statement of roles and responsibilities for each task, performance benchmarks anticipated and methods of monitoring, reporting and learning from the performance to date.
- Establish an ongoing monitoring plan aligned with the key issues to ensure that the project delivers within the envelope identified during the EIA process.

9.11 Communication

- Ensure through appropriate information leaflets and local press articles (subject to approval of the client) that the public are aware of the proposals in place, the work being done, the opportunities for public involvement and of the progress being made on the project.
- A suitable website for facilitating public communications on the project may be established.
- Public exhibition to coincide with second stage of formal consultation (at time of production of draft ES).

9.12 Reporting

- Prepare an option evaluation report to support the first consultation stage.
- Prepare a provisional draft ES report to support the second consultation stage.
- Prepare a final ES report to support the planning and other appropriate consent application
- Revise the final report and re-issue upon completing the planning application process.
- Development of an Environmental Management Plan to ensure the integration of all ES commitments into the overall project plan.

9.13 Project management

- Progress monitoring & reporting, including budget reporting.

- HSE management.
- Quality control.

10 Scoping questions

PWP would be grateful if stakeholders could address the following specific questions when responding to this Scoping Report. All other comments, feedback and advice is also very welcome.

Project description

1. Is the proposed phased approach to developing the site clear and does it appear an appropriate strategy for site development at this scale?
2. Are the operational principles of the technology and supporting infrastructure clear? If not, what other information would be beneficial?
3. Have the proposed activities associated with installation, operation and maintenance been provided in sufficient detail? If not, what other information would be beneficial?

Baseline environment

4. Has the information regarding the baseline environment been suitably outlined to facilitate this Scoping Process?
5. Do the information gaps relating to the baseline information and the strategies outlined for addressing each seem appropriate?

Potential key issues

6. Have the potential key issues associated with the proposed development been identified?
7. Is the approach proposed for addressing each of these key issues suitable?

Cumulative effects

8. Are the impact vectors and receptors identified appropriate for the analysis of potential cumulative effects?
9. Are the types of cumulative effects that are described appropriate for a development of this type and scale?

Stakeholder engagement strategy

10. Is the stakeholder engagement strategy appropriate for a development of this type and scale?
11. Are there other stakeholders that should be included within the strategy? If so, within which group?

EIA methodology

12. Is the outline EIA methodology suitable for a development of this type and scale?

Preliminary Hazard Analysis

13. Is the methodology proposed for the NRA appropriate for a development of this type and scale?
14. Have the key potential marine safety issues been identified?

Potential impacts on Natura Interests

15. Does the methodology used in the screening process seem robust and appropriate?
16. Have the correct sites and species (i.e. Interests) been identified?

Appendix I - Preliminary Hazard Analysis

Introduction

As part of the wider EIA and permitting processes, PWP will undertake a full Navigational Risk Assessment (NRA). The project specific NRA will include hazards, contingencies and mitigation relevant to the installation, operation, maintenance and decommissioning of approximately 20 Pelamis P2 machines and the associated offshore equipment. The NRA will accompany the licence applications required for project consents and form an integral part of the project's Health and Safety Management System. The NRA will also be used to develop the operational plans for the project through an iterative process; ensuring that all risks have been considered throughout the development and design of the project.

The risk assessment methodology will fulfill the requirements and follow guidance outlined in the following documents:

- Marine and Coastguard Agency's (MCA) Marine General Notice 275 "Proposed UK Offshore Renewable Energy Installations – Guidance on Navigational Safety Issues" (MCA, 2008a)
- MCA Marine General Notice 371 "Offshore Renewable Energy Installations – Guidance on UK Navigational Practice, Safety and Emergency Response Issues" (MCA, 2008b)
- Department of Trade and Industry (DTI), Guidance on the Assessment of the Impact of Offshore Wind Farms (DTI 2005)
- Health & Safety Executive (HSE) Offshore Technology Report on Marine Risk Assessment, (HSE, 2001)
- Det Norske Veritas (DNV), Risk Management in Marine and Subsea Operations (DNV, 2003)

As a precursor to the full NRA, this document comprising a Preliminary Hazard Analysis (PHA) has been prepared in line with the requirements outlined in the Department of Trade and Industry's (DTI), "Guidance on the Assessment of the Impact of Offshore Wind Farms" (2005) along with the draft guidelines provided in "Consenting, EIA and HRA Guidance for Marine Renewable Energy Developments in Scotland" (EMEC and Xodus AURORA, 2010). The objectives of the PHA are to:

- Provide stakeholders with a statement of the proposed approach to the full NRA
- Provide stakeholders with outline information regarding the proposed project and the relevant area of search
- Identify key data/information that is available and any gaps or uncertainties
- Identify the key marine safety issues in preparation for completing a full NRA

This PHA is concerned only with Phase 1 of the proposed Farr Point Wave Farm Development i.e.:

- Installation, operation and removal of up to 20 Pelamis Wave Energy Convertors, peak rated at 750 kW each with a total installed capacity of up to 15 MW
- Installation, operation and removal of associated mooring systems

- Installation, operation and removal of subsea power connections (dynamic umbilical's and subsea export cable)

The PHA process involves the following key steps:

- Development of an appropriate Navigational Risk Assessment (NRA) process
- Development of an outline project description (please also refer to the Project Description provided in Section 3 in the main body of the Scoping Report)
- Preliminary baseline survey
    - Preliminary assessment of shipping movements within the proposed development area
    - Preliminary assessment of fishing activity within the proposed development area
    - Identification of anchorages within the vicinity
    - Identification of potential search and rescue activities within the area
    - Identification of International Maritime Organisation (IMO) approved or other adopted routing measures within the area
    - Identification of any Marine Environmental High Risk Areas (MEHRAs)
    - Hydrography
        - Water depth
        - Tidal currents
- Identification of key data gaps
- Screening of potential key marine safety issues

This information is provided within the following sections and will be used to inform the scope and direction of the full NRA. Conformation is being sought over the acceptability of this approach for the proposed project.

Risk assessment methodology

The risk assessment will be undertaken using a structured process of risk identification, assessment and management that takes account of local conditions and relevant data sources as well as fulfilling the requirements of a Hazard Identification and Risk Assessment (HIRA) process.
The main sources of data and information that will be used to inform this process include:

- Environmental and metocean data
- Vessel traffic analysis
- High level project method statements – installation (moorings and device), operation, maintenance and decommissioning
- Operational experience of local mariners

A full methodology for risk assessment will be defined with consultation with the MCA and in line with guidance outlined above. The HIRA process will continue as the project develops, using more

detailed method statements as the project progresses. This ongoing HIRA process seeks to maintain good safety performance as operational plans become defined and to give guidance regards the suitability of methods that are being proposed.

In addition a risk control log will be established and maintained to provide a catalogue of the risks that are identified and an assurance process to check that the prevention and control measures for these risks are in place and effective.

The risk assessment process outlined in Figure AI1 outlines one methodology which may be applied throughout the NRA and is outlined further within the text below.

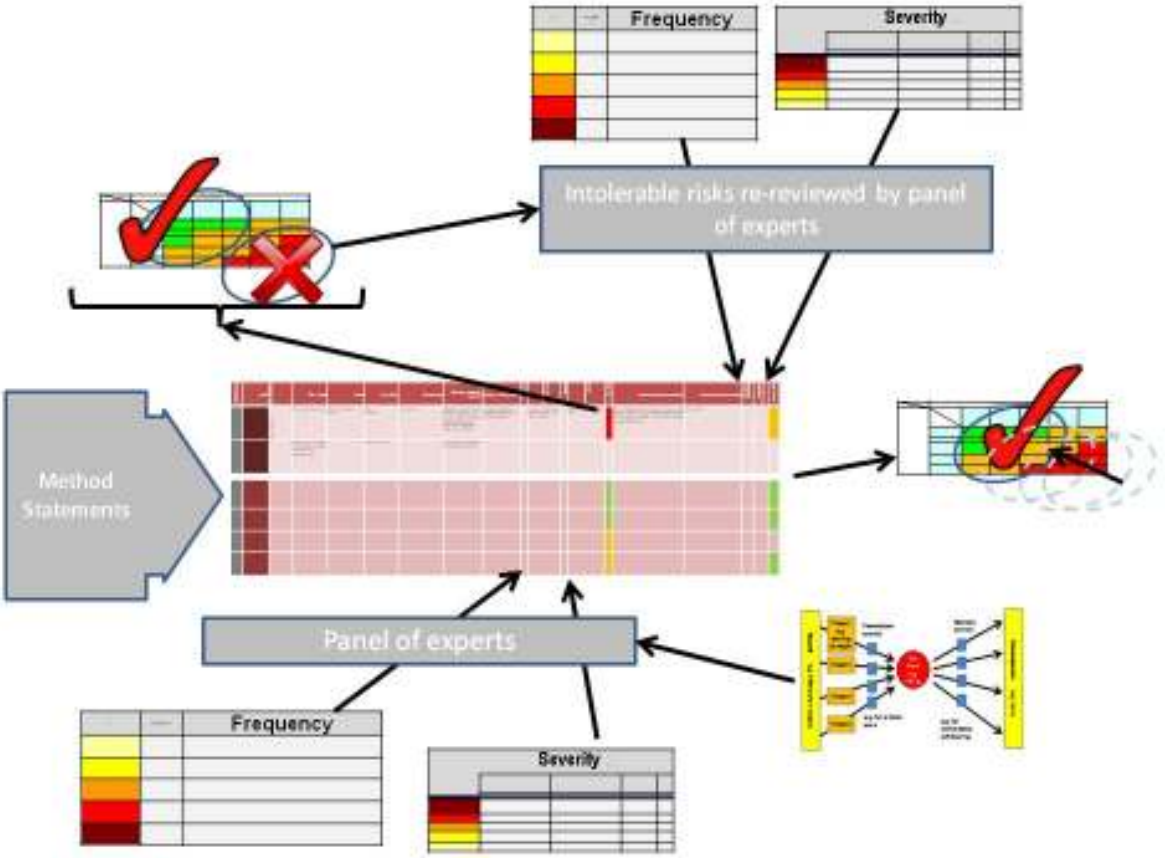


Figure AI1 - Risk assessment process

The risk assessment process for the maritime operation associated with the deployment of the Pelamis devices will follow this sequence:

1. The risk assessment starts with the establishment of a preliminary method statement. This gives an outline of the proposed activities and events for the entire project. The activities comprising the project need to be understood sufficiently that any risks associated with such activities can be identified. Where uncertainty over the proposed approach exists alternative strategies can be evaluated. This list of activities and events populates the left hand column of the risk assessment table

2. In the next phase an expert panel is convened, this panel is used to review the method statements, identifying any hazards pertinent to navigation. The approach to identifying hazards is based upon the SWIFT technique. This ensures that a variety of outcomes and all credible scenarios are considered. The identified hazards are used to populate the next columns in the risk assessment table.

3. The third phase is to undertake an analysis of the identified hazards to establish the events and consequences associated with each hazard. The approach used is to follow the so called 'bowtie' methodology.

The bowtie approach was originally pioneered for use in the offshore oil industry. Within the method it is recognised that a number of hazards can lead to a similar top event and that the occurrence of a top event can then lead to a number of possible consequences.

In the illustration below a **hazard** is released by carrying out an activity, which creates a **threat** of the hazard occurring. These **threats** have the potential to cause an accident or **top event**. The **consequences** arising from the top event will depend upon the **recovery controls** or mitigation put in place.

For example, a hazard could be working at the top of a ladder. The threat would be a difference in height. This hazard would be released by a 'top event', in this case the top event would be falling or slippage of the ladder. There is a potential for an intervention to affect the outcome, such as the use of a soft landing material around the ladder. The consequence of this would be injury.

