

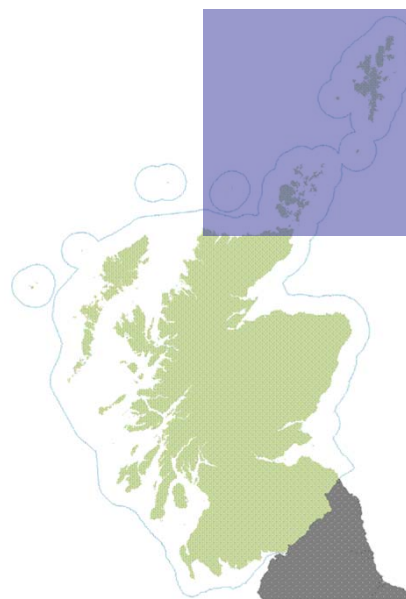
## 5. **NORTH**

The North Region four Scoping Areas of Search.

The Scoping Areas of Search are:

- N2-3 (Orkney);
- N4-6 (Shetland);
- N7 (Shetland); and
- N8 (Shetland).

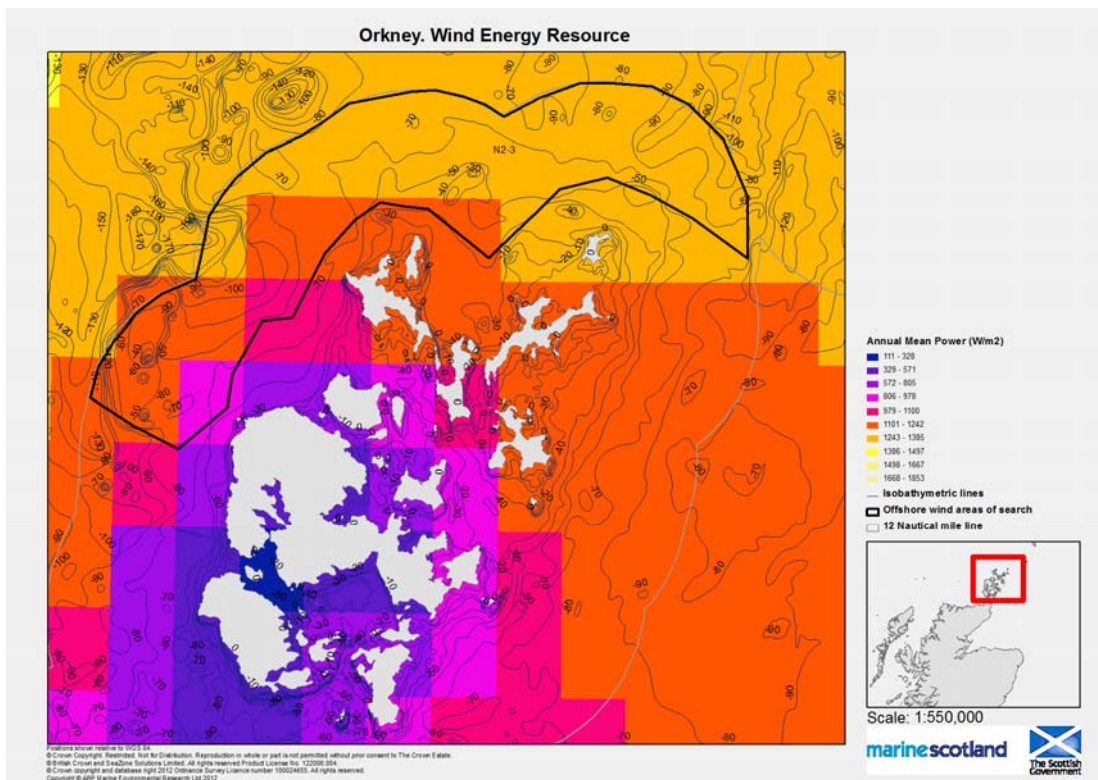
The north Section has been divided into Orkney (N2-3) and Shetland (N4-6, N7, N8) to allow a more detailed presentation of features.



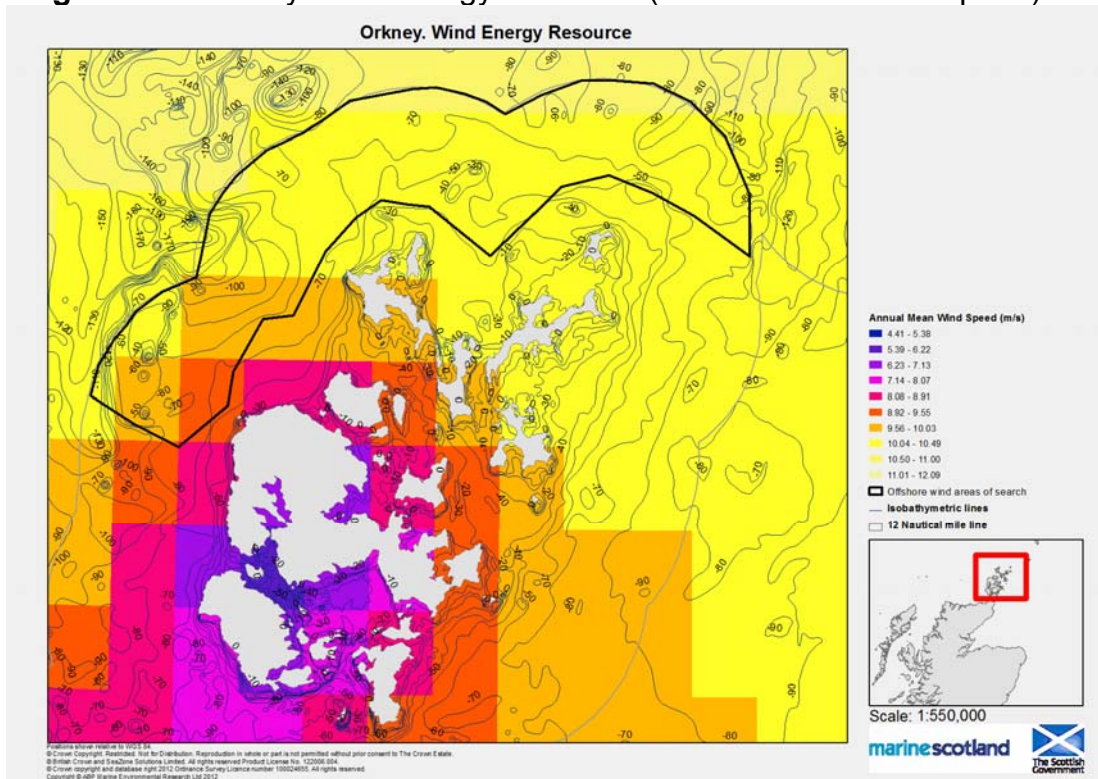
### 5.1 **Resource**

- 5.1.1 Wind resource is strong directly north of Orkney in N2-3; the mean annual wind power densities that can be expected at this location reach a maximum of  $1.3 \text{ kWm}^{-2}$  and a minimum of  $\text{kWm}^{-2}$ . Mean annual wind speeds are of  $9.5 - 10 \text{ ms}^{-1}$  in this area.
- 5.1.2 Summer mean wind power density is of  $0.5 \text{ kWm}^{-2}$  from  $8 \text{ ms}^{-1}$  mean wind speed and winter mean power density is four times that at  $2 \text{ kWm}^{-2}$  from a mean winter wind speed of  $12.5 \text{ ms}^{-1}$ .
- 5.1.3 The wind areas of search to the east, west and north of the Shetland Isles have good wind resources available. The area of search N7 to the east of Shetland displays  $1.3 - 1.4 \text{ kWm}^{-2}$  maximum mean power density and  $1 \text{ kWm}^{-2}$  minimum. Winds speeds in this area show an annual mean speed of  $10 \text{ ms}^{-1}$ .
- 5.1.4 The summer power density reaches  $0.6 \text{ kWm}^{-2}$  from  $8 \text{ ms}^{-1}$ . In winter it is of  $2 \text{ kWm}^{-2}$  from a wind speed of  $12.6 \text{ ms}^{-1}$ .
- 5.1.5 Area of search N8 to the north and N4-N6 to the west of Shetland isles have similar, or slightly higher, values than N7 with  $1.4 \text{ kWm}^{-2}$  mean maximum power density for N8 with expected mean annual wind speeds of  $10 \text{ ms}^{-1}$ . Area of search N4-N6 offers the highest mean wind power density of these three areas of search at  $1.4 - 1.5 \text{ kWm}^{-2}$  from mean annual wind speeds of  $10.9 \text{ ms}^{-1}$ .
- 5.1.6 Maximum power densities differ markedly from summer ( $0.63 \text{ kWm}^{-2}$  from  $8.2 \text{ ms}^{-1}$ ) to winter ( $2.3 \text{ kWm}^{-2}$  from  $13 \text{ ms}^{-1}$ ).

**Figure 5.1** Orkney Wind Energy Resource (Annual Mean Power)

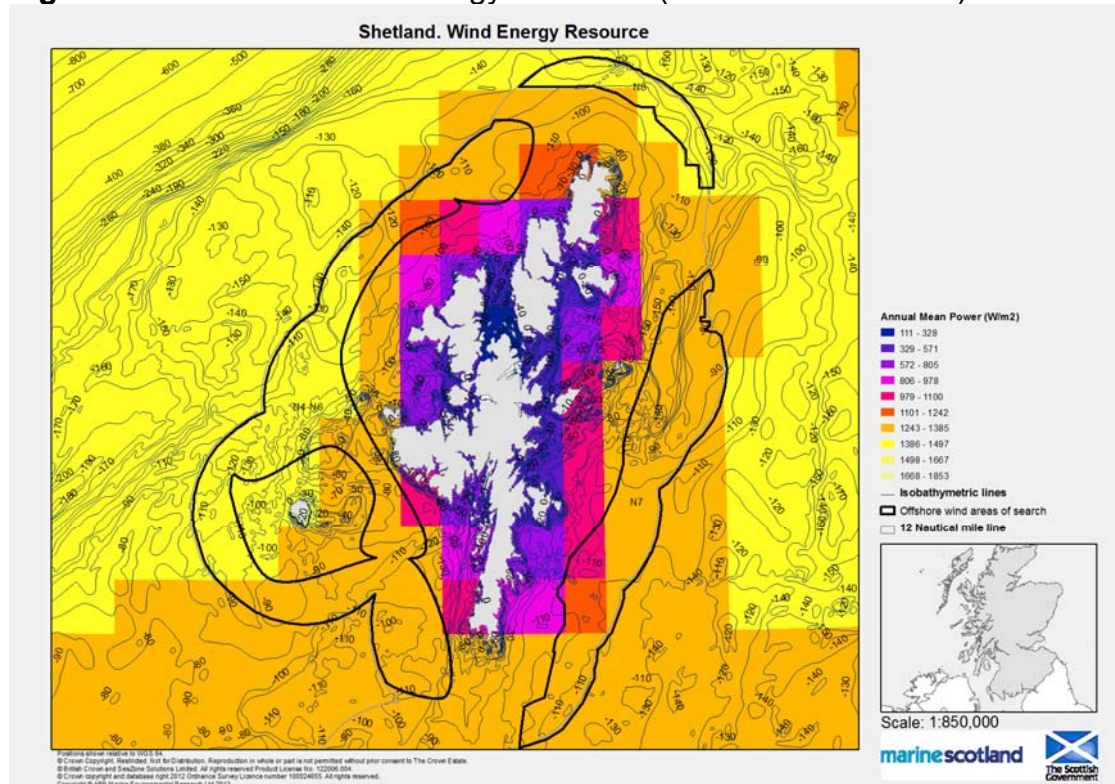


**Figure 5.2** Orkney Wind Energy Resource (Annual Mean Wind Speed)

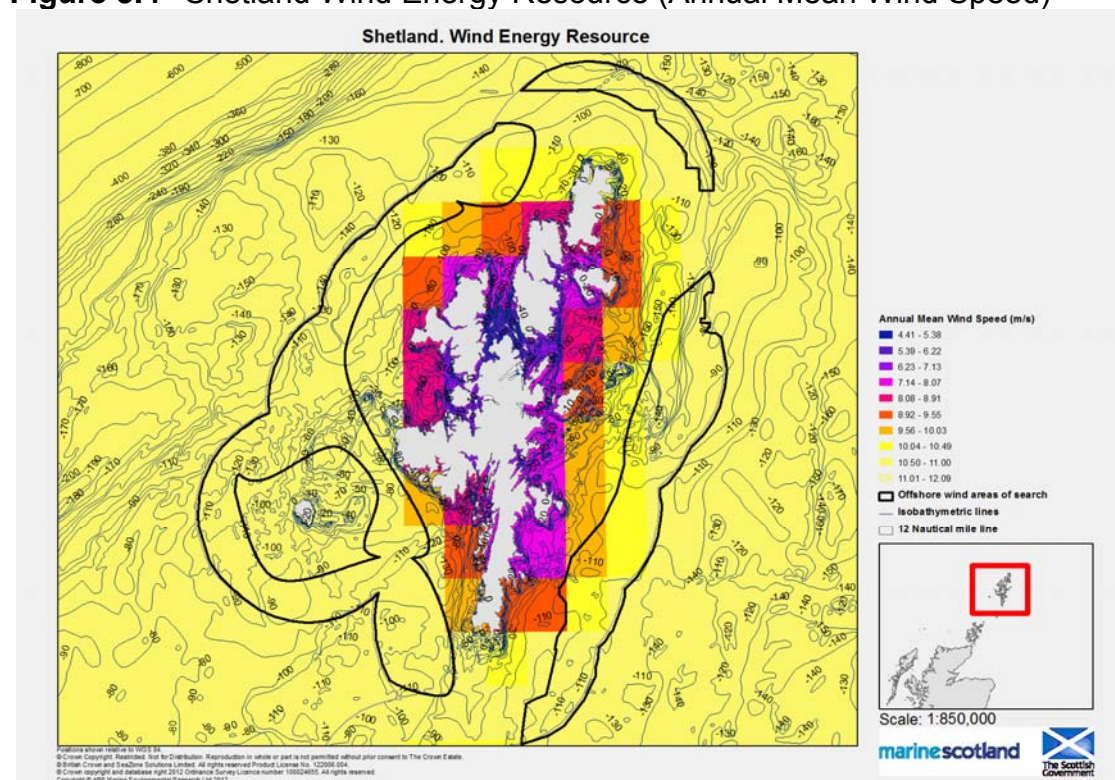




**Figure 5.3** Shetland Wind Energy Resource (Annual Mean Power)



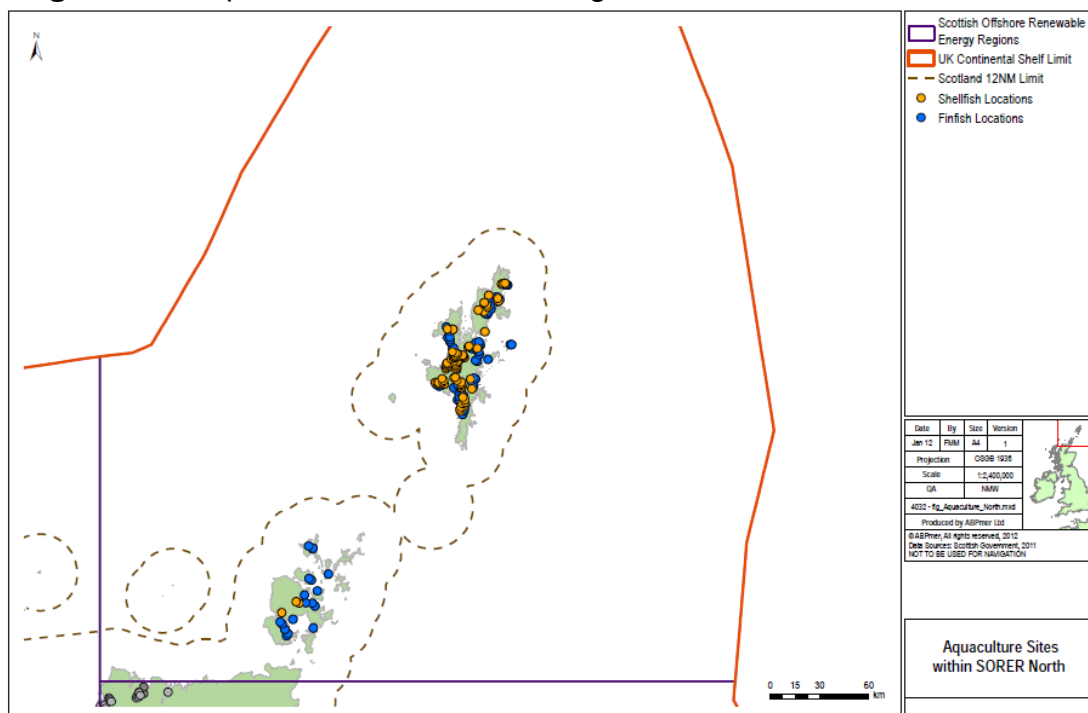
**Figure 5.4** Shetland Wind Energy Resource (Annual Mean Wind Speed)



## 5.2 Aquaculture

5.2.1 Marine aquaculture sites within the North Region are shown in Figure 5.5, where there are 120 finfish and 83 shellfish sites with a number being located along the coastline of the Orkney Islands and in particular the Shetland Islands.

**Figure 5.5** Aquaculture in the North Region



5.2.2 In 2010, the marine aquaculture industry in the North Region had an 299 full-time and 83 part-time staff.

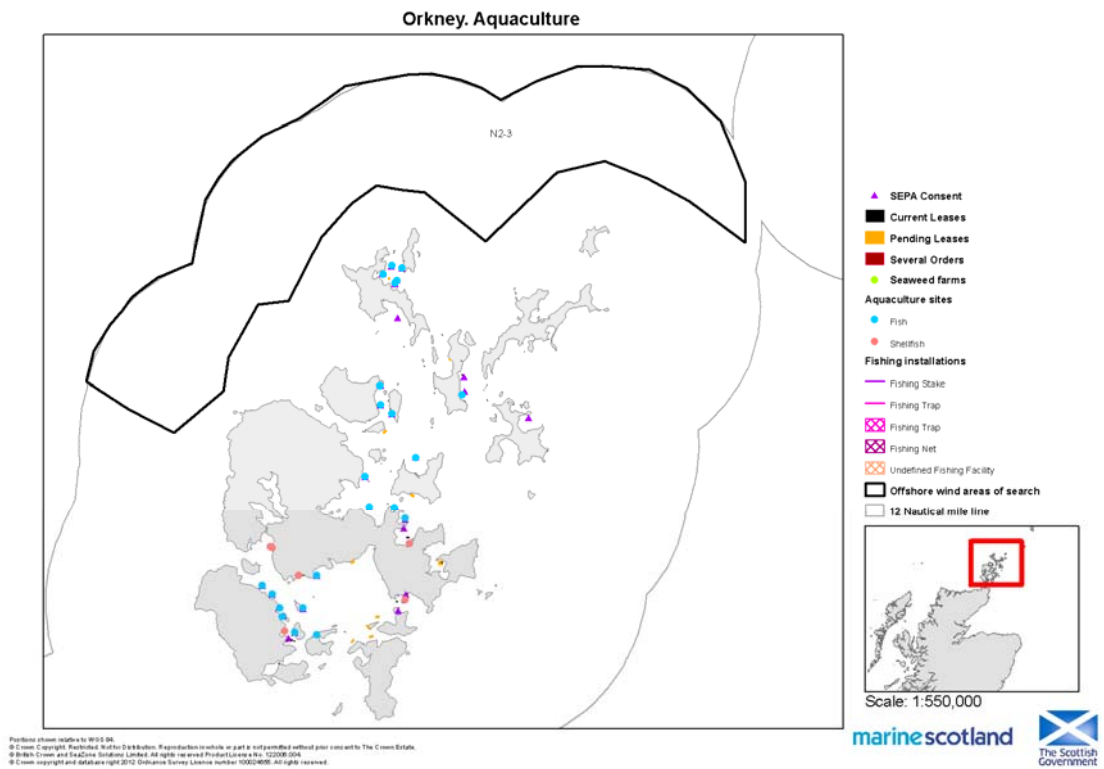
### *Orkney*

5.2.3 There are no aquaculture facilities within the area of potential development. Some 22 finfish farm sites and 4 shellfish farm sites surround the Orkney Isles. The area is responsible for 6% of Scotland's Atlantic salmon production. No shellfish production for the table or for on-growing was reported in 2011.

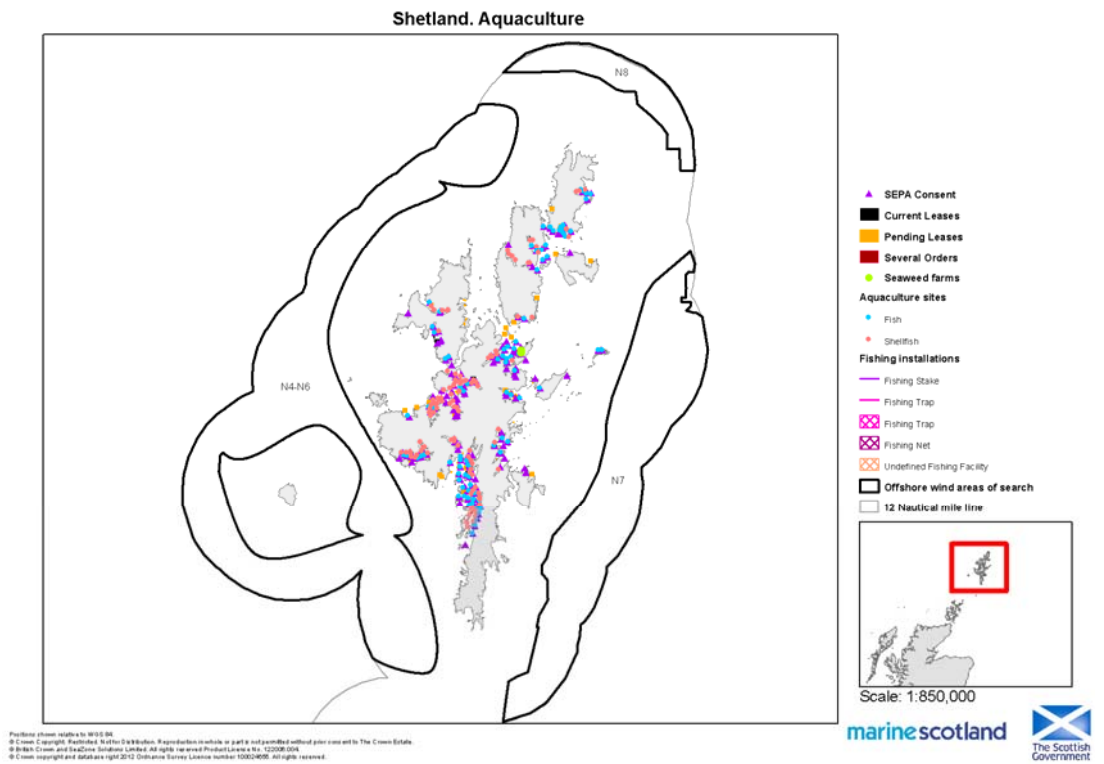
### *Shetland*

5.2.4 There are two fish farm sites and four shellfish farm sites within Ronas Voe which is included within one of the areas identified for potential development. There are numerous fish and shellfish farm sites surrounding the majority of the Shetland islands with the exception of the south east and some north west areas. Shetland is responsible for producing 29% of Atlantic salmon, 65% of mussels for the table, 63% of mussels for on-growing and 0.8% of Pacific oysters for the table.

**Figure 5.6** Aquaculture activities in Orkney (Areas of Search)



**Figure 5.7** Aquaculture activities in the Shetland (Area of Search)



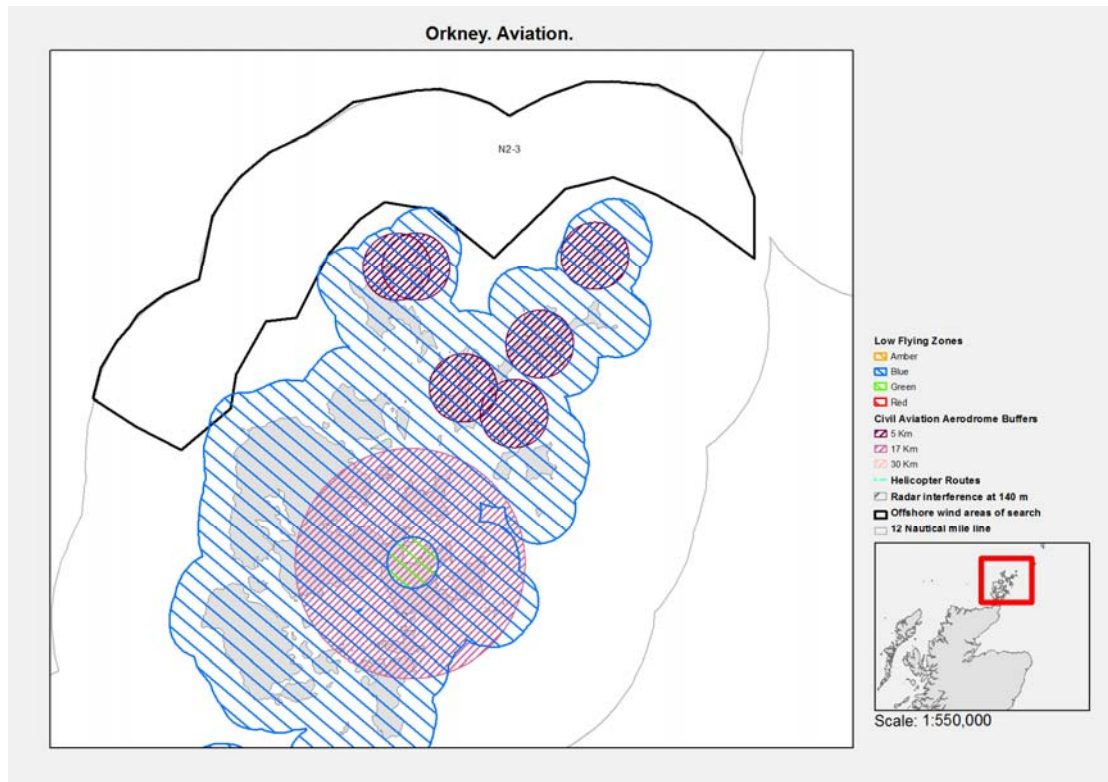


### 5.3 Aviation

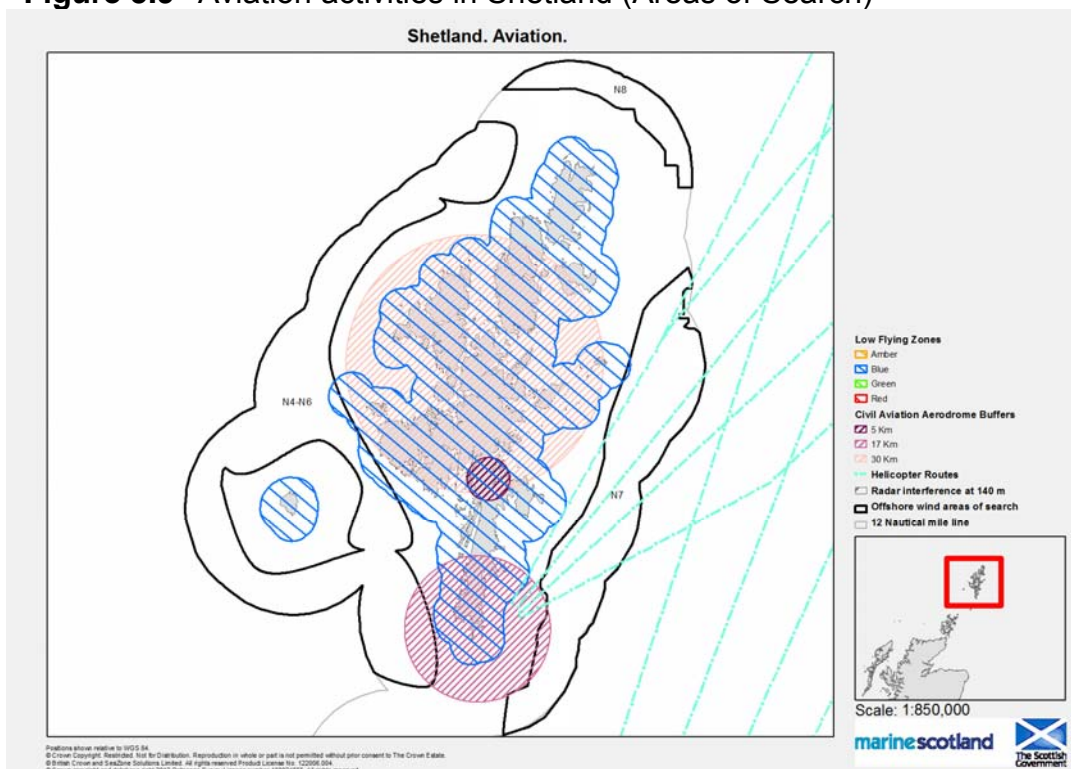
5.3.1 Airports in this region include the ‘minor’ airports of Kirkwall in Orkney and Sumburgh, Lerwick and Scatsta in the Shetland Islands.

