

9. SCOTTISH OFFSHORE MARINE AREA

As technologies and infrastructure for offshore wind energy continue to develop and progress, the offshore marine area beyond 12 nautical miles will become more accessible. This chapter seeks to illustrate the potential interactions and provide an initial stage analysis of the offshore marine area to identify areas of suitability for potential offshore developments

Three general areas have been identified:

- North Western
- Northern
- North Eastern

Resource

- 9.1.1 Without the interference of land masses both wind speed and the power density of the wind resource is physically unimpaired outwith the 12 NM limit.
- 9.1.2 The wind resource is typically stronger on the west coast with mean annual power densities of 1.6 kWatt m⁻² and speeds of 11.5 ms⁻¹
- 9.1.3 The seasonal variations in the western offshore area makes the resource go from 0.8 kWatt m⁻² from a mean summer windspeed of 9 ms⁻¹ to 2.5 kWatt m⁻² from 13.7 ms⁻¹ mean annual winter speed.
- 9.1.4 The north and northeast offshore areas display mean annual power densities of 1.4 kWatt m⁻² from mean annual speeds of 10.8 ms⁻¹. The differences between summer and winter are also notable in this area, mean summer power densities are 0.63 kWatt m⁻² from mean summer wind speeds of 8.25 ms⁻¹ winter mean power densities are larger at 2.6 kWatt m⁻² and mean winter wind speeds are of 13 ms⁻¹.
- 9.1.5 The north eastern offshore area has a lesser wind resource with a mean annual power density of 1.1 kWatt m⁻² that comes from a mean wind speed of 10 ms⁻¹. The summer mean power density is 0.53 kWatt m⁻² and the mean summer wind speed 7.8 ms⁻¹. This increases to 1.9 kWatt m⁻² from 12.16 ms⁻¹ in the winter time.

Figure 9.1 North Western Wind Energy Resource (Annual Mean Power)

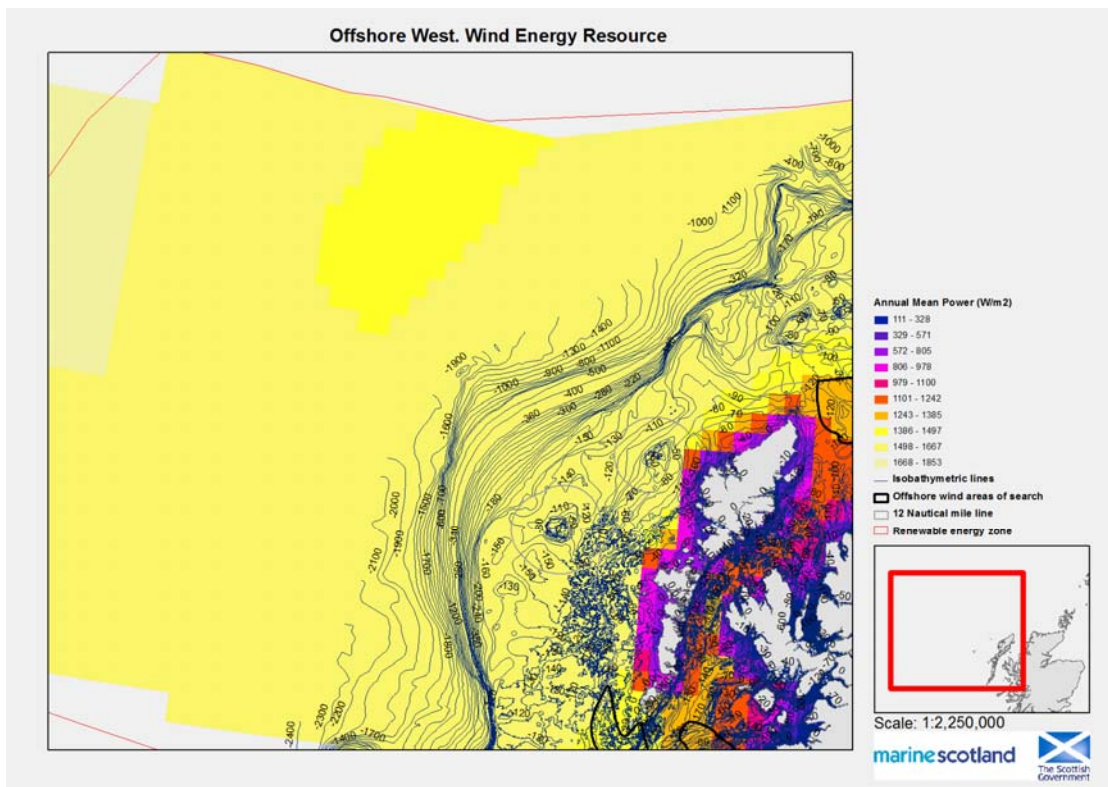


Figure 9.2 North Western Wind Energy Resource (Annual Mean Wind Speed)

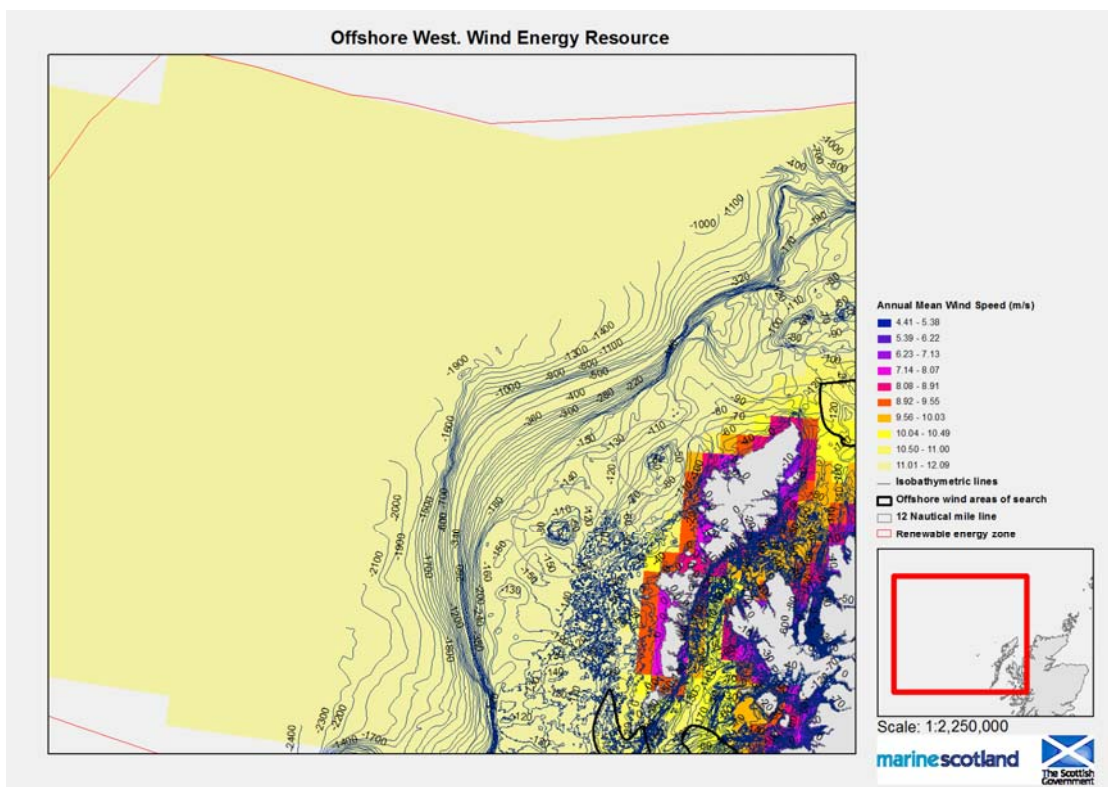


Figure 9.3 Northern Wind Energy Resource (Annual Mean Power)

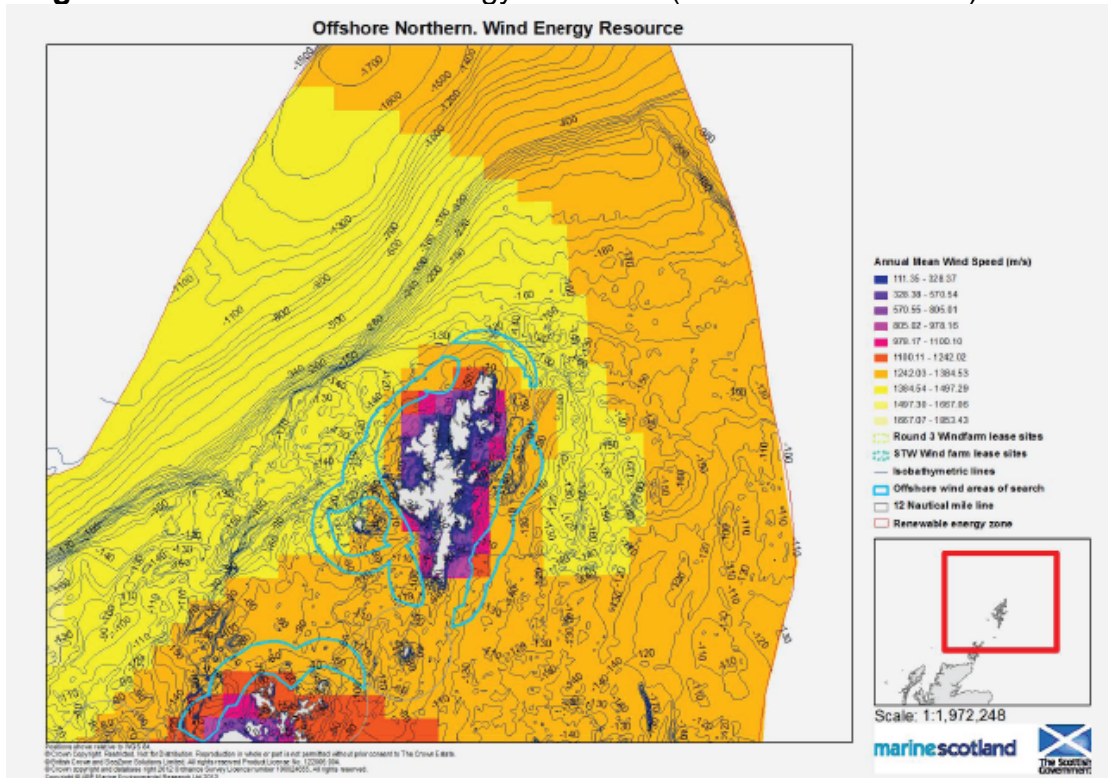


Figure 9.4 Northern Wind Energy Resource (Annual Mean Wind Speed)

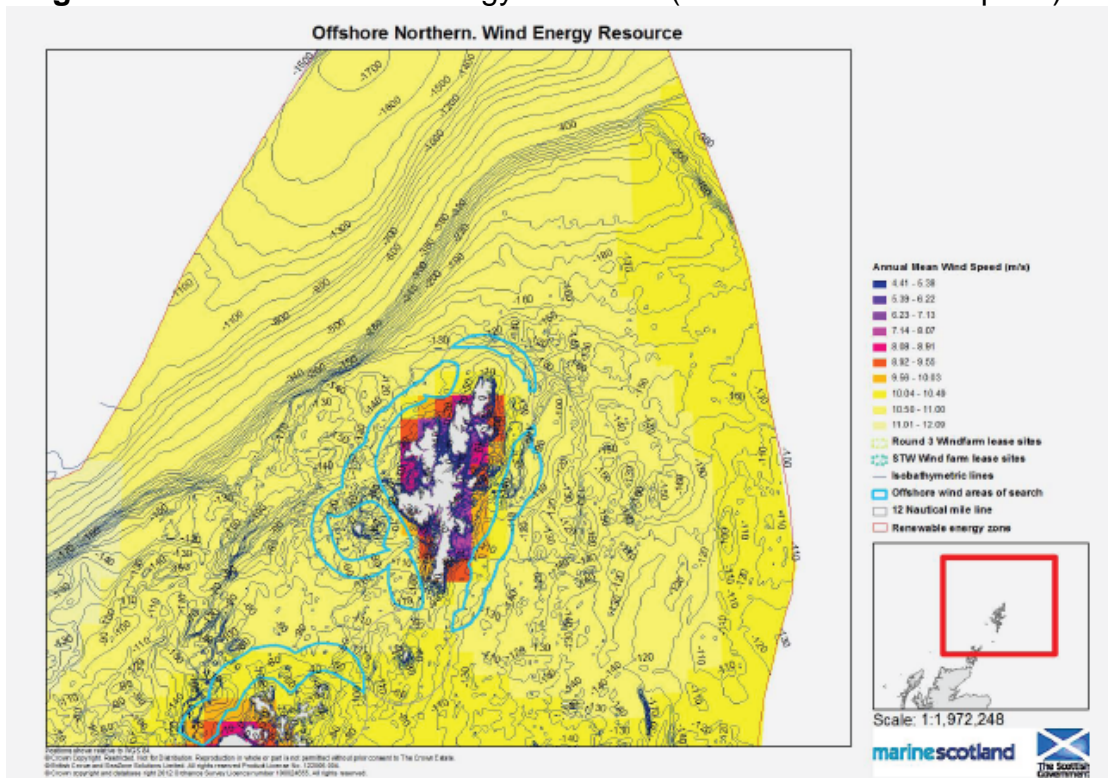


Figure 9.5 North Eastern Wind Energy Resource (Annual Mean Power)