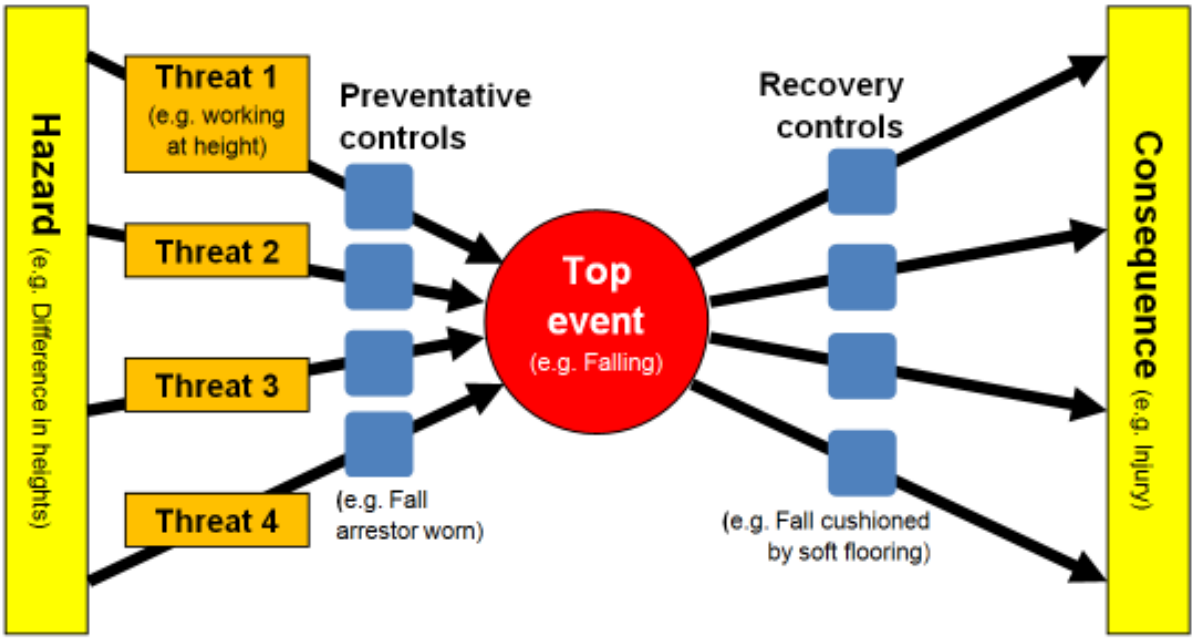


Figure AI2 - The bowtie methodology

This logic sequence helps to populate a number of columns within the risk table showing the possible consequences which could arise.

Further preventative and recovery controls can then be added if required to further reduce the level of risk that results. These measures may reduce either the consequences of likelihood of an event, or both.

This method is suitable for the management of risk rather than the detailed quantitative assessment of risk. It is particularly useful in proactive accident prevention, and the management of safety within a system. Understanding can be gained by examining the routes by which controls can fail and identifying the critical components of the system that prevent these failures.

The risk assessment will be undertaken using definitions for frequency and consequence and a tolerability matrix that are based on ISO 17776 Offshore production installations — Guidelines on tools and techniques for identification and assessment of hazards. A mainly qualitative approach will be applied to assess the frequency of an event for a defined consequence, using the Marine Accident Annual Reports (MAIB 2009) as a guide for accident statistics.

Having identified the possible hazards and consequences associated with these hazards these consequences are then classified according to a defined set of criteria. Industry standard severity (Table AI1 and Table AI2) and frequency (Table AI3) are then used to classify each hazard into an initial risk matrix (Table AI4).

Risks that are identified as 'High Risk' are then re-reviewed by the panel of experts and further mitigation measures are proposed. The risks are then given new frequency and severity scores based on the additional mitigation. Finally an 'Additional Mitigation Risk matrix' is produced where all risks are either acceptable (green boxes) or ALARP (orange boxes) (Table AI5).

Judgments about the severity classification of risks used guidance in Table AI1 (relative to Internal Factors) and in Table AI2 (relative to External Factors):

Table AI1 - Consequence Severity Categories – Internal factors

	Consequence Severity Categories Internal Factors			
	Health & Safety	**Project and Technical**	**Cost**	**Reputation**
	Risks arising from accidents and exposure to chemicals and agents	Operational lost time, reduced flexibility, novel technology	Capital, operating & risk assessed costs from liabilities	Perceptions of external stakeholders
Category				
5 Extreme	One incident with multiple fatalities or multiple fatal accidents. Large scale uncontrolled chemical exposure	Jeopardises total project objectives. Risk of delay > 1 year. Acceptable avoidance, mitigation and/or management (AMM) relies upon blue sky research or design from scratch	Equipment lost or financial liability of value > £5 M	Outcry threatens to prevent project
4 Major	Single fatality and/or multiple serious injuries / chronic health problems. Uncontrolled chemical exposure.	Jeopardises phase objectives. Leads to serious risk of lost time > 1 month and/or opportunities. AMM uses untested technology	Equipment lost or financial liability of value £1-5 M	International media coverage, national campaign against developer and/or facility
3 Moderate	Associated with serious injury and/or long term illness. Managed exposure to harmful chemicals	Jeopardises activity. Risk of delays > 1 week. AMM relies on not fully proven technologies and/or markedly hinders flexibility	Equipment lost or financial liability of value £100K-£1M	National hostile media coverage, local campaign against developer.
2 Minor	Risk of short term illness or minor injuries. Uncontrolled exposure to nuisance chemicals	Jeopardises task. Risk of delays > 1 day. AMM requires use of proven technology not tested in this field experience and presents some restricted flexibility.	Equipment lost or financial liability of value £10-100 K	Adverse public reaction, possible prosecution, considerable local news with some minor national coverage.
1 Negligible	Elevated risk of minor illness or injury. Managed exposure to nuisance chemicals	Partially disrupts task. Leads to minor delays < 1 day. AMM requires well established technology, but it could affect flexibility	Equipment lost or financial liability of value < £10 K	A minor public awareness and some concerns but minor local news coverage

Table AI2 - Consequence Severity Definitions – External factors

	Consequence Severity Categories External Factors			
	Ecological	**Economic**	**Social**	**Regulation**
Factors considered. Assumes likelihood >10%	Impacts arising from pollution, land take, access, cultural or archaeological impacts	Impacts from investment, inflation, jobs, interaction with current businesses	Impacts from social inequality, cultural influence, skills, third party accidents.	Compliance with external regulation and internal corporate policy
Category				
5 Extreme	Total change to total ecosystems and/or indeterminate recovery period	Loss of business >£10 M Inflation ≤1000%	Massive social changes, affecting majority of population negatively Substantial public safety impact to the wider community	In conflict with principles of regulation, leading to regulatory outrage
4 Major	High toxicity, geographical spread, and/or 5-10 year recovery potential	Loss of business <£10 M Inflation <100%	Substantial social changes, affecting local population or minor part of the wider community Public safety impact to local community	Out of line with regulation and unlikely to get approval
3 Moderate	Change beyond natural variability but local geographical effect and/or 1-5 year recovery potential	Loss of business <£1 M Inflation <10%	Moderate social changes affecting a large section of the local community or minor part of wider population Localised public safety impact for individuals	Explicitly limited or controlled by regulation, leading to difficulties in gaining approvals
2 Minor	Similar to natural variability, and/or localised to adjacent areas and <1 year recovery potential	Loss of business <£100,000 Inflation <1%	Minor social changes to localised community or limited organisational structures. Serious nuisance/disruption to individuals.	Limited or controlled by spirit of regulations and may lead to regulator challenge
1 Negligible	Within scope of natural variability and/or limited to the vicinity of the operations.	Loss of business <£10,000 Inflation <0.1%	Minor social changes affecting a few individuals negatively. Minor nuisance to individuals	Noted by regulations but not restricted

Table AI3 - Frequency Category Definitions

Consequence Probability	Weighting	Description
Extremely unlikely	1	Has rarely occurred in the industry
Very unlikely	2	Has occurred a few times per year in the industry (UK merchant fleet >100grt)
Unlikely	3	Has occurred several times a year in industry/sector and has occurred in operating companies (Contractors to this Project)
Possible	4	Has occurred many times per year in the industry and several times a year in operating companies
Likely	5	Has happened several times per year during operations at this location (Orkney/Pentland Firth)

Note that probability categories were informed by a review of Marine Accident Investigation Board's (MAIB) Annual Reports which cover the UK Merchant Fleet (excluding fishing vessels).

Table AI4 - Risk Matrix - Initial review with no additional mitigations

Consequence Probability \ Consequence Severity	1 Extremely Unlikely	2 Very unlikely	3 Unlikely	4 Possible	5 Likely
1 Negligible					
2 Minor					
3 Moderate					
4 Major					
5 Extreme					

Low Risk	Broadly acceptable risk
Medium Risk	Tolerable only if mitigation measures consistent with ALARP are implemented and the analysis team has found the residual risk tolerable
High Risk	Unacceptable risk requires further mitigation to reduce to Tolerable status

Risks will be numbered within the matrix corresponding to the risk identification numbers on the Hazard Log. The risks will be ranked on the basis of applying normal mitigations but not additional mitigations.

Table AI5 - Risk Matrix – Residual risks after applying additional mitigations

		Consequence Severity				
Consequence Probability		1 Extremely Unlikely	2 Very unlikely	3 Unlikely	4 Possible	5 Likely
	1 Negligible					
	2 Minor					
	3 Moderate					
	4 Major					
	5 Extreme					

Low Risk	Broadly acceptable risk
Medium Risk	Tolerable only if mitigation measures consistent with ALARP are implemented and the analysis team has found the residual risk tolerable
High Risk	Unacceptable risk requires further mitigation to reduce to Tolerable status

Table 10.1 Hazard Log template

Phase	Task	Hazard	Top Event	Consequence	Existing prevention measures	Existing recovery measures	Frequency	Severity	Initial Risk	Additional prevention measures	Additional recovery measures	Mitigated Frequency	Mitigated Consequence	Residual Risk	Ref. No.

Table 10.2 Risk Control Log template

Phase	Task	Hazard	Top Event	Consequence	Existing prevention measures	Existing recovery measures	Frequency	Severity	Initial Risk	Add'l prevention measures	Add'l recovery measures	Mitigated Frequency	Mitigated Consequence	Residual Risk	Compliance Required	Relevant Documentation	Responsible Person	Action Due Date	Verification Date

This has the same format and functionality as the Hazard Log with additional columns to log compliance/assurance actions.

Preliminary baseline survey

Existing shipping movements within the area

It is widely recognised that the Pentland Firth is an internationally important shipping route. The potential interactions between the proposals and existing shipping activity therefore, require detailed investigation. For the purpose of the PHA, in order to gain a basic understanding of the level of shipping within, through and around the area of search, AIS data from January to June in 2010 was used. This data is presented in the form of vessel tracks in Figure AI3.