5.3.2 Figures 5.8 and 5.9 shows the known aviation activities taking place in relation the the Orkney and Shetland (Areas of Search).

**Figure 5.8** Aviation activities in Orkney (Areas of Search)



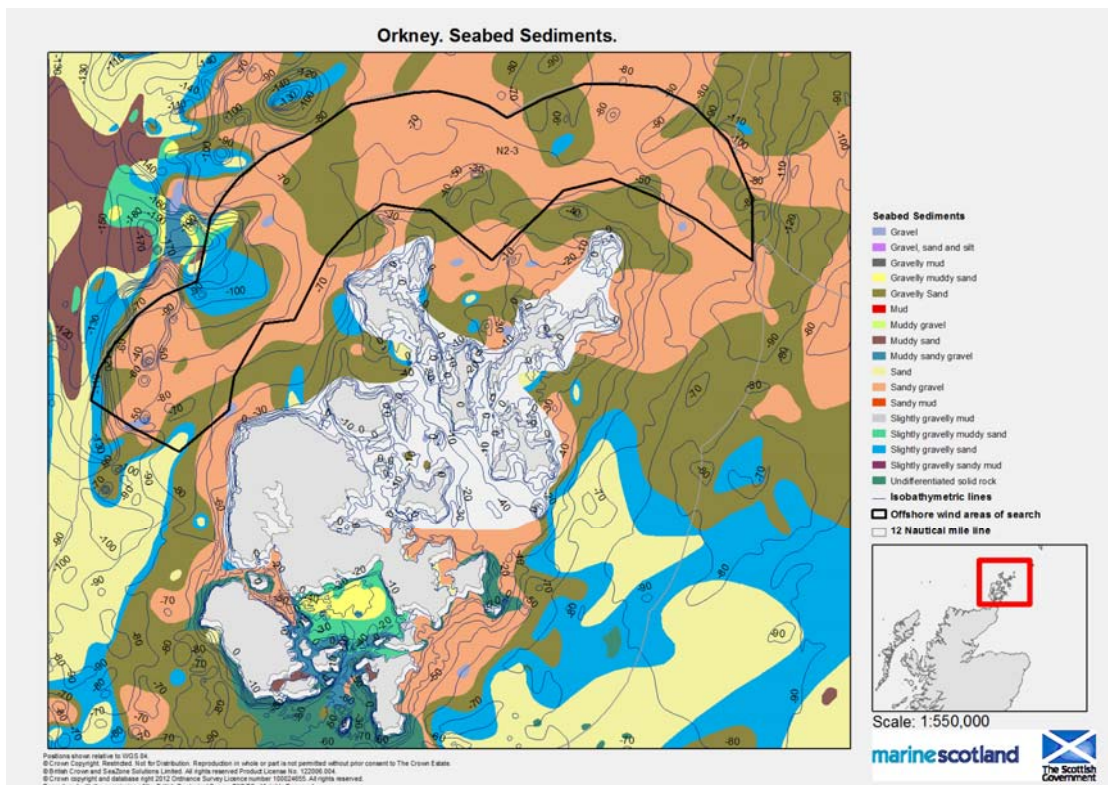
**Figure 5.9** Aviation activities in Shetland (Areas of Search)



#### 5.4 Bathymetry and Seabed

- 5.4.1 Depths within N2-3 vary from 30-100 m; the deeper parts being found at the southwestern part of the area.
- 5.4.2 The sediments in the Orkney area of search (N2-3) are mostly sandy gravel and gravelly sand with some patches of slightly gravelly sand as described in the BGS bottom sediment dataset. The EUNIS data describes this habitat as being composed predominantly of circalittoral coarse sediment with some areas of circalittoral deep coarse sediment, and a small patch of circalittoral sand.
- 5.4.3 Water depths are greater in the Shetland areas of search N4-6, N7 and N8. In N4-N6, the depth frequently exceeds 100 m, and often reaches a maximum of 130 m but at points close to the Shetland mainland it is shallower.
- 5.4.4 Search areas N7 and N8 display ranges of depth from 80-130 m, the predominant depth is around 110 m.
- 5.4.5 The sediment that characterises these areas is slightly coarse sediments such as sandy gravel and gravelly sand.

**Figure 5.10** Orkney (Area of Search) Seabed Sediments



**Figure 5.11** Orkney (Area of Search) Seabed Predicted EUNIS Habitats

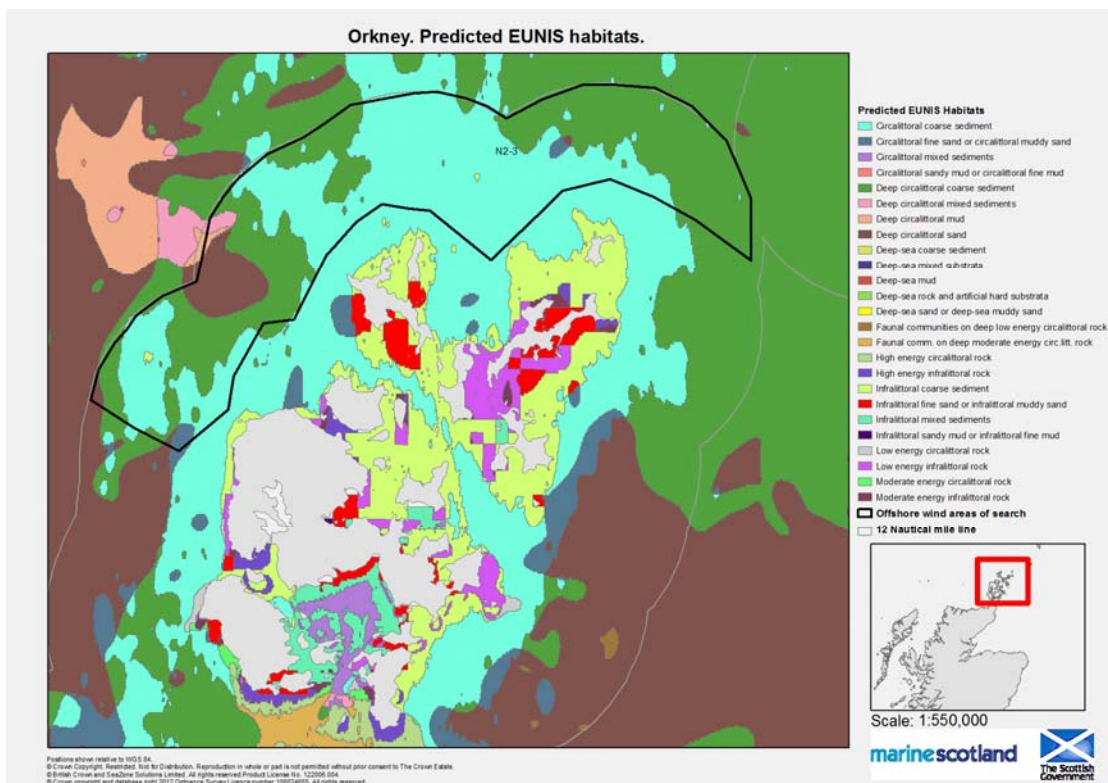




Figure 5.12 Shetland (Areas of Search) Seabed Sediments

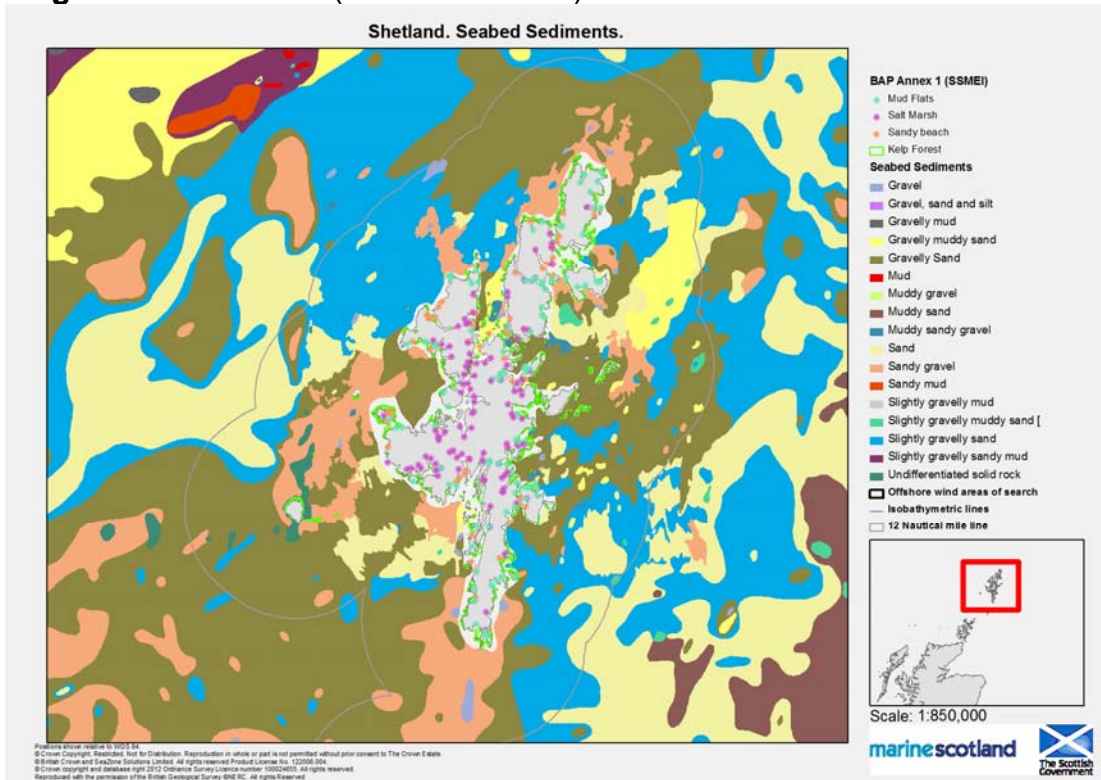
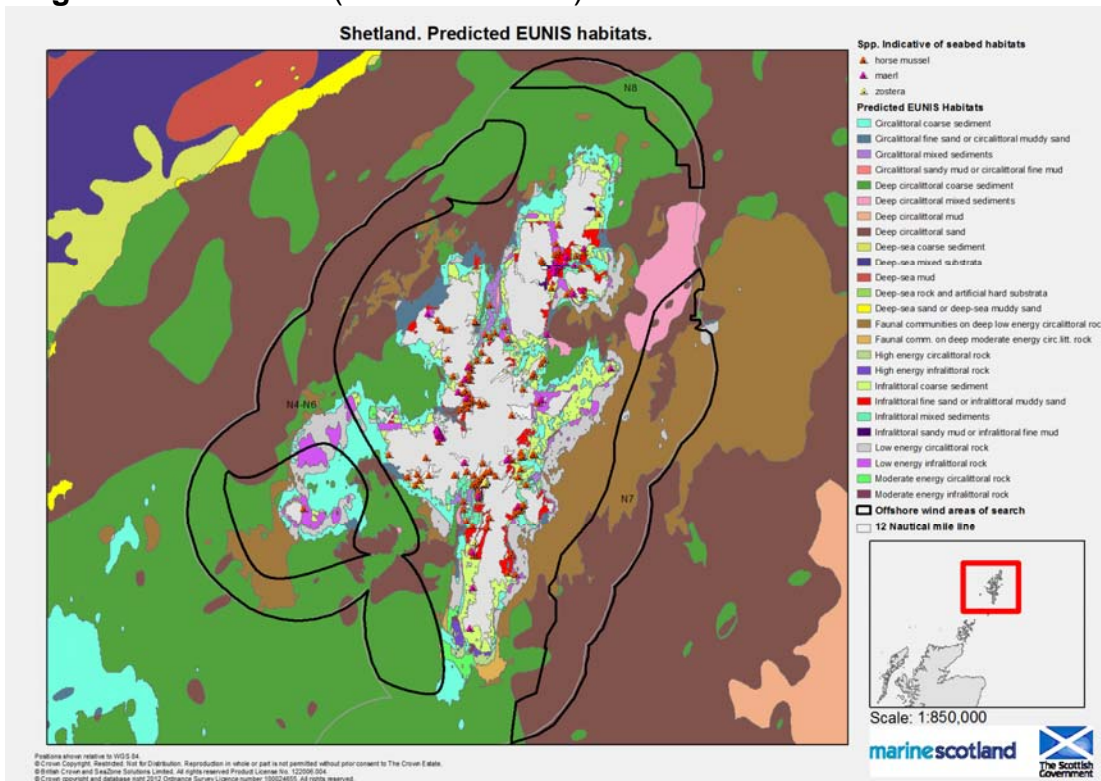


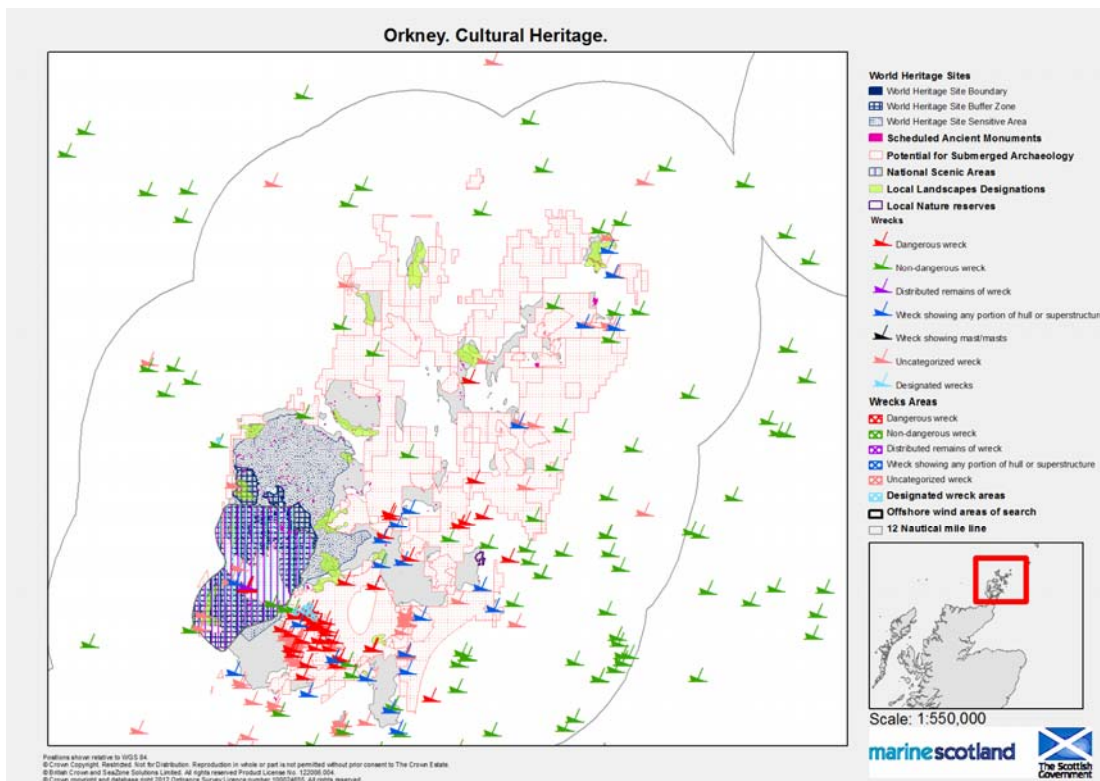
Figure 5.13 Shetland (Areas of Search) Seabed Predicted EUNIS Habitats



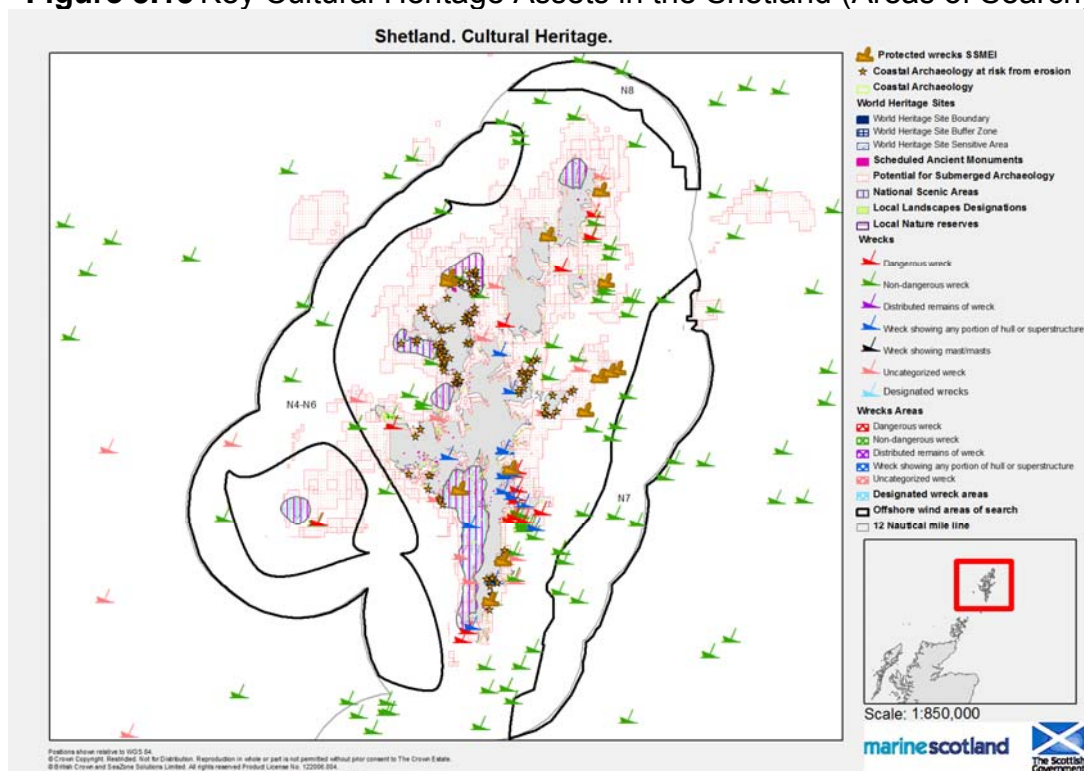
## 5.5 Cultural Heritage

5.5.1 The maps show that the area of search includes numerous wreck sites. Of greatest importance are the remains of ships from the German High Seas Fleet in Scapa Flow. These seven wrecks are scheduled monuments, and have been extensively mapped. A Voluntary Underwater conservation zone is in place for the Scapa Flow area, and any activities or developments which could impact on the scheduled monuments require consent from Historic Scotland.

**Figure 5.14** Key Cultural Heritage Assets in the Orkney (Area of Search)



**Figure 5.15** Key Cultural Heritage Assets in the Shetland (Areas of Search)



5.5.2 The area to the north and west of Orkney is close to extensive areas around the Orkney coast which have potential for submerged archaeology. On Orkney, the Heart of Neolithic Orkney World Heritage Site and its buffer zone covers an extensive area on the west coast of Orkney. The numerous listed buildings and scheduled monuments around the Orkney coast include lighthouses, cairns, chapels and dwellings, with varying levels of listing and importance.

5.5.3 Recent work to incorporate Orkney's marine heritage sites into the new marine legislation framework have recently been published. "Project Adair" seeks to integrate all available databases of known wrecks (UKHO, Canmore) for the Scottish territorial waters (0-200 NM) and develop ways to make this data available to the public. This project was implemented in order to support new marine environmental protection, marine planning and licensing systems, and to help guide sustainable development.

5.5.4 The results will be collected in a GIS geodatabase and will be available on request from the contractor.

5.5.5 There is a similar picture of cultural heritage interest on and around the Shetland Islands, where extensive areas have been identified as potentially of interest for submerged archaeology. There are clusters of designations distributed across the islands, from the North Unst Lighthouse in the north to the Sumburgh Head Lighthouse in the south, which are both Category A listed. Off the coast, there are two designated wreck sites: 'Kennemerland' which includes scattered remains over a wide area at Stoura Stack on Out



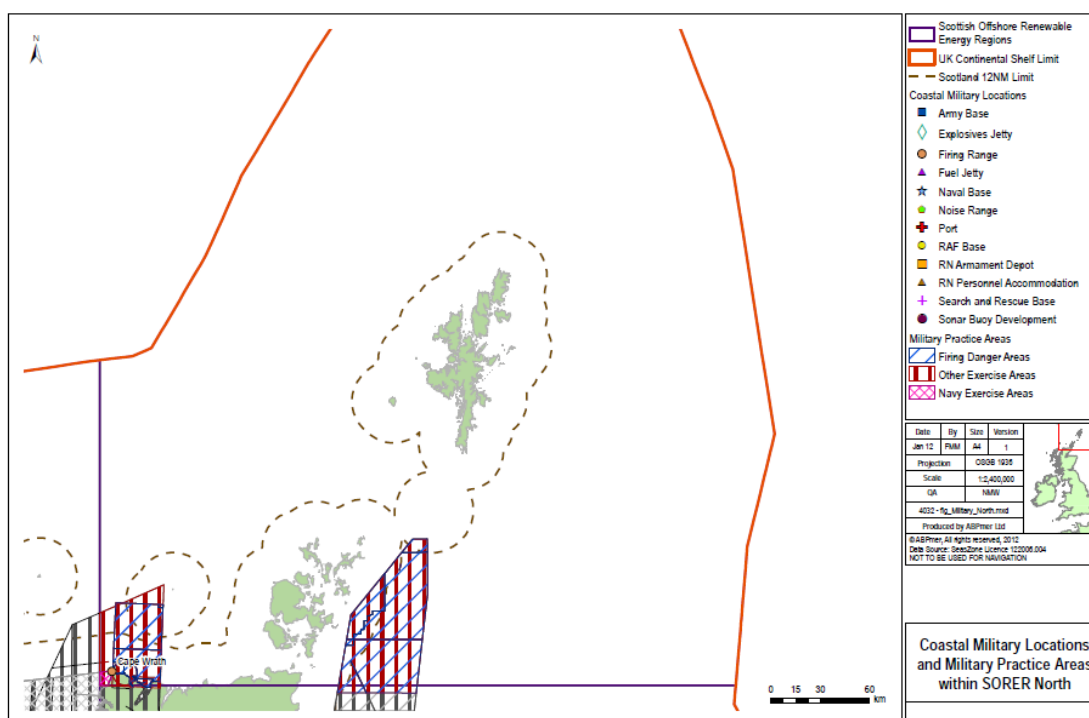
Skerries and ‘Wrangels Palais’ at Bound Skerry of the east coast of Out Skerries. There are a further 14 locally protected wreck sites around Shetland. The Shetland Marine Spatial Plan identifies several areas of coastal archaeology which is at risk as a result of coastal erosion.

## 5.6 Defence

5.6.1 The coastal military locations which occur within this region are shown in Figure 5.16. Military interests in this region include:

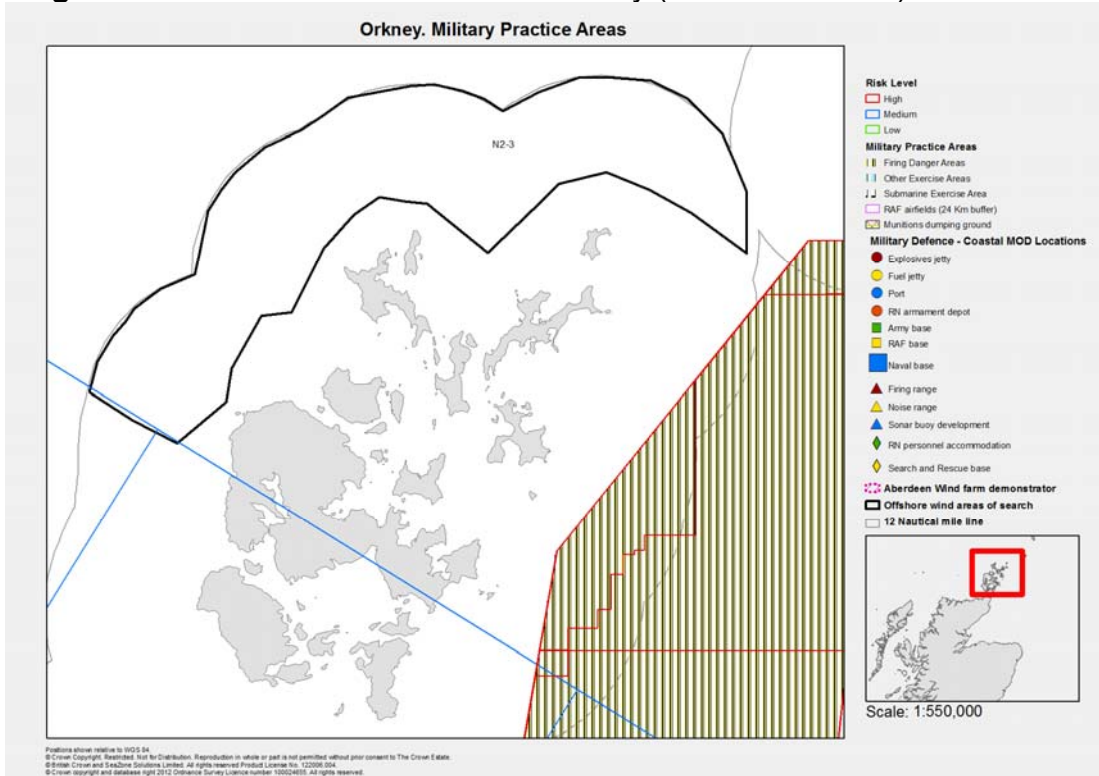
- Cape Wrath official gunnery and bombing range, mainly used for live gunnery practise by the Royal Navy and allied navies and for live bombing practise by the RAF and the Fleet Air Arm (FAA); and
- A ‘firing danger’ and ‘other’ exercise area to the East of Orkney (which extends into the North East SORER).