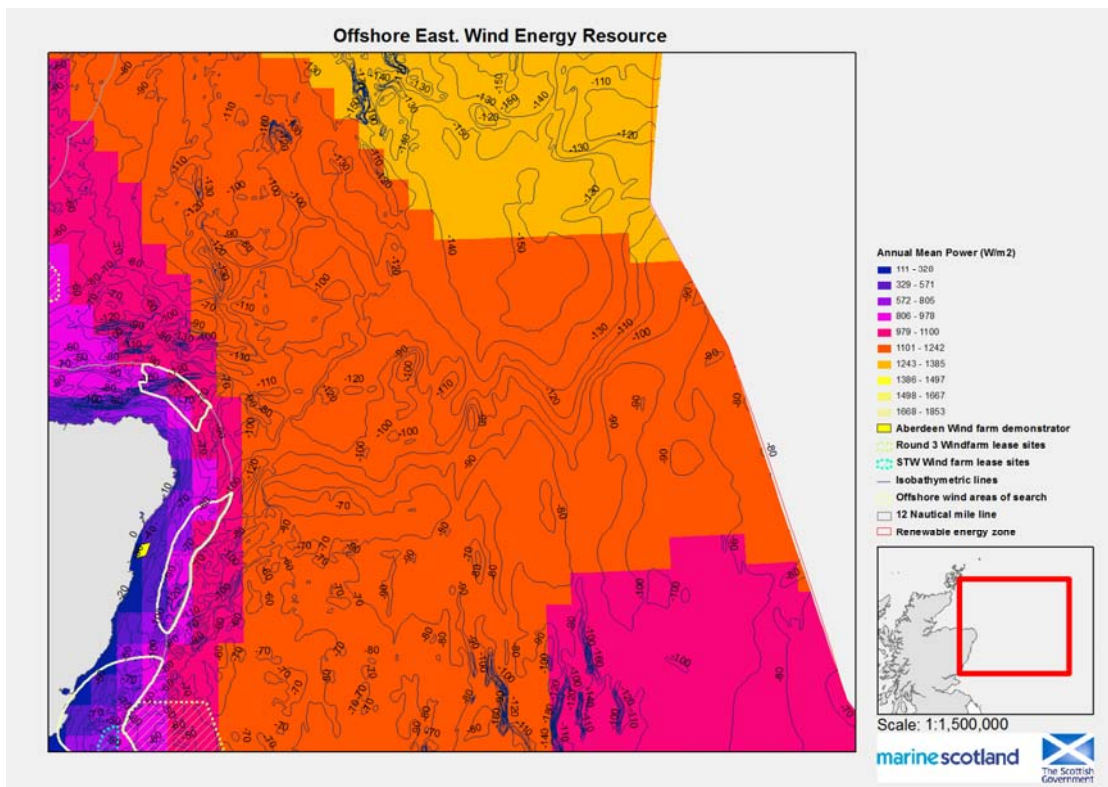
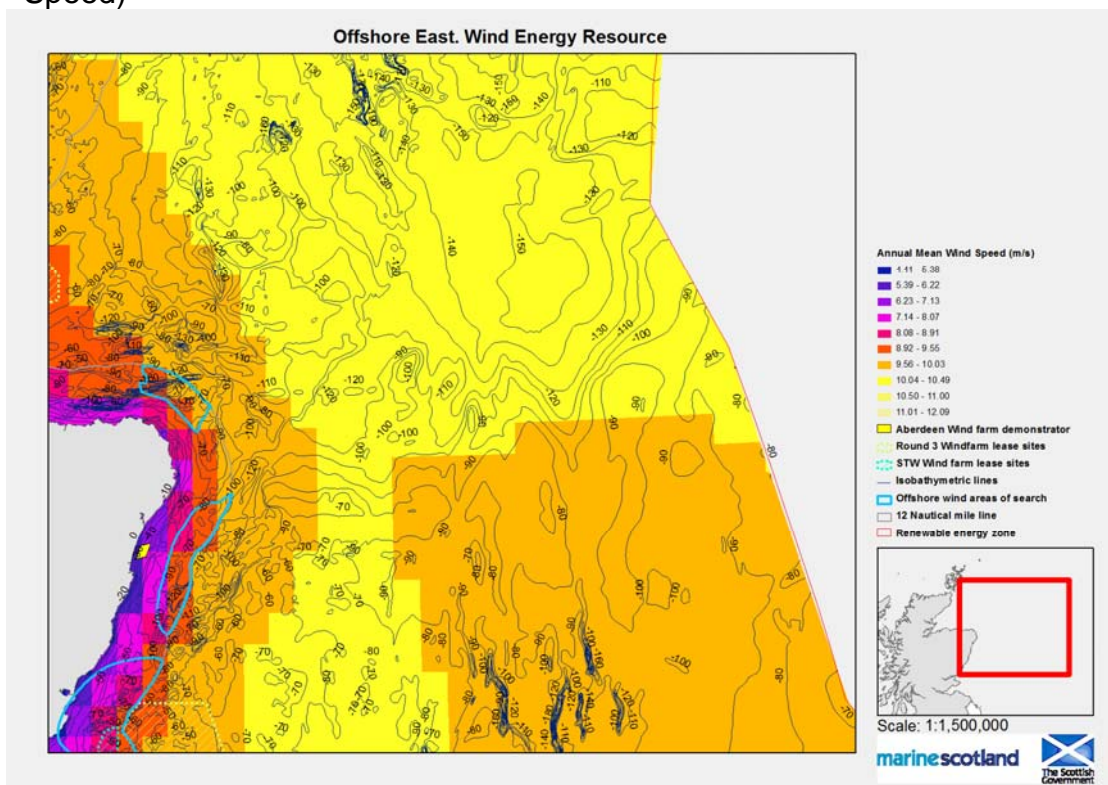


Figure 9.6 North Eastern Wind Energy Resource (Annual Mean Wind Speed)



9.2 Aquaculture

9.2.1 At this time there are no offshore aquaculture farms that may cause interactions with the existing offshore wind search areas. However the future exploitation of offshore waters in the Scottish Marine Area should not be discounted.

9.3 Bathymetry and Seabed

9.3.1 Towards the west outside of the 12 nm zone the depth stays around 100-180 till the shelf edge and increases rapidly to depths of over 2000 m. To the North and North East the depths remain around 100-180 m until the shelf edge also, North of Shetland the mean depth increases as the northern and eastern part of the shelf edge is reached.