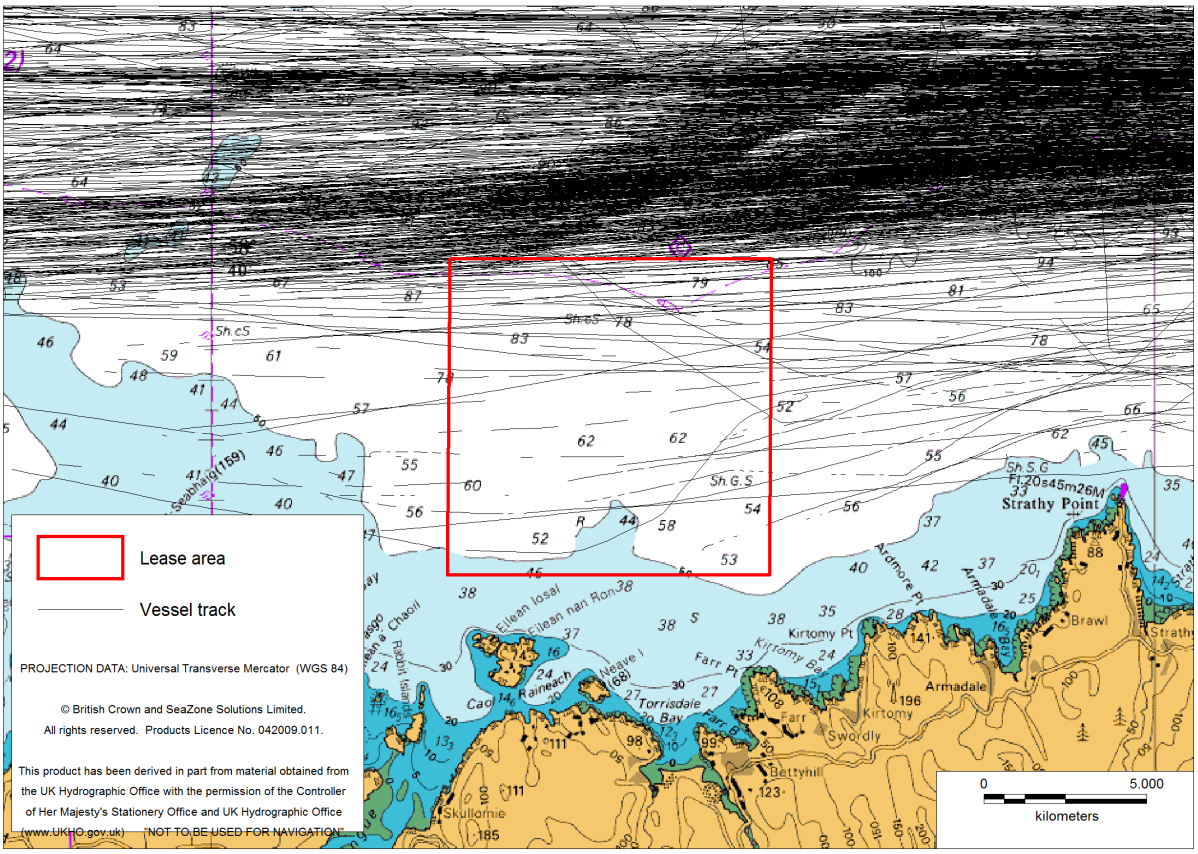


Figure AI3 AIS shipping data (January to June, 2010)

It is clear that the area of search lays outwith the main shipping channel for vessels fitted with AIS[28]. However, it is also apparent that a number of vessels during this period traversed the area of search. Within the NRA, it will be important to understand the circumstances that may lead to a vessel selecting this route e.g. certain weather conditions may lead to this.

The AIS data will be further analysed in order to:

- Determine what types of vessel (fitted with an AIS transmitter) are passing through the wider area (cargo ships, fishing vessels, cruise liners etc)

[28] AIS is mandatory for all vessels over 300 tonnes and for passenger vessels. A number of workboats around Orkney also have the system fitted on a voluntary basis.

- Levels of activity throughout the year

Fishing activity within the area

During the Scoping Process, it became clear that the wider area very likely to be important for a number of types of fishing. Therefore, within the context of the NRA (as well as the wider EIA), it will be important to understand the level of activity within the area associated with fishing. As always, it is difficult to understand fully, the number and types of fishing vessels operating within the area as well as the areas which are of particular importance to the fishing community. There are a number of potential sources of information:

- AIS data – fishing vessels over 300 tonnes will be fitted with an AIS transmitter (refer to the previous section for preliminary AIS data analysis)
- VMS data – fitted to all UK vessels over 15 m in length
- Consultation with fishing community (local fisheries representatives/organisations and fishermen)

As discussed, the AIS data will be further analysed to determine the activity associated with the larger fishing vessels within the area. VMS data from 2007 and 2008 shows that the area of search lays within grounds of moderate fishing vessel activity. Slightly denser vessel activity is seen to the west and north of the area of search.

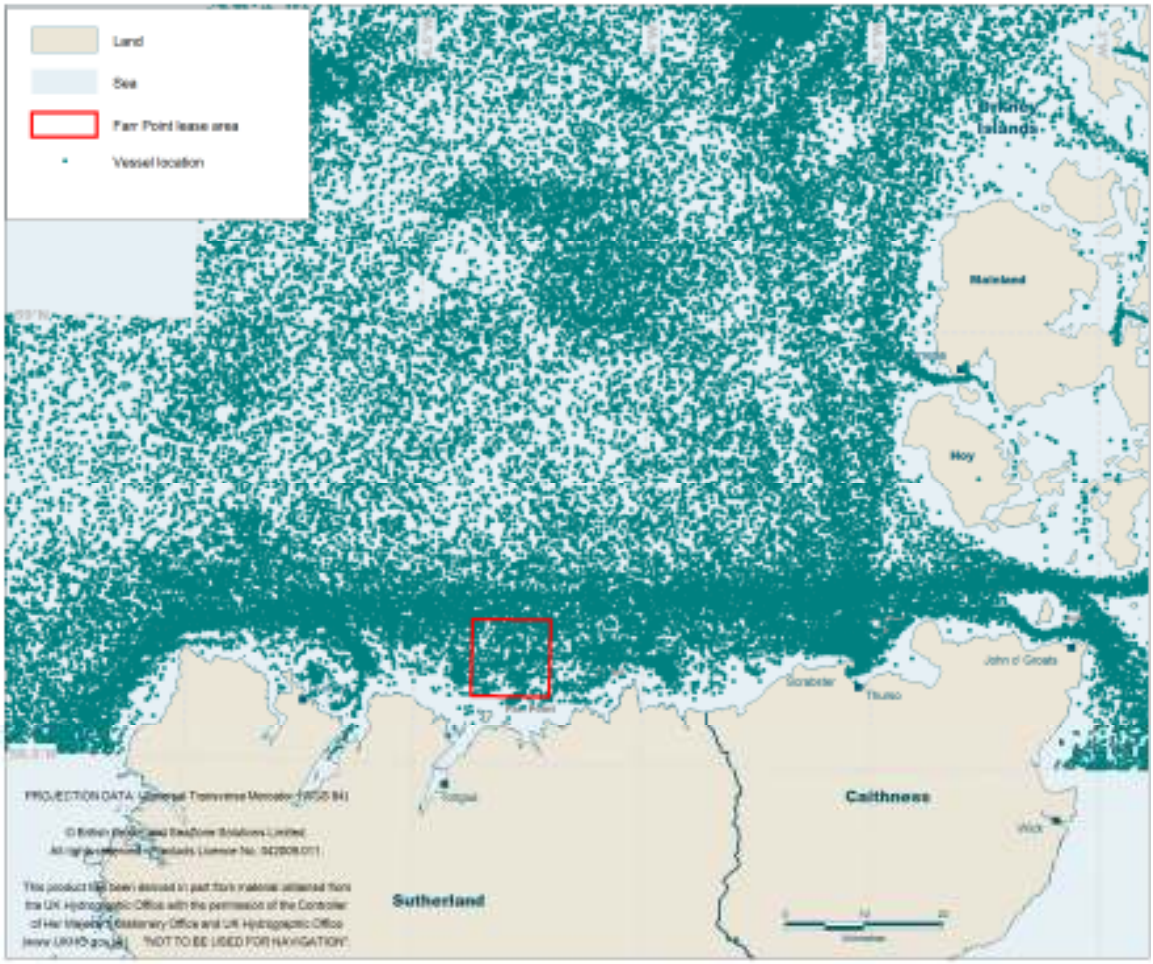


Figure AI4 - VMS data

A preliminary assessment of this data focussing on vessel speeds indicates that there is likely to be a range of fishing activities underway within the area as well as vessels travelling to and from fishing grounds. It is anticipated that fishing activity is more concentrated in the deeper water towards the west of the area of search and that there is a route used by vessels entering and exiting East Loch Roag.

10.2 Anchorages

There are no anchorages within the area.

10.3 Search and rescue

There are a number of lifeboat stations within the wider area. These are shown in Figure AI5.

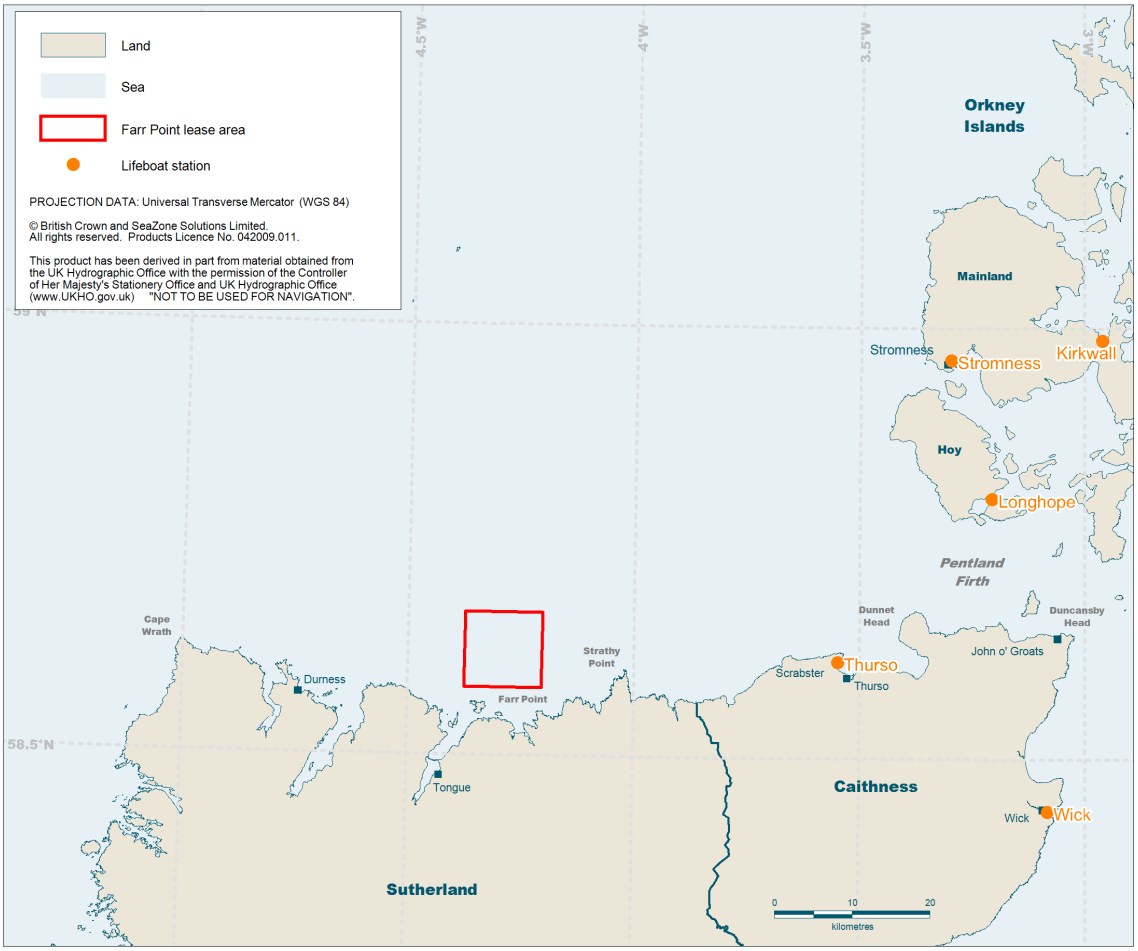


Figure AI5 - Lifeboat stations

IMO approved or other routing measures

There are no IMO approved or other adopted routing measures within the area.

Marine Environmental High Risk Areas (MEHRAs)

There are no recognised MEHRAs within the area.