**Figure 5.16** Defence activities in North Region

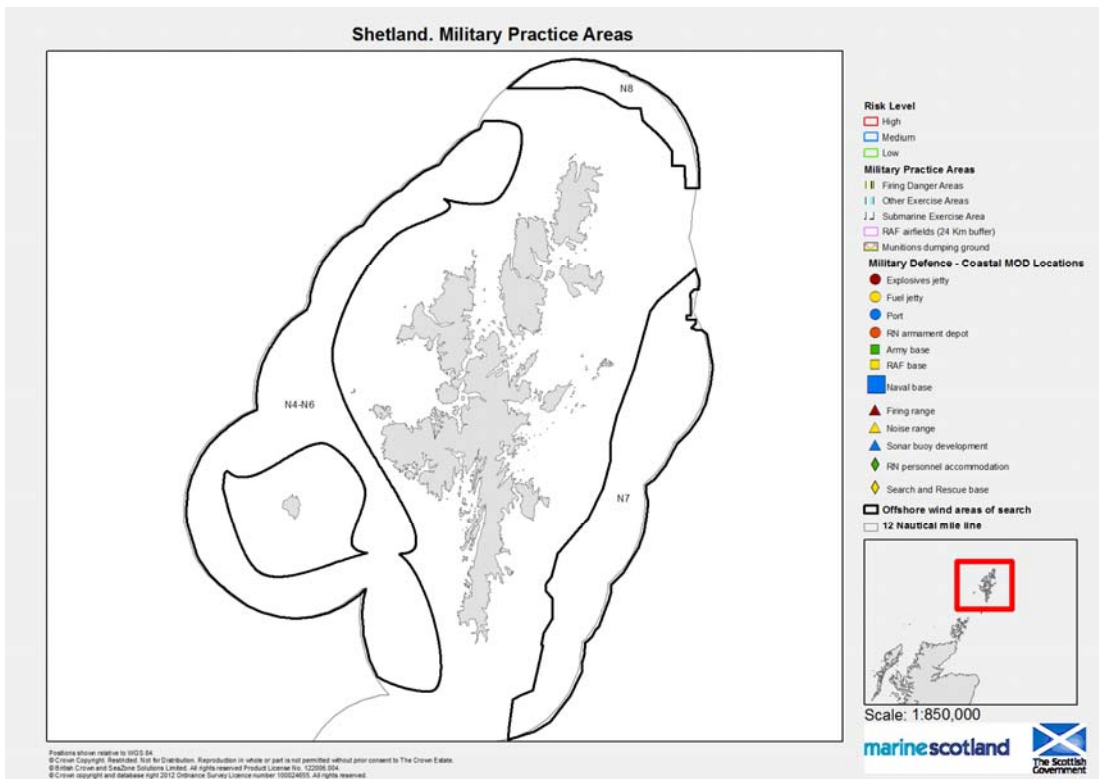


5.6.2 Figures 5.17 and 5.18 below show the known defence activities which take place within the current search areas for offshore wind energy in both Orkney and Shetland.

**Figure 5.17** Defence activities in the Orkney (Areas of Search)



**Figure 5.18** Defence activities in the Shetland (Areas of Search)



## 5.7 Environment

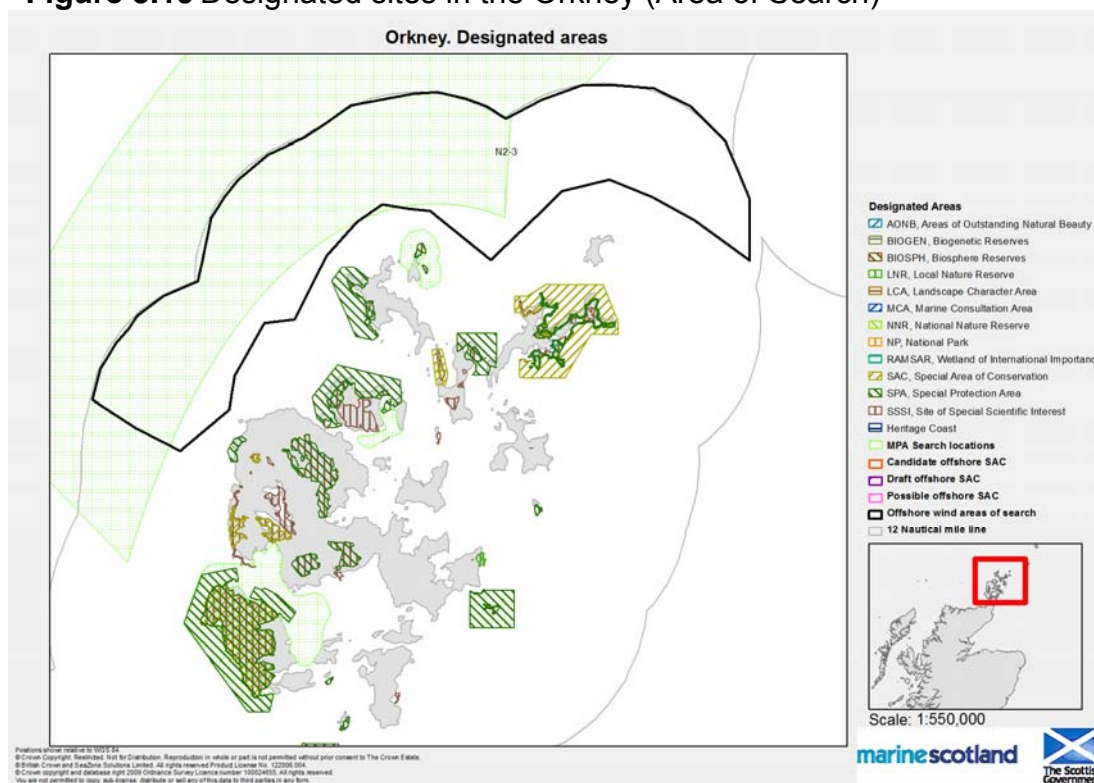
### Designations

#### 5.7.1 Orkney has a similar wealth of designated sites including:

- West Westray, Papa Westray, Calf of Eday, East Sanday Coast, Marwick Head and Rousay SPAs all at the northern end of the islands, supporting a range of seabird species. Other sites, such as Orkney Mainland Moors are further inland and support other bird species which are less closely reliant on the marine environment;
- SACs of greatest relevance to the initial area of search include Sanday, which is an extensive area, designated for its marine habitats, and which has common seals as a qualifying feature. In addition, Faray and Holm of Faray SAC is also of relevance and is designated for grey seals;
- The SACs and SPAs, and some further areas are also designated as SSSIs; and
- Possible MPA locations have been identified for further assessment around Papa Westray due to its interest for black guillemot, and at north west Orkney and Mousa in Shetland due to their role in supporting sandeels.

#### 5.7.2 There are further designated sites further south within the Orkney area and also along the north Caithness and Sutherland coast, which are potentially relevant to any potential development areas in this region.

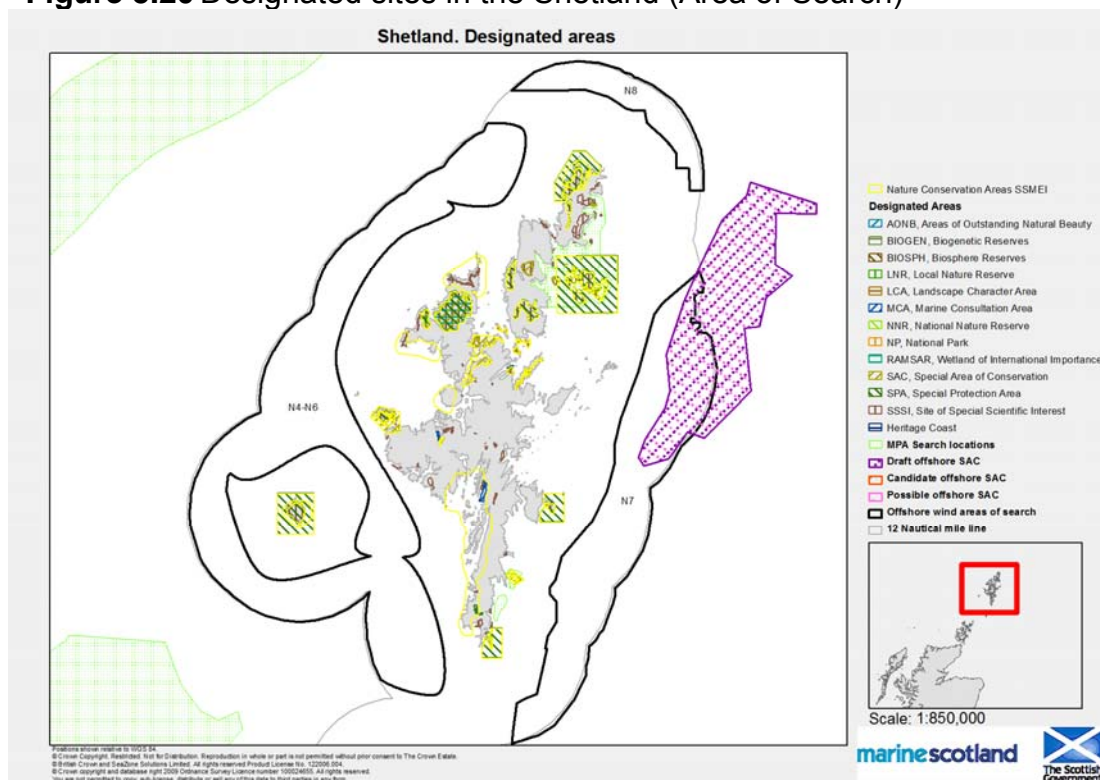
**Figure 5.19** Designated sites in the Orkney (Area of Search)





### 5.7.3 Around Shetland, key sites of interest include:

- Pobie Bank Reef possible / candidate SAC (pSAC) lies to the east of the islands, partly overlapping with the eastern area of search. It is a reef habitat, approximately 70km long and 20km wide which supports an extensive community of encrusting and robust sponges and bryozoans. Harbour porpoise, grey seal and harbour (common) seal are present in the area, but are non qualifying features.
- SPAs include Hermaness, Saxa Vord and Valla Field, Fetlar, Otterswick and Graveland, Ronas Hill (North Roe and Tingan) Papa Stour, Foula, Mousa, Noss, and Sumburgh Head. All of these sites have been designated for their interests for birds, including large assemblages of seabirds. Fair Isle SPA also lies to the south of the region.
- Papa Stour, Mousa, North Fetlar, Ronas Hill are also designated as SACs. Further SACs exist on Shetland both on the coast and inland, including East Mires and Lumbister, Sullom Voe, Yell Sound Coast, and the Vadills. These sustain a range of habitats, including coastal features and bog.
- These sites are generally also recognised as SSSIs, and there are some further areas with this status which do not have European protection. There are a total of 31 SSSIs of geological interest, and 29 designated for biological interest.
- An extensive area to the north west of Shetland, and a smaller area to the immediate east of Yell and Unst have been included as search areas for possible future Marine Protected Areas. The former is the Faroe Shetland Channel, recognised for its role in supporting, habitats such as muds, sands and gravels and its aggregations of deep sea sponges. The latter partly overlaps with Fetlar SPA, and is of interest due to its horse mussel beds, maerl beds, shallow tide-swept coarse sands with burrowing bivalves and black guillemot.

**Figure 5.20** Designated sites in the Shetland (Area of Search)

### Landscape Designations within Region

- 5.7.4 Areas of search identified at scoping extend around the Shetland Isles. Development proposals would need to take into account potential impacts on the special qualities of these areas.
- 5.7.5 The Shetland NSA includes seven areas that have a predominantly coastal character. SNH provides a description of its special qualities.<sup>1</sup> The designation includes Fair Isle, Foula, South West Mainland, Muckle Roe, Esha Ness, Fethaland and Herma Ness. All of these areas are valued for features including: *the stunning variety of the extensive coastline, coastal views (close and distance), coastal settlement, the landform creating hidden coasts, the effects of wind and shelter, the sense of remoteness, solitude and tranquillity, coastal stacks, promontories and cliffs, northern light* and effects on views and experience of the landscape, and *distinctive cultural landmarks*.
- 5.7.6 Shetland became a member of the European Geoparks Network and the UNESCO Global Geoparks Network in recognition of its internationally significant geodiversity. Although not specifically a landscape designation, it recognises the significant role that the geology of the islands play in the landscape experience, which is often particularly evident at the coast.
- 5.7.7 The areas of search identified at scoping are focused on the western seaboard, and are close to the Orkney NSA and West Mainland Local

<sup>1</sup> <http://www.snh.gov.uk/docs/B699717.pdf>

Landscape Area. Therefore development proposals would need to take into account potential impacts on the special qualities of these areas.

- 5.7.8 Orkney has a NSA on **Hoy and the West Mainland**. Its special qualities<sup>2</sup> include its *landscape setting for the archaeological World Heritage site*, the *layering of geology, topography, archaeology and land use*, the *presence of sandstone and flagstone* through archaeology and natural exposure. The *spectacular coastal scenery*, the strong presence of *curves and lines* is set against the backdrop of *constantly changing land and water*. *Long settled human presence* is apparent in the buildings and cultivation of the landscape, supported by the *productive land and sea*. Location specific qualities include the *high hills of Hoy* which form a backdrop to much of the West Mainland, the *townscape of Stromness*, *its setting and link with the sea* and the *traditional buildings and crofting patterns of Rackwick*.
- 5.7.9 The Orkney Islands Council has identified four Local Landscape Areas<sup>3</sup>, which support Policy N1 of the Orkney LDP, and are set out in Supplementary Guidance<sup>4</sup> supported by descriptions of their key characteristics<sup>5</sup>.
- 5.7.10 The key characteristics of the Local Landscape Area of **Denwick and Mull Head** include the high, eroded cliffs and associated landform features, and range of seabirds and plant communities. The area of Mull Head is also noted for its wild qualities. **East Holm to Weddell, Burray** is significant in relation to the strategic role it played during World War II, notably the man made features of the Churchill Barriers, and the Italian Chapel. The landscape is a significant element of the experience when crossing the barriers, which is undertaken by many visitors to Orkney. **Ignaness Bay** is noted for its sandy bays with intervening rocky coastline and low cliffs, and two brackish lochs are found at Swarsquoy. **St Peter's Pool and Dingieshowe** comprises the unusual geomorphology of a shingle ayre, areas of sandy beach, dunes, bay and sand flats, and exposed cliffs.
- 5.7.11 Development proposals within the offshore areas of search identified at scoping, would need to take into account any potential impacts on the special qualities of these areas.

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<sup>2</sup> <http://www.snh.gov.uk/docs/B699719.pdf>

<sup>3</sup> Local Landscape Designations replace the Areas of Great Landscape Value and Areas of Attractive Settled Landscape designations set out in the Orkney Local Plan 2004

<sup>4</sup> Orkney Islands Council (2011) Landscape Character and Designations Supplementary Guidance April 2011 [available online] <http://www.orkney.gov.uk/Files/Planning/Development-Planning/Landscape%20Character%20and%20Designations.pdf>

<sup>5</sup> Orkney Local Landscape Area descriptions, available from <http://www.orkney.gov.uk/Service-Directory/R/local-landscape-areas.htm>



*Marine mammals, Basking Sharks and Seals*

*- Orkney*

- 5.7.12 Marine mammal sightings on average within the area of search north of Orkney are low to moderate with more encounters seen towards the west of the area. Species that are regularly sighted around Orkney are similar to those seen around Shetland and include: minke whales to the north of the islands, white beaked dolphins and harbour porpoises.
- 5.7.13 SACs have been implemented for grey seals at Faray and Holm of Faray and for common seals at Sanday.
- 5.7.14 The two uninhabited islands of Faray and Holm of Faray in the northern part of Orkney support a well-established grey seal breeding colony. The seals tend to be found in areas where there is easy access from the shore, and freshwater pools on the islands appear to be particularly important. The islands support the second-largest breeding colony in the UK, contributing around 9% of annual UK pup production.
- 5.7.15 Sanday is situated in the north-east of the Orkney archipelago and supports the largest group of common seal at any discrete site in Scotland. The breeding groups, found on intertidal haul-out sites that are unevenly distributed around the Sanday coast, represent over 4% of the UK population. Nearshore kelp beds that surround Sanday are important foraging areas for the seals, and the colony is linked to a very large surrounding population in the Orkney archipelago (JNCC).
- 5.7.16 Five seal haul-out sites lie in close proximity to areas of search N2-3 for a mixture of grey and common seals. In total in the Orkney archipelago there are 28. this number rises to 34 if those around the Pentland Firth and Stroma are also included.
- 5.7.17 The sightings data show that there has been a small number of sightings spread around Shetland in the last 15 years with no discernable hotspots.

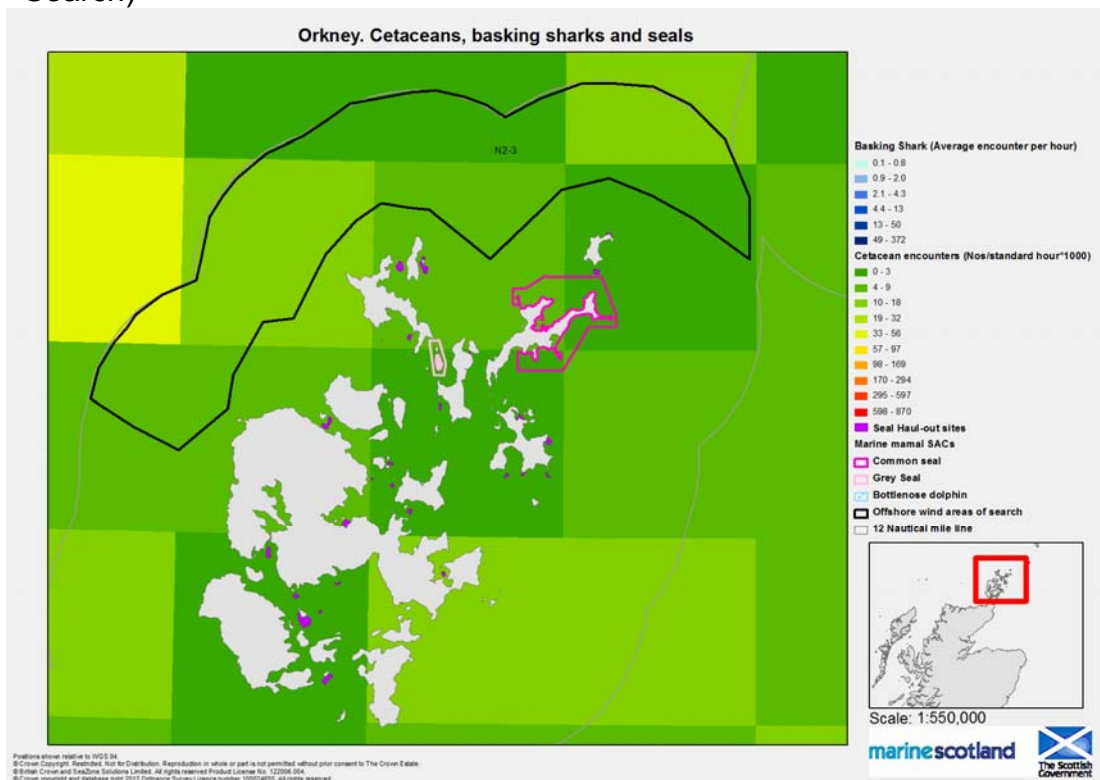
*- Shetland*

- 5.7.18 There are higher densities of marine mammal encounters in the grid squares that include Sumburgh Head and Bressay and Whalsay than elsewhere in the area. SSMEI data taken from the Shetland Marine Atlas shows inshore sightings of orca, minke whale, porpoise, Risso's dolphin and white beak dolphin. These additional data also includes sightings (from land) for grey and common seal and also sea otters. Although these sightings data are shore-based, the species listed coincide with those that show high abundance around the Shetland Isles according to the JNCC Cetacean Atlas (Reid, et al. 2003).
- 5.7.19 Orca show a higher abundance north of Muckle Flugga than elsewhere in the isles. During mackerel season, January to March and September-October to

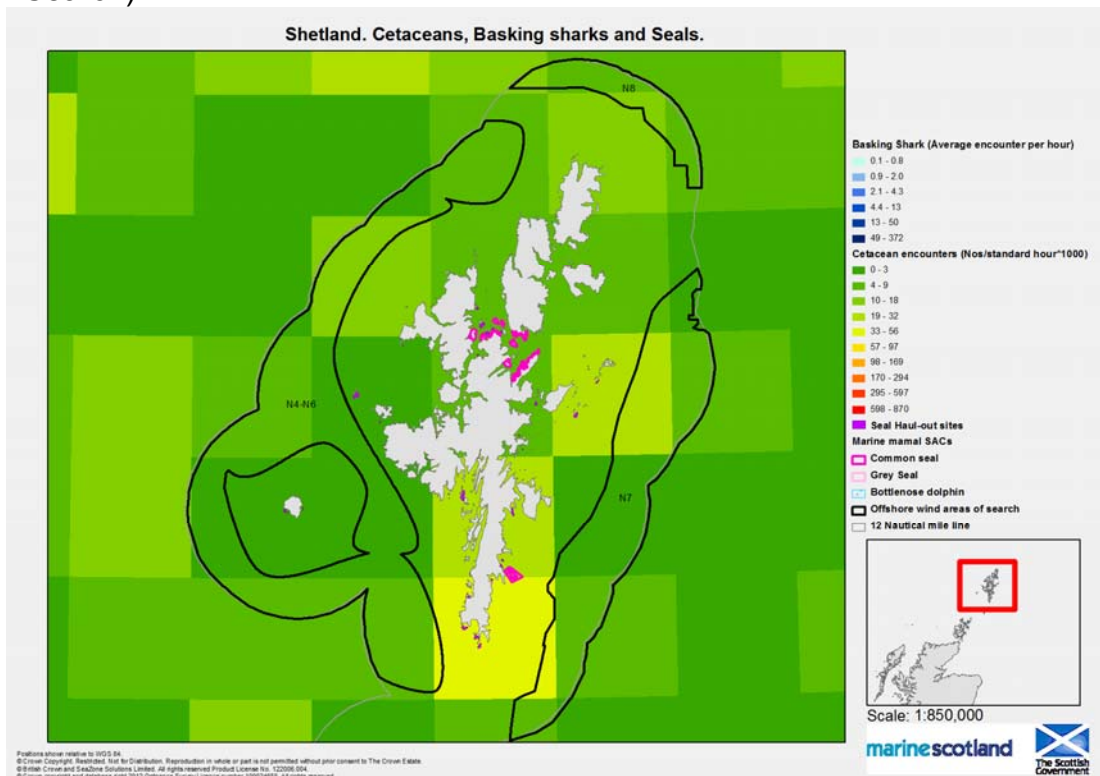
December, orca avidly feed on the mackerel that escape or fall out of fishing nets. This will present a combined interaction for developments within this area.

- 5.7.20 While interactions with marine mammals will be an element of EIAs, the densities of mammal sightings in where the areas of search are generally low.
- 5.7.21 In total 31 haul-out sites are for harbour seals and six are for grey seal can be found in this area. There is one site described as containing both species located west in the Ve Skerries.
- 5.7.22 None of the areas of search overlap with the seal haul-out sites but they still may overlap with the home range of these pinnipeds.
- 5.7.23 There are two SACs for seals in Shetland both created for common seals. The SAC at Yell Sound Coast in the Shetland Islands is the most northerly UK site selected for the common seal. The rocky shores and uninhabited islands and skerries within Yell Sound support a colony representing over 1% of the UK population.
- 5.7.24 The one at the exposed rocky island of Mousa, off the east coast of Shetland Mainland, supports one of the largest groups of common seal in Shetland and is one of the most northerly groups in the UK. The large rocky tidal pools on the island are of particular importance, as they are frequently used by the seals for pupping, breeding and moulting, and provide shelter from the exposed conditions on the open coast. The site supports just over 1% of the UK population (JNCC).
- 5.7.25 Seal haul-out sites are numerous in the Shetland Isles and have been identified practically everywhere except some shorelines in the north west points of of Cullivoe, Unst and Fethaland. Yell Sound shows a clustering of harbour seal haul-out sites and Sumburgh show a clustering of grey seal sites.
- 5.7.26 The sightings data show that there has been a small number of sightings spread around Shetland in the last 15 years with no discernable hotspots.

**Figure 5.21** Cetaceans, Seals and Basking Sharks in Orkney (Area of Search)



**Figure 5.22** Cetaceans, Seals and Basking Sharks in Shetland (Areas of Search)





## *Seabirds*

### *- Orkney*

- 5.7.27 Seabird density in Orkney is low around the area of search N2-N3 although Orkney itself is an important site for many species like Black legged Kittiwake, common guillemot atlantic puffin, european shag, fulmars, razorbills and black guillemots, and arctic terns. (ESAS report, 2010).
- 5.7.28 This is a sensitive environment where seabird population numbers and breeding success are tightly linked with fish prey such as sandeels. In recent years, there has been a sharp decrease in the abundance of species like guillemots and kittiwakes (Charting progress 2).
- 5.7.29 There are six SPAs in Orkney. The SPA at west Westray is the closest to the area of search and the cliffs support large colonies of breeding auks and Kittiwake, whilst the grassland and heathland areas support breeding colonies of skuas and terns. The seabirds feed in the surrounding waters outside the SPA (JNCC <http://jncc.defra.gov.uk>). Another two SPAs can be found at Calf of Eday on the East Sanday coast between these two sites there are colonies of gulls, cormorants fulmars kittiwakes and auks as well as wintering waders.
- 5.7.30 SPAs also exist further south at Copinsay, Marwick Head, Rousay and Hoy. The seabirds from these SPAs feed around the surrounding waters.
- 5.7.31 IBAs have also been established to protect the sensitive Orkney populations. The largest two are in Hoy, where up to 56,000 breeding pairs return regularly and in the mainland near Scapa Flow to protect waterbirds like red necked grebes and eider ducks. IBAs have been established in all the Orkney islands.
- 5.7.32 Eleven RSPB reserves have been created in Orkney, from Hoy in the south to North Hill in the north and Copinsay in the east. The numbers of seabirds at sea inside the areas of search around Orkney are low to moderate. However, it can be anticipated that any proposal for offshore wind development will have to give consideration to interactions with the highly varied and numerous seabird and waterbird species, both resident and passage populations in the general area.