Figure 9.7 North Western Seabed Bathymetry

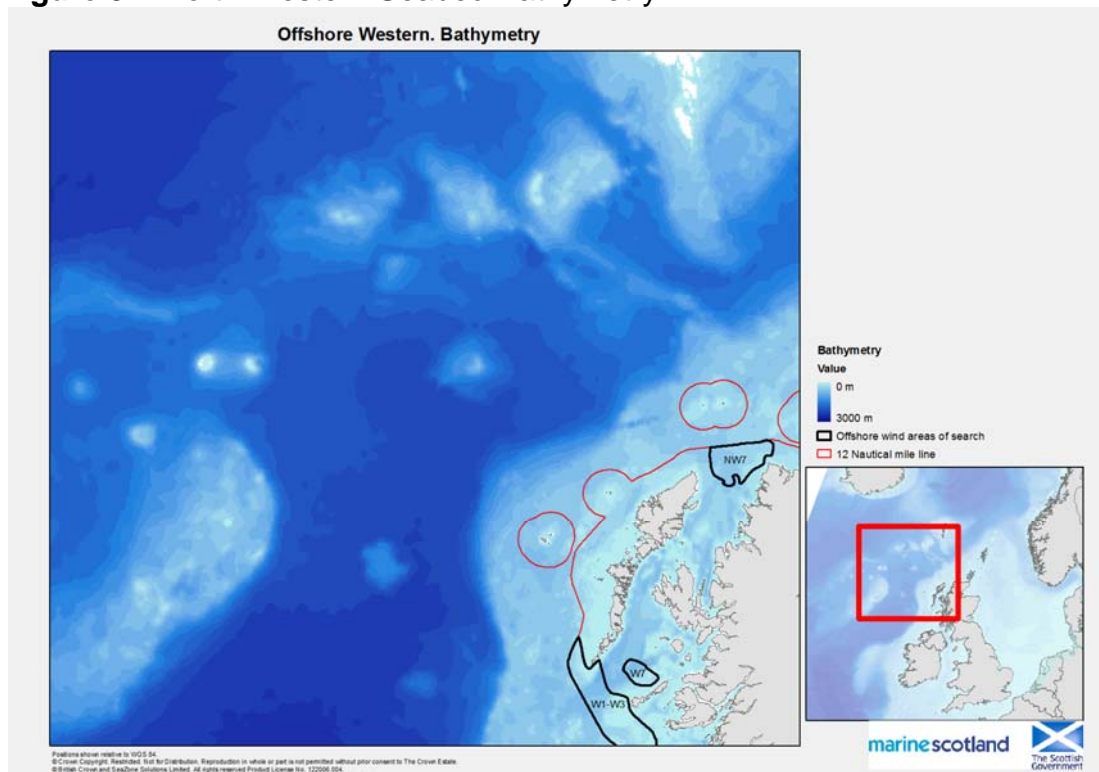


Figure 9.8 North Western Seabed Sediments

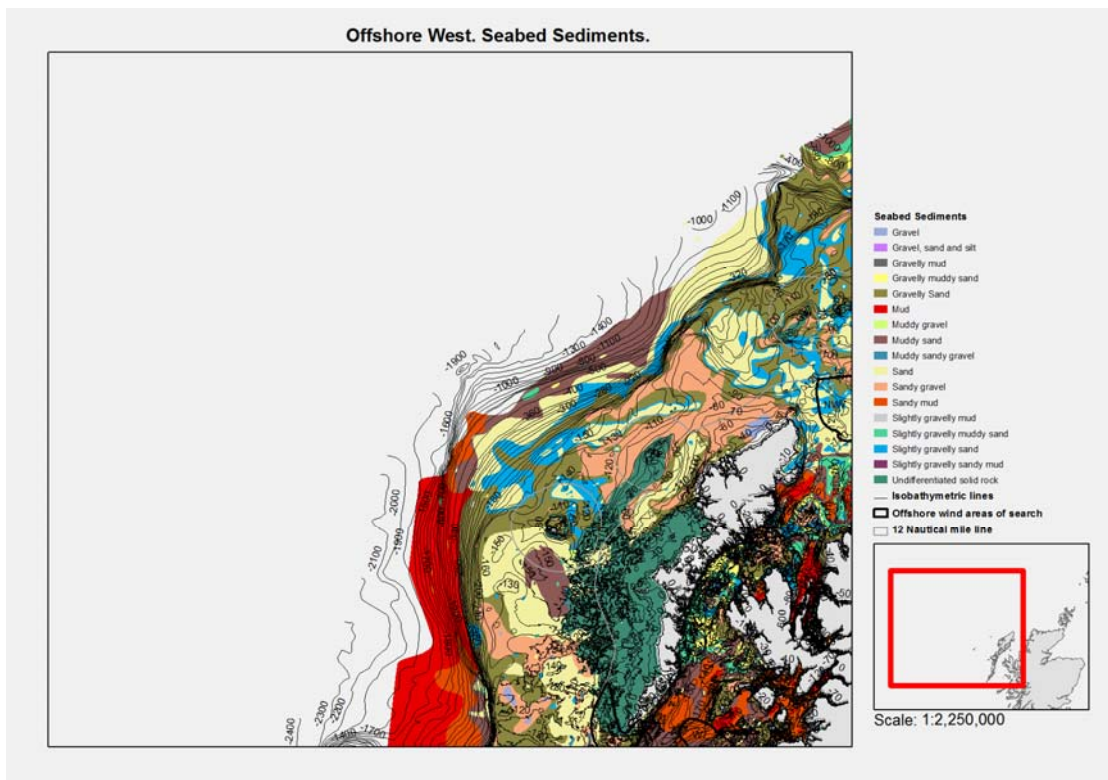


Figure 9.9 North Western Seabed Predicted EUNIS Habitats

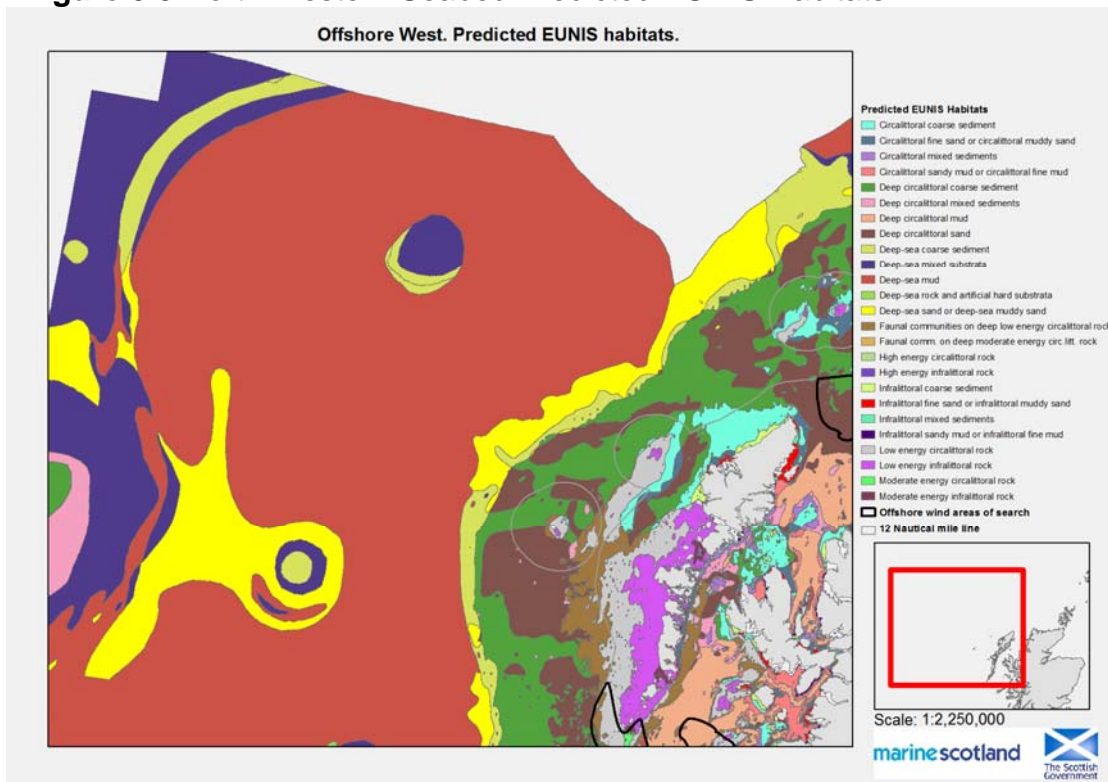


Figure 9.10 Northern Seabed Bathymetry

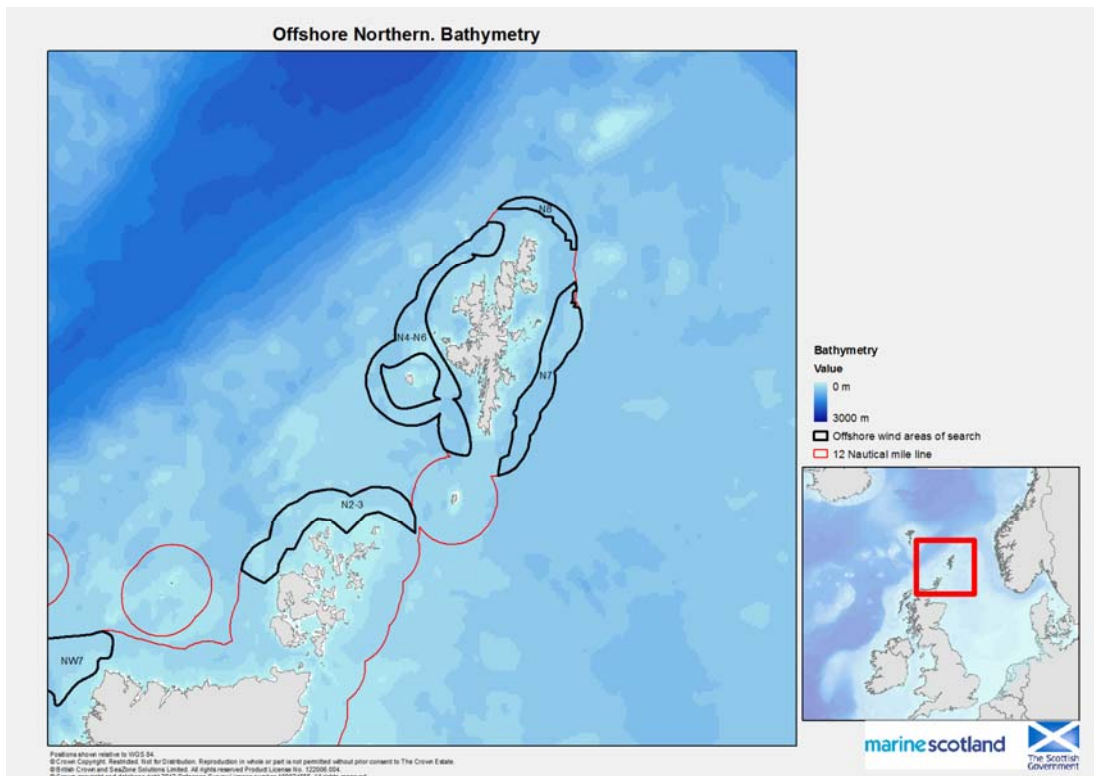


Figure 9.11 Northern Seabed Sediments

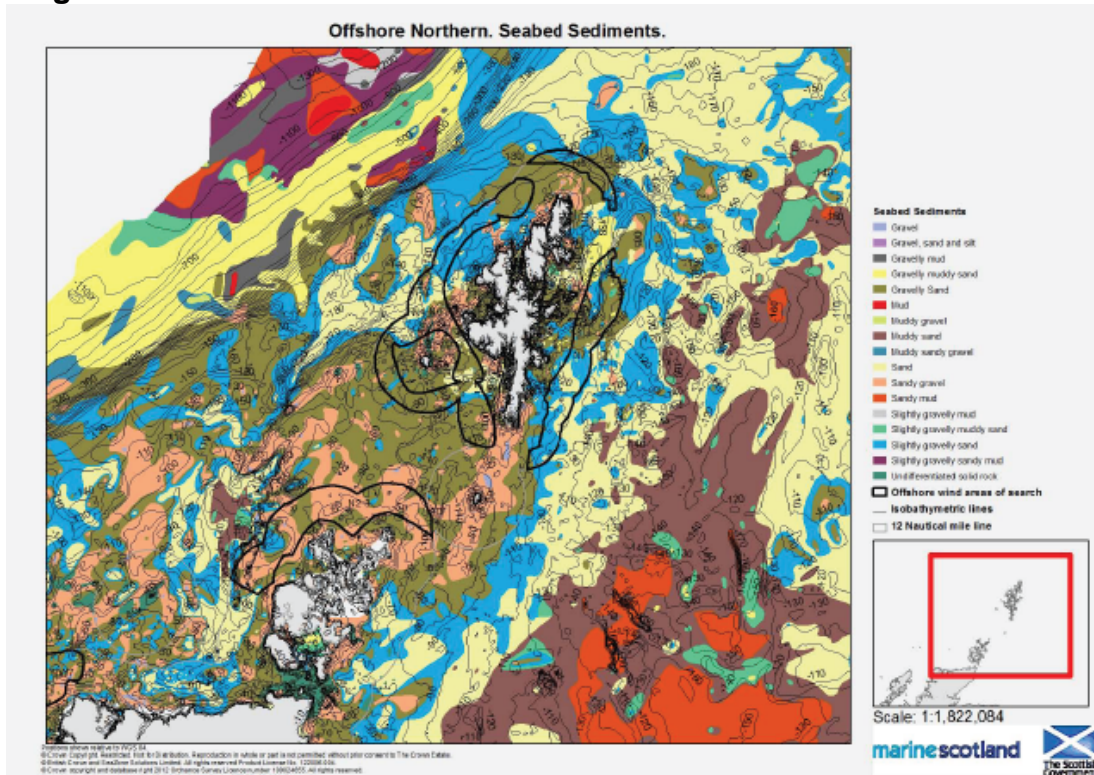


Figure 9.12 Northern Seabed Predicted EUNIS Habitats

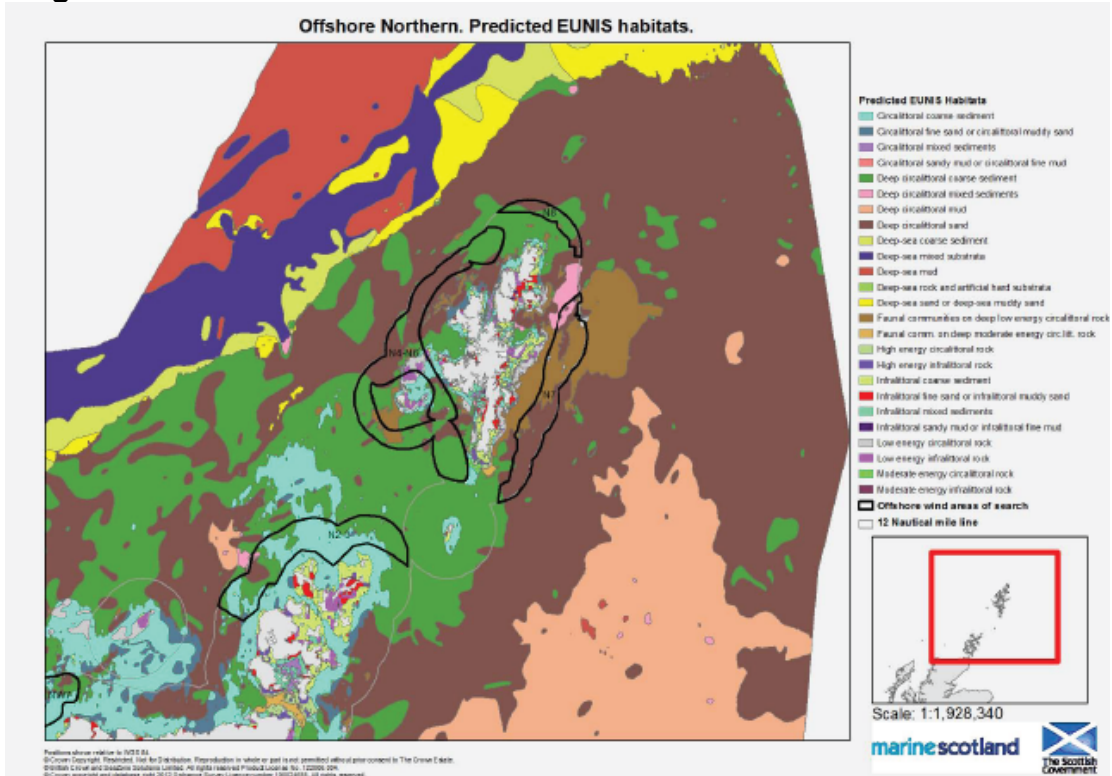


Figure 9.13 North Eastern Seabed Bathymetry

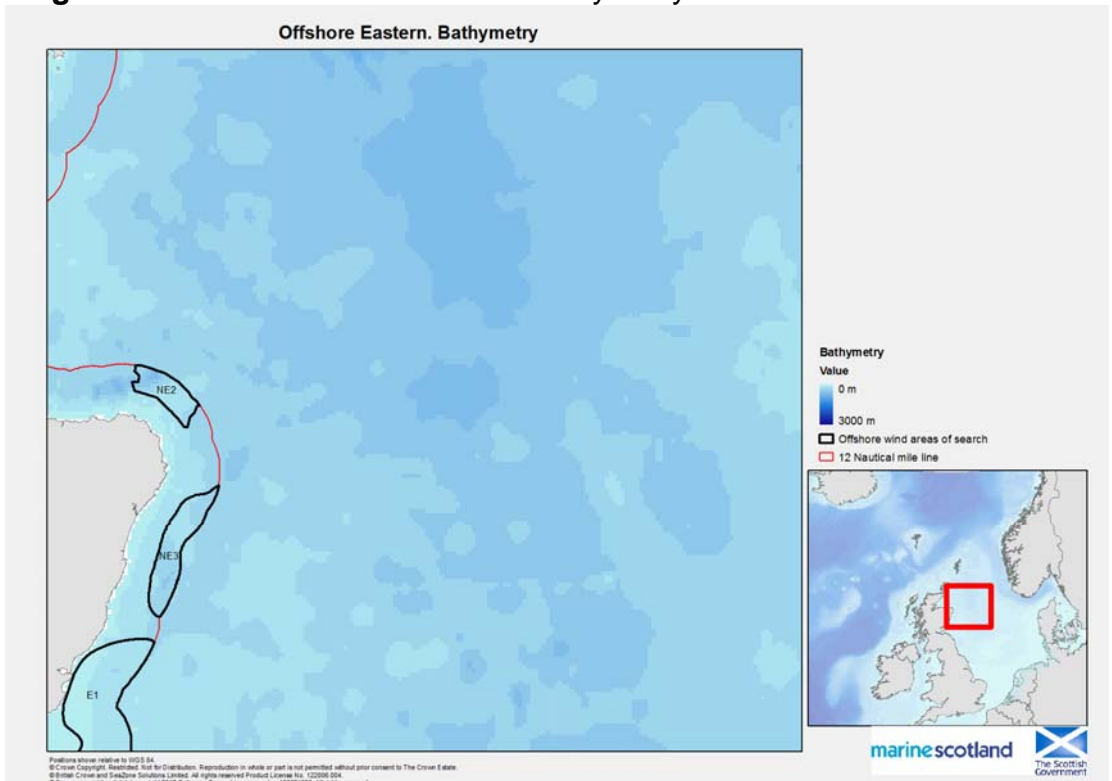


Figure 9.14 North Eastern Seabed Sediments

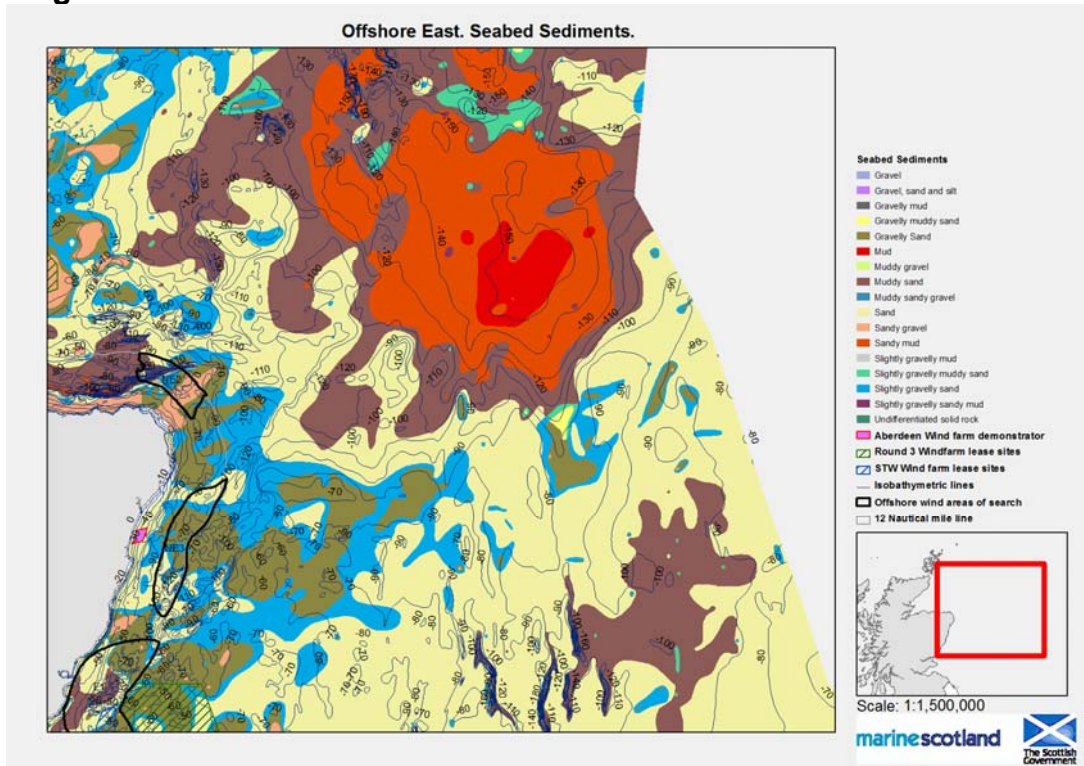
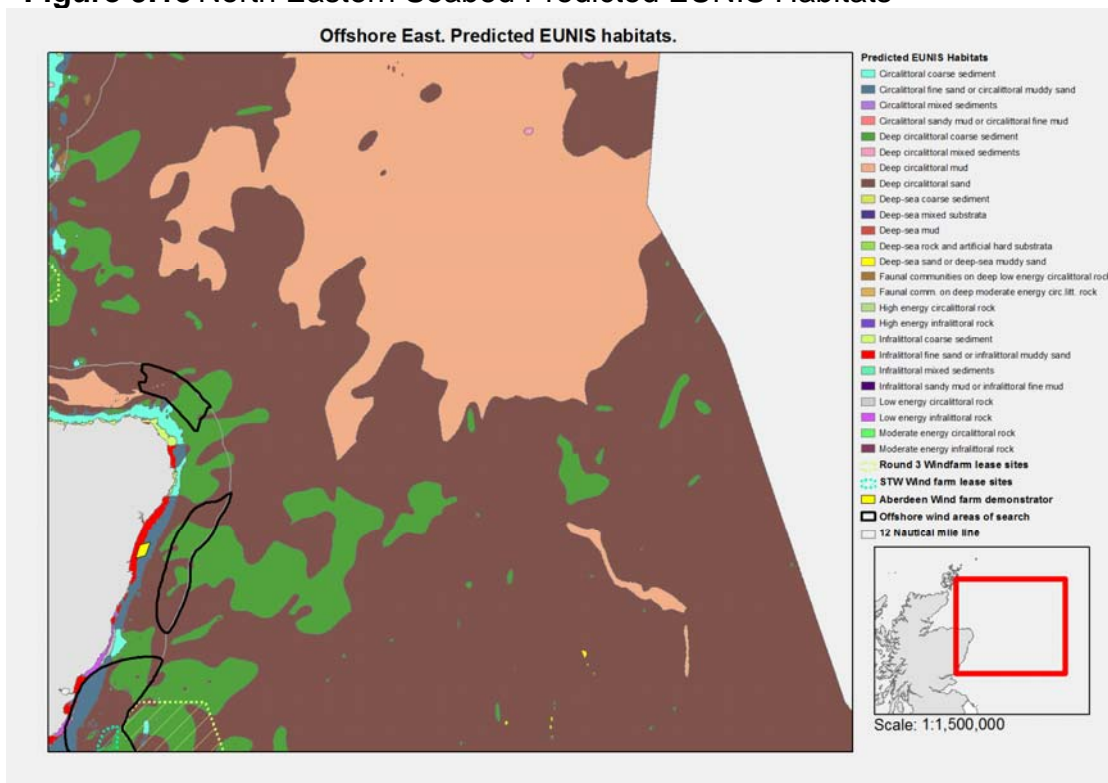