Hydrography

Tidal currents around the site

PWP has not undertaken any hydrographical surveys within the area to date. In order to gain a very basic understanding of the conditions within the area, the following information regarding notable tidal streams was taken from the North Coast of Scotland Pilot (1974):

- *Off Whiten Head*
    - *-0220 Ullapool – east going stream begins. Spring rate 3 knots*
    - *+0350 Ullapool – west going stream begins. Spring rate 3 knots.*

    (The above coastal streams run only weakly across the entrance to Loch Eriboll)

- *Whiten Head to Strathy Point*
    - *-0220 hrs HW Ullapool – E-going stream begins*
    - *+0350 hrs HW Ullapool – W going stream begins*

    (Both streams run fairly strongly off the salient points along this stretch of coast, and have a spring rate of about 3 knots off Whiten Head and Strathy Point, but they are weak off the bays and inlets between the salient points)

The north and west sides of Eilean nan Ron have been eroded by the sea; there is a subsurface rock off its north east extremity and the bay on its west side is foul.

The area between Rabbit Islands and the islet north of them, and the coast 1.25 miles west contains several dangers. A group of rocks about 0.5m high on which the sea always breaks, lies 8 cables north west of the northern extremity of Rabbit Islands; Dubh-sgeir Bheag, which dries 2m., lies 4 cables west of the western extremity of Rabbit Islands.

There is a tidal diamond within the area of search marked on Admiralty Chart 1954. The information given for the tidal diamond is shown in Table AI6.

Table AI6 - Tidal stream data NW off Strathy Point

Admiralty Chart 1954 – Tidal diamond 'C' – 58° 40'.2N 4 15.1W			
Hrs+/- HW Ullapool	Direction of stream (degrees)	Rate at spring tides (knots)	Rate at neap tides (knots)
-6	244	0.6	0.3
-5	255	1.3	0.5
-4	266	1.4	0.4
-3	277	0.9	0.2
-2	310	0.4	0.2
-1	033	0.4	0.2
0	068	0.7	0.3
+1	075	1.0	0.4
+2	081	1.1	0.4
+3	090	1.0	0.4
+4	106	0.7	0.3
+5	174	0.4	0.1
+6	233	0.6	0.2

Bathymetry

The seabed in the area of search is shown to be gently shelving out from the coast. There are no notable navigational obstacles in the open sea and no constraints for passing shipping.

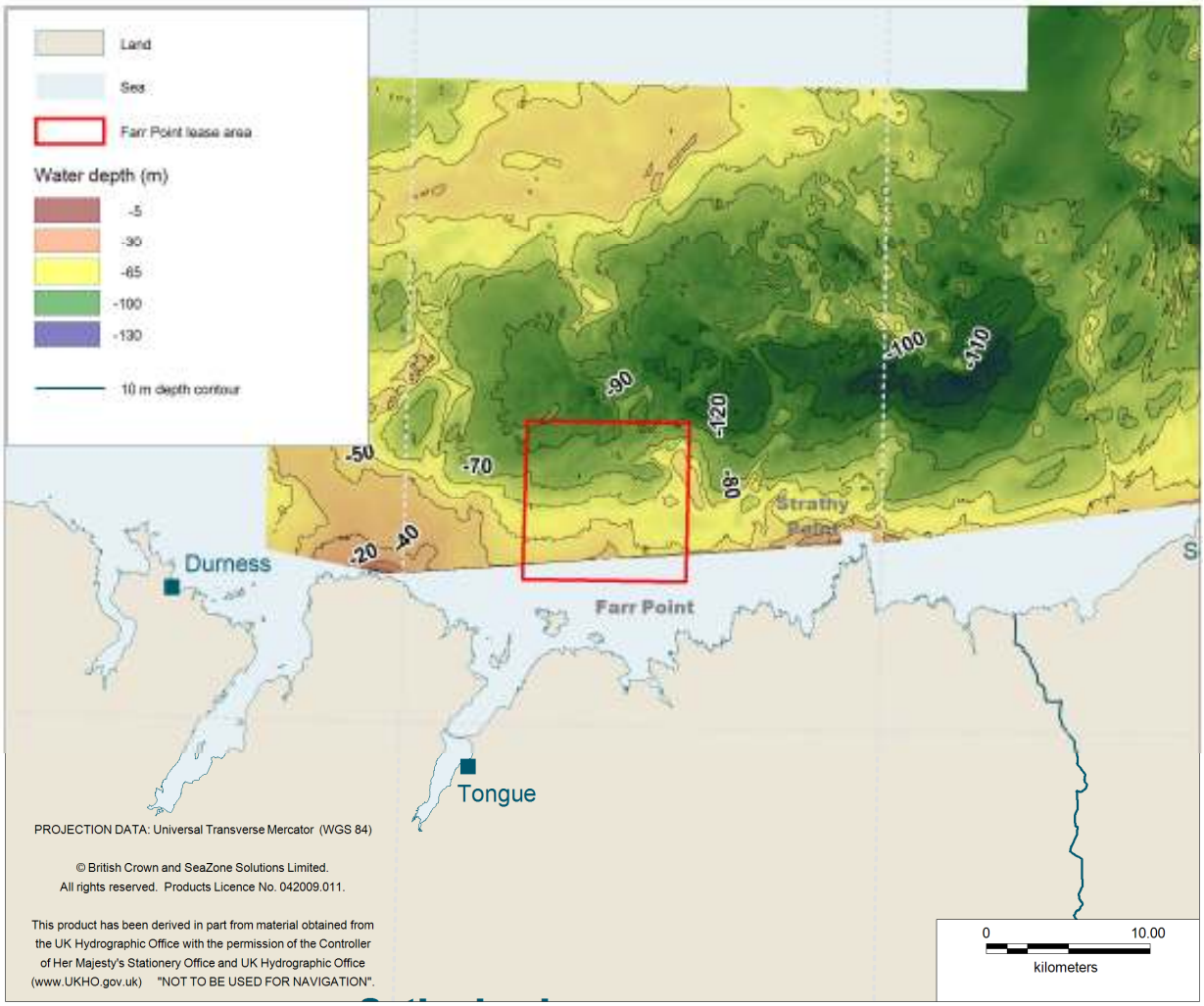


Figure AI6 – SeaZone bathymetric data (50m resolution)

Screening of potential key marine safety issues

A preliminary screening of potential key marine safety issues was undertaken based on the following information:

- Project description
- Baseline information
- Recent and previous operational experience

Potential key issues were considered at each stage of the proposed operations during the following activities:

- Installation Phase
    - Transport of moorings from operational base to site

    - Moorings installation
    - Pre-laid moorings installed in water
- WEC installation
    - Tow of WEC from operational base to site
    - Connect pre-installed moorings to WEC and electrical connection
    - Start power generation
- Operational Phase
    - Planned maintenance activities
    - Unplanned maintenance activities
    - Presence of WEC and moorings in the water
- Recovery/decommissioning
    - Mooring retrieval – there will be a period of time when mooring is unattended in water

The results of this process are presented within Table AI7 and. It is proposed that these key issues will form the basis of the Hazard Log which will be fully developed during the NRA as operational planning progresses.

Table AI7 - Preliminary assessment of marine safety issues

Phase	Potential Key Issue	Strategy for evaluation	Possible mitigation strategies
Installation Phase			
Transport of moorings from operational base to site	Increased traffic density leading to collision with third party vessel	Evaluate the exact increase in traffic numbers due to the transport of moorings	Use vessel with experienced personnel. Proper communication with relevant harbour authorities. Notification given to MCA.
	Unexpected change in weather may cause shifting of deck cargo	Consider the likelihood of weather conditions changing unexpectedly	Secure cargo in suitable manner for harsh conditions
	Loss of control of vessel while transiting	Consider likelihood of loss of control of vessel	Use well maintained vessel with a good record of reliability, give obstacles in tidal streams a wide berth, keep away from leeward shorelines
Moorings installation	Entanglement of lines	Consider the likelihood that there may be some entanglement of lines during mooring installation	Develop a deployment method that minimises likelihood of difficulties Use experienced personnel for the installation of moorings.
	Unexpected change in weather leading to vessel being unable to perform task	Consider the likelihood of weather conditions changing unexpectedly	Use vessels used to working in local conditions Consider the cost benefit of different weather window strategies
	Obstruction for other vessels whilst pre-laying moorings leading to a collision	Evaluate the capacity of the moorings installation phase to obstruct other vessels	Operations for pre-laying moorings will take place within a site which is marked by cardinal buoys and is designated as an area to be avoided. There will be proper communication with the relevant harbour authorities and notification given to the MCA.
	Loss of control of installation vessel whilst at site	Consider likelihood of loss of control of vessel	Use well maintained vessel with a good record of reliability Ensure preventative maintenance is

			undertaken
	Man overboard from project vessel during operations	Consider frequency of man-overboard situations, possible scenarios and rescue operations	Careful planning, internal review of method statements and risk assessment. Job Hazard Analysis and on site safety toolbox before work starts. Assurance that control measures are in place and effective. Use of drysuits and other enhanced PPE when working in “at risk” areas Survival training for all crew Regular man overboard exercises
Pre-laid moorings installed in water	Period of time when mooring is installed without WEC connected. Third party vessel snags fishing gear or anchor on cables or mooring system	Consider the likelihood that a third party vessel could become ensnared with the moorings. Assess possible outcomes of snagging events	Moorings will be placed within a site which is marked by cardinal buoys and is designated as an ‘Area to be Avoided’. The moorings will be marked with surface buoys. The time period that the moorings will be in place without a WEC connected will be kept to a minimum. Local seafarers will be kept informed of works at the site and any new equipment put in place
WEC installation			
Tow of WEC from operational base to site	Loss of tow	Consider the likelihood that the tow may be lost and the factors that would be most likely to cause this scenario	Suitable towing gear selected and inspected, Tow Plan approved, emergency/back-up tow line available and procedures followed
	Loss of control of towing vessel(s)	Consider likelihood of loss of control of vessel	Use well maintained vessel with a good record of reliability. Have a back-up/support vessel in hazardous areas
	Unexpected change in weather conditions	Consider the likelihood of weather	Threshold of metocean limits known

	whilst carrying out tow endangers the operation	conditions changing unexpectedly	for the task in question. Regular review of weather forecast and weather windows, timescale for towing operations to be carried out calculated accurately
Connect pre-installed moorings to WEC and electrical connection	Unexpected change in weather leading to abandonment of task	Consider the likelihood of weather conditions changing unexpectedly	Threshold of metocean limits known for the task in question. Regular review of weather forecast and weather windows
	Man overboard from project vessel or WEC during operations	Consider frequency of man-overboard situations, possible scenarios and rescue operations	Procedures for over the side working; have rescue boat standing by during higher risk activities. Survival training for all offshore crew Regular man overboard exercises Use of enhanced PPE for “at risk” tasks
	Equipment failure leads to operation being aborted and return to base	Consider likelihood that the operation would suffer from equipment failure	Develop and adhere to project-specific procedures for operations. Inspect all equipment especially tow ropes before use
Start power generation	None anticipated		
Operational Phase			
Planned maintenance activities	Man overboard during device recovery	Consider frequency of man-overboard situations, possible scenarios and rescue operations	Careful planning, internal review of method statements and risk assessment. Job Hazard Analysis and on site safety toolbox before work starts. Assurance that control measures are in place and effective. Survival training for all offshore crew