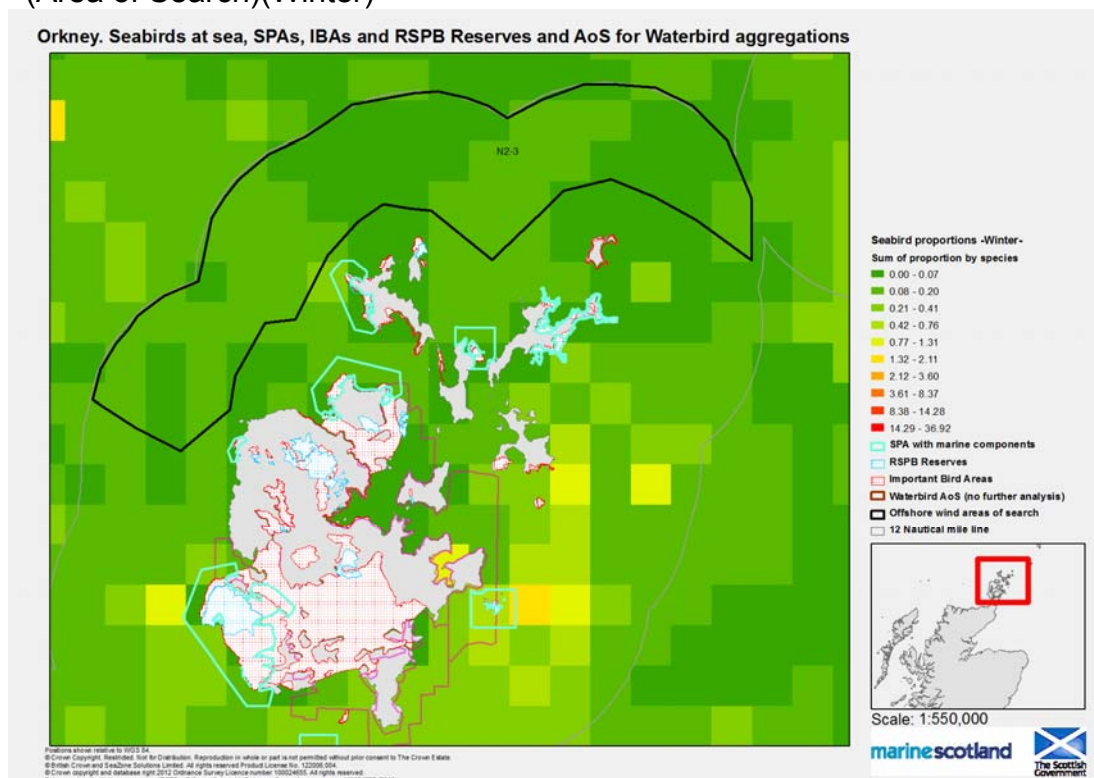
### *- Shetland*

- 5.7.33 Shetland is host to a great variety of breeding and overwintering seabirds and waterbirds. Relative densities of seabirds from the ESAS data show medium to low proportions of all seabirds within the areas of search. A hotspot of higher proportions is notable south west of Foula which can be attributed to high numbers of european shag in this particular grid square.
- 5.7.34 The seabird density maps for Shetland contain extra data from the Shetland SSMEI project and originate from the Shetland Marine Atlas. This data

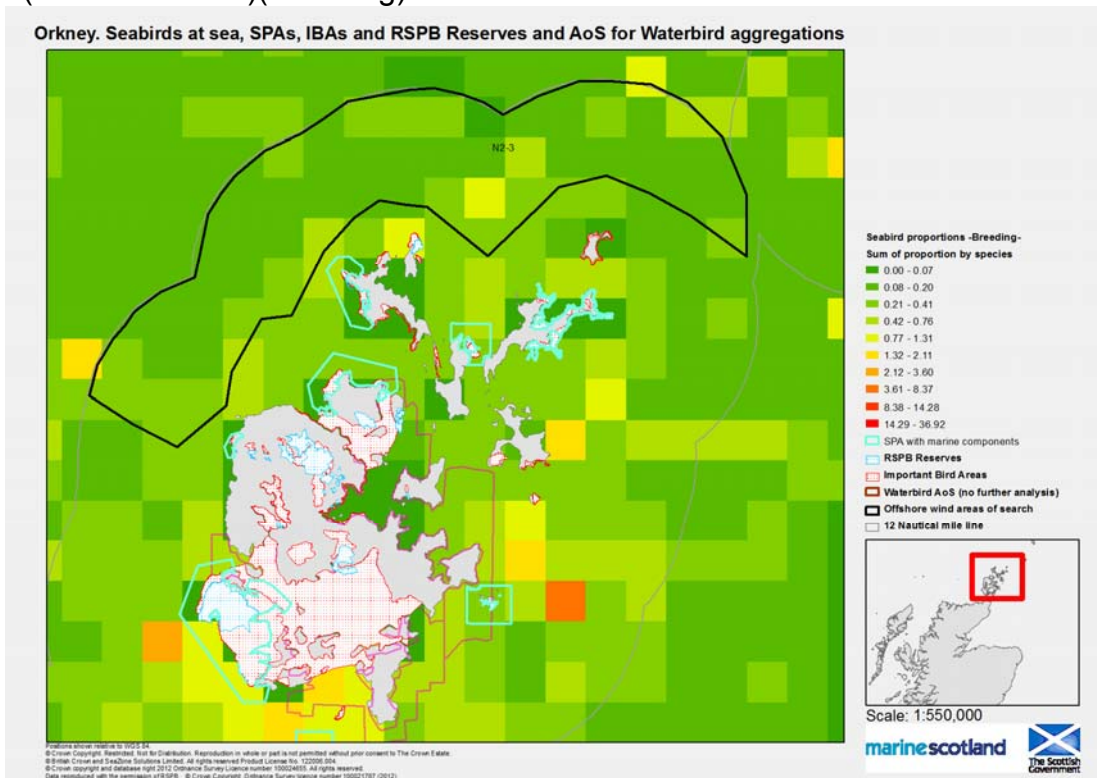
provides information on specific important locations for coastal seabirds (arctic tern, storm petrel, black backed gull, black guillemot, common tern, fulmar, gannet, ducks, diving birds and eiders).

- 5.7.35 Including Foula and Fair Isle there are six SPAs in the Shetland area that span from Sumburgh head to Hermaness and Foula to Noss. Species protected by these SPAs include common species like northern fulmar, common guillemot, arctic tern, arctic skua, northern gannet, atlantic puffin and also rarer species like red throated divers, whimbrel, ringed plover (RSPB). Great Skuas numbers are high in Shetland and it is estimated half of the world's population reside in these Isles ([www.visit.shetland.org](http://www.visit.shetland.org)).
- 5.7.36 There are 18 Important Bird Areas in the Shetland area that include Fair Isle and span the width and breadth of the Shetland Isles.
- 5.7.37 RSPB reserves have been created at Fetlar, Loch of Spiggie, Ramna stacks and Gruney, Sumburgh head, Mousa and Yell.
- 5.7.38 The areas of search as they stand form an almost continuous ring round Shetland. The cumulative impact of developments is therefore likely to be an important element in project design and licensing.

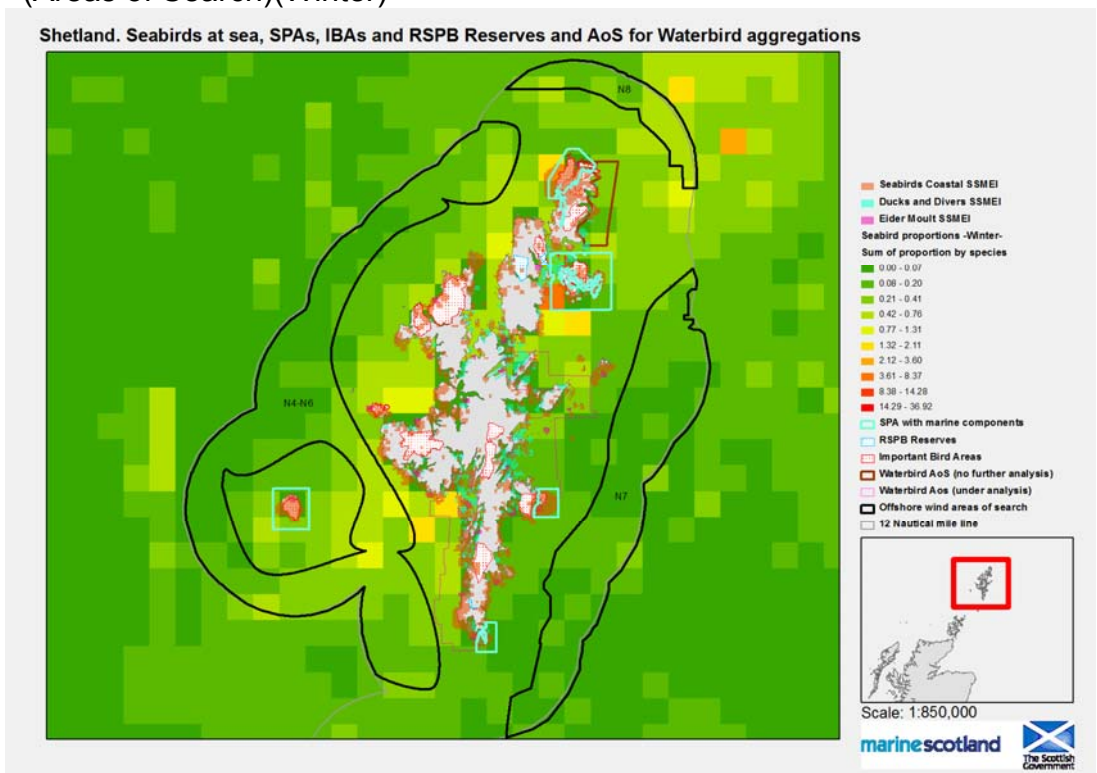
**Figure 5.23** Seabirds, Important Bird Areas and RSPB Reserves in Orkney (Area of Search)(Winter)



**Figure 5.24** Seabirds, Important Bird Areas and RSPB Reserves in Orkney (Area of Search)(Breeding)

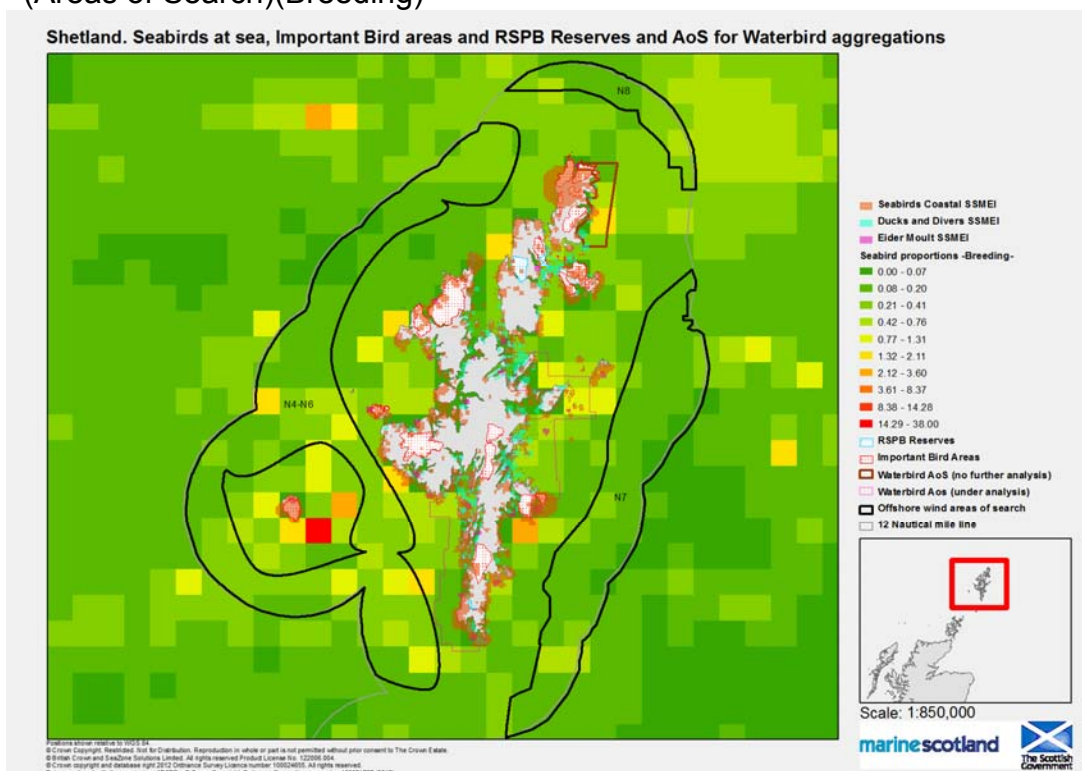


**Figure 5.25** Seabirds, Important Bird Areas and RSPB Reserves in Shetland (Areas of Search)(Winter)





**Figure 5.26** Seabirds, Important Bird Areas and RSPB Reserves in Shetland (Areas of Search)(Breeding)



## 5.8 Fishing

### *Commercial Fishing Regional Overview*

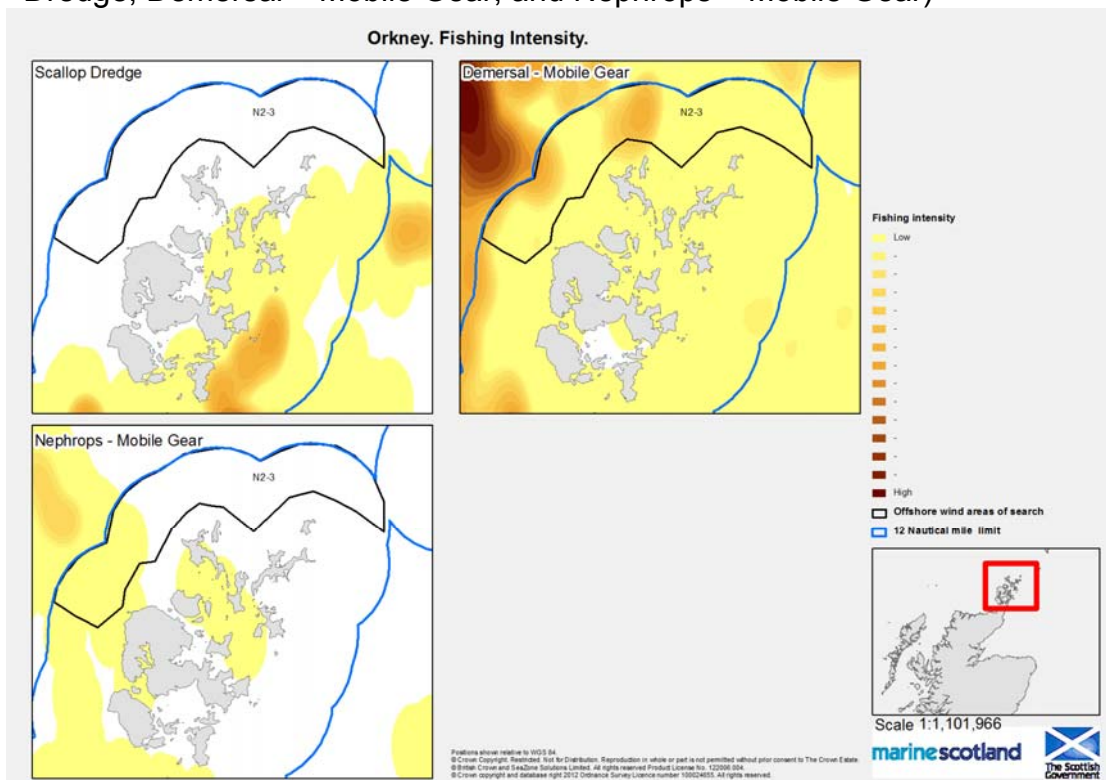
- 5.8.1 Landings caught by UK vessels within the North SORER had an average annual value of £162 million (42.4% of the Scottish total) and an average annual live weight of 209,200 tonnes (48.8% of the Scottish total) for the ten year period from 2001 to 2010.
- 5.8.2 The type of species landings from within the North SORER differ significantly between inshore / offshore waters and between different locations within this region. Inshore, and particularly around the islands, shellfish account for the majority of the value and volume of species landed whereas offshore, the value and volume of landings are mainly pelagic and demersal species.
- 5.8.3 Inshore, landings of scallops and other shellfish (excluding Nephrops) accounted for 57% of the total catch value in 2010 whilst demersal species made up 26% and pelagic species made up 16% of the total catch value. Offshore, landings of mackerel accounted for 36% of the total catch value in 2010, 27% were monkfish haddock and cod (combined), 11% were other whitefish, and herring and Nephrops each accounted for 9% of the total catch value.
- 5.8.4 In 2010, 41% of the value of landings from inshore waters were taken by vessels 10m and under in length, and 46% were landed by vessels 15m and over; whereas offshore, 94% were landed by vessels 15m and over.

- 5.8.5 For inshore waters, 34% of the total catch value was taken by pots, 26% by demersal trawl, 18% by dredges and 15% by pelagic trawl; whereas for offshore waters, 45% was taken by pelagic trawls and 37% by demersal trawls.
- 5.8.6 The main administrative fishing ports in this region are Scrabster, Kirkwall (Orkney) and Lerwick (Shetland) and there are also 28 smaller ports throughout the region.
- 5.8.7 There are 1025 fishermen employed on Scottish based vessels in these districts (857 of these are based in Orkney and Shetland), with 676 of these employed full-time and 349 part-time. There are 466 active vessels registered in these districts, 355 of which are 10m and under in length.
- 5.8.8 Shetland has 6% of the total employment in the catching sector in Scotland. The islands of Shetland, Orkney and the Western Isles combined account for 22% of the total catching employment in Scotland. Direct employment in the fishing sector has a whole accounts for between 5% and 10% in Shetland (Baxter et al., 2011)

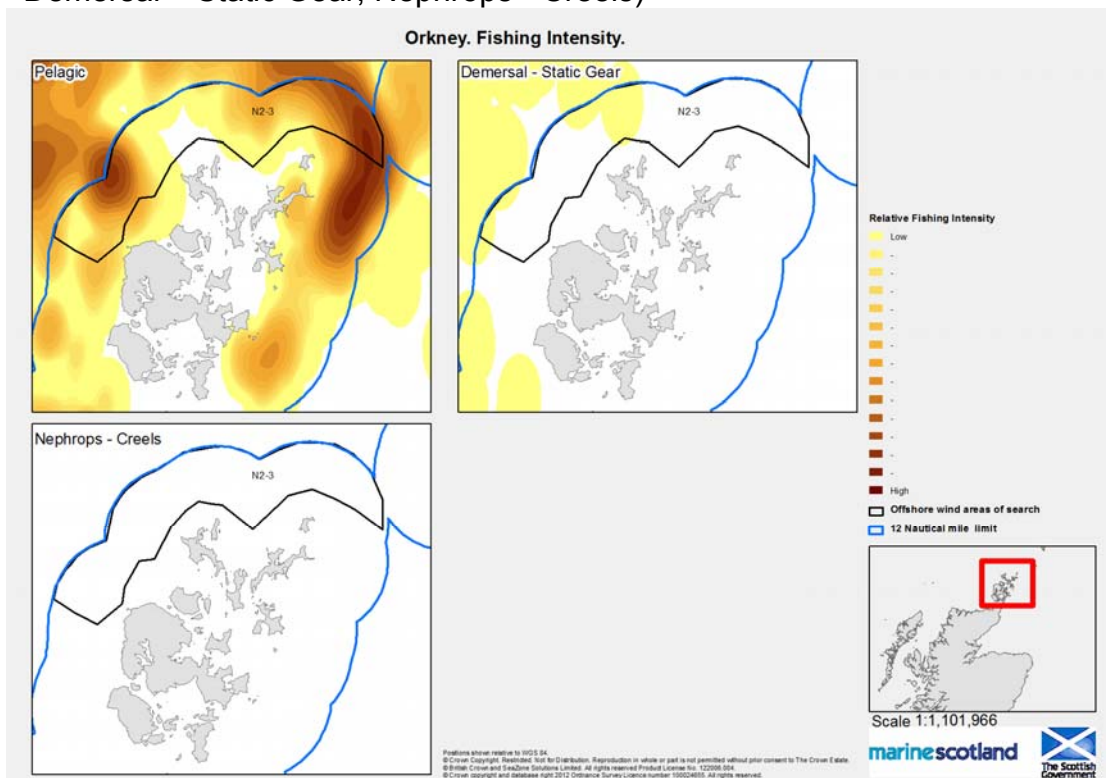
*Area of Search Interactions*

- 5.8.9 The species that overlap with the area of search north of Orkney are: nephrops, sandeel, norway pout, lemon sole, herring, sprat.
- 5.8.10 Nursery sites of species' that overlap with area N2-3 are: lemon sole, nephrops, norway pout, saithe and sandeel.
- 5.8.11 The Shetland areas of search overlap with spawning sites for sandeel, haddock, lemon sole, whiting, saithe, herring, sprat all spawn in these areas through the year. The collected spawning times cover from January to December with the exception of October. Any interactions should be investigated on a species and month specific basis.
- 5.8.12 Species' nursery sites that overlap with the Shetland areas of search are: blue whiting, haddock, lemon sole, mackerel, norway pout, saithe, sandeel.

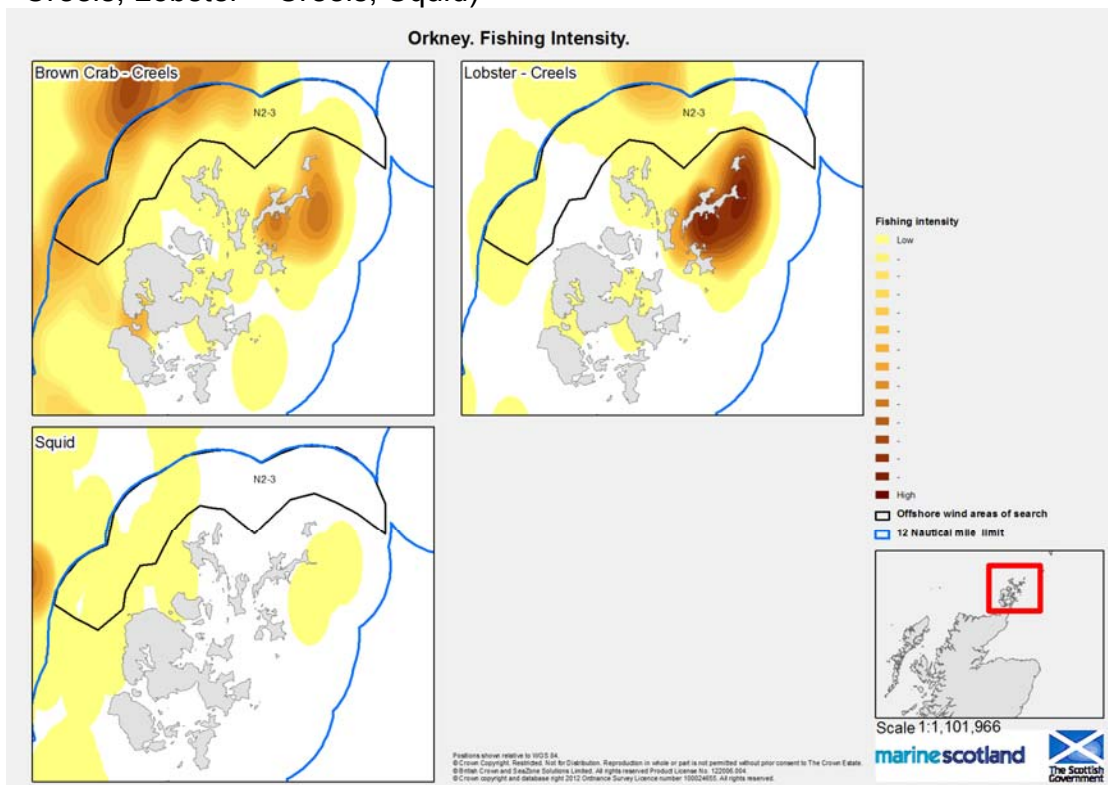
**Figure 5.27** Fishing Intensity in the Orkney (Area of Search) (Scallop Dredge, Demersal – Mobile Gear, and Nephrops – Mobile Gear)



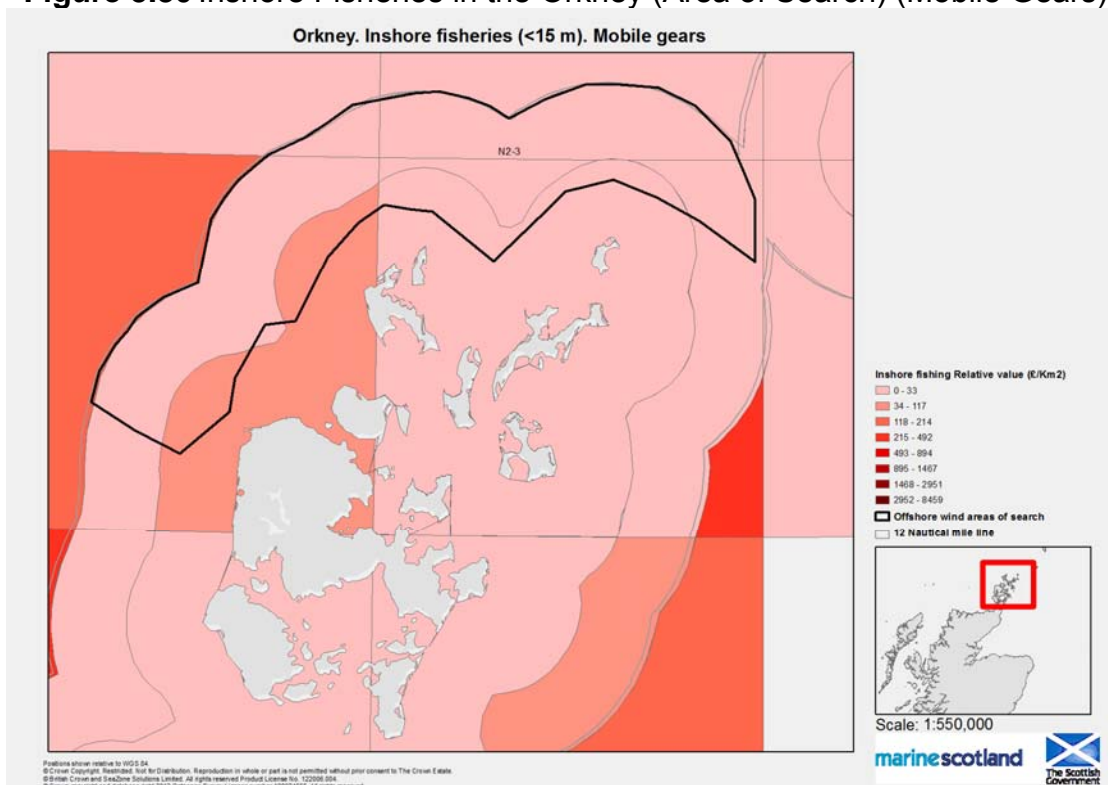
**Figure 5.28** Fishing Intensity in the Orkney (Area of Search) (Pelagic, Demersal – Static Gear, Nephrops - Creels)