Figure 9.15 North Eastern Seabed Predicted EUNIS Habitats



9.4 Cultural Heritage

9.4.1 In general, the Offshore Areas do not contain significant levels of cultural heritage features. All of the offshore areas contain a significant number of non-dangerous wrecks along. St.Kilda's World Heritage site in the North West Areas is of significant cultural value.

9.4.2 Figure 9.16 – 9.18 show the key cultural heritage assets in the offshore areas.

Figure 9.16 Key cultural heritage assets in the North Western Offshore Area

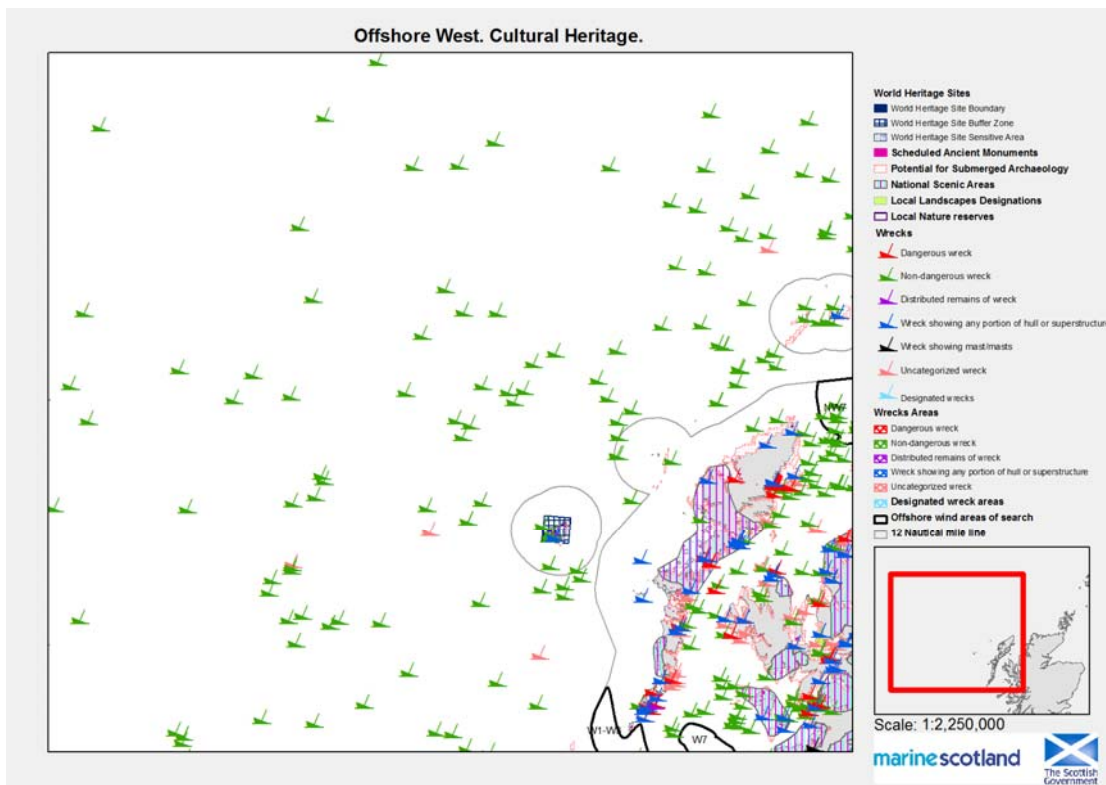


Figure 9.17 Key cultural heritage assets in the Northern Offshore Area

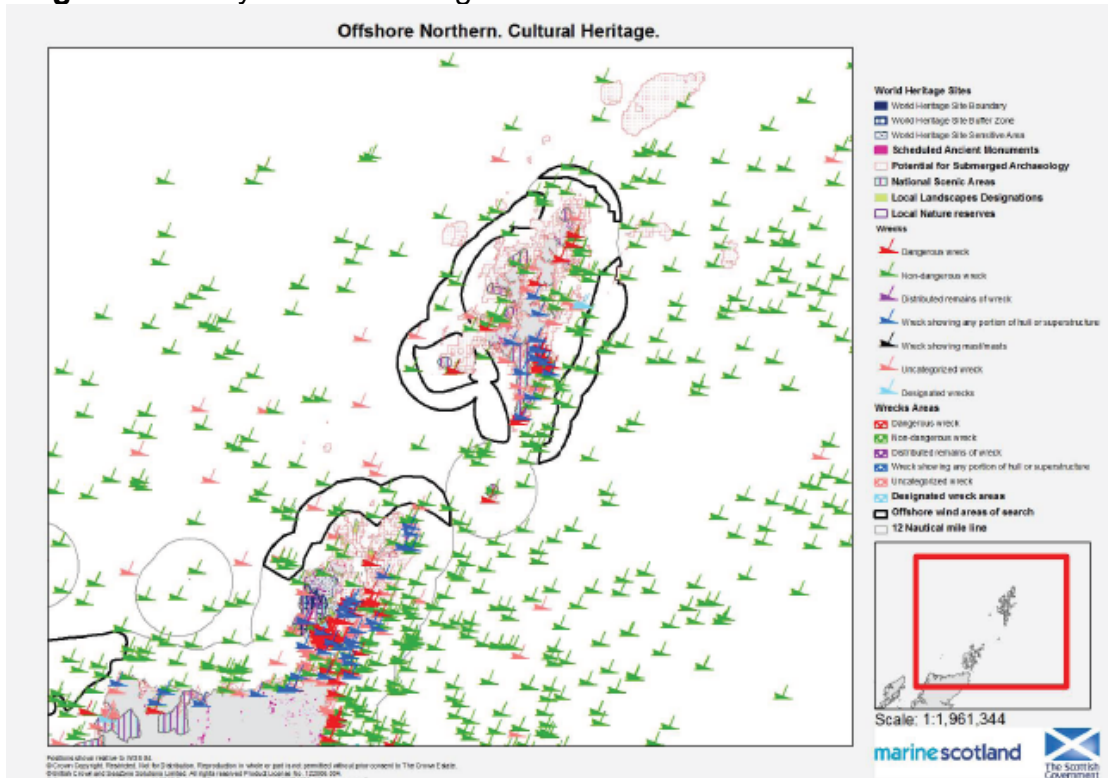
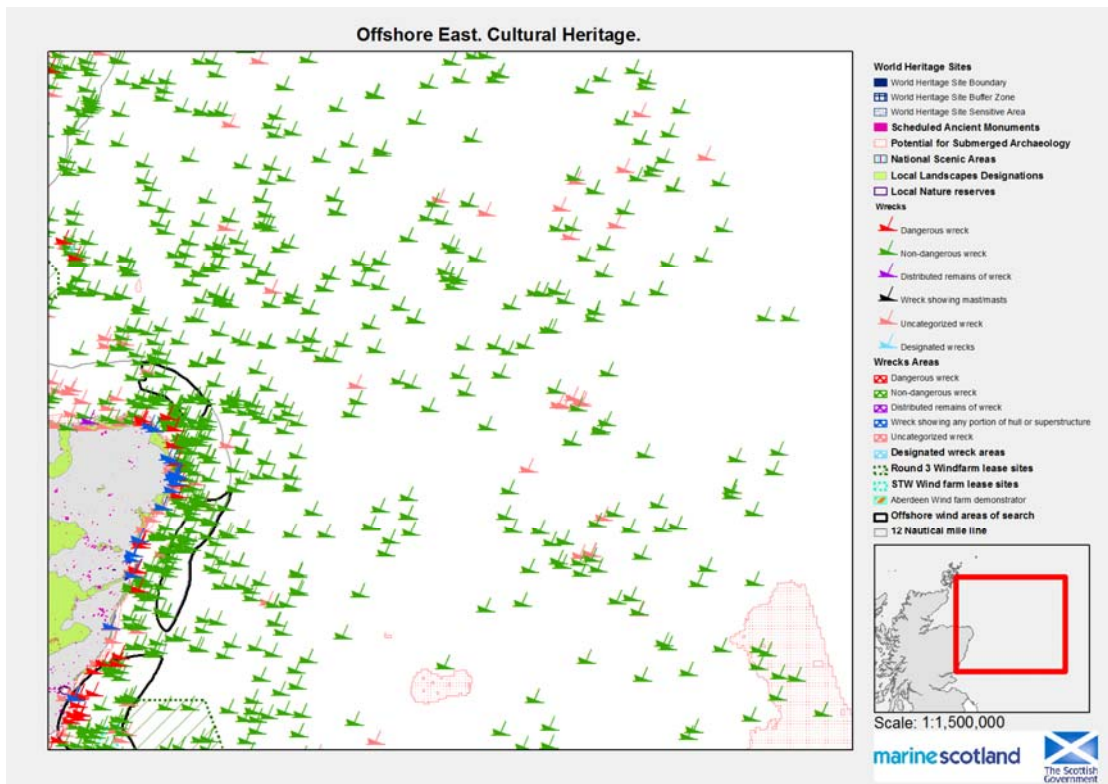