			Regular Man overboard exercises Use of enhanced PPE for “at risk” tasks
	Vessel and WEC collide. Vessel fouls/catches subsea mooring line	Consider likelihood of vessel and WEC colliding and mooring line becoming fouled	Ensure the detailed intervention procedures are available and followed. Metocean conditions should be suitable at time of intervention. Protect vessel propulsion systems from snagging risks. Build in added safety systems/redundancy for vessels working within the array
Unplanned maintenance activities	Working with WEC in severe conditions (wind, waves etc)	Evaluate the main risks arising from unplanned intervention in adverse conditions	Constant WEC monitoring and detailed weather forecasting will reduce need to intervene with WEC in severe conditions
Presence of WEC and moorings in the water	Potential for collision between WEC’s and third party vessels	Early consultation with key stakeholders such as the MCA. Use the information gathered during the vessel traffic survey and the proposed layout options for the site. All activities will be carried out consistent with MGN 371 and other relevant legislation. Assess potential for drafting vessel to contact array and compare to existing grounding risks.	Cardinal buoys positioned to mark the site boundaries. Clear marking of device with bright colours and lights (as per NLB recommendations) Notification to local mariners of the location and nature of the wave site Notification to UKHO as ‘Area to be Avoided’ listed on Notices to Mariners All activities will be completed in line with relevant MGNs and in consultation with NLB and MCA and local sea users. This will inform guidance on routes for vessels and procedures for notification of

			mariners, and marking of the site. Collaborate with the establishment of emergency towage procedures through MCA/RNLI
	Third party vessel snags fishing gear or anchor on cables or mooring system	Carefully consider which type of fishing vessel activity would be taking place in the vicinity of the site. Undertake a consequence analysis. Compare existing and potential risks.	Notification to UKHO/local mariners of the location and nature of the site and list as 'Area to be Avoided' Notices to Mariners. Collaborate with the establishment of emergency response procedures through MCA/RNLI
	Moorings fail and are unable to hold WEC on station	Consider the likelihood of the moorings being unable to hold the WEC during extreme conditions and the possible consequences of this	Use appropriate thresholds for metocean limits Monitor mooring performance during early deployments
Recovery/decommissioning			
Mooring retrieval – there will be a period of time when mooring is unattended in water	Third party vessel snags fishing gear or anchor on cables or mooring system and capsizes	Consider the likelihood that a third party vessel could become snagged with the moorings. Undertake a consequence analysis. Compare existing and potential risks.	Moorings will be placed within a site which is marked by cardinal buoys and is designated as an 'Area to be Avoided'. The moorings will be marked with surface buoys. The time period that the moorings will be in place without a WEC connected will be kept to a minimum. Collaborate with the establishment of emergency response procedures through MCA/RNLI

Appendix II - Identification of relevant Natura Interests and screening of potential impacts

European Directives and supporting UK and Scottish regulations have afforded special protection to a number of habitats and species that are considered to be of prime importance for conservation. A key component of the strategy is the establishment of a network of sites which hold representatives of many of these habitats and species. This is known as the Natura Network.

Under the regulations regarding this network, there is a requirement for the Competent Authority to consider the potential effects of any proposed plan or project upon the primary and qualifying features of Natura Sites as well as the relevant conservation objectives. This is achieved by undertaking a Habitats Regulation Assessment (HRA) which consists of the following tasks:

1. The identification of possible Natura Sites that could be affected by a proposed plan/project
2. A test of Likely Significant Effect (LSE) on primary and qualifying features as well as the relevant conservation objectives
3. An Appropriate Assessment (where it is anticipated that LSE is possible)

SNH has requested in correspondence to PWP that the Natura sites which may be affected by the proposed wave farm development are identified within this Scoping Report (essentially completing task 1 listed above). The aim of this section therefore, is to present the sites for which an LSE test will be completed; determining the 'scope' of the HRA. It is proposed that this will form the basis of an HRA Screening Report which will present the results of the LSE test for each site; its habitats, species and conservation objectives.

In order to identify the Natura Sites relevant to the proposed project, the team has drawn significantly from the "Report to Inform Appropriate Assessment for the Pentland Firth Strategic Area (PFSA) Leasing Round" (ABPmer, 2010) as commissioned by the Crown Estate. This report considers the potential effects on Natura Sites of the Crown Estate's Leasing Round which constitutes a 'plan' and must undergo its own HRA.

Identification of Special Areas of Conservation

The Crown Estate report (ABPmer, 2010) identified a number of SACs for which there is a potential LSE. Each Site was considered within the context of four assessments:

- Potential for adverse effects on habitat features
- Potential for adverse effects on marine mammal features
- Potential for adverse effects on otter features

- Potential for adverse effects on fish and freshwater pearl mussel features

Within each of these categories, a number of habitats and species were identified with which there was the potential for the leasing round to have a LSE. These are summarised below:

- Habitat features
    - Reefs
    - Subtidal sandbanks
    - Intertidal mudflats and sandflats
    - Supralittoral dune habitats
- Marine mammal features
    - Common seal (*Phoca vitulina*)
    - Grey seal (*Halichoerus grypus*)
    - Bottlenose dolphin (*Tursiops truncates*)
- Otter features
    - Otters (*Lutra lutra*)
- Fish and freshwater pearl mussel features
    - Freshwater pearl mussel (*Margaritifera margaritifera*)
    - Atlantic salmon (*Salmo salar*)
    - Sea lamprey (*Petromyzon marinus*)

Based on these conclusions, the following criteria were developed for identifying the SACs relevant to the proposed development:

- Habitat features – SACs along the north coast of Scotland with relevant qualifying features
- Marine mammal features – SACs for seals and cetaceans within 100km of the proposed development area (buffer zone defined within the Crown Estate report [ABPmer, 2010])
- Otter features – SACs along the north coast of Scotland from which otters may forage into the proposed development site and landward areas
- Fish and freshwater pearl mussel features – SACs along the north coast of Scotland from/to which migratory fish could feasibly be passing through the proposed development and adjacent areas during migration

The map presented in Figure AII1 was then used to confirm site locations and proximity to buffer zone limits.

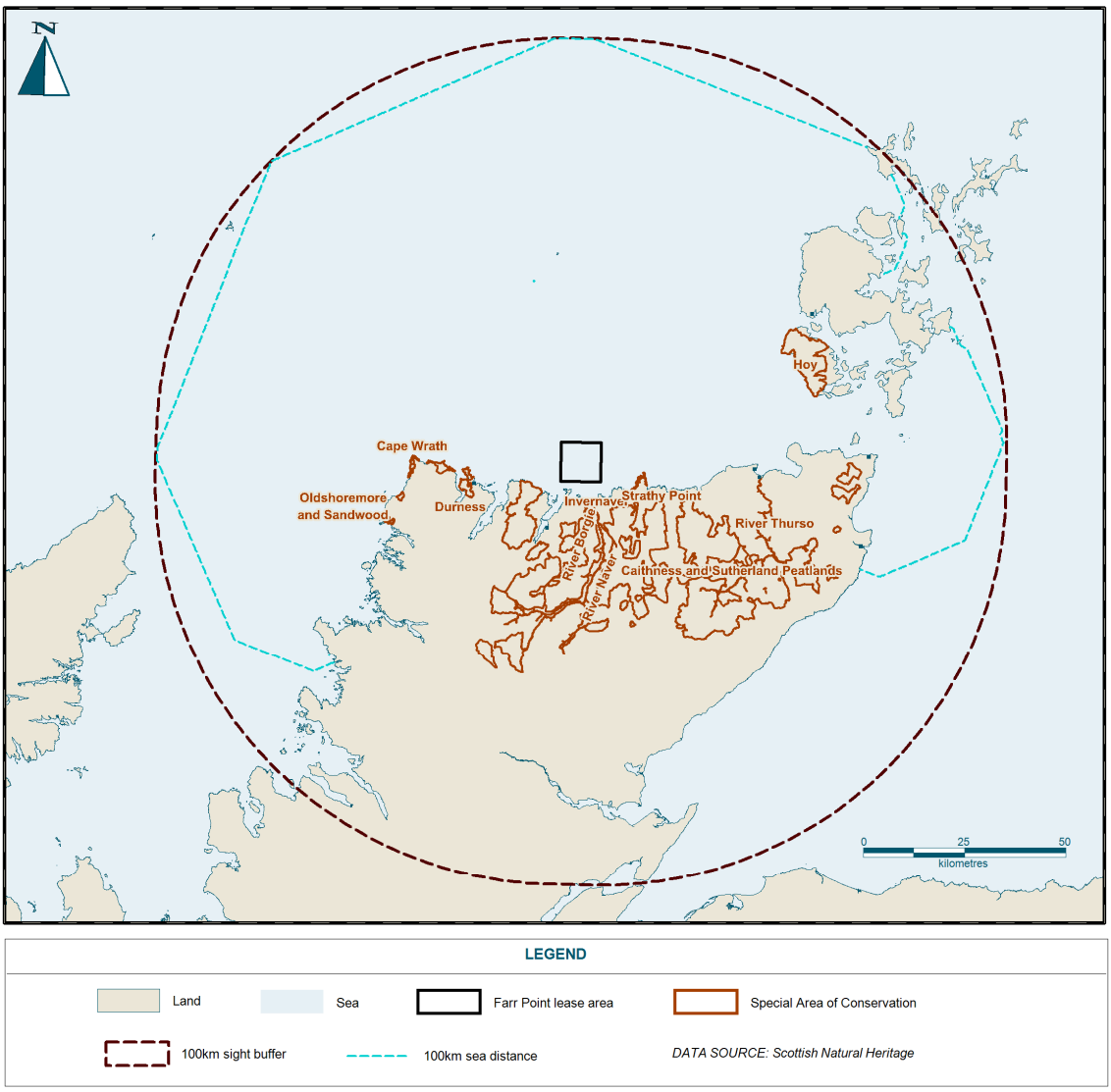


Figure AII1 - SAC's relevant to the proposed project

Through this process, the SACs presented within Table 10.3 are deemed to be relevant to the proposed development and will be considered during the LSE test. Features for which a potential LSE was predicted within the Crown Estate report (ABPmer, 2010) are highlighted in green for each site.

Table 10.3 Table AII1 - SACs considered relevant to the proposed project

SAC	Annex I Habitat/Annex II Species as a primary feature	Annex I Habitat/Annex II Species as a qualifying feature
Caithness and Sutherland Peatlands (SAC and Ramsar)	Otter	Northern Atlantic wet heaths with *Erica tetralix*
		Transition mires and quaking bogs
	Marsh saxifrage	Depressions on peat substrates of the *Rynchosporion*
Durness	Fixed dunes with herbaceous vegetation ("grey dunes")*	Shifting dunes along the shoreline with *Ammophila arenaria*

SAC	Annex I Habitat/Annex II Species as a primary feature	Annex I Habitat/Annex II Species as a qualifying feature
	Hard oligo-mesotrophic waters with benthic vegetation of Chara spp	Humid dune slacks
		Northern Atlantic wet heaths with *Erica tetralix*
	Alpine and subalpine calcareous grasslands	European dry heaths
		Hygrophilous tall herb fringe communities of plains and of the montane to alpine levels
	Limestone pavements	Alkaline fens
	Blanket bogs	Otter
Invernaver	Supralittoral dune habitats	Shifting dunes along the shoreline with *Ammophila arenaria*
		Alkaline fens
Oldshore and Sandwood	Fixed dunes with herbaceous vegetation (`grey dunes`)	Shifting dunes along the shoreline with *Ammophila arenaria*
	Machairs	
River Borgie	Freshwater pearl mussel	Atlantic salmon
		Otter
River Naver	Freshwater pearl mussel	None
	Atlantic salmon	
River Thurso	Atlantic salmon	None

Identification of Special Protection Areas

The Crown Estate report (ABPmer, 2010) identified a number of SPAs for which there is a potential LSE from the PFSA Leasing Round. This report concluded that there is a possibility of a LSE (or that it is not possible to conclude no LSE) for eighteen breeding seabird species that are qualifying features of these sites. These species, along with their buffer zones (based on foraging distance) are presented in Table AII2.

Table AII2 - SPA features and presented buffer zones

Species	Presented buffer (km)
Red-throated diver	13
Fulmar	50
Manx Shearwater	330
European Storm Petrel	100
Leach's Storm Petrel	100
Gannet	-
Cormorant	35
Shag	17
Common Scoter	-

Species	Presented buffer (km)
Arctic Skua	10
Great Skua	31
Herring Gull	54
Great Black-backed Gull	40
Kittiwake	50
Arctic Tern	25
Common Guillemot	50
Razorbill	50
Puffin	50

These buffer zones have been used to identify the SPAs considered relevant to the proposed project (Table AII3). Those species identified as having a possible LSE with the development site (those with foraging distances that could potentially overlap with the proposed development site) are highlighted for each site (Table AII3).