**Figure 5.29** Fishing Intensity in the Orkney (Area of Search) (Brown Crab – Creels, Lobster – Creels, Squid)

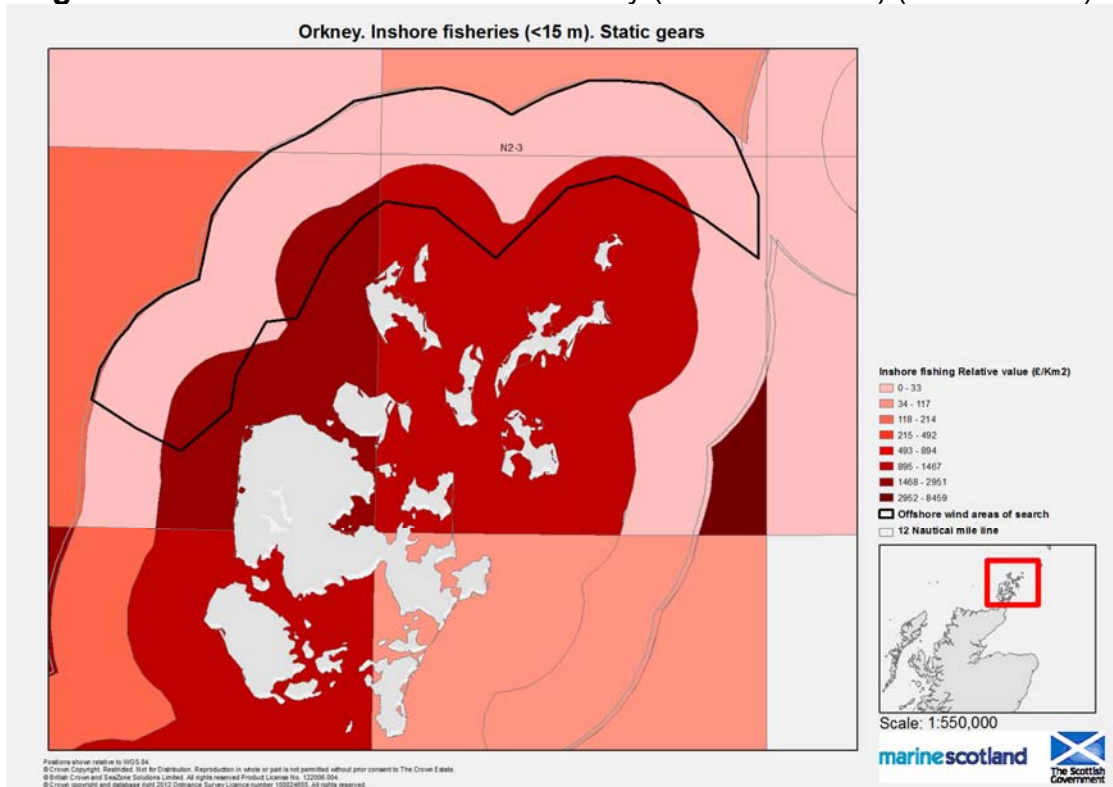


**Figure 5.30** Inshore Fisheries in the Orkney (Area of Search) (Mobile Gears)

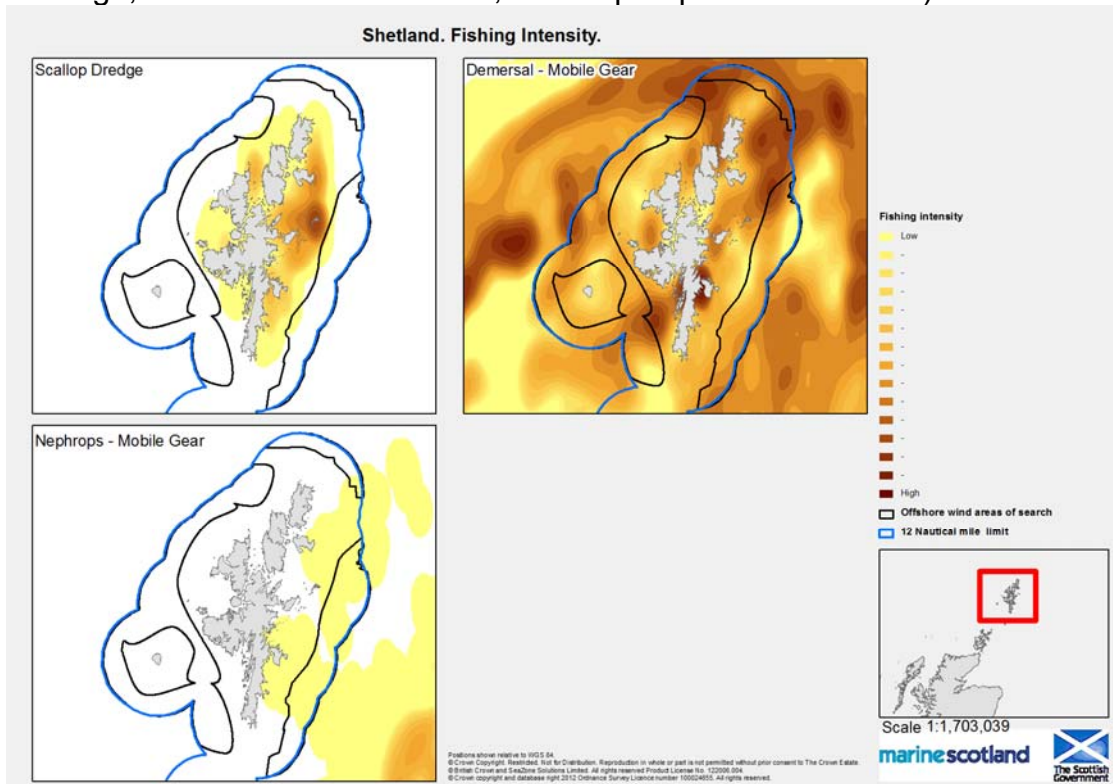




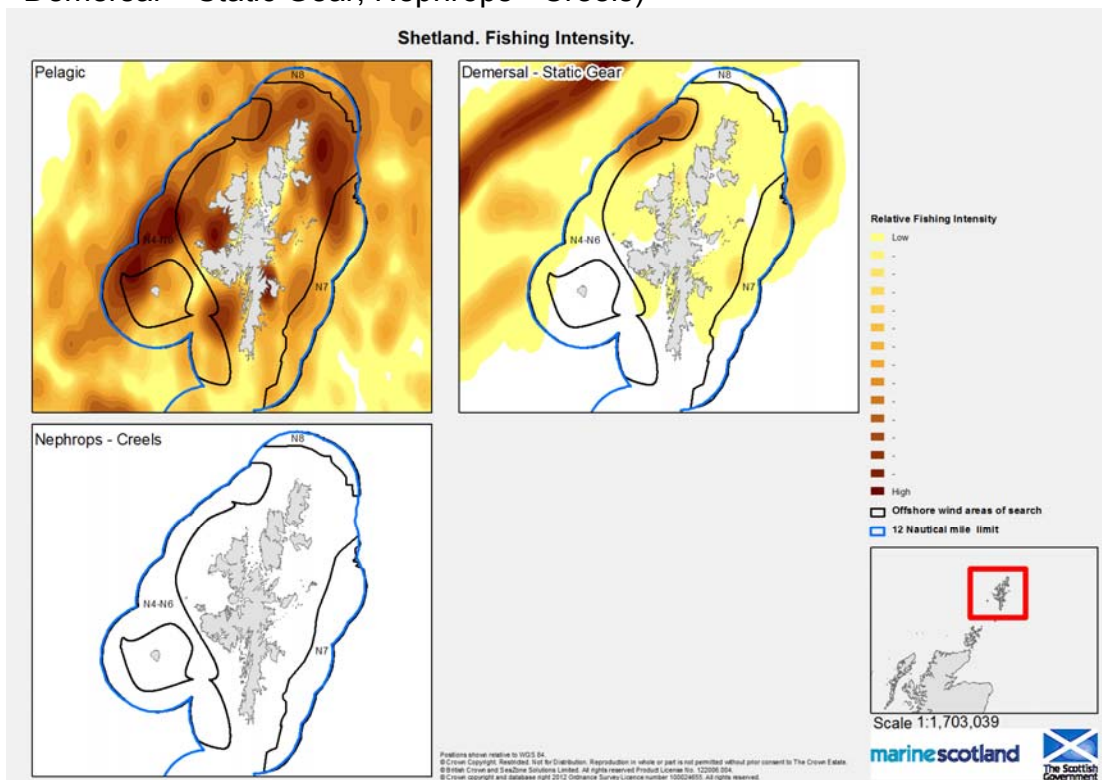
**Figure 5.31** Inshore Fisheries in the Orkney (Area of Search) (Static Gears)



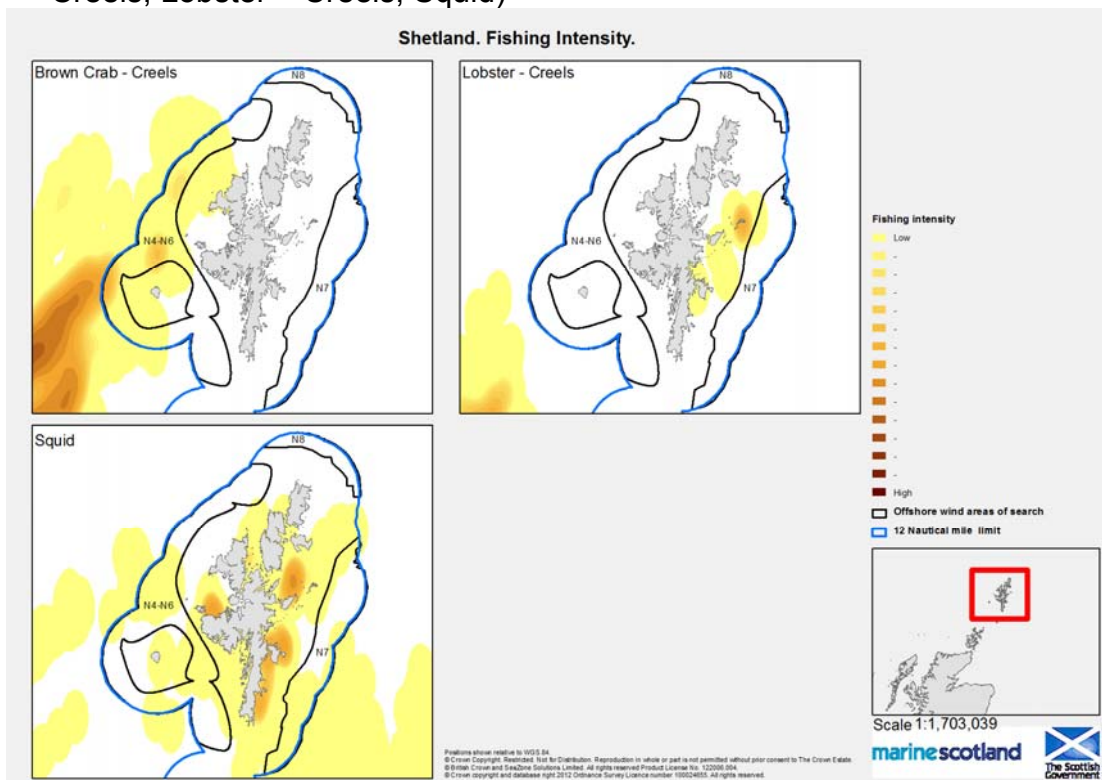
**Figure 5.32** Fishing Intensity in the Shetland (Areas of Search) (Scallop Dredge, Demersal – Mobile Gear, and Nephrops – Mobile Gear)



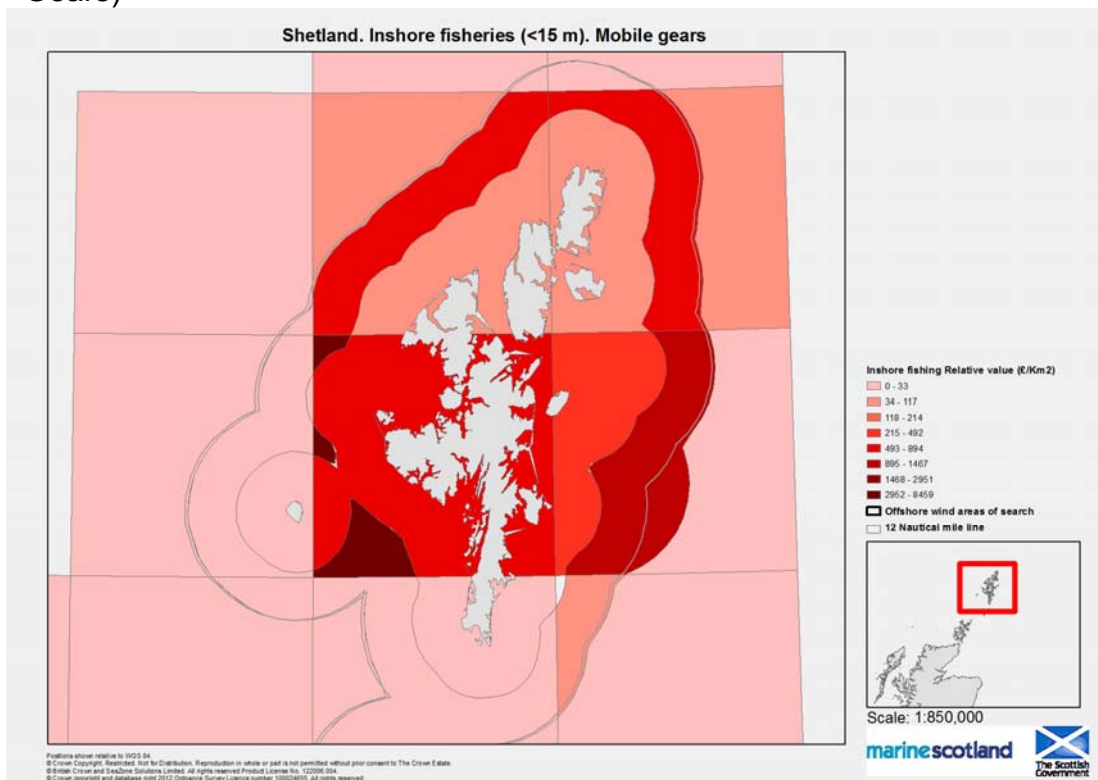
**Figure 5.33** Fishing Intensity in the Shetland (Areas of Search) (Pelagic, Demersal – Static Gear, Nephrops - Creels)



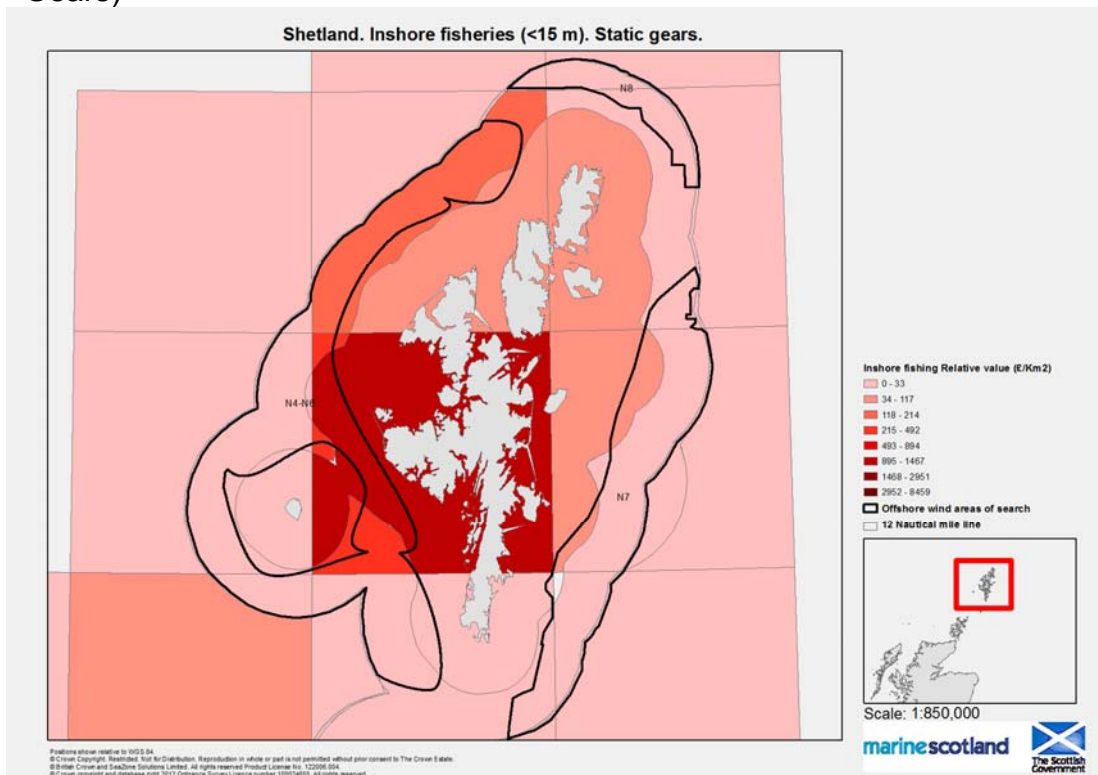
**Figure 5.34** Fishing Intensity in the Shetland (Areas of Search) (Brown Crab – Creels, Lobster – Creels, Squid)



**Figure 5.35** Inshore Fisheries in the Shetland (Areas of Search) (Mobile Gears)



**Figure 5.36** Inshore Fisheries in the Shetland (Areas of Search) (Static Gears)

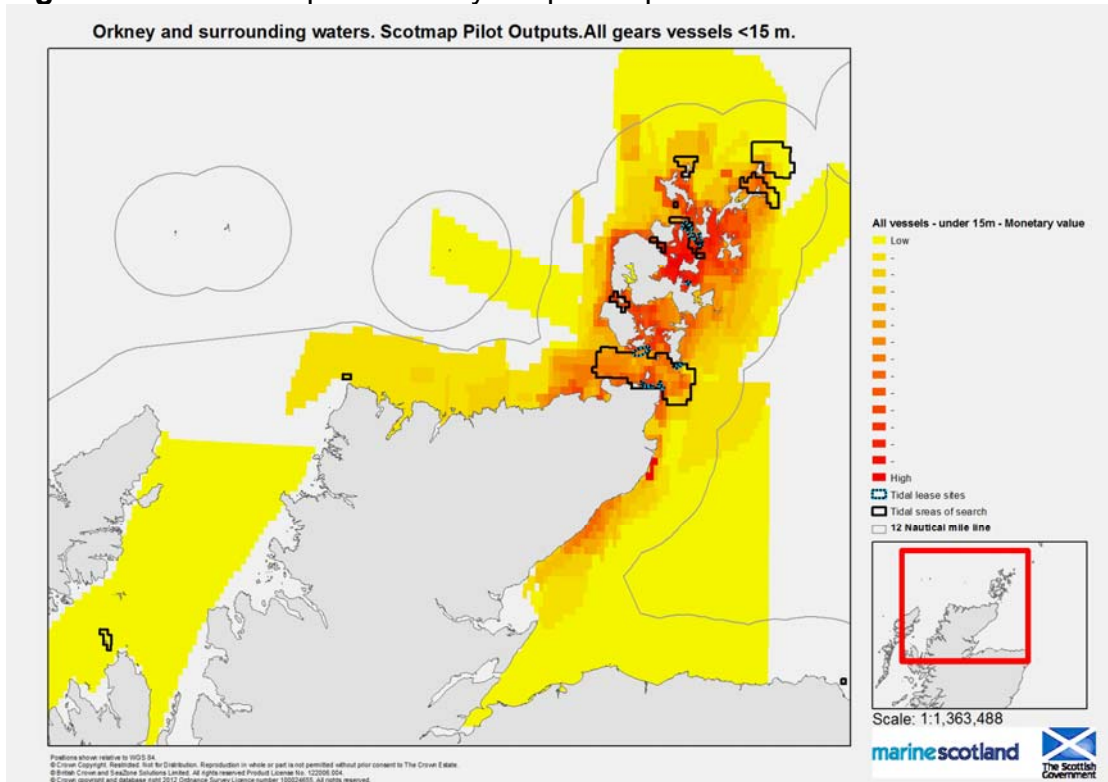


### *Scotmap Pilot Project*

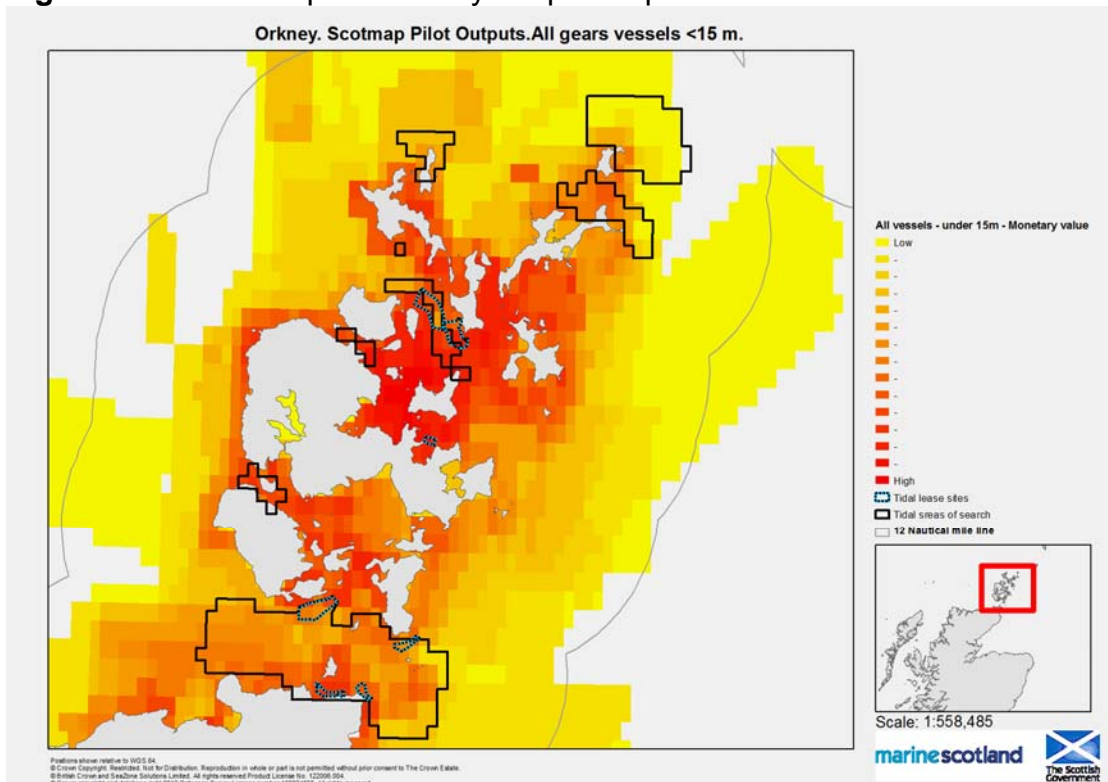
- 5.8.14 The activity of fishing vessels 15 m and over has been well documented through the use of Vessel Monitoring System (VMS) data, however there has always been less detailed information available for the smaller inshore fleet. As a result, a project is being undertaken to describe spatially this inshore activity and produce a series of maps representing the relative value, weight landed and general usage.
- 5.8.15 The SCOTMAP pilot study project was developed in order to generate more accurate and reliable representations of inshore fishery activity and value.
- 5.8.16 In view of their importance to renewable energy, waters around Orkney and the Pentland Firth were chosen for the SCOTMAP pilot study, which was completed in June 2012. The project trialled an interview based fishing activity mapping tool. It was undertaken jointly by SG Marine Renewables policy team and the Marine Scotland Science (MSS) Inshore Fisheries Group.
- 5.8.17 The data was derived from information submitted during interviews with fishermen (187 in total). This took the form of a questionnaire and a GIS plotting session. The data were then collated and analysed by MSS and the SG Rural and Environmental Science Analytical Services (RESAS). The draft report can be found at:
- <http://www.scotland.gov.uk/Topics/marine/marineenergy/wave/rlg/pentlandorkney/draftreportonScotMapPentlandFirthandandOrkneyWater>.
- 5.8.18 The SCOTMAP output, Figures 5.35 and 5.36, summarise the relative monetary value of fishing areas around Orkney and the Pentland Firth for all the under 15m vessels interviewed. Most of these vessels were creel vessels, although there were small numbers of demersal vessels, scallop dredgers and scallop divers



**Fig.5.35** Scotmap Pilot Study Output Map 1



**Fig.5.36** Scotmap Pilot Study Output Map 2



### *Fish Processing Activities*

- 5.8.19 Shetland has the largest pelagic processing factory of its kind in Europe, Shetland Catch, which is based in Lerwick. Shetland also has a whitefish and wild shellfish processing factory in Scalloway among several other smaller processing units serving the local economy. The majority of Shetland whitefish is traded on to mainland businesses.
- 5.8.20 Orkney has one of Europe’s largest and most sophisticated crab processing factories, based in Stromness. It is operated by a cooperative, the Orkney Fishermen’s Society, with over 75% of local crab fishermen belonging to it and employs 70 people onshore. The new factory, which was built in the mid 1990s, initially handled 200 tonnes of crab a year, but it has been extended many times since then and capacity has increased ten-fold (Reid, 2010).
- 5.8.21 For the North SORER, the largest concentration of employment in this sector is in Shetland. Rationalisation and downsizing of the processing industry has taken place in Shetland. Today only one major firm survives, together with several smaller businesses supplying the local market.
- 5.8.22 In 2010, it was estimated that there were 482 full-time and 140 part-time staff involved in the processing and preserving of fish, crustaceans and molluscs in the North Region.

### *Wild Salmon and Sea Trout*

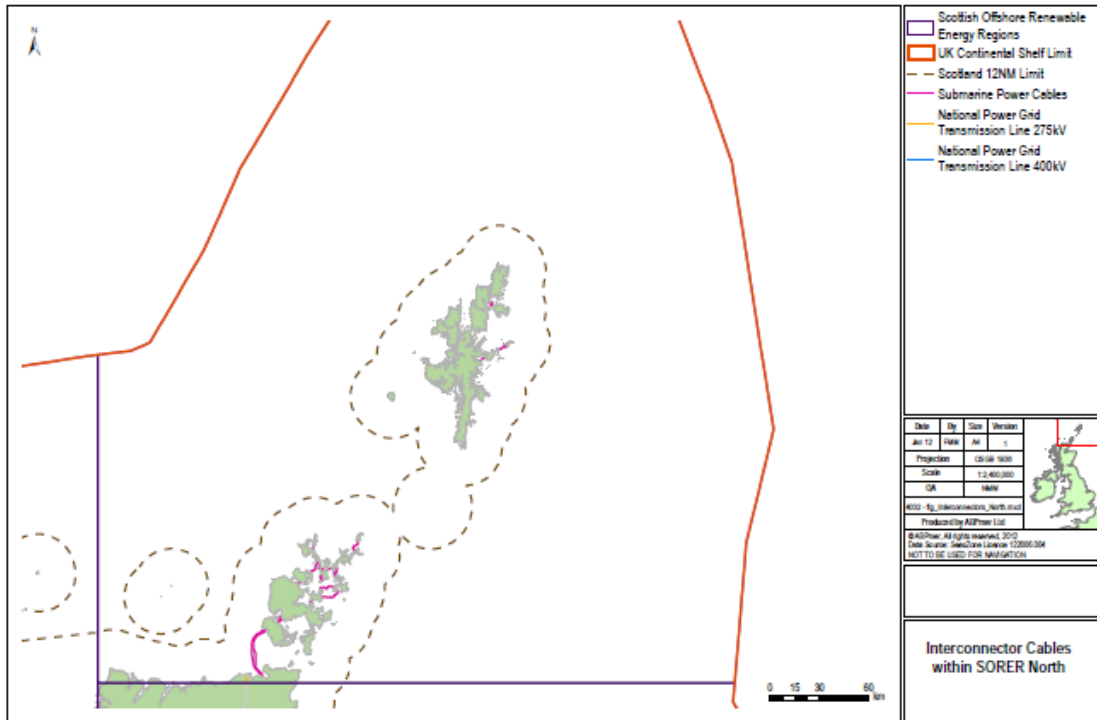
- 5.8.23 There is one fixed engine site, located on the North coast near Thurso, and no net and coble netting sites in the North SORER.
- 5.8.24 The main rod and line fishing rivers in this region are the Thurso (salmon), Halladale (salmon), Naver (salmon and sea trout), Borgie (salmon), Dionard (salmon and sea trout), Laxford (salmon). Stocks of sea trout have declined dramatically in the Laxford in the last twenty years (Gray J., 2009).