Figure 9.18 Key cultural heritage assets in the North Eastern Offshore Area



9.5 Environment

9.5.1 The designated sites in relation to the offshore areas are contained in Figs.9.19 – 9.21.

Designated Sites

Figure 9.19 Designated sites in the North Western Offshore Area

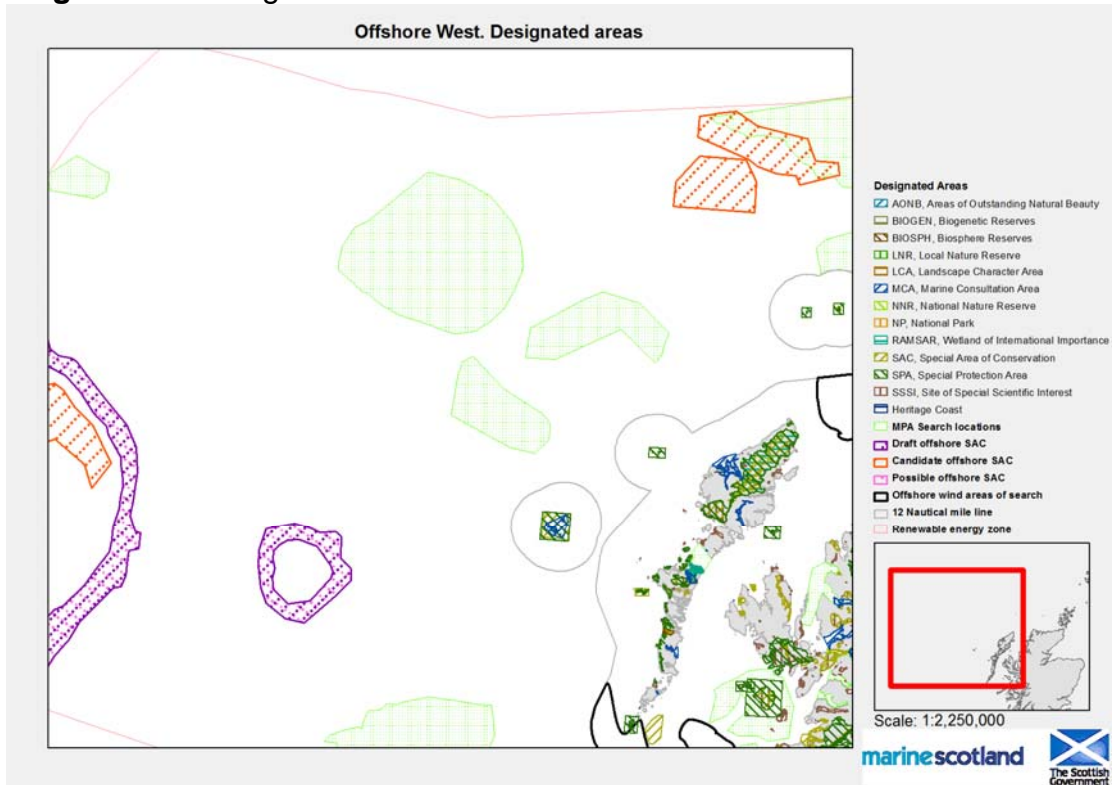


Figure 9.20 Designated sites in the Northern Offshore Area

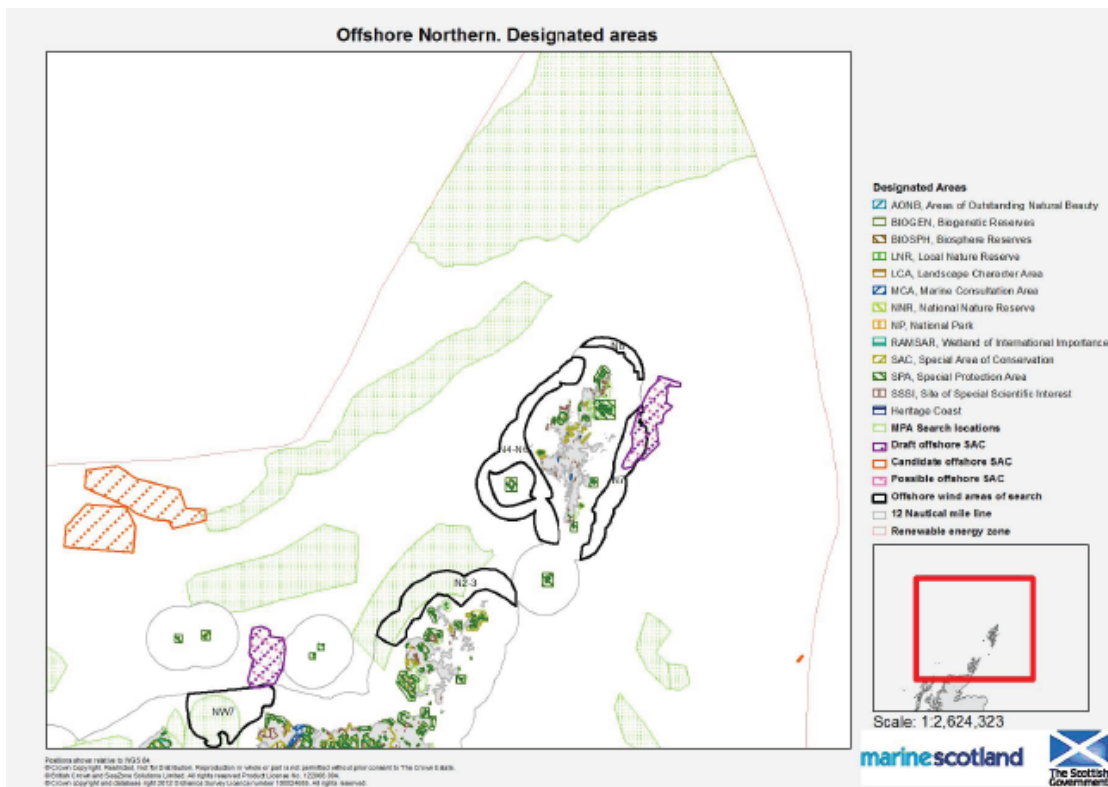
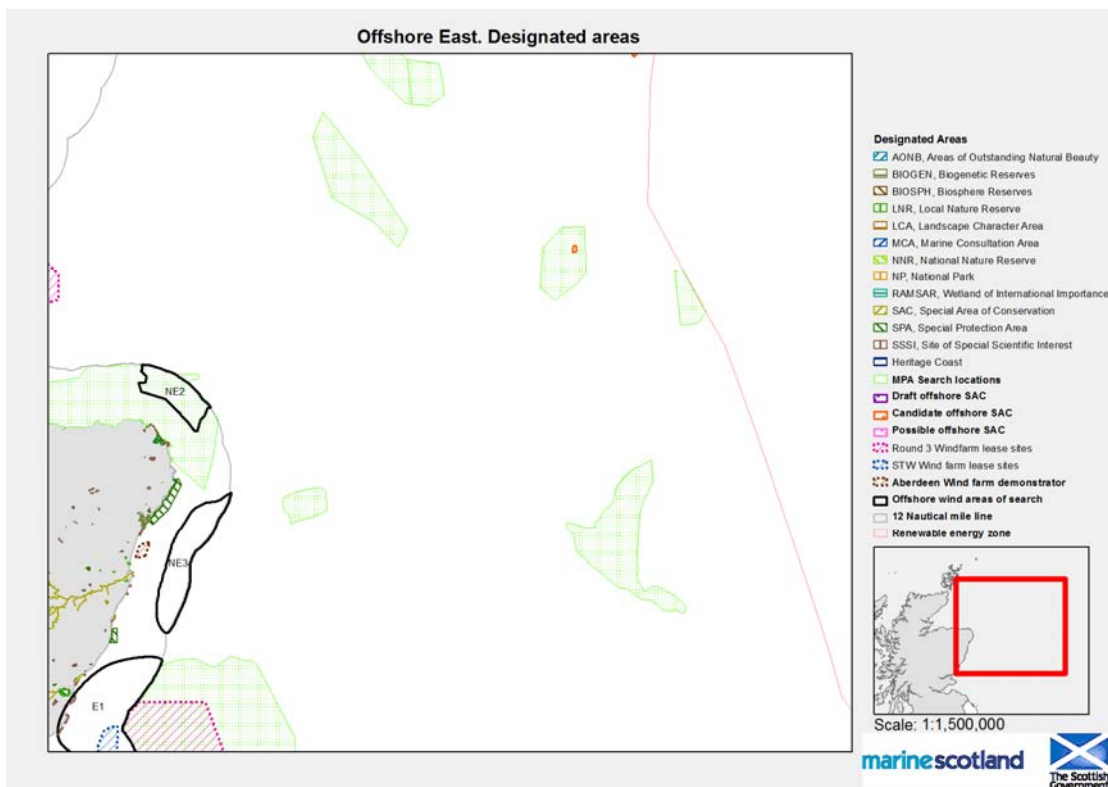


Figure 9.21 Designated sites in the North Eastern Offshore Area



Marine Mammals, Basking Sharks and Seals

- North Western Offshore Area

- 9.5.2 In the North Western Offshore Area, the composition of the cetacean species that can be sighted changes. In these further off waters there are more consistent records for species like the Atlantic white sided dolphin and Risso's dolphin, minke whale is a common sighting also. Beyond the shelf the composition changes to rarer more oceanic species like fin whale, sei whale and a higher concentration of pilot whales.
- 9.5.3 Harbour porpoise is a common sighting all the way up till the shelf edge and at shallower banks like the Faroe bank.
- 9.5.4 A seal SAC has been designated at the Monach Islands, off the Outer Hebrides, offer a wide area of largely undisturbed habitat for breeding grey seal and there is easy access to the grassy swards and dune systems of the islands. These islands hold the largest breeding colony in the UK, contributing over 20% of annual UK pup production (JNCC)
- 9.5.5 Seal haul out sites number 18 all situated in the Hebrides from the small island of Gasker to Barra Head which is within area of search W1-W3. Fifteen of these have been implemented for common seals and three for grey seals.
- 9.5.6 No seal haul outs have been established further offshore in Sule Skerry or the Flannan Isles.

- Northern Offshore Area

- 9.5.7 In the Northern Offshore Area, the abundance of sightings of marine mammals is higher towards the western part of this area close to the western shelf edge with some spots of high proportional abundance due to species like orca or pilot whales. The same species that are highly abundant in other locations like harbour porpoise are also seen in great numbers in this area.
- 9.5.8 A seal SAC has been designated in North Rona, this is a remote and very exposed island in the North Atlantic off the north-west tip of mainland Scotland. The islands are rarely disturbed by human activities in the breeding season. Grey seal are found over much of the island and use many of the submerged sea caves that are found around the coast. North Rona supports the third-largest breeding colony in the UK, representing some 5% of annual UK pup production.
- 9.5.9 The other SACs and their potential for interaction in this general area, Shetland and Orkney have been covered in the North section of this RLG. Seal haul-outs have, likewise been covered in the Shetland and Orkney sections of the North sector and no other sites exist outwith those already mentioned.

9.5.10 There have been few sightings of basking sharks recorded in this offshore area and no hotspots exist.

- North Eastern Offshore Area

9.5.11 In the North Eastern Offshore Area, the sightings of marine mammals remains moderately constant towards the offshore east section. A grid square of high intensity lies due east from Peterhead which reflects a high level of harbour porpoise sightings in this locality.

9.5.12 Other species that will have to be considered are: atlantic white sided dolphin, white beaked dolpin and Minke whale. Rarer encounters are with are Risso's dolphin, pilot whale and to the northern part of this section orca.

9.5.13 No offshore SACs exist for seals, all seal SACs have been covered in the preceding sections.

9.5.14 No high concentrations of basking sharks exist in the offshore Northeastern section.

Figure 9.22 Cetaceans, Seals and Basking Sharks in North Western Offshore Area

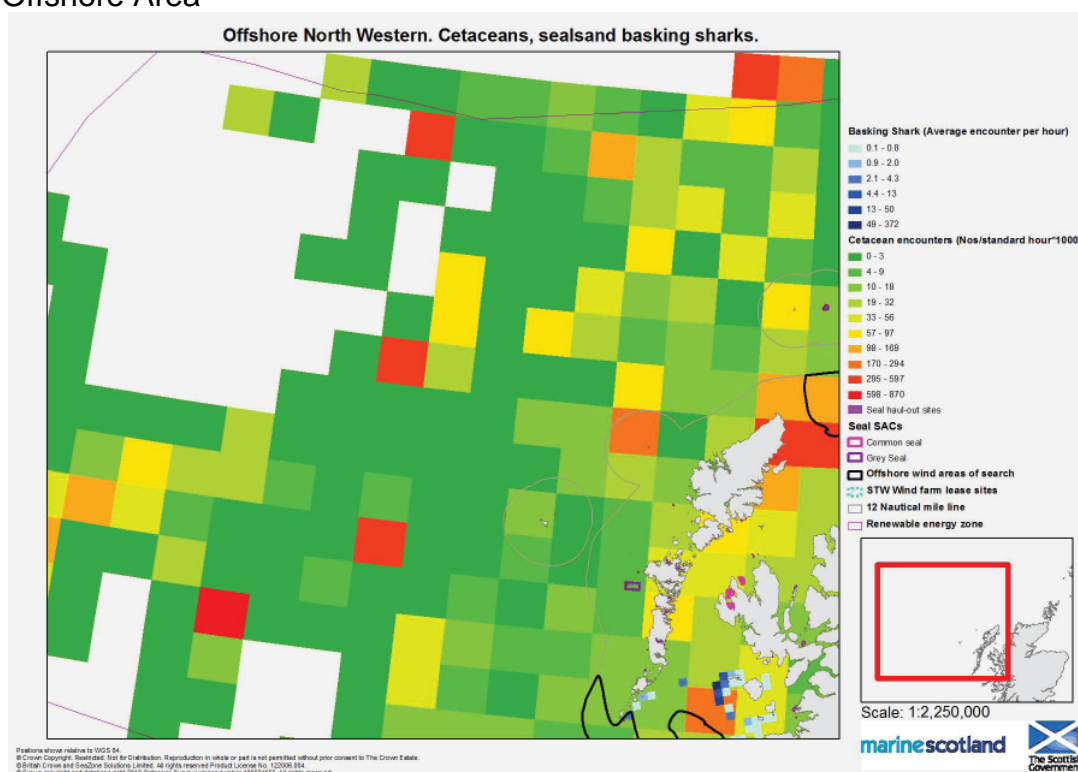


Figure 9.23 Cetaceans, Seals and Basking Sharks in Northern Offshore Area

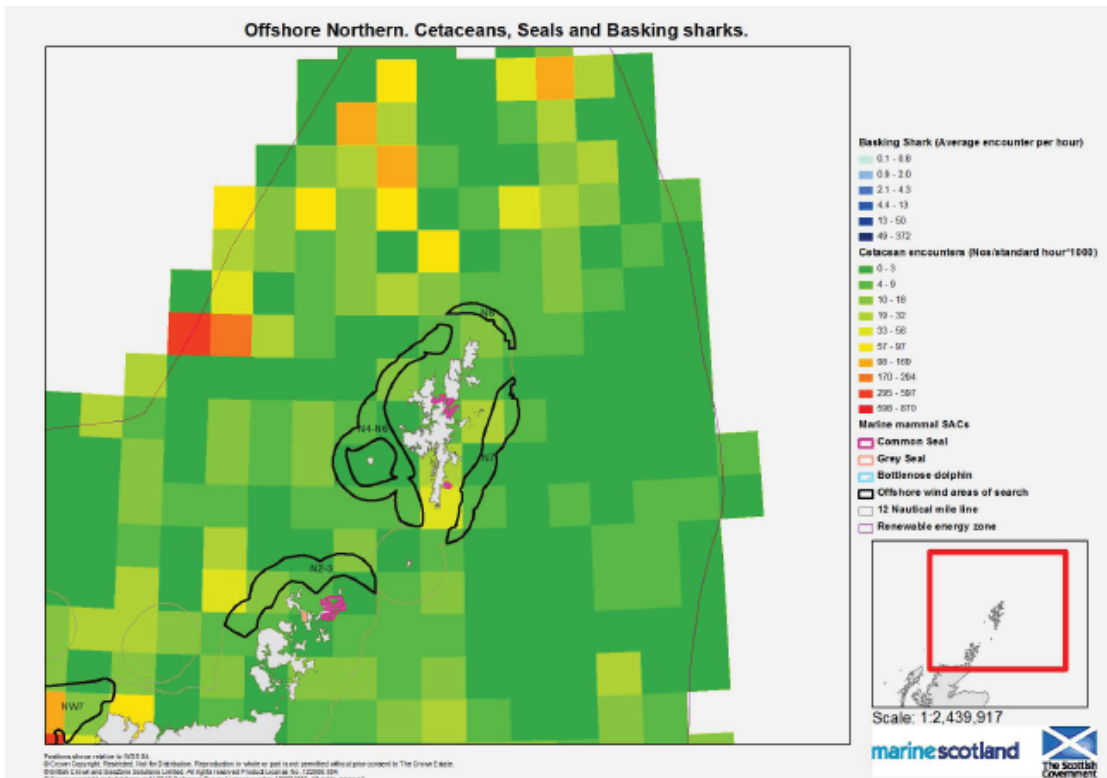
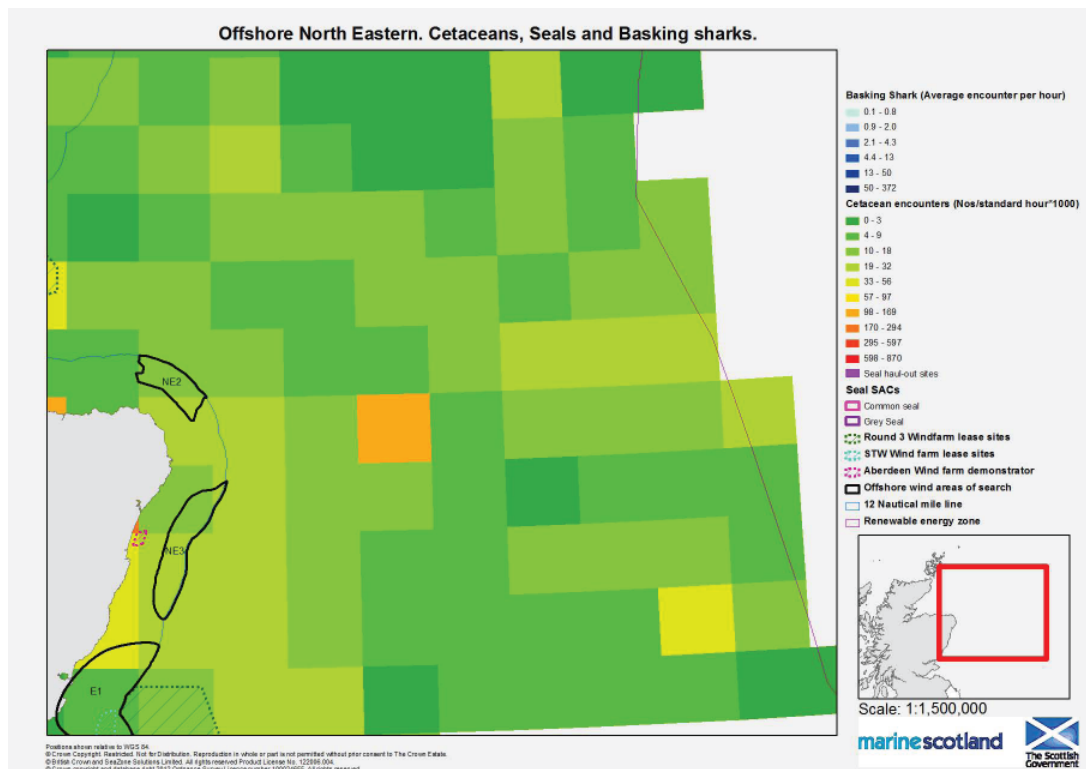