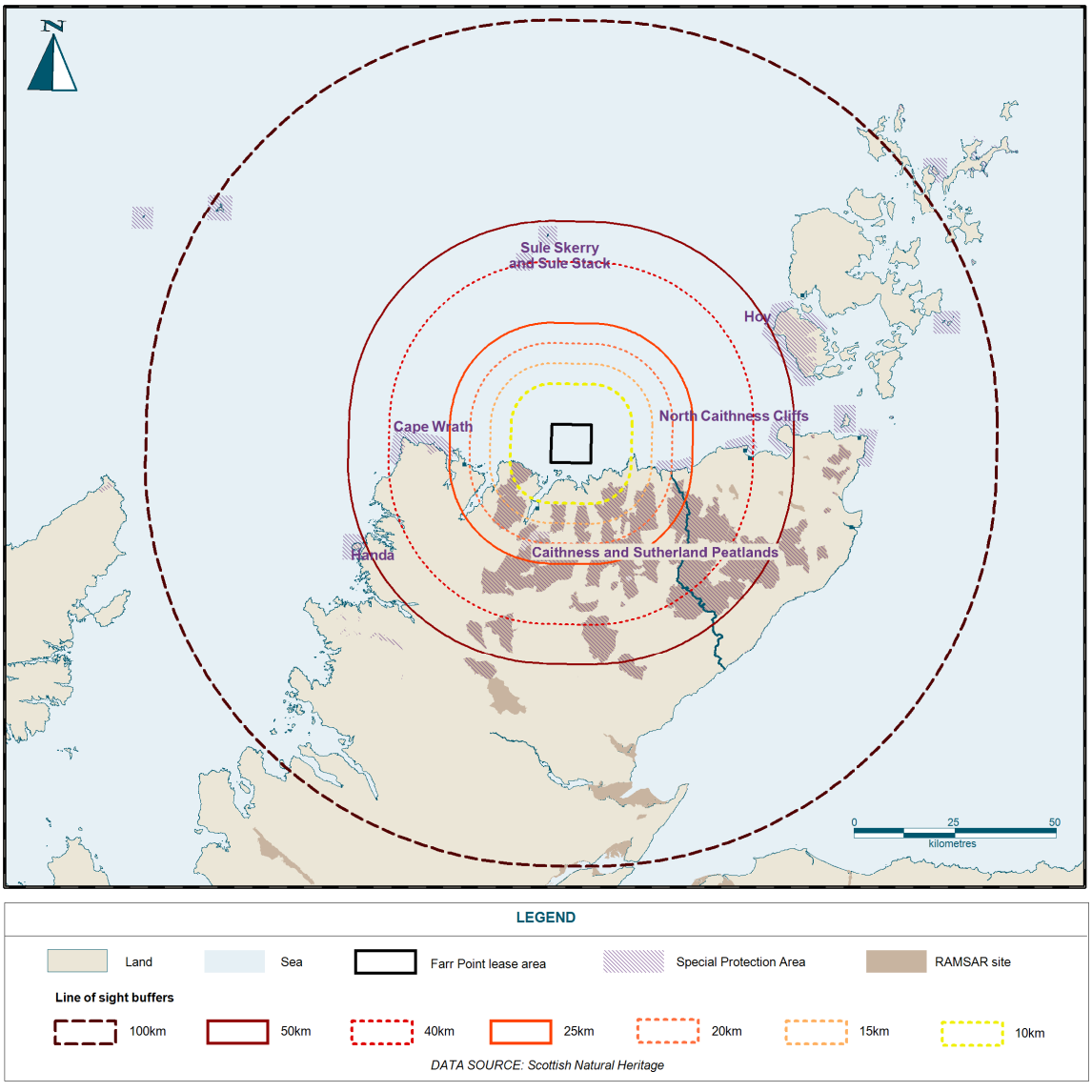


Figure AII2 - SPA's relevant to the project

Table AII3 - SPAs considered relevant to the proposed project

SPA	**Relevant qualifying species** * part of seabird assemblage ( ) other qualifying features of site – no LSE due to distance from area of search
Hoy	Fulmar* Kittiwake* Common guillemot* Puffin* (Seabird assemblage, Red-throated diver, Arctic Skua*, Great Skua*, Great black-backed gull*)
North Caithness Cliffs	Common Guillemot Fulmar* Kittiwake* Razorbill* Puffin* (Seabird assemblage)
Sule Stack and Sule Skerry	European Storm Petrel Leach's Storm Petrel Gannet Puffin Common Guillemot* (Seabird assemblage, Shag*)
Handa	Fulmar* Common guillemot Kittiwake* Razorbill (Seabird assemblage, Great skua)
Cape Wrath	Fulmar* Kittiwake* Common guillemot* Razorbill* Puffin* (Seabird assemblage)
Caithness and Sutherland Peatlands	Red-throated diver Common Scoter
St Kilda	Manx shearwater*

SPA	Relevant qualifying species * part of seabird assemblage ( ) other qualifying features of site – no LSE due to distance from area of search
	Gannet (Seabird assemblage, Leach's petrel, Storm petrel, Great skua, Puffin, Razorbill*, Guillemot*, Kittiwake*, Fulmar*)
Rum	Manx shearwater (Seabird assemblage, Red-throated diver, Kittiwake*, Guillemot*)

Cumulative effects

There are a number of other projects and plans which may be relevant to the Farr Point project in relation to the consideration of cumulative and in-combination effects under the Conservation of Habitats and Species Regulations 2010. In particular, there will be interest in the more mobile qualifying interests such as grey seal, common seal, salmon, sea lamprey and seabirds. For such species, activities such as breeding, migration and foraging behavior could potentially be affected by multiple developments in different locations.

At present time it is understood that the advice from SNH is that the potential presence of individuals from a Natura site within an area is sufficient reason to assume the potential exists for a "likely significant effect". Therefore, it needs to be established whether the integrity of a population is likely to be affected by the proposed activities. This proximity test will therefore be used as a basis for identifying "likely significant effects" in the following way:

1. The first stage is to define the area of search – this is taken as being an area covering twice the distance of agreed disturbance radii (up to 100km). For this project there are a number of species where the notional disturbance threshold is considered to be 100km or more; seals, gannets and Manx shearwaters.

2. The second stage is to map designated Natura sites potentially relevant to the area of search (i.e. out to 200km distance from the site, by sea). This latter condition reflects the fact that none of the species of interest will normally cross the land.

3. The third stage is to establish which sites hold which species and then to establish zones of influence maps for each species, by adding the zones of influence for each relevant site.

4. The fourth stage is to map the locations of the proposed project along with existing and planned projects and activities to establish which ones may lie within overlapping areas of influence.

5. The fifth stage is the draw up a short list of projects that are within the relevant range to lead to the potential for "likely significant effects" for each species.

6. The sixth task is to review the possible impact mechanisms that may affect the qualifying species and which of these may be relevant to the short listed projects, plan and activities.
7. The seventh task is to establish zones of effect for each impact mechanism or other relevant parameter and to then examine the distribution of this impact in relation to the sites, species and impact mechanisms relevant to the project in question.

Where possible zones of effect overlap, further investigation will be required into whether the impacts that are anticipated to arise could affect the integrity of the relevant qualifying interests. This may take the form of a focussed literature review, a small targeted survey, perhaps some research or most likely a desk based analysis of the issue and the likely outcomes that could arise. These outcomes and any other information will then be assessed in relation to the conservation objectives and other metrics being developed to characterise the nature of the integrity and the extent of mortality or change that may be acceptable. This information will help to inform an Appropriate Assessment (AA) which will be undertaken by the Competent Authority, in this case Marine Scotland.

Where the zones of effect do not overlap, this would normally be sufficient to demonstrate that cumulative and in-combination effects will not arise. In taking this approach it is realised that sequential impacts through space or time have not been fully addressed. However, this issue is notoriously difficult to deal with.

Establishing zones of cumulative influence

Over recent years there has been a range of studies to try and establish over what distances species from a particular site travel to reach foraging sites etc. This work has focussed particularly on birds and seals. A report produced[29] for The Crown Estate for the Pentland Firth and Orkney Waters leasing round provided a number of agreed foraging ranges which have been used as a basis for the table below. Work has also been undertaken to better understand where bottlenose dolphins are distributed. There is also a body of published literature regarding otter behaviour. Unfortunately there are virtually no studies of the behaviour of salmon and lampreys at sea and little is therefore known of their possible migration routes.

[29] Report to inform Appropriate Assessment for the Pentland Firth Strategic Area (PFSA) Leasing Round (ABPMer, 2010). Crown Estate Commissioned Report.

Table AII4 - Distances for considering possible cumulative effects of other projects upon key species

Species	Possible range of cumulative influence
Seals (grey & common)	200km
Bottlenose dolphin	100km
Otter	20km
Auks, kittiwakes, gulls, fulmar	100km
Skua, tern, cormorant	60km
Shag	40km
Divers	30km
Arctic skua	20km
Sea lamprey	Coastal waters around rivers
Salmon	Waters along line of travel between rivers and the NW Atlantic

Given the lack of information about the migration routes for salmon the map presented within Figure AII3 has been devised. The defined areas have been established around key seascape features such as headlands and divisions between major firths. This divides Scottish waters into distinct areas along presumed routes of salmon migration between Scotland and the NW Atlantic. The map could be used to identify which river systems were pertinent to any nearby coastal development. It is suggested that given the uncertainty associated with, and the extensive nature over space and time of salmon migration that only impacts within the 'north western waters' sea area are examined.

Indicative scheme of sea areas used to help identify where salmon can be assumed to go to during their migration to and from Greenland.