## 5.9 Infrastructure and Grid Provision

### *Existing*

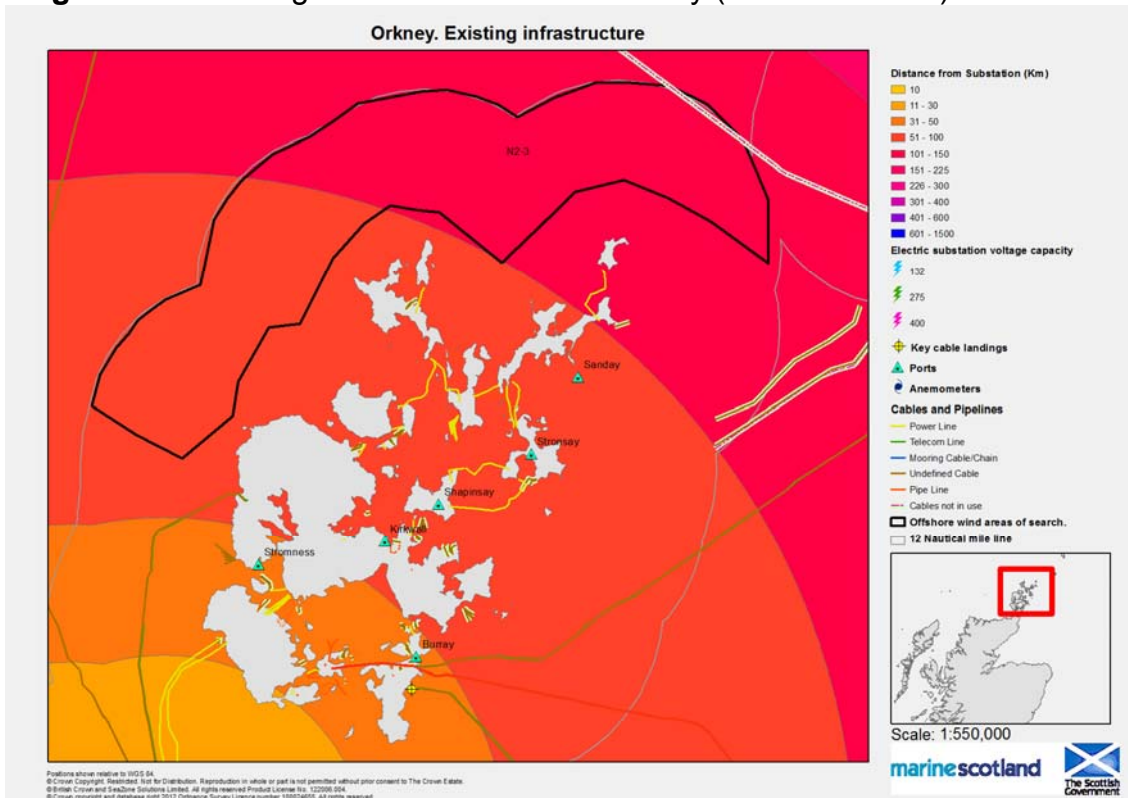
- 5.9.1 The North does not host any major power stations.
- 5.9.2 Numerous domestic subsea power cables exist in this region, connecting the North coast of Scotland and Orkney and islands within the Shetland Islands

**Figure 5.37** Interconnector cables in the North Region

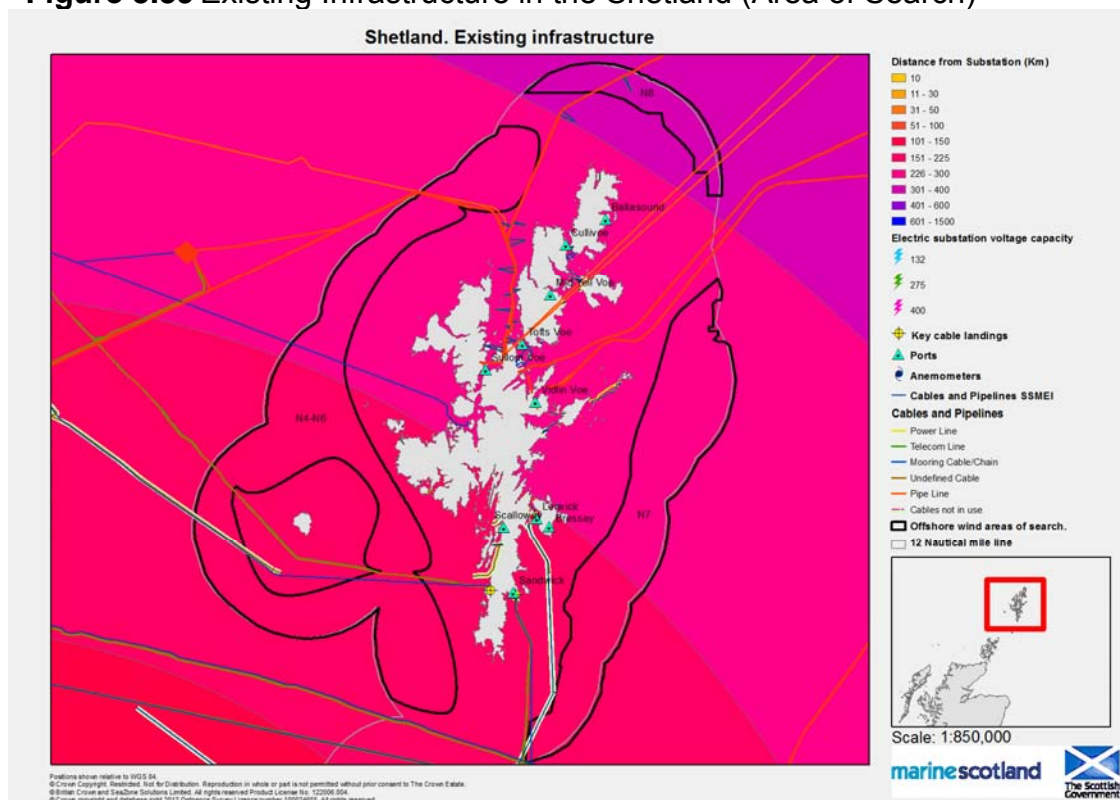


5.9.3 The existing infrastructure for electricity grid substations along with an indication of sub-station voltage capacity in relation to the Orkney and Shetland Areas of Search is outlined in Figures.5.38 and 5.39 (below):

**Figure 5.38** Existing Infrastructure in the Orkney (Area of Search)



**Figure 5.39** Existing Infrastructure in the Shetland (Area of Search)



*Future*

5.9.4 The potential infrastructure and grid provision within the North Region includes:

- Developments in Pentland Firth connect into Dounreay;
- Developments at Orkney connect to Dounreay via the reinforced Orkney sub-sea cable; and
- Developments around Shetland connect via the Caithness / Moray / Shetland link.

5.9.5 Table 5.1 provides an indication of the current stage of the planning for the potential infrastructure projects:

**Table 5.1** Current stage of planning for potential infrastructure projects (North region)

Project	Current Stage of Planning
Orkney – Caithness connection	<p>Reinforcement was included in principle within NPF2 and its SEA</p> <p>Included in ENSG but not subjected to SEA</p> <p>HVDC link generally included in EGPS (referring to ENSG) but not specifically assessed.</p> <p>SHETL consultation published October 2011:  <a href="http://www.sse.com/uploadedFiles/Z_Microsites/Template_">http://www.sse.com/uploadedFiles/Z_Microsites/ Template _</a></p>



	<p><a href="#">_transmission(1)/Controls/Lists/Resources/Orkney%20Caithness%20Connection%20-%20Consultation%20Document%20v1.1%20-%20FINAL.pdf</a></p> <ul style="list-style-type: none"> <li>• Would require:             <ul style="list-style-type: none"> <li>• a new indoor 132/33kV substation located on the Orkney Mainland;</li> <li>• a section of buried 132kV cable from the substation location to the landfall point;</li> <li>• a subsea 132kV cable from the landfall in Orkney to the landfall in Caithness; and</li> <li>• a buried 132kV cable from the Caithness landfall to the existing substation at Dounreay.</li> </ul> </li> </ul> <p>Exploring options with environmental studies (voluntary Environmental Appraisal) to reach view on preferred option. This identifies the likely environmental effects of the options.</p>
<p>New Caithness / Moray / Shetland Link</p>	<p>Not covered in NPF2 and SEA. Included in ENSG but not subjected to SEA. Not covered in EGPS, although HVDC covered generally (referring to ENSG).</p> <p>Requires:</p> <ul style="list-style-type: none"> <li>• new 600MW converter station and associated substation at a site adjacent to Achanarras, near Spittal in Caithness;</li> <li>• a High Voltage Direct Current (HVDC) buried cable connection to the coast from the proposed converter station;</li> <li>• sub-sea cabling between the landfall at the coast north of Wick to a proposed offshore hub;</li> <li>• the Moray Firth HVDC Hub – which would be a switching station in the North Sea located out with 12 nautical miles from the Scottish coast where water depth is approximately – 50m; connection to an HVDC cable planned to be installed between the hub and an existing substation near Keith in Moray; and</li> <li>• a 600MW converter station with associated substation located between Mybster and Thurso</li> </ul> <p>Cable permissions have been secured for a 600MW link between Upper Kergord on Shetland and Blackhillock in Moray, and outline planning permission has been secured for convertor stations at Upper Kergord and Blackhillock..</p> <p>Slippage of the Viking wind farm on Shetland means that a planned Caithness/Moray subsea circuit to allow for the export of renewable generation from Caithness, Pentland Firth and Orkney now comes before Shetland link. The offshore hub is</p>

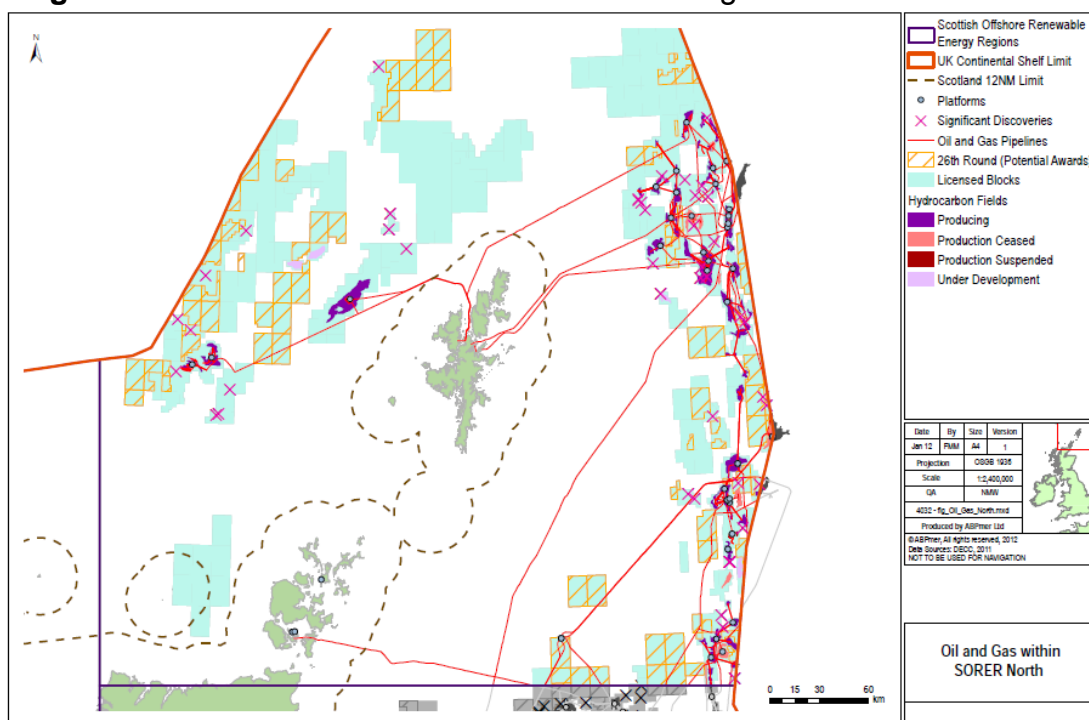
therefore proposed as part of Caithness-Moray circuit, allowing for connection of future Shetland link as well as potential offshore wind farm developments in the Moray Firth. An updated funding request to Ofgem is being prepared.

## 5.10 Oil and Gas

5.10.1 In this region, Oil and Gas activity is concentrated in offshore waters to the East and West of the Shetlands and to the East of the Orkney Islands (i.e. along the Eastern and Western borders of the SORER). Oil and Gas pipelines connect these areas of high activity with the Shetlands, Orkney and Aberdeen (in the North East SORER).

5.10.2 There are 65 producing hydrocarbon fields in this region (51 producing oil; four gas and 10 condensate) (DECC website<sup>51</sup>) as shown in Figure 5.40.

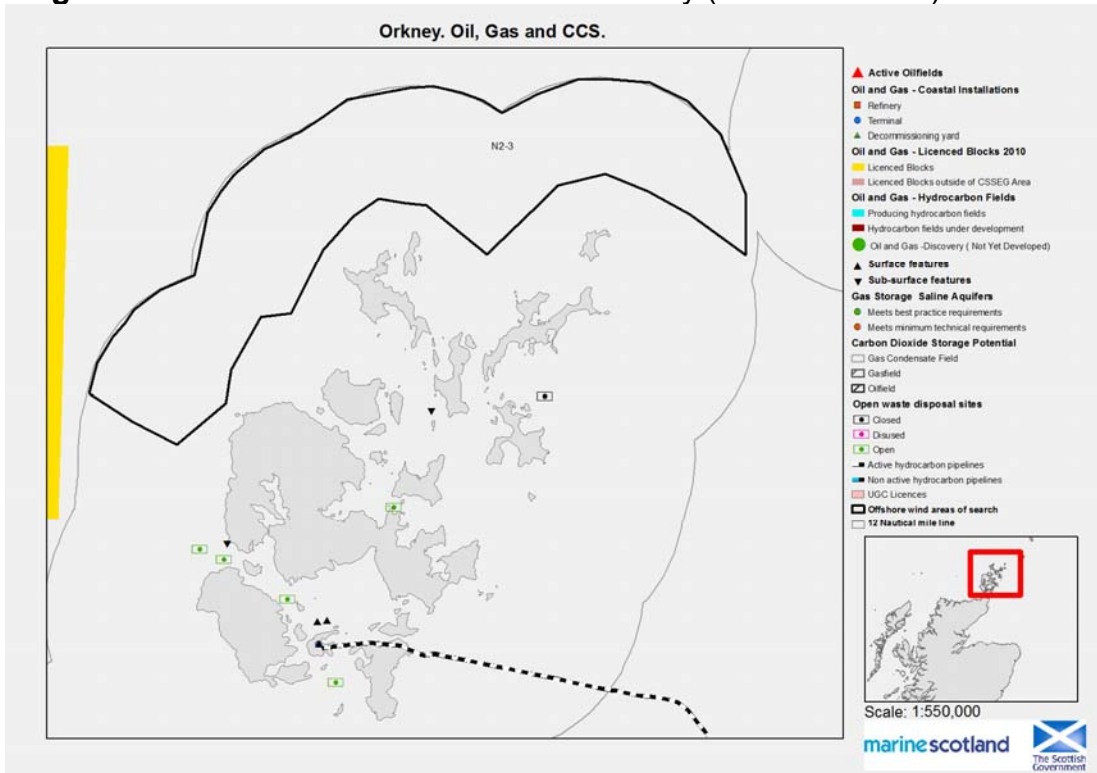
**Figure 5.40** Oil and Gas activities in the North Region



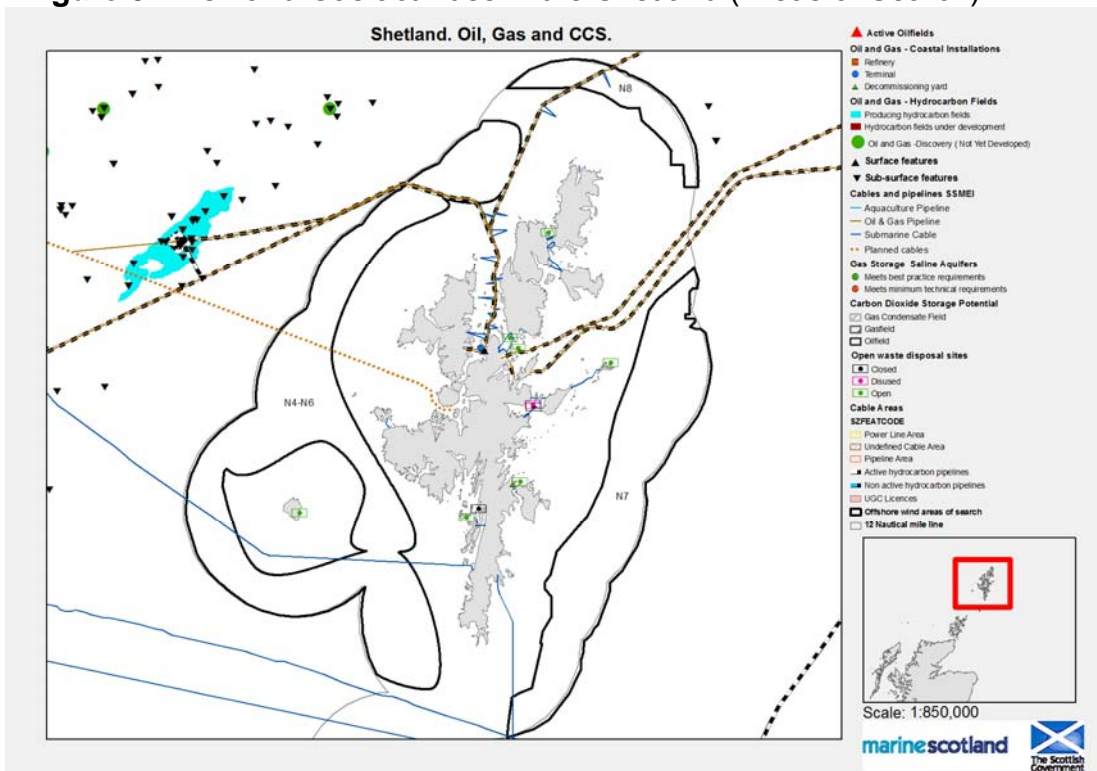
5.10.3 Information on the annual production of crude oil from hydrocarbon fields in the UKCS is provided by DECC. Indicative estimates of the total production of crude oil from hydrocarbon fields within this region was 18 million tonnes in 2008 and 2009, and 17 million tonnes in 2010. Gas production statistics are not allocated to hydrocarbon fields and hence it was not possible to estimate gas production from fields within this region.

5.10.4 The known activities in relation to oil and gas in relation to the areas of search around Orkney and Shetland are shown in Figures 5.41 and 5.42 respectively.

**Figure 5.41 Oil and Gas activities in the Orkney (Area of Search)**



**Figure 5.42 Oil and Gas activities in the Shetland (Areas of Search)**



## 5.11 Planning Issues

### *Shetland Islands Marine Spatial Plan*

5.11.1 The Shetland Islands Marine Spatial Plan provides the key planning framework of relevance to marine renewable energy proposals within the Shetland area of the North West region. A Draft Plan was published for consultation, and the responses are currently being reviewed, with a view to finalising the Plan in 2012. The Plan aims to promote sustainable use of the marine environment and covers only territorial waters. It sets out a hierarchy of policies to achieve this, ranging from broad principles to more sector specific objectives. Key considerations set out in the plan include climate change, with the plan noting the importance of renewable energy and highlighting the need to improve grid connections to realise its development aspirations.

5.11.2 The plan includes a series of heritage based policies which also aim to achieve the right balance between protecting assets and fulfilling development aspirations. Its general policies emphasise the need for activities within the marine environment to take into account impacts on other sectors, with Policy GEN2, stating that this includes heritage, community, business and industry, infrastructure and services. Policy GEN1 sets out the impacts that should be considered when proposing new developments and activities: including whether existing facilities are inadequate, post-development restoration, land based impacts, impacts on climate changer, water resources, wider ecosystem function, coastal erosion and sediment transport.

5.11.3 More specifically, key policies relating to renewable energy are as follows:

- Policy MSP NRG1: Exploratory, Appraisal or Prototype Renewable Energy Proposals. This supports experimental activities, subject to compliance with protective policies, appropriate monitoring and restoration arrangements; and
- Policy MSP NRG2: Renewable Energy Development Proposals. This encourages development where they comply with the plan's protective policies, all elements including onshore connections are considered, appropriate monitoring, restoration and maintenance. Early engagement with SNH, communities, and local industry (particularly fishing) is recommended.

5.11.4 The Plan also safeguards the sustainability of the fishing industry and stocks, and restricts development where it could obstruct an important fishing ground (as identified by the industry), routes between a port or harbour of spawning and nursery areas. Areas of interest are mapped in detail in the accompanying marine atlas.

### *Shetland Islands Local Development Plan*



- 5.11.5 Shetland Islands Council produced a MIR for its LDP was published in March 2010. Work is now progressing on the Proposed Plan. Supplementary guidance on wind energy development was also being progressed, along with adoption of the marine spatial plan as supplementary guidance.

#### *Orkney*

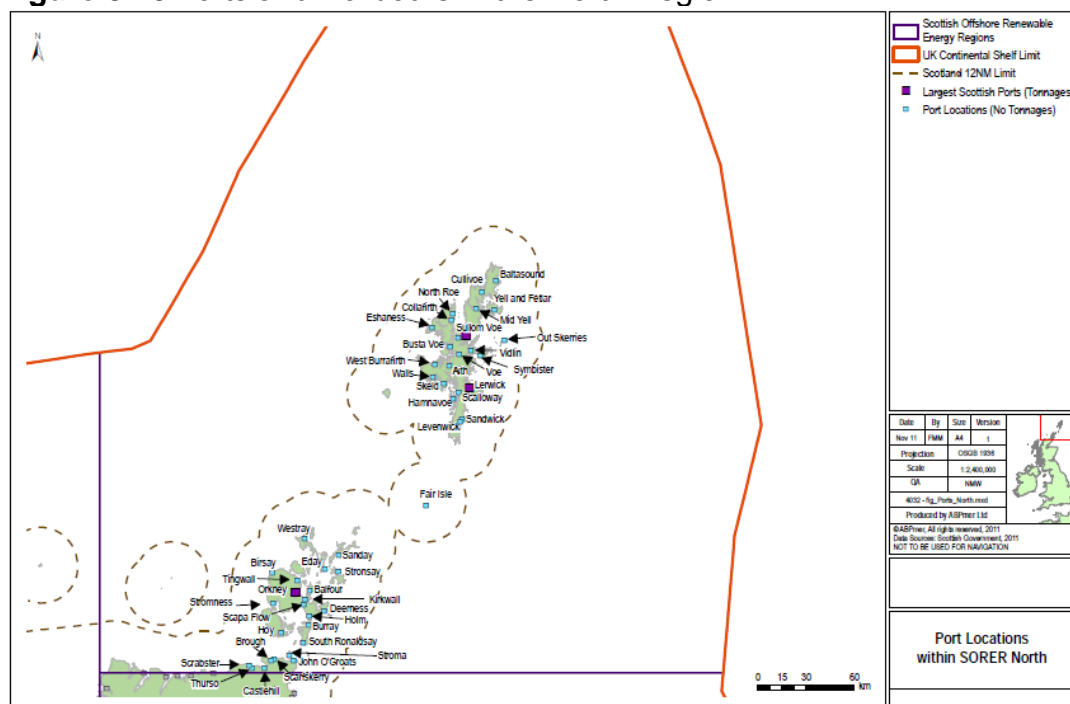
- 5.11.6 The Proposed Orkney LDP was published in 2011. It recognises the importance of renewable energy development in tackling climate change and achieving economic growth. It includes policies that aim to protect the sensitive landscapes within its coastal zone, whilst avoiding frustrating development that requires a coastal location. As a result, Strategic Development areas are identified at Lyness, Billia Croo, Stromness and Houton, to facilitate investment in the marine and renewables sectors. Constrained areas are also identified, to help steer renewable energy developments towards areas where there is greater capacity. Broad Areas of Search are set out in Supplementary Guidance, which take into account a range of constraints. The proposed LDP also states that Supplementary guidance will be produced to address onshore infrastructure requirements arising from marine renewable energy developments, and the need for improved grid connections.
- 5.11.7 Policy SD7 of the proposed LDP provides a decision making framework for renewable energy developments. This aims to achieve development, where significant adverse environmental effects can be avoided or appropriately mitigated.

#### Ports and Harbours

- 5.12.1 On Orkney, Hatston (Kirkwall) and Lyness on Orkney are included within the Low Carbon / Renewables North Enterprise Area. They have also been identified as key sites to support the wave and tidal sectors, for further consideration in N-RIP Phase 2. NorthLink Ferries uses both Kirkwall to connect to the more northern Shetland Isles and Stromness and as a port for the mainland ferry. The opening of deep water facilities at the adjacent **Hatston** extended the scope for Kirkwall to service a range of larger craft including cruise ships. This is a key centre for both fishing and leisure activities. Hatston is already linked into the renewables sector, and used by developers involved in the European Marine Energy Centre (EMEC). Further development of the port is already underway.
- 5.12.2 **Lyness** is the port for the ferry from the Mainland to Hoy. It is a key economic investment area, identified to support assembly, storage and servicing of renewable energy devices. A development brief has been prepared to guide the planning and investment planned around Lyness Harbour and the wider peninsula. Improvements will be made to the moorings, new buildings are planned and extensive areas of hard standing will be laid.

- 5.12.3 On Shetland, **Sullom Voe** is a major deep water harbour servicing the oil sector. It provides extensive facilities and can accommodate large scale vessels and freight.
- 5.12.4 **Lerwick** harbour supports fishing and leisure activities. **Scalloway Harbour** lies on the west coast of Shetland, accommodating freight and commercial fishing activities.
- 5.12.5 On the mainland **Scrabster** is a key port, identified for further consideration in Phase 2 of the N-RIP. Its location on the Pentland Firth is focusing plans for improvement and investment, to support the wave and tidal renewables sectors. Redevelopment is ongoing. **Wick** has also been identified as a key potential location to support wave and tidal related activities in Phase 2 of N-RIP.
- 5.12.6 In addition to the three large ports in this region, a further 42 ports and harbours are located in four distinct areas: mainland Scotland, the Orkney Island, Fair Isle and the Shetland Islands. Many of these ports provide important facilities, quays, jetties and shelter for offshore vessels moving between port locations and the offshore oil, gas and renewable industry in Scottish waters.

**Figure 5.43** Ports and Harbours in the North Region



**Table.5.2** Ports and Harbours in the North Region

Port	Operator	Type
Aith		Local Authority
Balfour		Local Authority
Baltasound		Local Authority
Birsay	Barony Hotel - Birsay	Private
Brough		Private
Burray		Local Authority
Busta Voe		Local authority
Castlehill		Private
Collafirth		Local Authority
Cullivoe		Local Authority
Deerness	Deerness Small Boat Owners Association	Private
Eday		Local Authority
Eshaness		unknown
Fair Isle		Local Authority
Hamnavoe		Local Authority
Holm		Local Authority
Hoy		Local Authority
John O'Groats		Local Authority
Kirkwall	Orkney Islands	Local Authority
Lerwick	Lerwick Port Authority	Trust
Levenwick		unknown
Mid Yell		Local Authority
North Roe	Shetland Islands Council	Local Authority
Out Skerries	Shetland Islands Council	Local Authority
Sanday	Orkney Islands Council	Local Authority
Sandwick	Also known as Broonies Taing Pier	Brownies Taing Pier Trust
Scalloway	Shetland Islands Council	Local Authority
Scapa Flow	Orkney Islands	Local Authority
Scarfiskerry		Local Authority
Scrabster	Scrabster Harbour Trust	Trust
Skeld		Local Authority
South Ronaldsay		Local Authority
Stroma		Local Authority
Stromness	Orkney Islands	Local Authority
Stronsay		Local Authority
Sullom Voe	Sullom Voe Harbour Authority	Local Authority
Symbister		Local Authority
Thurso		Local Authority
Tingwall		Local Authority
Vidlin		Local Authority
Voe		Local Authority
Walls		Local Authority
West Burrafirth		Local Authority
Westray		Local Authority
Yell and Fetlar		Local Authority

(Source: Marine Scotland, 2011a)

5.12.7 Ports within this region contribute to the local and the regional economy as employers, and through the provision of essential services and facilities as lifeline services for ferries, and berths for fishing vessels other than the cargo tonnages detailed for Orkney, Sullom Voe and Lerwick. Other ports providing input to the local economy include Scrabster Harbour which has an annual reported economic output of £39m, supporting 339 full time jobs and contributing a GVA impact of £14.6 million to Caithness. Scrabster Harbour handles a gross tonnage in 2007 of 9.85Mt. The port also has a significant

trade in shellfish and demersal fish (see Section 6.6). The port also accommodates lifeline ferry service links to the Orkney Isles with 149,000 passenger and 46,000 vehicles. The port hosts international ferry services and cruise liner calls with some 6,294 passengers and 2,000 vehicles handled in 2007, returning an estimated £4m for the Highland economy (Scrabster Harbour Trust, 2008).