Figure 9.24 Cetaceans, Seals and Basking Sharks in North Eastern Offshore Area



Seabirds

9.5.15. Figures 9.25 – 9.30 provide an overview of seabird activity in the offshore regions. In general, there are decreasing numbers of seabirds the further out from the coastline.

Figure 9.25 Seabirds, Important Bird Areas and RSPB Reserves in North Western Offshore Area (Winter)

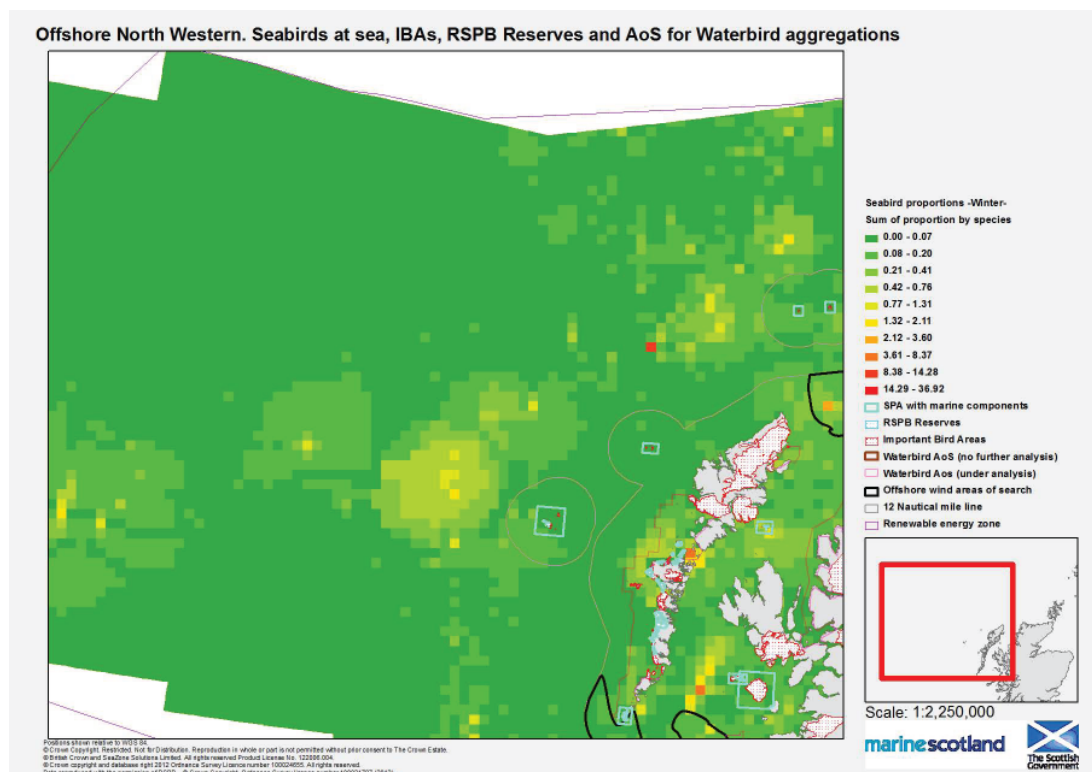


Fig.9.26 Seabirds, Important Bird Areas and RSPB Reserves in North Western Offshore Area (Breeding)

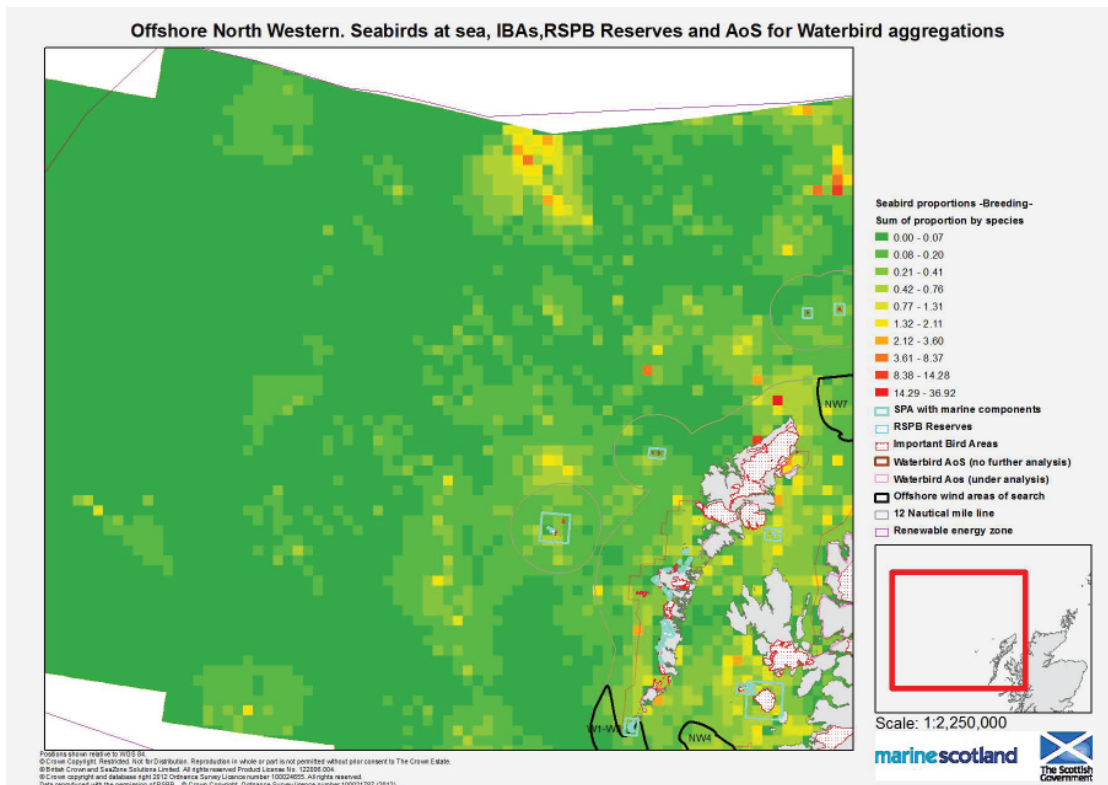


Fig.9.27 Seabirds, Important Bird Areas and RSPB Reserves in Northern Offshore Area (Winter)

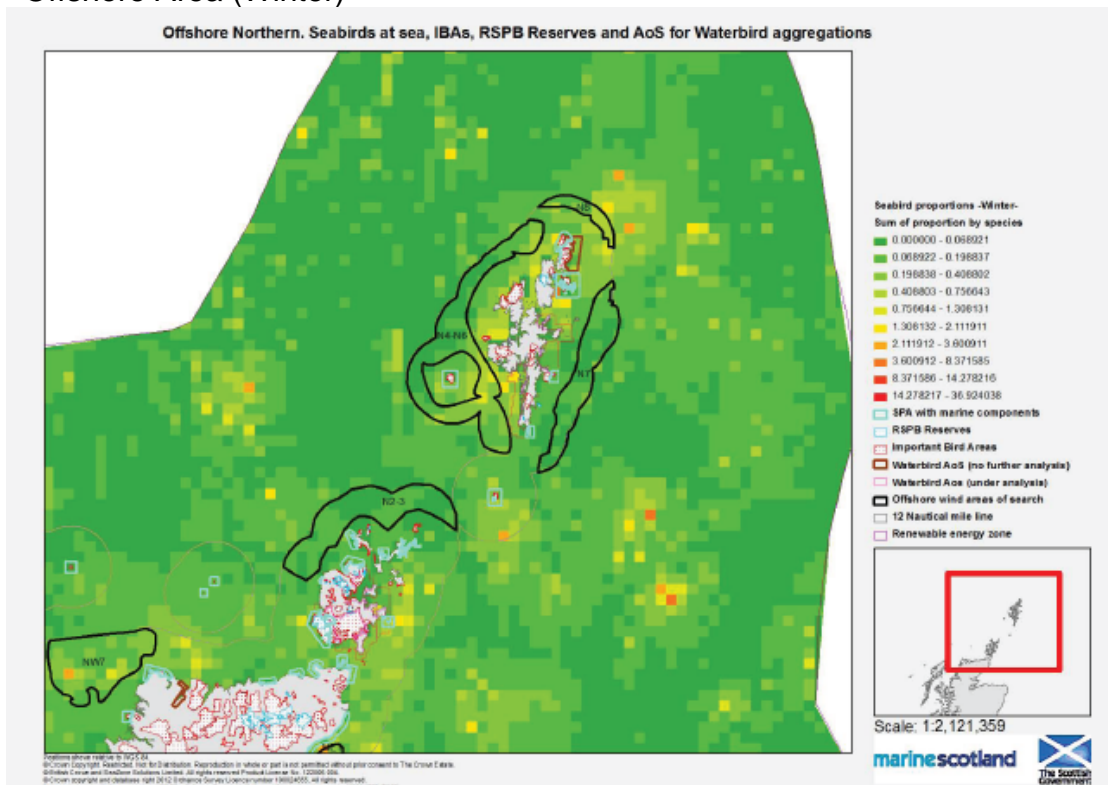


Figure 9.28 Seabirds, Important Bird Areas and RSPB Reserves in North and North East Offshore Area (Breeding)

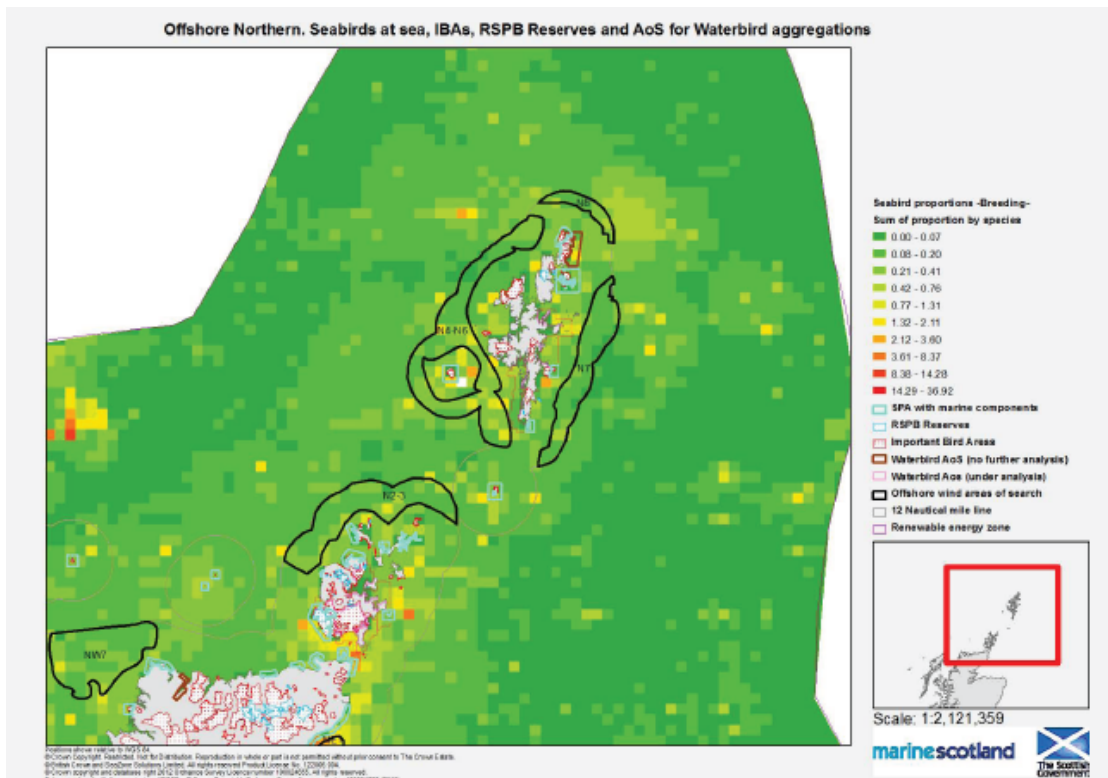


Fig.9.29 Seabirds, Important Bird Areas and RSPB Reserves in North Eastern Offshore Area (Winter)