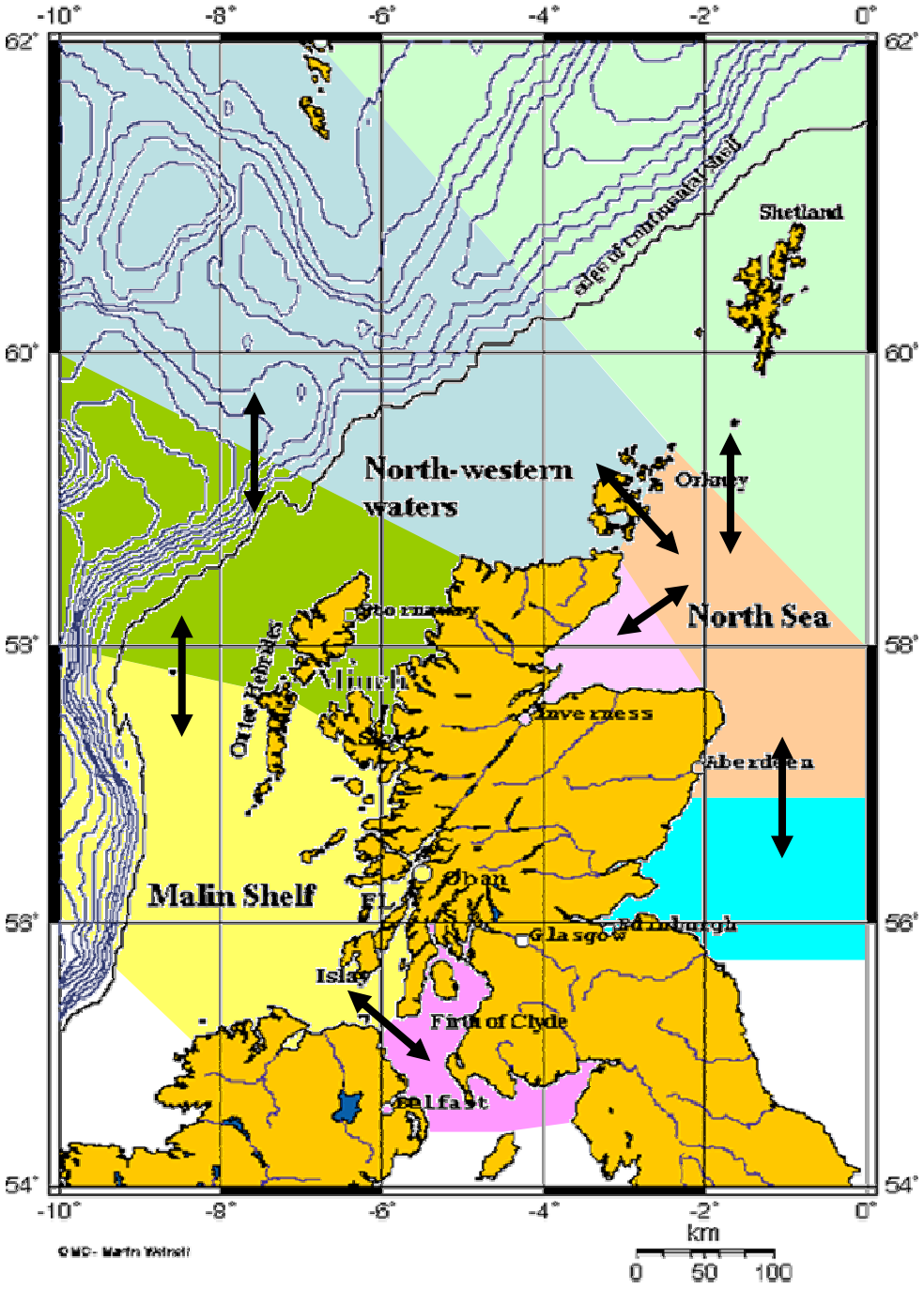


Figure AII3 - Indicative salmon migration zones

Appendix III – Stakeholder feedback from Project Briefing Note

Stakeholder	Topic	Comment	Recommended action/request etc
SNH	Baseline surveys – general	It is essential that details of the baseline survey proposed for the development are provided in the Scoping document.	Provide baseline study programme for the development within the Scoping Report outlining strategies for addressing key issues and data gaps. All studies will be fully justified and synergies with ongoing/planned strategic level work investigated to ensure continuity and effective management of resources.
SNH	Landscape Seascape	A landscape/seascape assessment should be considered, particularly in relation to the nearby Kyle of Tongue National Scenic Area (NSA).	Include landscape/seascape assessment within development study programme. Outline methodology within the Scoping Report.
SNH	Marine mammals	Marine mammal entanglement risk with mooring cables/lines etc could be an issue. Monitoring of the deployment at EMEC will go some way to addressing this query but assessment of potential impact and contingency measures should be considered for this issue.	Assess potential impact(s) within Scoping Document and address appropriately throughout EIA.
SNH	Marine mammals	All cetaceans are European Protected Species. The potential impact of all phases of the development on cetaceans should be considered.	Assess potential impact(s) within Scoping Document and address appropriately throughout EIA.
SNH	Marine mammals Marine fish Marine birds	Potential impacts of all stages of the development on seals, basking sharks and diving birds should also be considered.	Assess potential impact(s) within Scoping Document and address appropriately throughout EIA.
SNH	Conservation	It is essential that the scoping documents aims to identify the European protected sites (SPAs and SACs) which might be affected by this development. These can be distant from the development site. The European sites to consider should be determined, based on the biology of the qualifying species of the protected sites, and the animals found within the development area following baseline assessment and existing information.	Identify the SPAs and SACs which might be affected by the proposed development and present preliminary results within the Scoping Document. Develop findings further within the ongoing HRA process and Screening Document.

Stakeholder	Topic	Comment	Recommended action/request etc
SNH	Conservation	The Supporting Information Document submitted for the Pre-Application process lists a number of designated sites in the North Sutherland coastal area. There are several sites which are not mentioned: River Borgie SSSI, River Borgie SAC and River Naver SAC which are designated for Atlantic Salmon and freshwater pearl mussel, plus the river Borgie is also designated for otter. The North Sutherland Coastal Islands SPA must be considered.	Ensure all relevant SPAs and SACs are identified within the Scoping Document.
SNH	Project description/information	Further details on the on-shore infrastructure will be required, including cable landing points and proposed method, operations centre, substation, grid connection, tracks, operation and maintenance sites. This information is required in order to provide more detailed advice on potential impacts.	Provide as much information regarding the proposed development as possible within the Scoping Document.
SNH	Landfall selection	Initial thoughts on cable landing points are that Farr Bay would appear to be the preferred landing point site in terms of least impact on the natural heritage as there are no statutory designated sites. However 'Farr Glebe' which lies between the graveyard and the dunes is a great yellow bumblebee site. The other landing points vary in the number of designations associated with them. Torrisdale Bay seems to be the least preferred landing point as it has a number of coastal habitats which are SAC qualifying interests and has 2 salmon rivers (both SACs) flowing into it.	Present the most up to date information regarding landfall location selection as well the opportunities and drawbacks associated with each location under consideration.
SNH	Cumulative and in-combination effects	The pre-scoping report briefly mentions potential cumulative impacts (but not in-combination), however both would need covered in greater detail in scoping and ES.	Present a preliminary list of potential cumulative and in-combination impacts within the Scoping Document and fully assess each issue during the EIA and within the ES.
Transport Scotland	Site access	Prior to commencement of deliveries to site a Route Access Report will be required to ensure that exceptional loads can be safely transported through the trunk road network. Details of the issues to be addressed can be made available nearer that time.	Prepare a Route Access Report prior to site deliveries

Stakeholder	Topic	Comment	Recommended action/request etc
SEPA	General	We would encourage you to consider producing a single ES which covers all aspects of the proposed development. This will enable a full assessment of the potential effects of the development as a whole, rather than just parts of it.	None
SEPA	Project description/information	It is not clear if there will be a requirement for new harbour infrastructure from which to service the development in the future. It would be helpful if this could be clarified in the ES.	Clarify within the Scoping Document and ES.
SEPA	Project description/information	The ES should contain plans giving detailed information on the site layout, including details of all onshore and offshore components such as access tracks, buildings, cabling and marine devices. These plans should be supported by a Statement detailing the development and reasons for the choice of site and design of the development.	Provide the information within the Scoping Document/ES as far as possible.
SEPA	Project description/information	Maps should be included in the submission showing the array of the devices, cabling routes and associated onshore infrastructure.	Provide the information within the Scoping Document/ES as far as possible.
SEPA	EIA	Background information that will help inform the ES process is available from the European Marine Energy Centre (EMEC). The EMEC has produced guidelines to assist developers in considering the range and scale of impacts that may result from the testing of devices. These guidelines are available at www.emec.org.uk/index.asp. Generally, if this standard industry guidance is followed for scoping, preparing and undertaking EIA for marine renewables, then we are likely to be satisfied with the standard of assessment.	Refer to EMEC Guidelines as and where appropriate
SEPA	Cumulative and in-combination effects	There may be a need to address the cumulative effects of devices/arrays on coastal processes depending upon array density and location with respect to existing renewable and coastal developments.	Assess potential impact(s) within Scoping Document and address appropriately throughout EIA.

Stakeholder	Topic	Comment	Recommended action/request etc
SEPA	NOT RELEVANT	Impoundments and tidal barrages are considered to have the potential to have the biggest impact upon coastal processes and hydromorphology and the habitats and species that these support. As such, there may be a need to carry out hydrodynamic modelling to predict the impacts of the structure/s on water quality during construction and coastal processes in the longer term.	NOT RELEVANT
SEPA	Coastal processes	Coastal processes should be assessed as part of the ES. This should include a baseline assessment to identify the coastal and sedimentary processes operating in the area.	Assess potential impact(s) within Scoping Document and address appropriately throughout EIA. Consider including a coastal processes assessment within development study programme. Outline methodology within the Scoping Report as appropriate.
SEPA	Environmental baseline	The environmental baseline information should include sections describing RBMP and the current ecological status of the Cape Wrath to Strathy Point water body, marine ecology/ biodiversity and coastal processes.	Include within the environmental baseline information
SEPA	EIA Project description/information	It would be useful if the ES could provide information on the area of the seabed which is likely to be scoured by the movement of the mooring chains below each device. Footprint information e.g. cable routes across seabed and intertidal zone should also be provided.	Address the issue of 'scour' fully during the EIA and within the ES. Include 'footprint' information within the Scoping Document and ES.
SEPA	Cumulative and in-combination effects	The cumulative impact assessment should consider the footprint of the cabling and onshore works alongside the existing coastal development and activities already present within the water body in which landfall occurs. This should include changes to the wave regime in the area and implications for the neighbouring coastline. A map and information should be included in the ES showing the areas of seabed likely to be affected by the development landwards of 3nm offshore limit and the area of intertidal zone that is likely to be affected by shoreline infrastructure development.	Assess potential impact(s) within Scoping Document and address appropriately throughout EIA.

Stakeholder	Topic	Comment	Recommended action/request etc
SEPA	EIA	The ES should demonstrate that the proposals will not compromise WFD objectives. A methodology to assess cumulative impacts in line with WFD objectives has been developed. The methodology uses a concept of 'system capacity' to measure impacts to morphological conditions. Please contact SEPA for further guidance on the assessment methodology.	Include an assessment of the proposals potential to compromise WFD objectives within the ES. Request assessment methodology from SEPA.
SEPA		In order to meet the objectives of the Water Framework Directive, developments should be designed wherever possible to avoid engineering activities in the water environment.	
SEPA		A site survey of existing water features and a map of the location of all proposed engineering activities in the water environment should be included in the ES or planning submission. A systematic table detailing the justification for the activity and how any adverse impact will be mitigated should also be included. The table should be accompanied by a photograph of each affected water body along with its dimensions.	
SEPA		Sensitive water uses, such as bathing waters and shellfish growing waters, and associated potential impacts should be assessed. The proximity to existing discharges and designated areas i.e. estuarine abstractions and cooling water discharges, should also be assessed.	
SEPA		Where a proposal involves shipping or port developments, it may be necessary to submit a detailed description of the actions to be taken to prevent the introduction of non-native marine species from ballast water transfers or hull-fouling which can result in a deterioration of a water body under The Water Framework Directive.	
SEPA		Where borrow pits are proposed, information should be provided regarding their location, size and nature including the depth of the borrow pit floor and the final reinstated profile. The impact of such facilities (including dust, blasting and impact on water) should be appraised as part of the overall impact of the scheme.	

Stakeholder	Topic	Comment	Recommended action/request etc
SEPA		Systematically identify all aspects of site work that might impact upon the environment, potential pollution risks associated with the proposals and identify the principles of preventative measures and mitigation. This will establish a robust Project Environmental Management Process (PEMP) for large scale development (e.g. Major and Environmental Impact Assessment Projects). A draft Schedule of Mitigation should be produced as part of this process.	
SEPA		Therefore, the Schedule of Mitigation should include a timetable of works that takes into account all environmental sensitivities, such as fish spawning, which have been raised by SEPA, SNH or other stakeholders. Timing should also be planned to avoid construction of roads, dewatering of pits and other potentially polluting activities during periods of high rainfall.	
SEPA		A Construction Environmental Management Document (CEMD) is a key management tool to implement the Schedule of Mitigation. We recommend that the principles of the CEMD are set out in the ES drawing together and outlining all the environmental constraints and commitments, proposed pollution prevention measures and mitigation as identified in the ES.	
SEPA		The onshore components of the development should be assessed for flood risk from all sources in line with Scottish Planning Policy (Paragraphs 196-211).	
SEPA		A baseline assessment of existing intertidal and subtidal habitats and species. This should include any UK Biodiversity Action Plan habitats and species e.g. maerl, sea pens, eel grass, horse mussels (www.ukbap.org.uk/UKPlans.aspx?ID=35).	
SEPA		We also recommend information on how the development will contribute to sustainable development. Opportunities to enhance marine habitats in line with Water Framework Directive and The Nature Conservation (Scotland) Act 2004 objectives and Scottish Planning Policy guidance should be explored.	