5.12.8 Employment in this region is dominated by employees in the service industry supporting water transportation. In 2010, it was estimated that there were 284 full-time and 131 part-time staff working in port and harbours in the North Region.

### 5.13 Recreation

#### *Recreational Angling*

5.13.1 The main launch spots for charter based angling are Thurso in North Scotland and Stromness on Orkney (Radford et al., 2009). Wreck angling is popular in Scapa Flow and also on other wrecks found offshore from Orkney. Cod, pollack and mackerel, are the most popular target species in Caithness and Sutherland. There is some evidence, however, of sports fishing for rarer species such as porbeagle shark becoming more popular. In Orkney conger eel is found amongst the wrecks of Scapa Flow and is the most popular target species, followed by mackerel and bass (Radford et al., 2009).

5.13.2 A study by Radford et al. (2009) estimated the sea angling activity and economic value in eight regions of Scotland. Two of these regions, North Scotland and Orkney and Shetland fall within the North Region. As the areas in Radford et al. (2009) do not align with the North Region the values should only be taken as indicative values for comparison between areas. The total estimated regional sea angling activity and expenditure within these two regions is £11.2m in the North and £6.1m in Orkney and Shetland. In terms of employment, angling accounts for around 300 employees in the North Region and a further 145 in Orkney and Shetland.

#### *Recreational Boating*

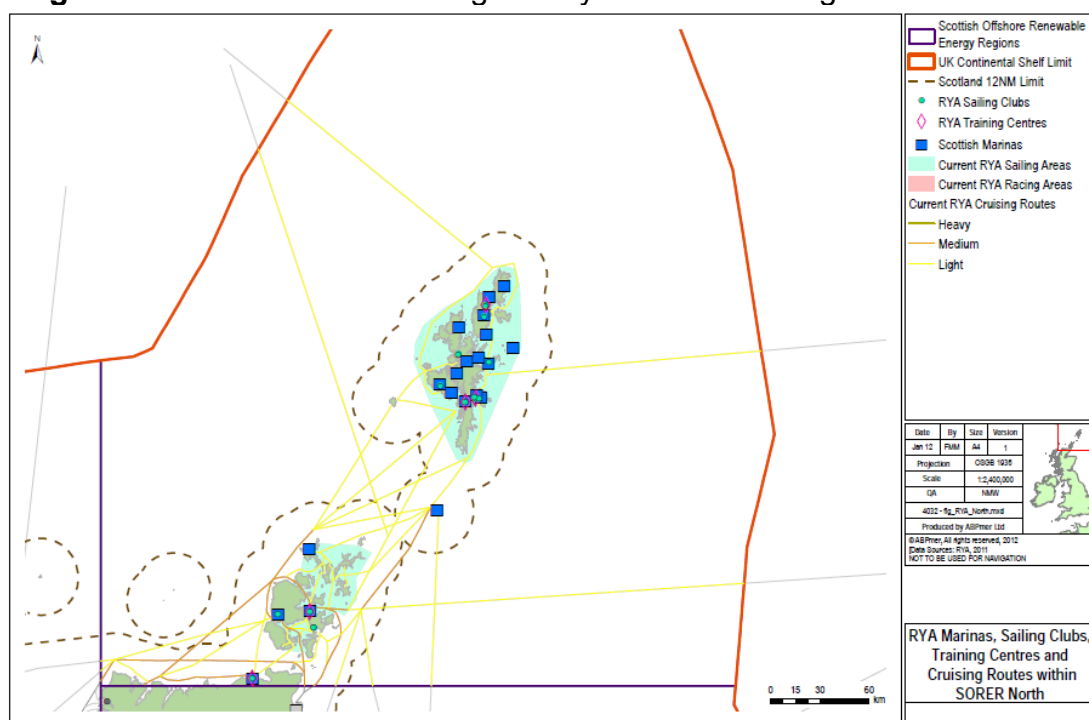
5.13.3 Recreational boating along the North coast of Scotland and outlying islands of Orkney and Shetland is seen by many as the ‘fringe’ of recreational boating, but the number of berths available has increased in recent years, following a growth in demand from Scottish residents for home port facilities and to service a growing volume of visitors, many from overseas. The North is characterised by a significant proportion of demand that derives from visitors from outside Scotland, notably other Northern European countries, this overseas demand is notably present in Orkney and Shetland waters (Scottish Enterprise, 2010).

5.13.4 Informal cruising routes in the study area are shown in Figure 5.44. These include Wick Harbour (marina) and deep water anchorage either directly to the Shetland Isle or Fair Isle, or via Duncansby Head to the Orkney Isles, or



along Scotland's Northern coastline. There are few facilities for recreational boaters cruising through Pentland Firth on passage to Cape Wrath and the Hebrides, other than small anchorages, piers and jetties. The principal port of call along Scotland's Northern coast is Scrabster which provides a number of marine facilities. Recent marina developments have provided stopping points along the East Coast of Scotland, making progression to the Isles of Orkney and Shetland a more attractive proposition. The four main marina operators between Inverness and Shetland have grouped together to create the Viking Trail to encourage greater use of the new facilities and open up cruising routes to the Northern isles.

**Figure 5.44** Recreational boating activity in the North Region



5.13.5 Until recently the Orkney Islands were viewed primarily as a stopping off point for sailors en route from Scandinavia to Scotland. However, after over £6 million of investment by Orkney Islands Council in breakwaters and pontoons, recreational boaters now have the choice of three marinas at Kirkwall (94 berths), Stromness (64 berths) and at a small marina and pontoon facility at Westray. Numerous islands have alongside jetty berthing available and there are also visitor moorings available at locations throughout the islands. The smaller islands are a haven for wildlife, and all have interesting flora and fauna. The net result is that Orkney is now viewed as a destination in its own right by cruising yachtsmen, be they on a circumnavigation of Scotland or Britain, or charterers taking a boat from the charter company based in Kirkwall, (Sail Scotland, 2011) and (Orkney Marinas, 2011).

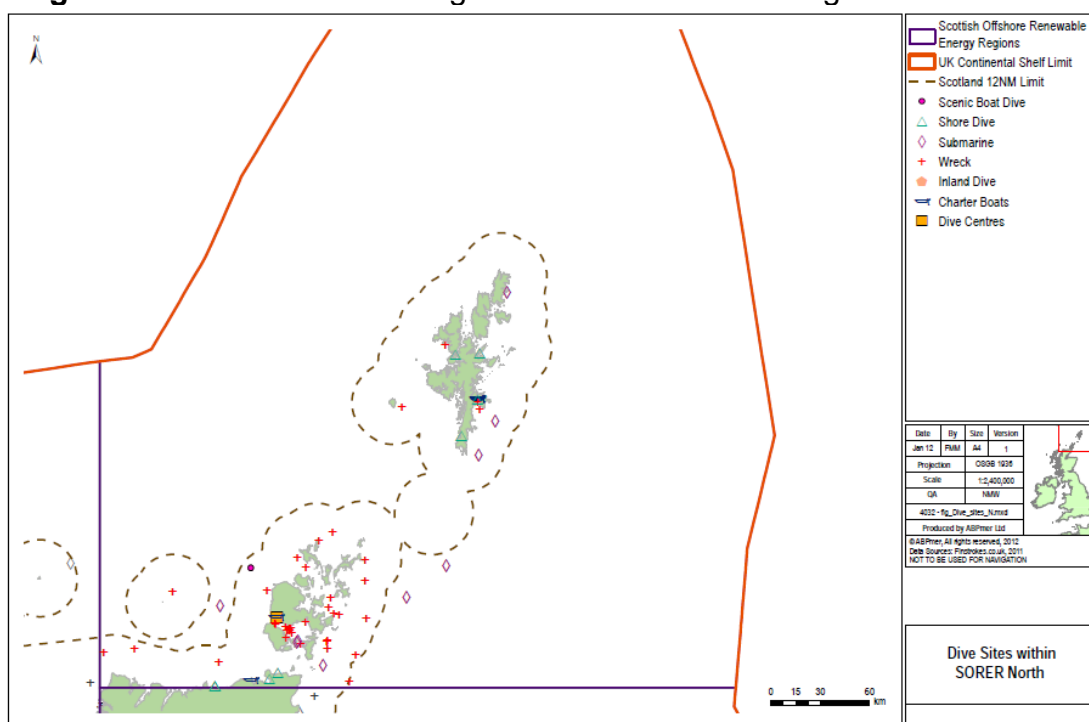
5.13.6 An indicative estimate of the economic impact of sailing on this region is provided by the Scottish Enterprise (2010). It is estimated that the sailing

area has a GVA of £7.9m with 1,792 pontoons and 224 moorings in the Region.

### Scuba Diving

5.13.7 The most popular area for scuba diving in the region is around Scapa Flow in Orkney (Figure 5.45). This body of water is considered one of the finest wreck diving sites in Europe and has ranked among the top five wreck diving areas of the world (Jack Jackson, 2007; Baxter et al, 2011). While scuba diving has predominantly been based in Scapa Flow historically, it increasingly involves diving in other parts of Orkney (Jack Jackson, 2007; Visit Orkney, 2009) and also on Shetland. Recreational diving is predominantly charter based with an estimated 3,000 visiting divers annually (The Orkney Hyperbaric Trust). A limited amount of diving is also undertaken on the mainland in this region.

**Figure 5.45** Recreational diving activities in the North Region

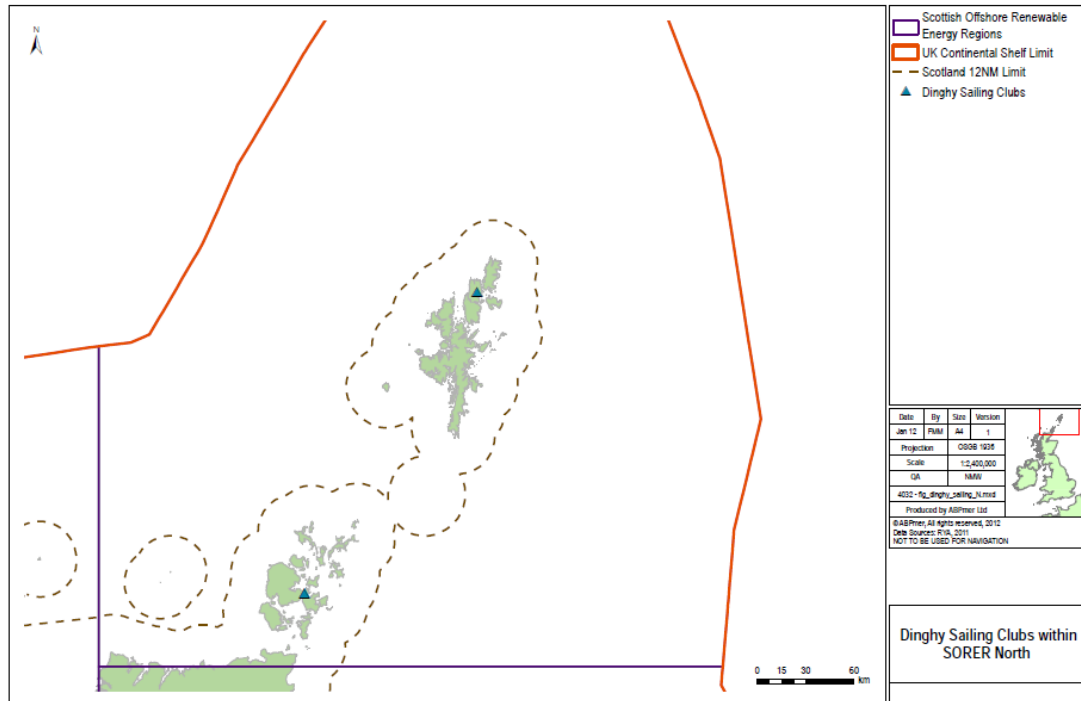


5.13.8 The Orkney Hyperbaric Trust was set up to increase diver safety within Orkney waters. Diving is an important industry in this region and is estimated to be worth at least £3m a year to the Orkney economy (The Orkney Hyperbaric Trust, 2008). The diving industry consists of military and police, commercial and archaeological and recreational, the latter accounting for approximately 25,000 of the dives made each year which are carried out from two dive boats, who take around 3,000 visiting divers/year, to dive sites such as the Scarpa Flow area.

*Sea Kayaking and Small Sail Boat Activity*

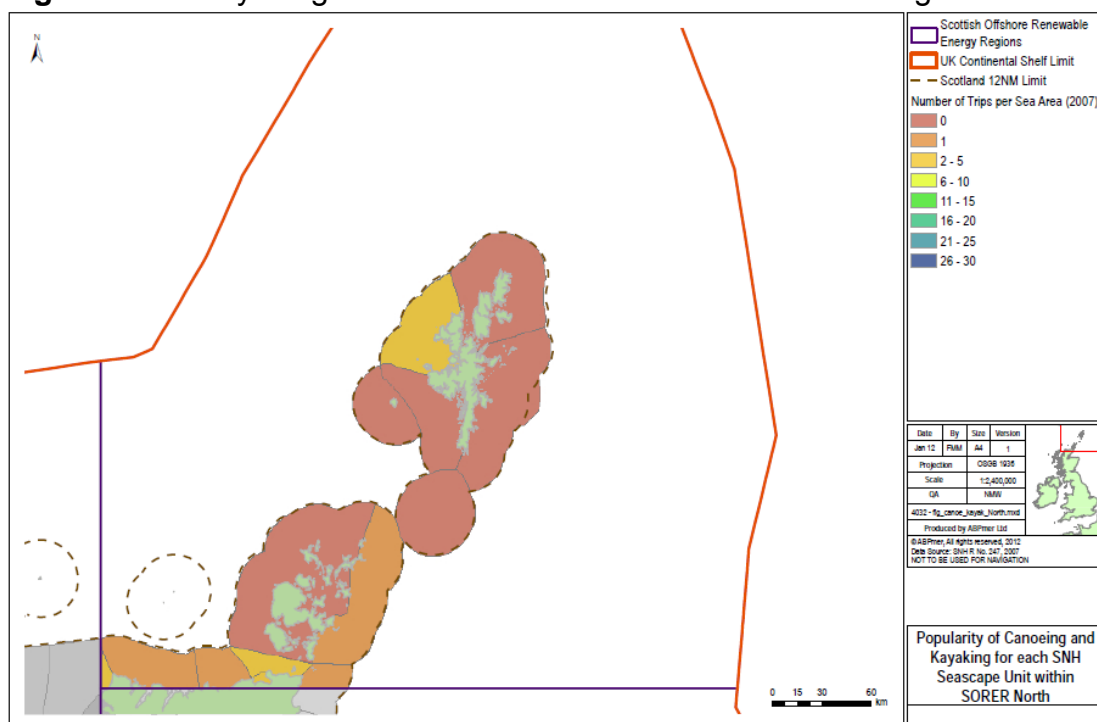
5.13.9 Dinghy sailing clubs are located in Kirkwall, Orkney and in Northern Shetland (Figure 5.46).

**Figure 5.46** Dinghy Sailing Clubs in the North Region



5.13.10 In terms of popularity, kayaking around Orkney and the North coast of Scotland is not considered as important as other regions such as the Inner Hebrides and East Grampian Coast (Land Use Consultants, 2007) (Figure 5.47).

**Figure 5.47** Kayaking and Small Boat Activities in the North Region

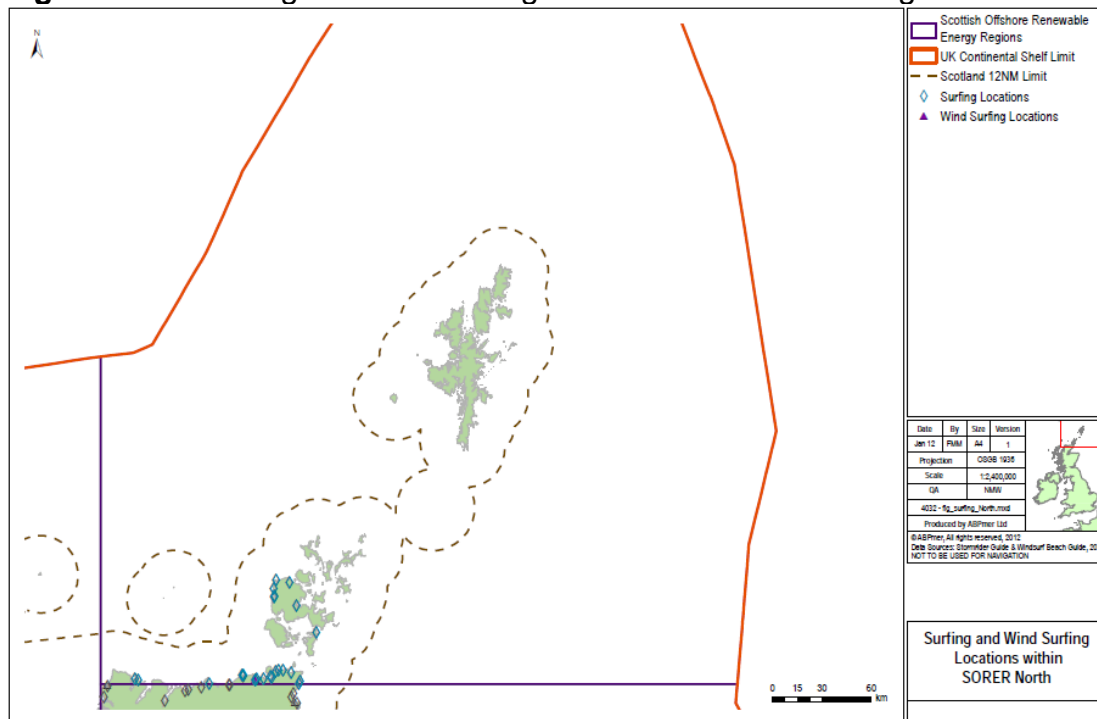


### *Surfing and Wind Surfing*

5.13.11 Some of the UK's best surfing breaks are situated along the North coast of Scotland. The region receives strong, powerful swells and provides a number of high-quality surfing spots. In particular, the reefs situated around Brims Ness and Thurso are considered to be world-class (SAS, 2009). Orkney also has good quality surfing locations although participant numbers are less than on mainland North Scotland, primarily due to accessibility (SAS, 2010). The location of surfing breaks in the North area can be seen in Table 5.2 and Figure 5.48.



**Figure 5.48** Surfing and Windsurfing locations in the North Region



**Table.5.3** Key Surfing and Windsurfing Locations in the North Region

General Location	Surf Location
Sutherland	Melvich
	Strathy
	Armadale Bay
	Farr Bay
	Torrisdale
	Kyle of Tongue
	Sandwood Bay
	Point of Ness
	Dunnet Bay
	Castlehill to Murkle
	Murkle Point
	Thurso East*
	Shit Pipe
	Brimms Ness - The Point
	Brimms Ness - The Cove
Brimms Ness - The Bowl	
Sandside Bay*	
Caithness	Gills Bay
	Brunt Skerries
	Harrow Harbour
	Scarfskerry Reefs
Orkney	Ham
	Marwick
	Skail Bay Right
	Skara Brae

\* Also listed in the Windsurf magazine 'beach guide' (<http://www.windsurf.co.uk/beachguide>)

(Source: Based on SAS, 2009 and 'Stormrider Guides', 2010 (<http://www.lowpressure.co.uk>); and Windsurf Magazine 'Beach Guide', 2011 (<http://www.windsurf.co.uk/beachguide>))

5.13.12 Windsurfing on Orkney is a popular activity at Kirkwall’s Scapa Beach and Orphir’s Waulkmill Bay. In addition, the storm beach of Skail Bay on the West coast of mainland Orkney and Sandwick, are popular spots (Visit Orkney, 2009).

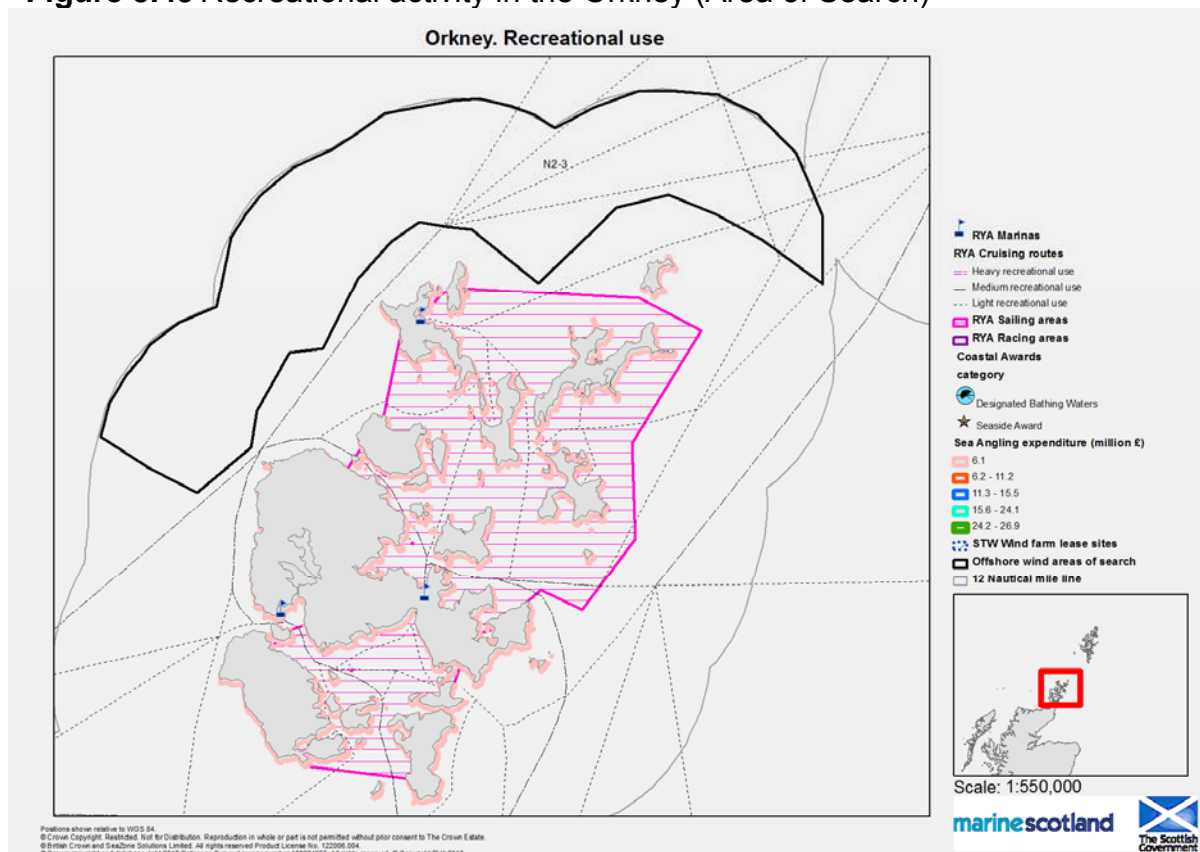
5.13.13 While no estimates of the total value of surfing in the North Region are available the value of Scotland’s largest surfing event, the O’Neill Coldwater Classic at Thurso East has been calculated. The annual competition is an Association of Surfing Professionals (ASP), World Qualifying Series (WQS) event, which is listed as a six star event, the highest rating in the WQS and also the highest rated professional surf contest ever held in the UK (Event Scotland, 2010). The 2010 event achieved estimated spectator numbers of 5,500 over the 8-day event. The event resulted in an estimated expenditure of £440,000 to the local economy and an additional £420,000 within wider Scotland with major influential media coverage totalling £3.8m.

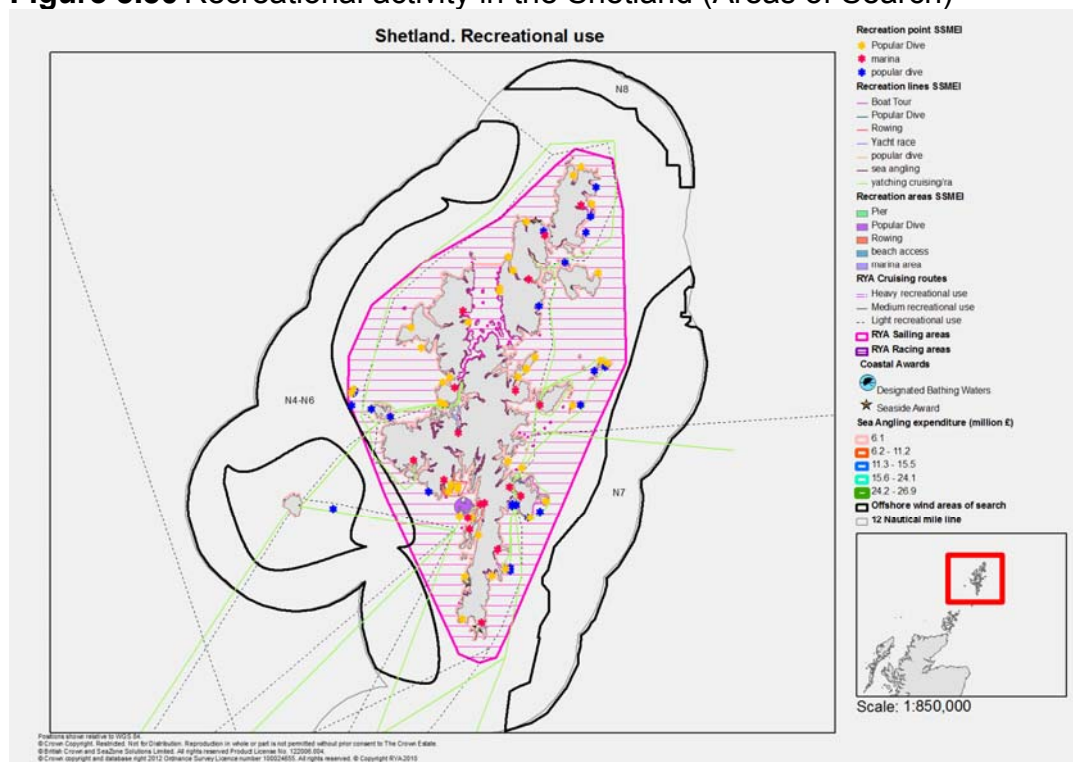
### Areas of Search

5.13.14 The inshore and inter-island areas within both Orkney and Shetland contain RYA Boating Areas. In relation to the areas of search, there interactions with RYA cruising routes have been identified.

5.13.15 Figures 5.49 below identifies the recreational activities taking place in the North Region and the areas of search around Orkney and Shetland.