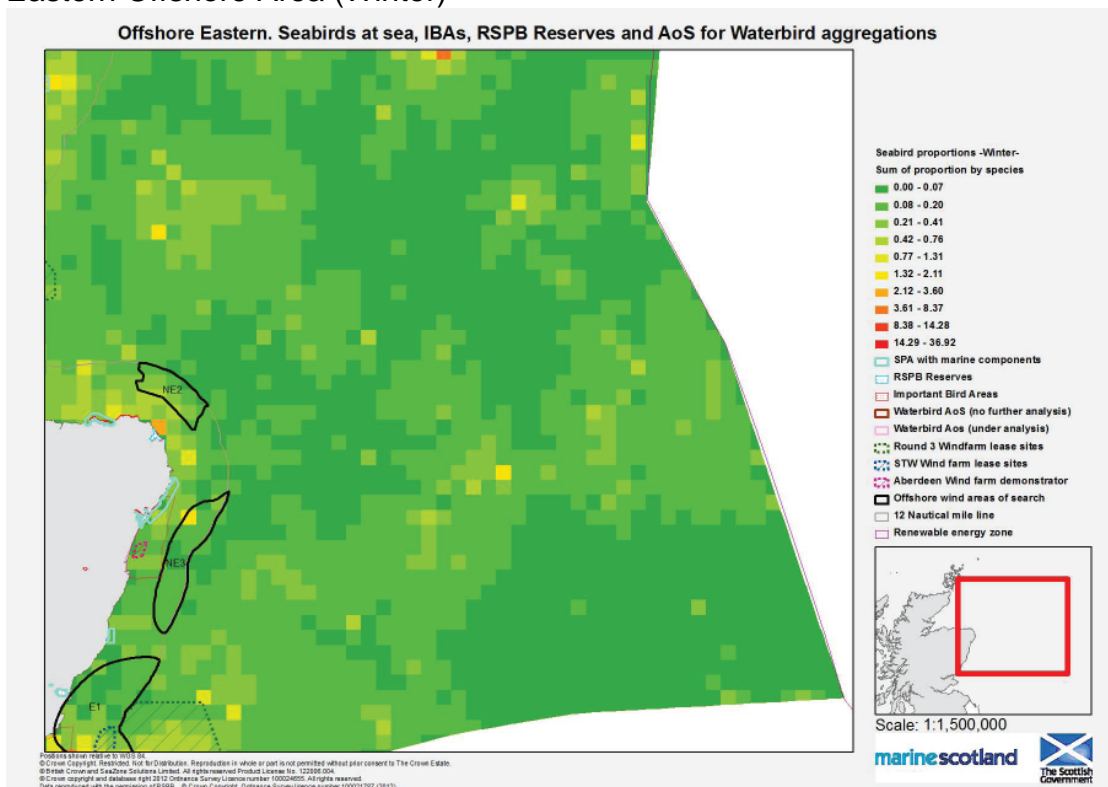
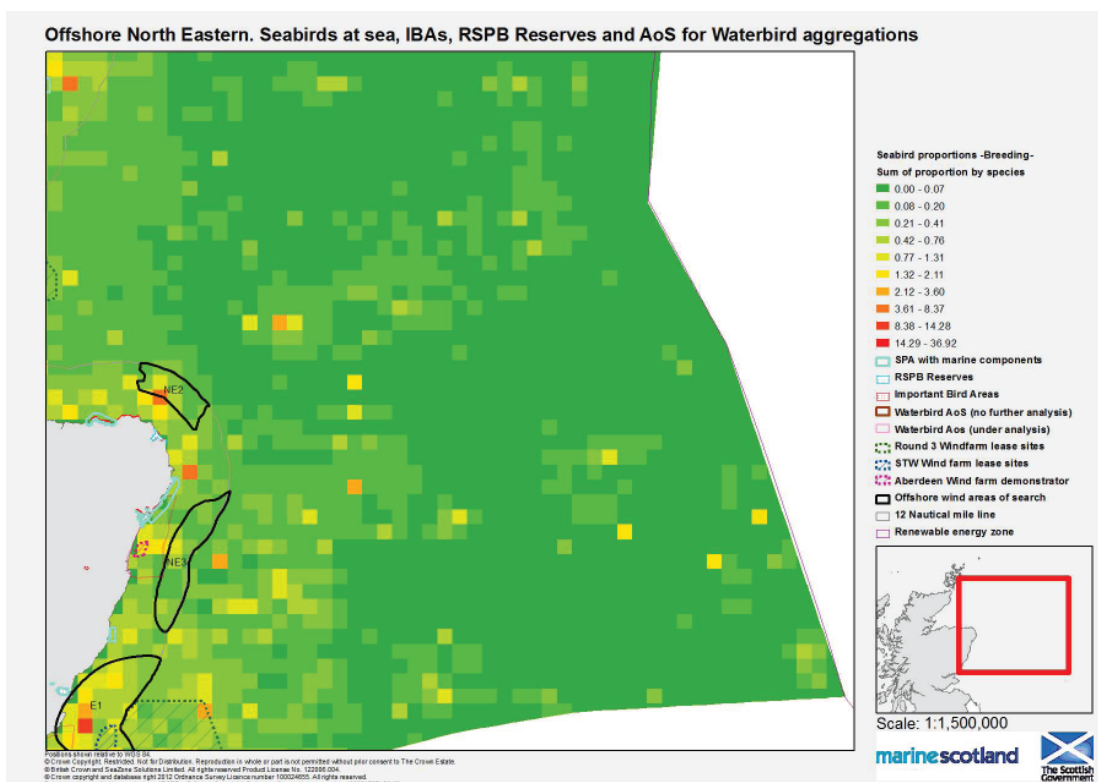


Fig.9.30 Seabirds, Important Bird Areas and RSPB Reserves in North Eastern Offshore Area (Breeding)



9.6 Fishing

9.6.1 Outside 12 nm the fishing activity is predominantly undertaken by vessel 15m and over. As a result the VMS data provides an accurate representation of the key areas of fishing activity.

9.6.2 On the east coast offshore fishing is mainly targeting nephrops and demersal fish by mobile gears. There are also patches of herring through the year. Scallop dredging is mainly contained within the 12 nm limit but in the Moray Firth, Firth of Forth and off Aberdeen there are key scallop ground which extend out with the 12 nm boundary.

9.6.3 Off the northern coast line again demersal fishing is the main activity. These fish are targeted from the north east of Shetland all the way along the shelf edge to the Hebrides. Demersal fish are targeted with both mobile and static gears along the shelf edge.

9.6.4 The mackerel fishery follows a similar pattern to the demersal fishery although there is a progression from east to west though the year. This starts approximately during the last quarter of each year, although movements westward have been happening earlier in the last two to three years.

9.6.5 Also along the northern coast, squid are caught as a by-catch in large numbers. These patches extend west to the Hebrides and are also seasonal fishery.

- 9.6.6 Edible crab are landed all year round in large numbers from grounds north west of Orkney and in the ‘windsock’ closed area (closed as part of the cod recover measures). This is a highly important fishery for fishermen from Orkney, Hebrides and Irish vessels.
- 9.6.7 To the west, Demersal fishing is again the main fishery. This is mainly focused around the Rockall sea mount. There are also large landings of squid from this area.

Figure 9.31 Fishing Intensity in the North Western Offshore Area (Scallop Dredge, Demersal – Mobile Gear, and Nephrops – Mobile Gear)

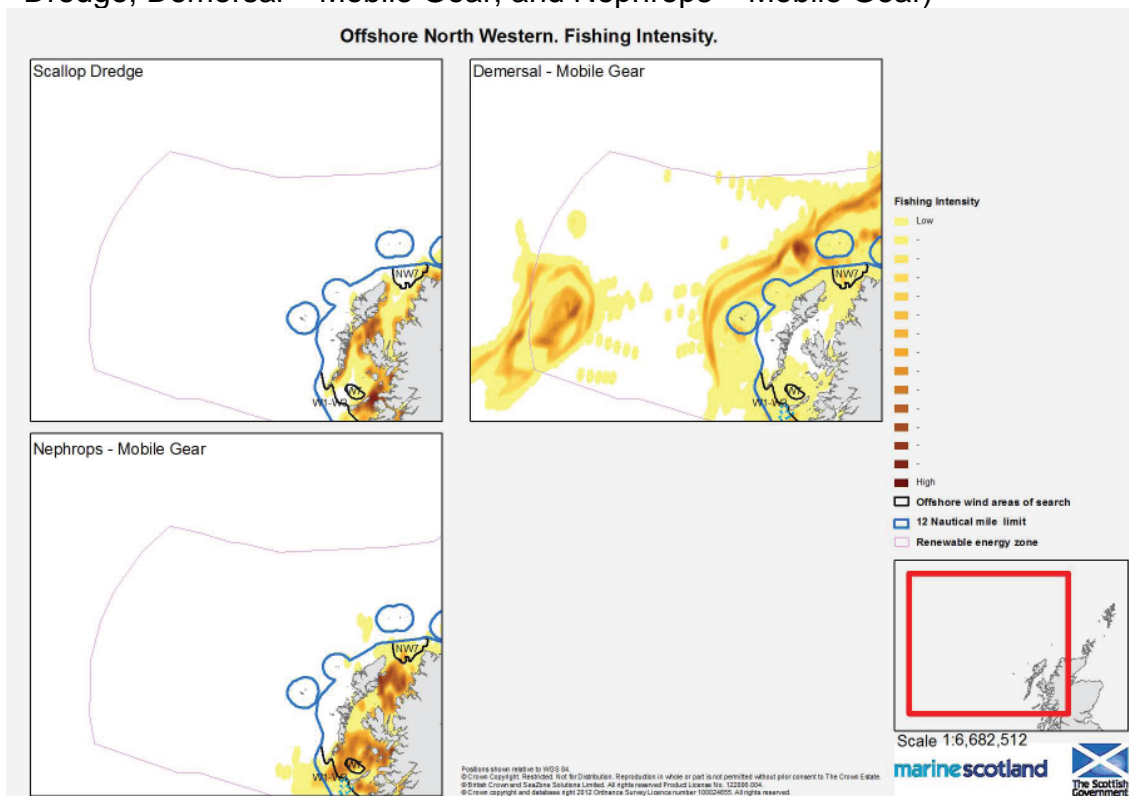


Figure 9.32 Fishing Intensity in the North Western Offshore Area (Pelagic, Demersal – Static Gear, Nephrops - Creels)

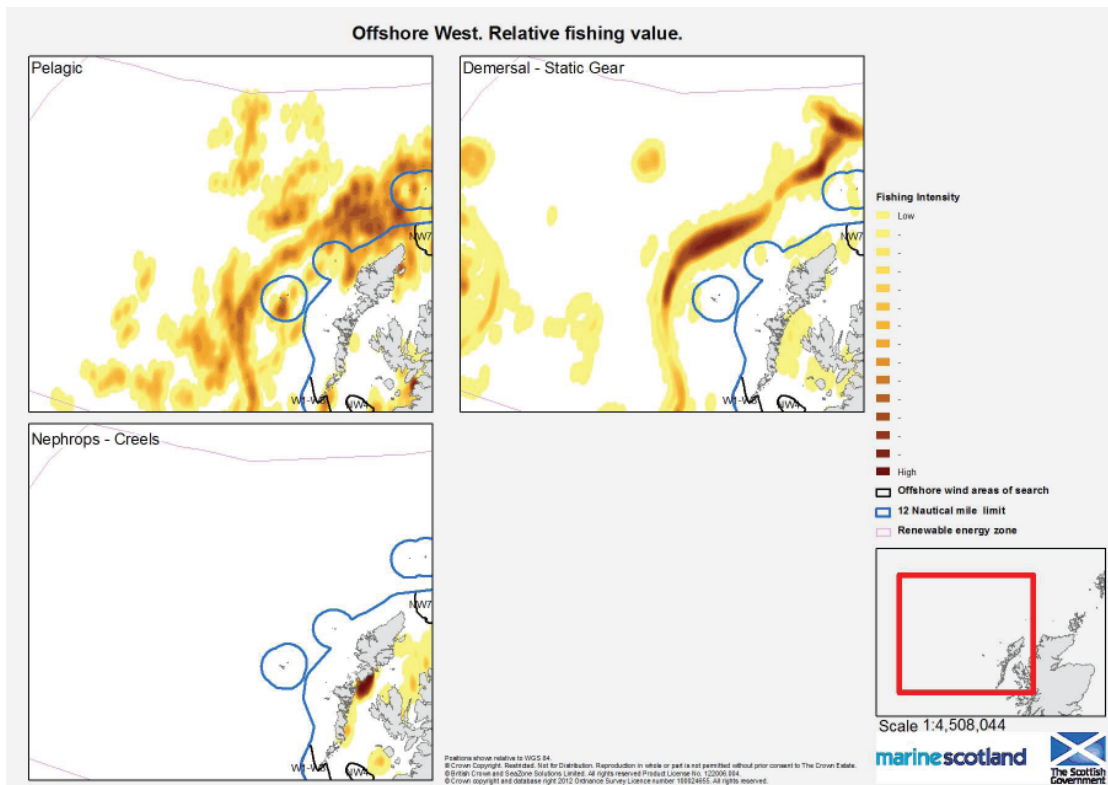


Figure 9.33 Fishing Intensity in the North Western Offshore Area (Brown Crab – Creels, Lobster – Creels, Squid)