Stakeholder	Topic	Comment	Recommended action/request etc
SEPA		Advice on designated sites and European Protected Species should be sought from SNH.	
Highland Council	Policy and regulation	*Outlines provided for a number of relevant policies*	Consider all policies in the formulation of a proposal for a wave farm at Farr Point.
Highland Council		Consider proposed quarry development in ES	
Highland Council		In addition to consideration of the impact of proposals on designated nature conservation sites the Structure Plan provides, in Policy N4, for regard to be had to Local Biodiversity Action Plans.	
Highland Council		Proposals for new and replacement lines will be assessed for environmental impact, and in sensitive locations by virtue of landscape character, visual intrusiveness or bird movements, the case for undergrounding should be strongly considered.	
Highland Council		It may be relevant to refer to Inset Maps in the Local Plan for details of policies and proposals.	
Highland Council		There are a wide range of international (red), national (amber) and local/regional (dark green) features present in the area, onshore and in the coastal zone. The developer may find it helpful to refer to the Background Maps included in the Local Plan, which identify specific features present. The developer should also check original sources for information on features present, as the Proposals Map will not be up-to-date and in any case not all features covered by the policy are included on the mapping in the Local Plan.	
Highland Council		Where necessary, compliance with Scottish Planning Policy will need to be demonstrated through submission of a Flood Risk Assessment.	
Highland Council		Developers will be expected to demonstrate appropriate mitigation.	
Highland Council		Development may require reference to be made to the Caithness Local Plan (2002).	

Stakeholder	Topic	Comment	Recommended action/request etc
Highland Council		Underground or sub-sea alternatives to over ground route proposals will generally be supported where they would not have a significantly detrimental impact on the environment. Where new infrastructure provision will result in existing infrastructure becoming redundant, the Council will seek the removal of the redundant infrastructure as a requirement of the development.	
Highland Council		It should be noted that Policy 73 includes an expectation that developments such as this will follow a robust project environmental management process.	
Highland Council		The value of major headlands as viewpoints may be under-publicised and could benefit by better visitor facilities. Offshore development in the vicinity of these should pay close regard to visual impact.	
Highland Council		There are a number of policies set out above which need to be considered in the formulation of a proposal for a wave Farm at Farr Point.	
Highland Council		Environmental Impact Assessment (EIA) will need to provide justification for the proposals by exploring environmental issues thoroughly, including consideration of impacts on specific constraints present, to enable the Council to consider fully any application.	
Highland Council		The EIA will need to clearly demonstrate that alternatives to the submitted proposals have been meaningfully considered.	
Highland Council		The developer must ensure that EIA has covered all relevant matters and if necessary are addressed by the developer. In terms of the detailed siting and design, the developer will need to demonstrate that they have considered alternatives to the submitted proposals.	
Highland Council		The Environmental Statement, submitted with the application, must highlight worst case scenarios.	

Stakeholder	Topic	Comment	Recommended action/request etc
Highland Council		Any application should be accompanied by evidence of the developer's relevant consultations with organisations and interests in respect of matters which are the subject of material planning considerations, and a clear indication of the outcome including any mitigation agreed.	
Highland Council		The developer is recommended to liaise with the council on aspects of design as the preparation of proposals progress and more details become available.	
Highland Council		Regard should be had to the Council's "Designing for Sustainability in the Highlands- Development Plan Policy Guideline" (Nov 2006) and a Sustainable Design Statement should be prepared for submission with the application with particular reference to Checklist (B) in the guideline document.	
Highland Council		The elements should all be subject to assessment for Landscape and Visual impacts, which should include cumulative impacts with other developments along the coast and assessment of night-time visibility of lighting.	
Highland Council		Pelamis should clarify the likely visible structures required to bring the cable ashore and carry out an assessment of the Landscape and Visual impacts for both Construction and Operational Phases. They should clarify what, if any, removal or remedial works would be required and/or undertaken following decommissioning of the development.	
Highland Council		The earlier [PWP] can define the likely extent of the Wave Farm itself in order that Landscape & Visual Impact Assessment can be carried out.	
Highland Council		A Landscape and Visual Impact Assessment should be carried out; in addition to the usual visibility assessment a study of night time impacts of lighting should also be included.	

Stakeholder	Topic	Comment	Recommended action/request etc
Highland Council		The assessment should take due account of both National and Local Landscape designations including the north coast Special Landscape Areas, as well as character sensitivities identified in the Landscape Character Assessment.	
Highland Council		It is recommended that a Sequential Cumulative Assessment of the A836 be carried out	
Highland Council		Clarification is also required on the size of the transformer and its location together with any access roads.	
Highland Council		A traffic management plan (TMP) may be required for the onshore construction of the transformer and the overhead powerline restringing operations. Once the scale of the works is determined the need for a TMP can be reviewed.	
Highland Council		TECS also has an interest in coastal erosion and the exact landfall location together with engineering details should be forwarded once this is finalised.	
Highland Council		It would be helpful if the Council could be notified by the developer of the date when proposals will be made public. When carrying out community consultation we recommend that full consideration is taken of Planning Advice Note 3/2010 - Community Engagement.	
Highland Council		We believe it would be beneficial to take into consideration all of the comments made by members of the public before a planning application is submitted to ensure that the public feel they have had an influence over the proposals. For public consultation it may be useful to use the SP=EED tool developed by Planning Aid Scotland.	

Appendix V – Proposed stakeholder groups

KEY

SG = Stakeholder Group

P = Priority

RO = Representative Organisation

IP = Interested Party

Regulator Group

Organisation	MRFG	Key Role
Marine Scotland - Licensing Operations Team (MS-LOT)	Yes	Licences (FEPA, CPA, Fisheries and aquaculture Navigation and other sea users, EPS)
UK Department of Energy and Climate Change (DECC)	Yes	Decommissioning
Highland Council (HC)	Yes	Terrestrial Planning and EIA Regs
Scottish Natural Heritage (SNH)	Yes	Statutory Consultee for MS-LOT And EIA Regs
Marine Coastguard Agency (MCA)	Yes	MS-LOT Consultee
Northern Lighthouse Board (NLB)	Yes	MS-LOT Consultee
Scottish Environment Protection Agency (SEPA)	Yes	MS-LOT Consultee and EIA Regs
Marine Scotland - Science	Yes	MS-LOT Consultee
Marine Scotland –Compliance	Yes	MS-LOT Consultee
Marine Planning Partnerships	Yes	MS-LOT Consultee
The Crown Estate (TCE)	TBC	Seabed Lease
Scottish Water	No	Refer to Appendix A
Health and Safety Executive (HSE)	No	Refer to Appendix A
Scottish Ministers	No	Refer to Appendix A
RYA	No	Refer to Appendix A
Highland Council Harbour Authority	No	Refer to Appendix A

Non-Statutory Stakeholder Group (consulted directly by MS-LOT)

Level	Who
RO	Association of (District) Salmon Fisheries Board
RO	Association of Scottish Shellfish Growers
RO	British Trout Association
IP	BT (Network Radio Protection)
IP	Chamber of Shipping
IP	Civil Aviation Authority
RO	Fishermans Association Ltd
P	Historic Scotland
IP	Inshore Fisheries Groups
IP	Joint Radio Company
IP	Marine & Coastguard Agency (12-200nm)
RO	Marine Conservation Society
RO	Marine Safety Forum
IP	National Air Traffic Services (NATS)
IP	National Trust for Scotland
P	RSPB
P	RYA
P	Scottish Fisherman's Federation
RO	Scottish Renewables Forum
IP	UK Marine Management Organisation

Wider non-statutory stakeholder group (not directly consulted by MS-LOT)

Level	Who
IP	Armadale Salmon Fishing
RO	Bettyhill, Strathnaver and Altnaharra (North West Central Sutherland) CC
IP	Biological Records Centre
IP	British Geological Survey
RO	British Marine Federation (Scotland)
RO	British Ports Association
RO	British Surf Association
IP	Butterfly Conservation
IP	Caithness Archaeological Trust
IP	Caithness Diving Club
IP	Caithness Regeneration Partnership
IP	Caithness Sea Coast
IP	Community Energy Scotland
IP	Crofters Commission
IP	Cycling Scotland
P	Department for Transport (DfT)
IP	Department of Business Innovation and Skills
IP	Energy Saving Trust
IP	Forest Enterprise
P	Forestry Commission
IP	Friends of the Earth
IP	Greenpeace
IP	Highland Biological Recording Group
P	Highland Council Harbours
IP	Highlands and Islands Airport Ltd
IP	Highlands and Islands Enterprise (HIE) – Caithness and Sutherland
IP	International Tanker Owner's Pollution Federation (ITOPF)
IP	John O Groats Ferries
IP	Joint Nature Conservation Committee (JNCC)
IP	Landowners (tbc)
IP	Loch Eriboll Oysters
RO	Melvich (North West Central Sutherland)

Level	Who
P	Ministry of Defence (MoD)
IP	National Grid
IP	NFU Scotland
IP	North Coast Marine Adventures
RO	North District Fisheries Board
RO	North of Scotland Industries Group
IP	Northlink Orkney and Shetland Ferries Ltd
IP	Nuclear Decommissioning Authority
IP	Nuclear Safety Directorate
IP	OBC Shipping Ltd
IP	Ofcom
RO	Orkney Renewable Energy Forum (OREF)
IP	Pentland Ferries
IP	Pentland Firth Tidal Energy Project
RO	Ramblers Association
IP	Residents (tbc)
IP	RNLI
P	Royal Commission on the Ancient and Historical Monuments (RACHMS)
RO	Salmon Net Fishing Association
RO	Scottish Aquaculture Research Forum
RO	Scottish Association for Marine Science (SAMS)
RO	Scottish Canoe Association
RO	Scottish Coastal Forum
RO	Scottish Environment Link
RO	Scottish Fisherman's Federation
IP	Scottish Gas Network
IP	Scottish Government (Sea Fisheries Division)
IP	Scottish Government Directorate for the Built Environment Planning Decisions Division
IP	Scottish Government Rural Environment Directorate
RO	Scottish Ornithologists Club
RO	Scottish Pelagic Fishermen's Association
RO	Scottish Rural Property & Business Association
RO	Scottish Salmon Producers Association

Level	Who
RO	Scottish Sea Angling Conservation Network
IP	Scottish Sub-Aqua Club
RO	Scottish Surfing Federation
RO	Scottish White Fish Producers Association
RO	Scottish Wildlife Trust
P	Scrabster Harbour Trust
RO	Sea Fish Industry Authority
IP	Sea Mammal Research Unit (SMRU)
IP	Sea Mammal Watch
P	SGRPID
IP	Sport Scotland
RO	Strathy/Armadale Community Council (North West Central Sutherland) CC
IP	Supply boat operators
RO	Surfers Against Sewage
IP	Sutherland Biodiversity Group
IP	Sutherland Field Club / Caithness Field Club
IP	Sutherland Schools Sailing Association
IP	The Carbon Trust
P	The Fisheries Committee
RO	Tongue (North West Central Sutherland) CC
P	Transport Scotland
IP	UHI – North Highland College of Further and Higher Education
IP	UK Cable Protection Committee
IP	UK Civil Aviation Authority
P	UK Hydrographic Office
IP	UK Oil and Gas
IP	Verona Boat Trips
IP	Visit Highland
IP	Visit Scotland
RO	Voluntary Action Highland
RO	Whale & Dolphin Conservation Society
IP	World Wildlife Fund