**Figure 5.49** Recreational activity in the Orkney (Area of Search)



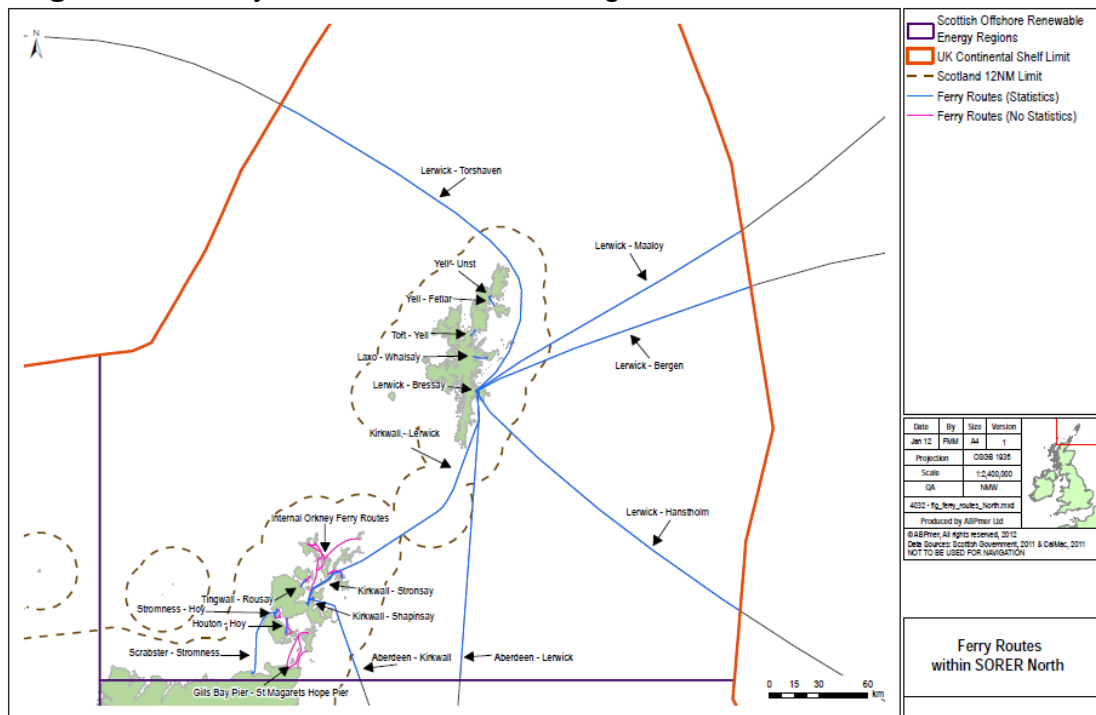
**Figure 5.50** Recreational activity in the Shetland (Areas of Search)

## 5.14 Shipping

- 5.14.1 The North coast of Scotland from Cape Wrath to Dunnet Head is mainly steep cliffs with few navigational hazards lying in offshore waters. At Dunnet Head, the Pentland Firth separates the Scottish mainland from the Orkney Islands. Midway between South and North Ronaldsay, the Orkney Islands are divided into two parts by the Stronsay Firth and Westray Firth which together form a continuous navigable passage running North West and South East linking the Atlantic to East and West Orkney Islands. Scapa Flow, virtually a small enclosed inland sea, lies in the South part of the group with a navigable entrances open to the Atlantic and Pentland Firth.
- 5.14.2 Further offshore to the North East of this region is the Island group of The Shetlands. This is composed of about 100 islands; holms and rocks lie with Sumburgh Head as their Southern extremity and stretch some 60 miles North to Muckle Flugga. Toward the Northern end of the group Yell and Bluemull Sounds both have navigable passages. The high and rocky island of Fair Isle also forms part of the Shetlands, and dividing the otherwise deep unobstructed passage collectively known as 'Fair Isle Channel' between Orkney and Shetland Islands (GLA, 2010).
- 5.14.3 Shipping within the study area includes vessels transiting from the Western Atlantic to the Baltic states and Russia; combined with traffic using Orkney Ports, Shetland Ports and Scottish Ports on the mainland. Most of the transiting traffic uses Pentland Firth, which is one of Scotland's busiest seaways, or travels further North and passes through the Fair Isle Channel.

- 5.14.4 The Pentland Firth is considered as an International Shipping Lane and provides the shortest route around the North of Scotland and is the only practical access to Scapa Flow and the Flotta oil terminal for large vessels. This intensity of shipping within Pentland Firth is set against a navigational background of strong tidal flows and an area prone to adverse wind and wave conditions.
- 5.14.5 The MSP Framework for PFOV (Marine Scotland, 2011b) uses Automatic Identification System (AIS) data from the MCA as its main data source, augmented by track surveys carried out in summer and winter period during 2006. This information identifies a range of area usage including a variety of cargo vessels, passenger ferries, recreation and fishing vessels. Orkney ports handled around 1,500 vessel arrivals in 2008, which has been relatively consistent since 1995. Although Slum Voe has seen annual fluctuations in vessel call counts over the study period overall there has been a gradual decline since 1995 to 2008 of 58%. The vessel arrival count for Lerwick has been relatively stable at around 950 per year.
- 5.14.6 Ferry services in the region provide a lifeline for local communities living in both the Orkneys Island and the Shetland Islands. Ferry routes in the region are shown in Figure 5.51. Orkney Ferries Ltd (run by Orkney Islands Council) operate ferries to thirteen Islands within the Orkney Islands, which provides the transport link to mainland Scotland via larger ferry links to Scrabster, Gills Bay, and Aberdeen. Shetland Islands Council provides the internal ferry system to eight Islands within their area. A direct link also exists from Lerwick to Europe (Bergen, Maaloy, Hanstholm and Torshaven) and from Aberdeen direct to Kirkwall and Lewick.

**Figure 5.51** Ferry Routes in the North Region





5.14.7 There is no published information on the specific economic value of shipping to this region. Employment extracted from Office for National Statistics shows that employment in the category ‘Sea and Coastal Passenger Water Transport’, provides 259 people full-time employment in 2010. There has been a reduction in people employed in ‘Sea and coastal freight water transport from 116 in 2009, to 64 in 2010.

#### *Areas of Search*

5.14.8 Area of search N2-N3 north of the Orkney islands is not intersected by any of the established ferry routes. Its easternmost side finishes short of the Kirkwall-Lerwick route by 0.3 nm. The busiest stretches of shipping activity around the Orkney area are concentrated in the Pentland Firth and the approaches to Kirkwall. The activity is predominantly generated by ferry traffic, although larger vessels approach Flotta from the south.

5.14.9 The east coast of Hoy is a MEHRA due to high abundances of sensitive such as: fulmars, puffins, guillemots and razorbills. Landscape and geological designations also contribute to this site's classification as a MEHRA.

5.14.10 The area of search chosen around Shetland all but surrounds the islands, and as such, many interactions should be expected.

5.14.11 Three distinct areas of search surround the Shetland Isles N4-N6, N7 and N8. N7 and N8 on the east and north respectively overlap with existing ferry routes. N7 is crossed by the Lerwick-Maaloy and the Lerwick- Bergen ferries to the north and the Lerwick-Hansthalm ferry to the south. The southmost extent of N7 overlaps the Lerwick-Aberdeen ferry route by 0.3 nm. High volumes of cargo, tankers and offshore vessels also travel the same route as the Aberdeen Shetland ferry

5.14.12 Up to 1,800 vessels add to the weekly traffic (257 vessels a day) to and from Lerwick harbour. The Shetland Marine Spatial Atlas indicates that, in addition to the ferries, there are high numbers of oil and gas tankers, supply vessels and cargo vessels that radiate eastward and southward from Shetland. Cruise ships also visit Shetland from Scandinavian countries and tend to use a route south west from Lerwick that crosses through area N7.

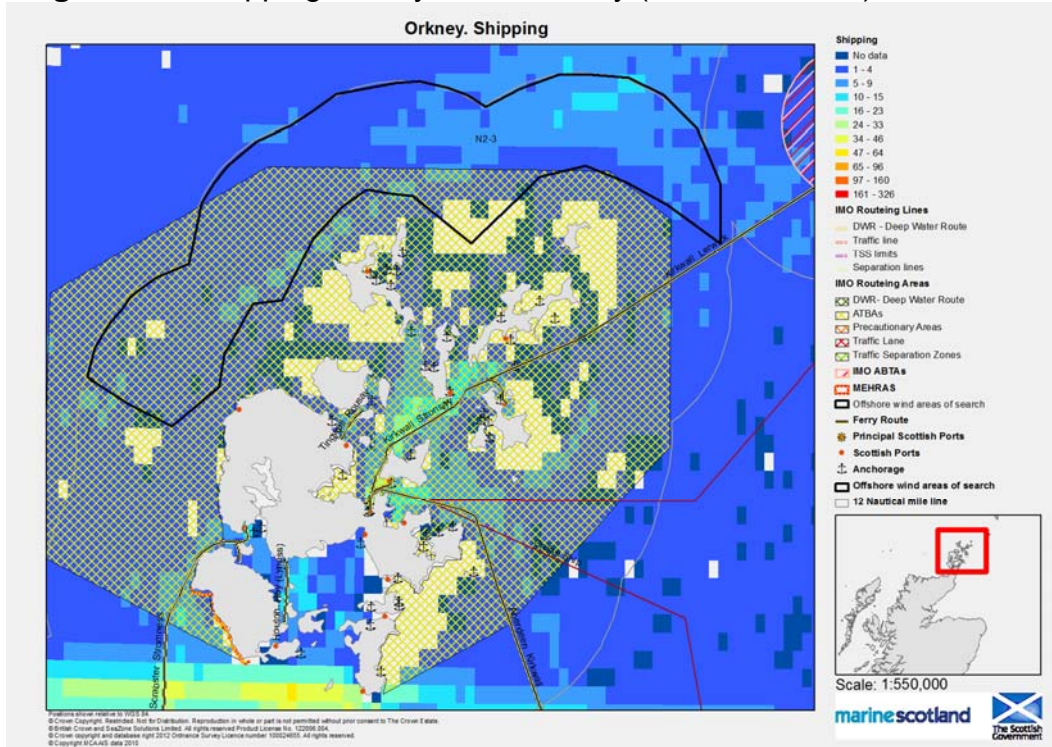
5.14.13 Area N8 is intersected in its westernmost part by the Lerwick-Torshaven ferry. Directly south of this area the shipping traffic can reach up to 140 vessels a week (20 vessels a day). These are mostly oil and gas vessels, oil tankers and cruise ships with routes to the Faroe islands.

5.14.14 Further south, a MEHRA exists at Muckle Flugga due to vulnerable seabird sites, geological and landscape designations.

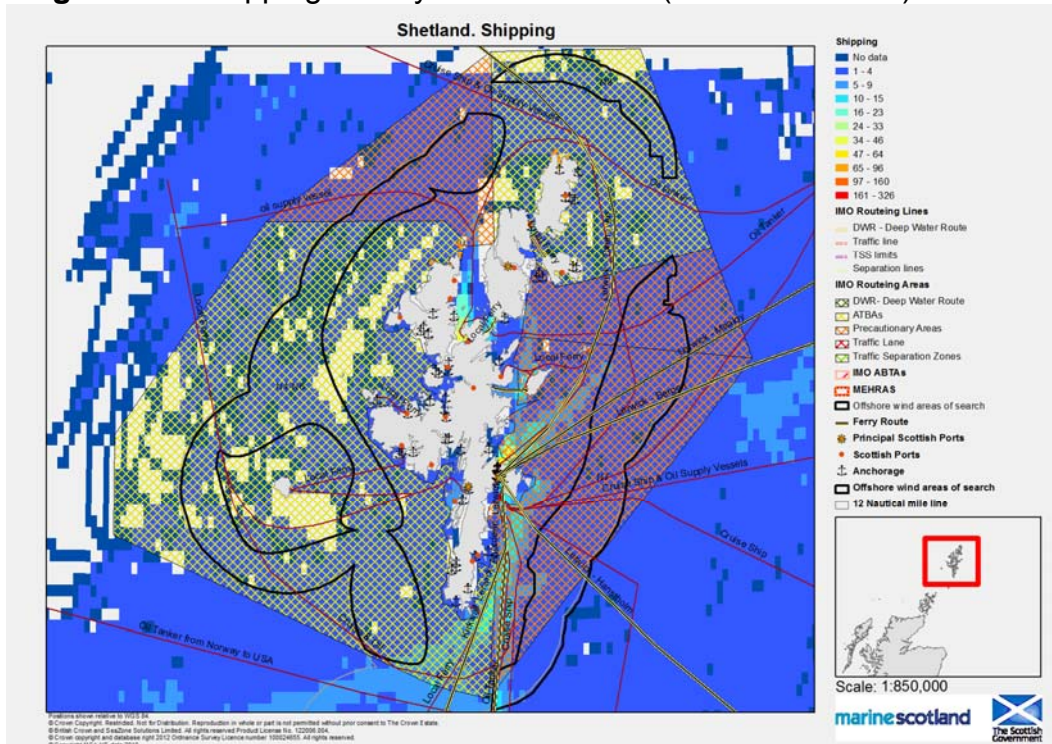
5.14.15 Fethaland to the south and west contains another MEHRA on its north coast due to very high concentrations of vulnerable seabirds, also fishing activity and landscape interests.

5.14.16 Area of search N4-N6 shares sea space with local ferries from Scalloway-Foula and Walls-Foula. Shipping is generally less dense in this eastern side with weekly traffic peaking at 40 vessels (around 6 a day). East and northeast bound oil tankers and supply vessels cross over this area of search. the Norway to USA tanker route lies 5 nm south of this area.

**Figure 5.52** Shipping activity in the Orkney (Area of Search)



**Figure 5.53** Shipping activity in the Shetland (Areas of Search)



## 5.15 Social Considerations

- 5.15.1 The total population in North Region is 41,000, it being much more sparsely populated than other regions. The overall average age in the North Region is 40 years old (one year greater than the national average). The working age population declined from a peak of 35,700 in 1996 to around 34,300 in 2002, after which it has levelled off. In 2010, the working age population was 34,500, and the overall change (1996 to 2010) is a reduction of 3.2%. The population of children has declined across the whole period (from 12,700 in 1996 to 10,300 in 2010, equivalent to a reduction of 18.5%) while the number of people of pensionable age has increased by 29.7% (from 9,800 in 1996 to 12,800 in 2010).
- 5.15.2 Average income in 2009 was higher than the national average for the Shetland Islands but lower for the Orkney Islands. The greatest number of jobs are associated with human health and social work activities (20% of the total for 2010). Other industry sectors accounting for more than 10% of jobs are public administration and defence; compulsory social security at 15%, wholesale and retail at 12%, and education at 10%. Agriculture, forestry and fishing and arts, entertainment and recreation both make up around 3% of all jobs in the North.
- 5.15.3 Crofting is an important part of the economy and community in Orkney and Shetland (small areas of the NE Highland counties of Caithness and Sutherland are also located in this region, but are not included due to the overlap with other regions). The Orkney area contains 466 crofts with 8035 households in parishes containing crofts. Shetland contains 2755 crofts with 9111 households. Crofting makes up a relatively high percentage of household income in Orkney (47.3%), and is almost double that in Shetland (27.22%). Total income is higher in Shetland than in Orkney (£20,240 in Orkney, £31,020 in Shetland) and income from crofting activities is high in both regions (£12,800 in Orkney, £10,050 in Shetland).
- 5.15.4 The proportion of people rating their health as good or very good in the Orkney Islands increased from 89.9% (2001/2002) to 90.1% (2007/2008). This compares with a decrease in the Shetland Islands from 92.9% (2001/2002) to 88.3% (2007/2008).
- 5.15.5 There are 612 coastal datazones for the SIMD in the North, with 78% of all datazones being coastal. No datazones (coastal or all) fall into the 10% most deprived in the North. There is no difference in percentage that are in the most affluent decile for income or housing, but an increase to 10% (from 8%) of coastal zones being in the most affluent decile for employment, and from 5% to 6% for health. These statistics suggest that communities in the North are more likely to be affluent (in the wider sense of quality of life), although only a small proportion of datazones fall into the most affluent 10%.
- 5.15.6 There has been an increase in the population with no qualifications within this region. The Orkney Islands has the highest proportion of the population with no qualifications in both 2004 (9.9%) and 2008 (11%). The values for

the Shetland Islands are 9.1% in 2004, with no change in 2008. The minimum drive time to a college of Further or Higher Education in the North Region varies from 61 minutes in the Shetland Islands to 77 minutes in the Orkney Islands.

- 5.15.7 House prices for both the Orkney and Shetland Islands are below the national average. In 2010, the national average was £154,078 while the average in the Shetland Islands was £120,157, 22% lower than the national average. The average in the Orkney Islands was £114,153, or 26% lower than the national average. Affordability of housing is likely to be greater in the Shetland Islands (since gross earnings are higher than the national average). Average earnings in Orkney (2009) were around 7% lower than the national average, so affordability in the Orkney Islands may also be greater than for Scotland as a whole.
- 5.15.8 The highest perceived quality of life in 2007/2008 was in the Orkney Islands, where 77.9% rated their neighbourhood as good or very good. The Shetlands Islands was only slightly lower at 77.6%. Both local authority areas have shown a considerable increase since 1999/2000 in the population rating their neighbourhood as very good or good. The increase in the Orkney Islands is 15.8% and in the Shetland Islands is 12.5%.
- 5.15.9 Average electricity consumption (per household) in the North Region was 10.4 MWh in 2009 (compared with an overall estimated average per household for Scotland of 5.7 MWh). Those households where the highest income earner (HIH) is 60+ are more likely to be in fuel poverty than the whole population in 2007/2009. At 63.9%, this is much higher than the national average of 45.9% for this group. The percentage of HIH 60+ in fuel poverty has, though, decreased between 2005/2008 and 2007/2009. The proportion of households with HIH 60+ that are in fuel poverty is very similar for the Shetland Islands (63.3%) and Orkney Islands (64.4%). In terms of change, though, there has been a much greater reduction in the proportion of the total population in fuel poverty in the Orkney Islands (-11.3%) than in the Shetland Islands (-3.5%).

#### *Future Trends*

- 5.15.10 Table 5.3 summarises the statistics and trends discussed above to give an indication of the likely future changes by indicator, comparing national with local trends (where data are available). There is much greater uncertainty over trends for the time period of 30 to 50 years and, in both cases, it is assumed that future trends follow recent and historic trends.

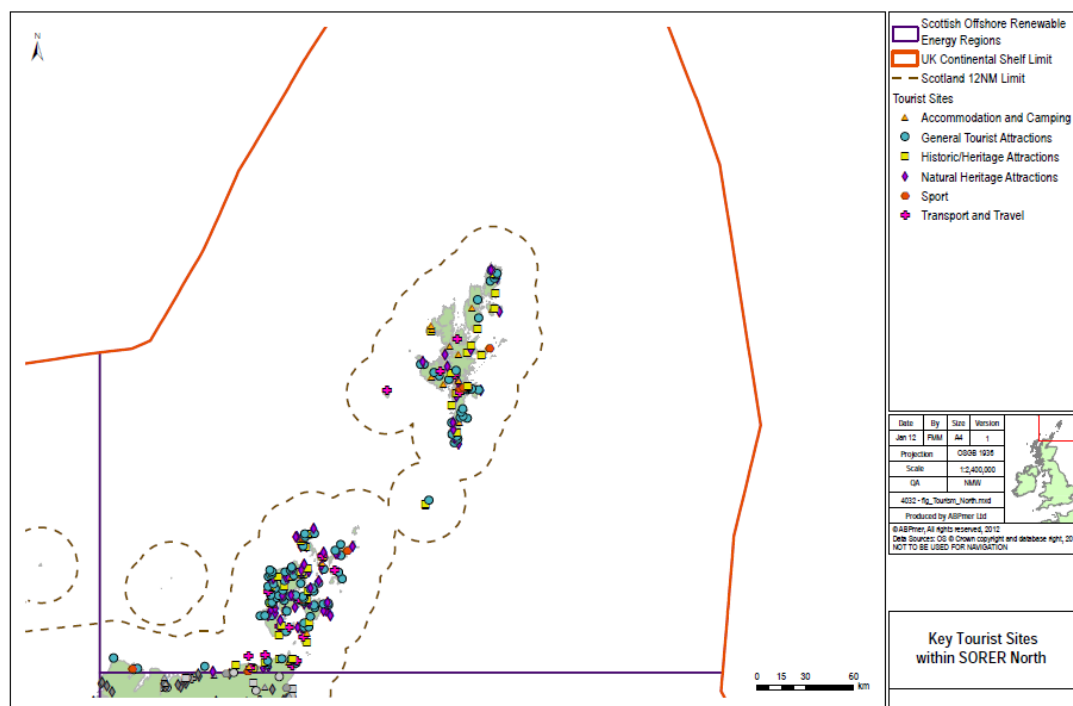


**Table 5.3** Summary of future trends in North Region

Indicator	National		Regional		Evidence for Trend
	10-20 years	30-50 years	10-20 years	30-50 years	
Average age	↑	↑	↑	↑	Estimate of proportion of the population that is of pensionable age between 2001 and 2010
Working age population	↑	→	↓	→	Recent trends suggest a slight decrease in the number of people of working age
Income	↑	↑	↑	↑	Recent trends suggest increase in median weekly income over time, but there have been recent fluctuations
Health	↑	→	↕	↕	Recent trends suggest uncertainty due to regional differences
Perception that neighbourhood is a very good place to live	↕	↕	↑	↑	Regional trends suggest small increases, but with recent fluctuations
Affordability of housing	↑	→	↑	→	Suggestion that affordability has increased recently, but this may not be sustained. Data on house prices and mean income suggests houses should be more affordable than for Scotland as a whole, but social sector debt is much higher
Housing quality	↑	↑	↑	↑	Housing quality, as measured by percentage of housing failing the SHQS, is improving, although the definition used in the standard has changed over time, making this difficult to confirm
Energy consumption	↓	↕	↓	→	Recent trends suggest potential for continued slight decline, in longer term is more uncertain
Fuel poverty	↑	→	↑	→	Recent trends show an overall increase even though the Scottish Government policy is that there should be no fuel poverty in the medium to long-term. HIH 60+ and

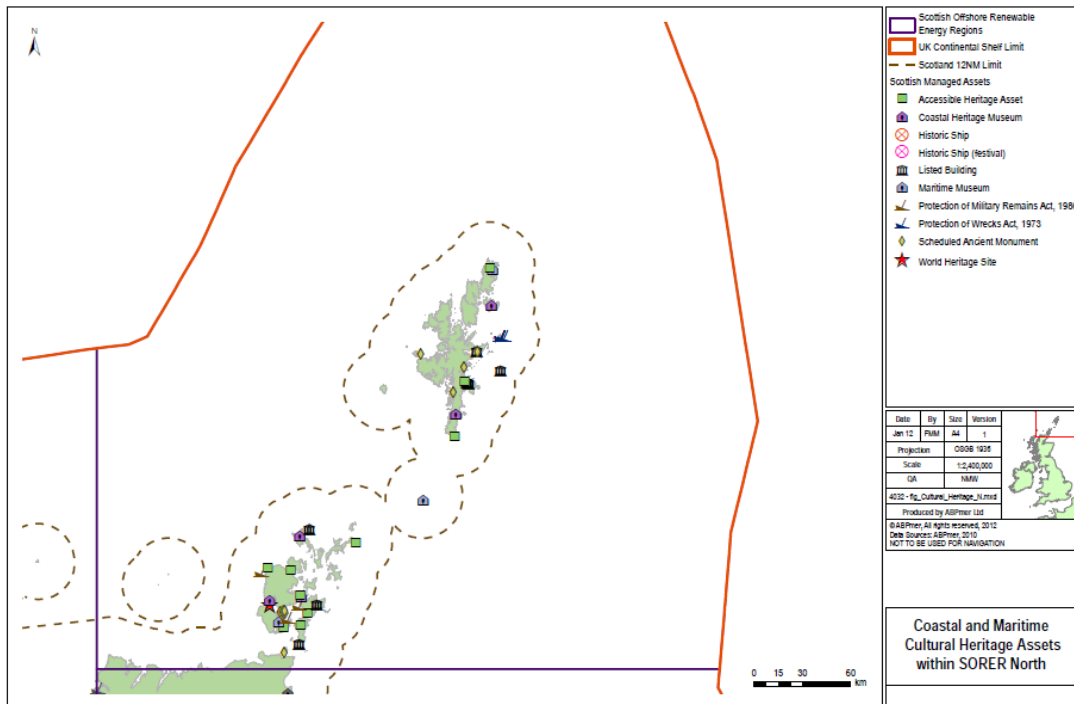


**Figure 5.54** Key tourist sites in the North Region



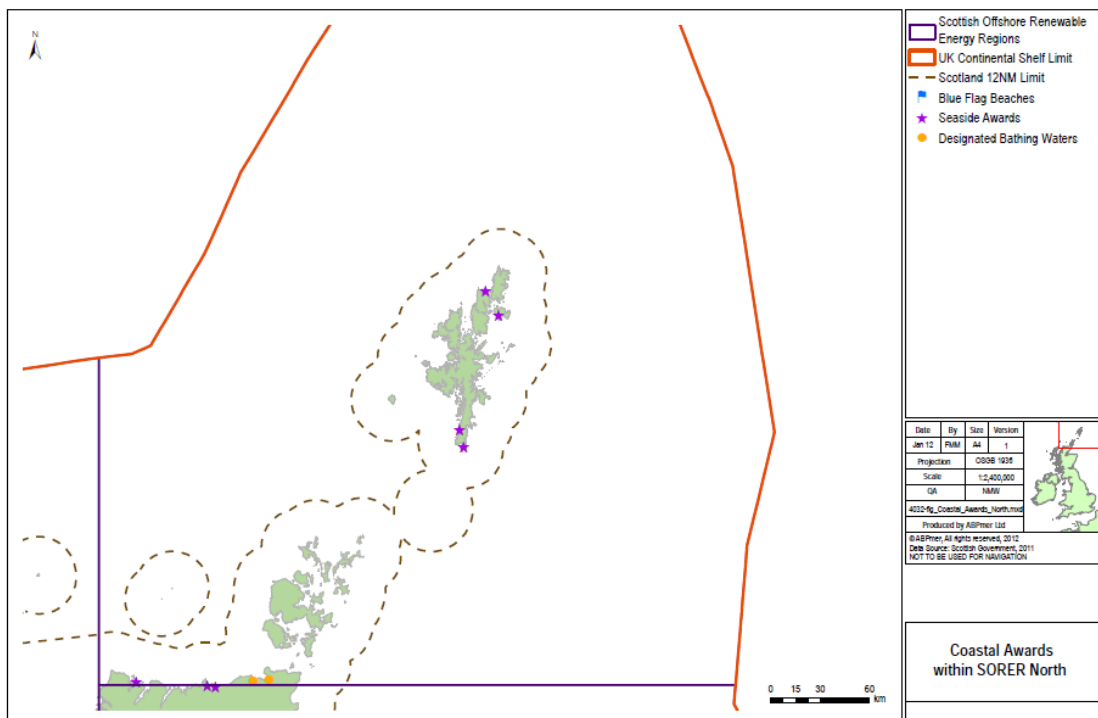
5.17.2 Historic/heritage attractions and natural heritage attractions also feature in significant numbers on both Orkney and Shetland. Figure 5.56 shows the locations of coastal and maritime cultural heritage assets, including the World Heritage Site on Orkney. The Heart of Neolithic Orkney was designated as a World Heritage Site in 1999 and includes the tomb of Maeshowe, the Stones of Stenness, the Barnhouse Stone, the Watchstone, the Ring of Brodgar and associated monuments and stone settings, and the Skara Brae settlement.

**Figure 5.54 Cultural and Maritime Heritage Assets in North Region**



5.17.3 Within the region, there are additionally several areas with seaside awards (see Figure 5.56). These include Sango Sands, Strathy Bay and Melvich Beach along the North coast, as well as some sites on Shetland. There are also a couple of designated bathing waters at Thurso and Dunnet. The importance of natural marine resources is also illustrated by this region having nine Marine SACs, mainly in areas around the Northern Islets.

**Figure 5.56 Coastal awards in the North Region**





5.17.4 While visitor numbers for the whole region are not readily available, it was possible to obtain data for Shetland and Orkney from VisitScotland. Data for 2009 indicate that UK visitors made around 70,000 trips to Orkney, stayed for some 400,000 nights and spent approximately £30 million. Considering Shetland, UK visitors made around 40,000 trips, stayed for around 250,000 nights and spent approximately £12 million (VisitScotland, 2010).