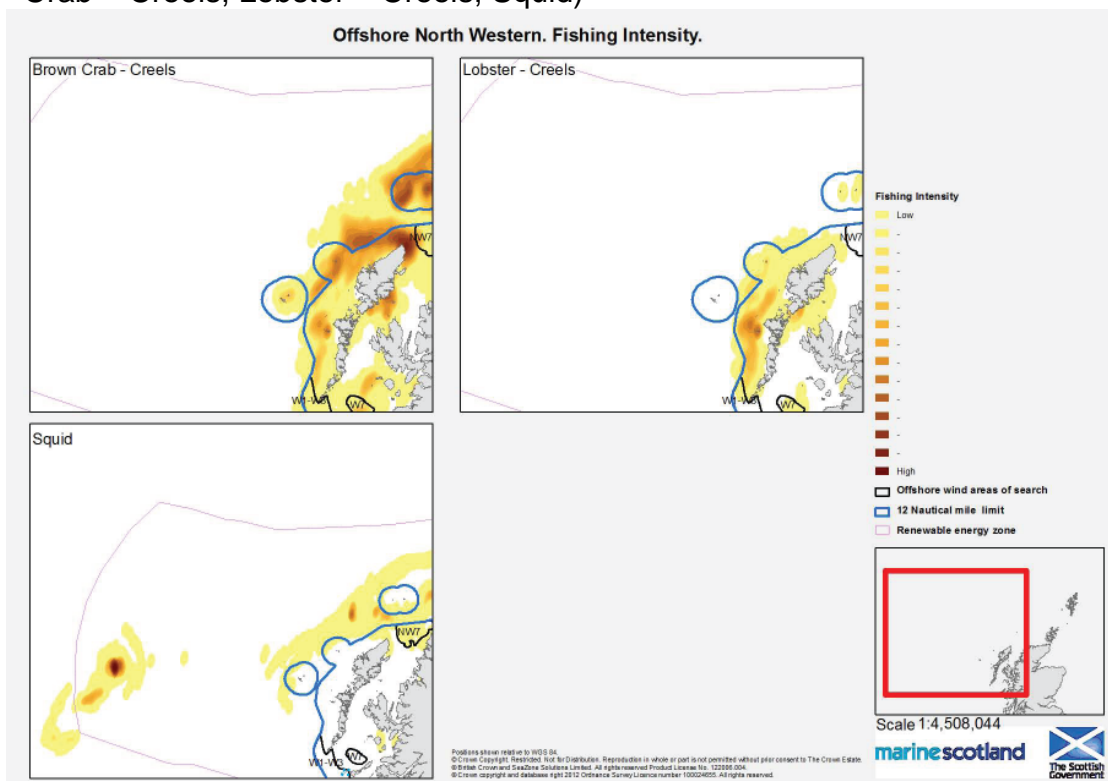


Figure 9.34 Fishing Intensity in the Northern Offshore Area (Scallop Dredge, Demersal – Mobile Gear, and Nephrops – Mobile Gear)

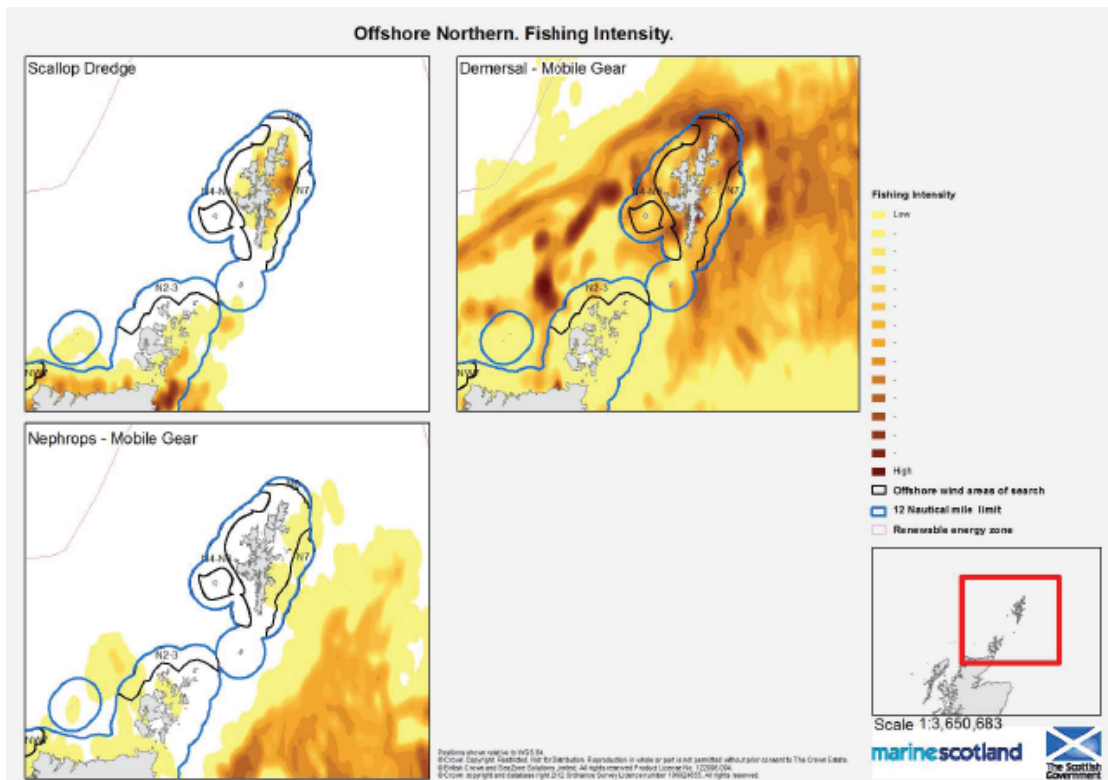


Figure 9.35 Fishing Intensity in the Northern Offshore Area (Pelagic, Demersal – Static Gear, Nephrops - Creels)

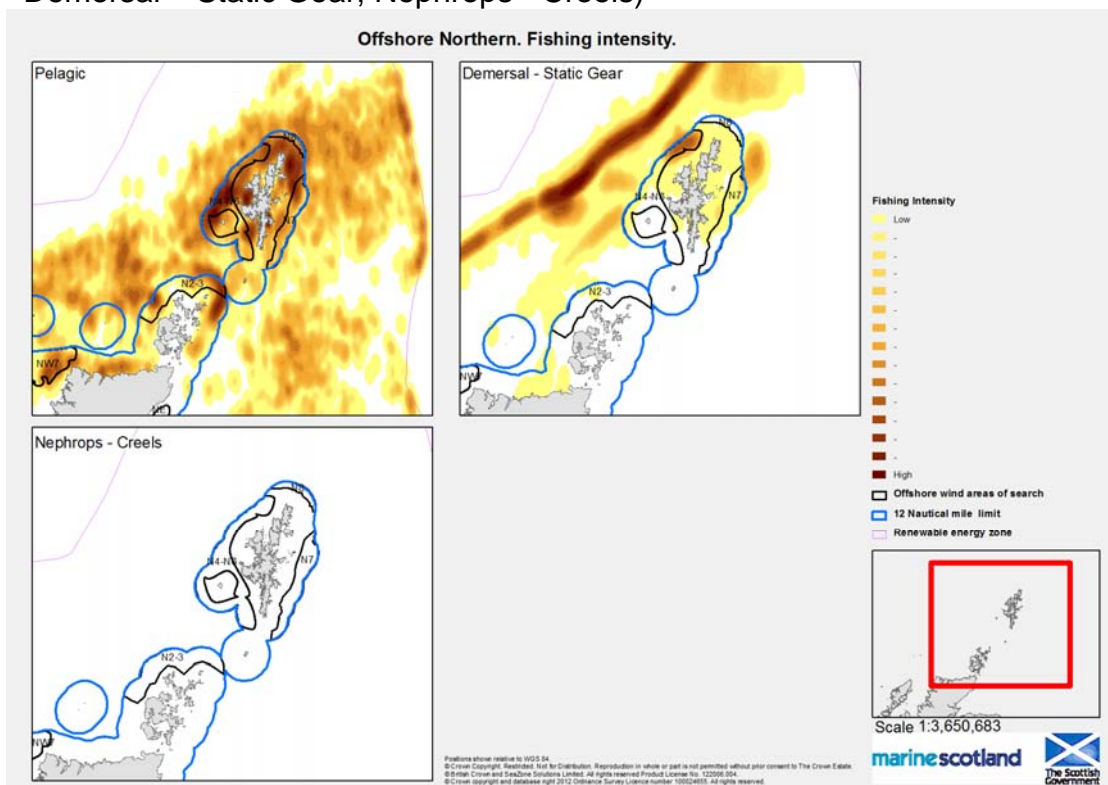


Figure 9.36 Fishing Intensity in the Northern Offshore Area (Brown Crab – Creels, Lobster – Creels, Squid)

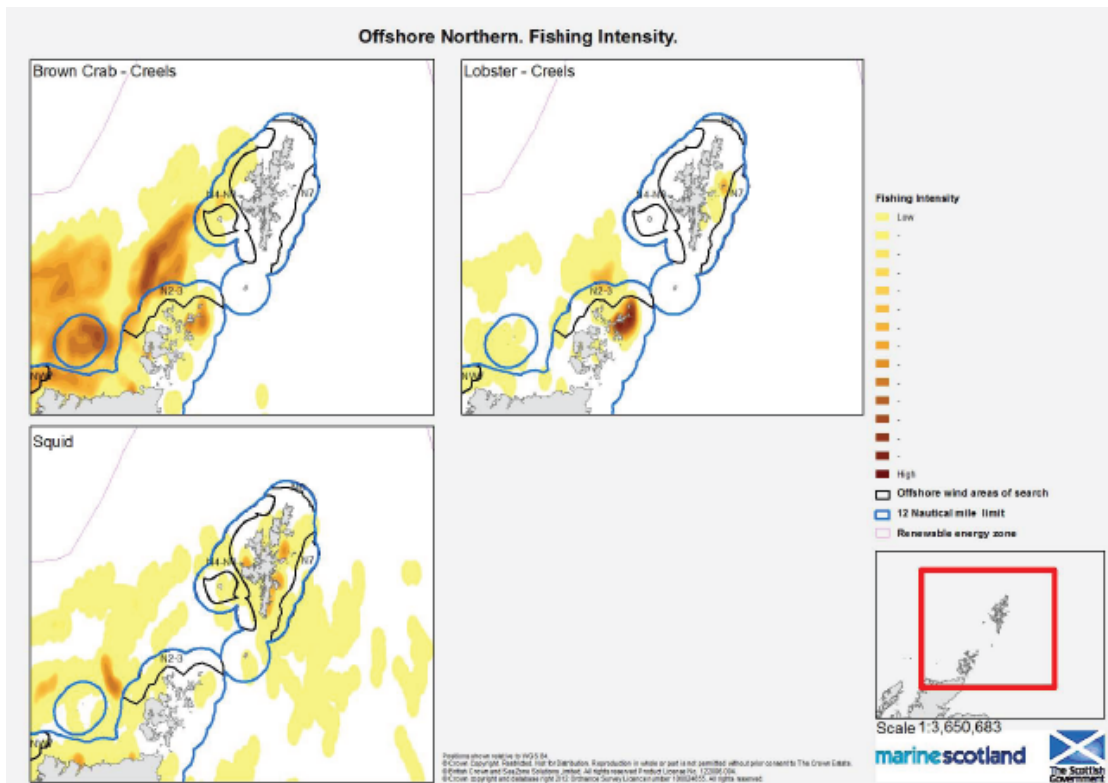


Figure 9.37 Fishing Intensity in the North Eastern Offshore Area (Scallop Dredge, Demersal – Mobile Gear, and Nephrops – Mobile Gear)

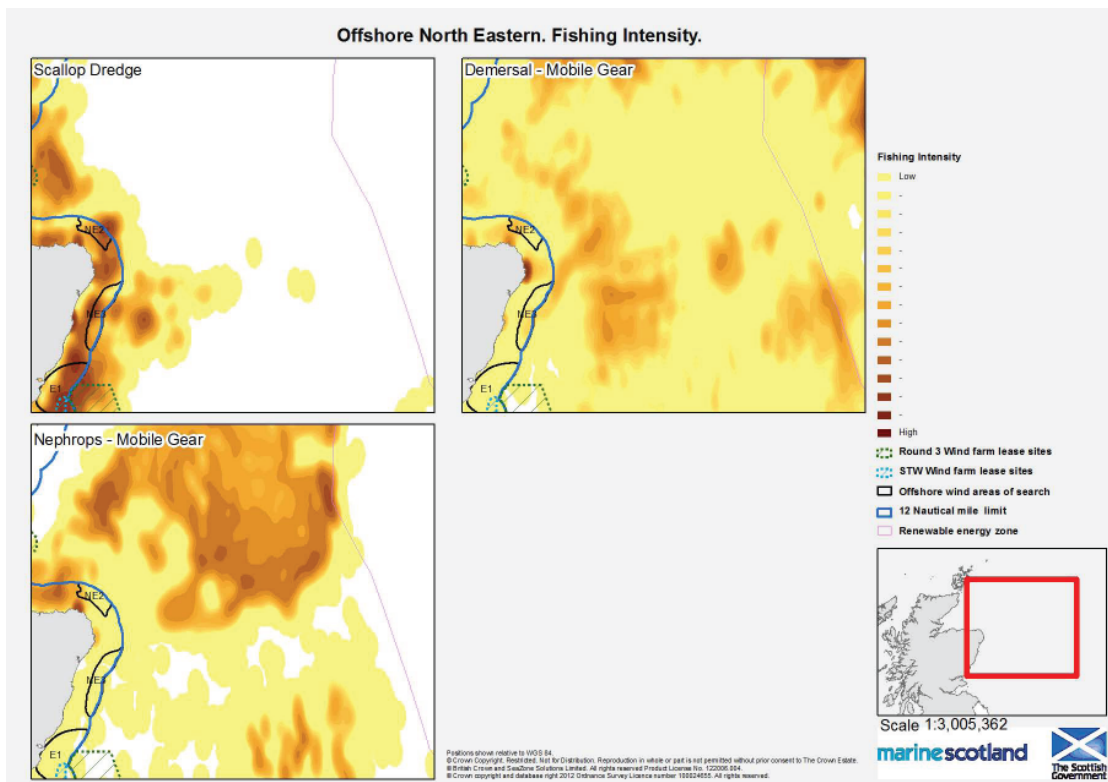


Figure 9.38 Fishing Intensity in the North Eastern Offshore Area (Pelagic, Demersal – Static Gear, Nephrops - Creels)

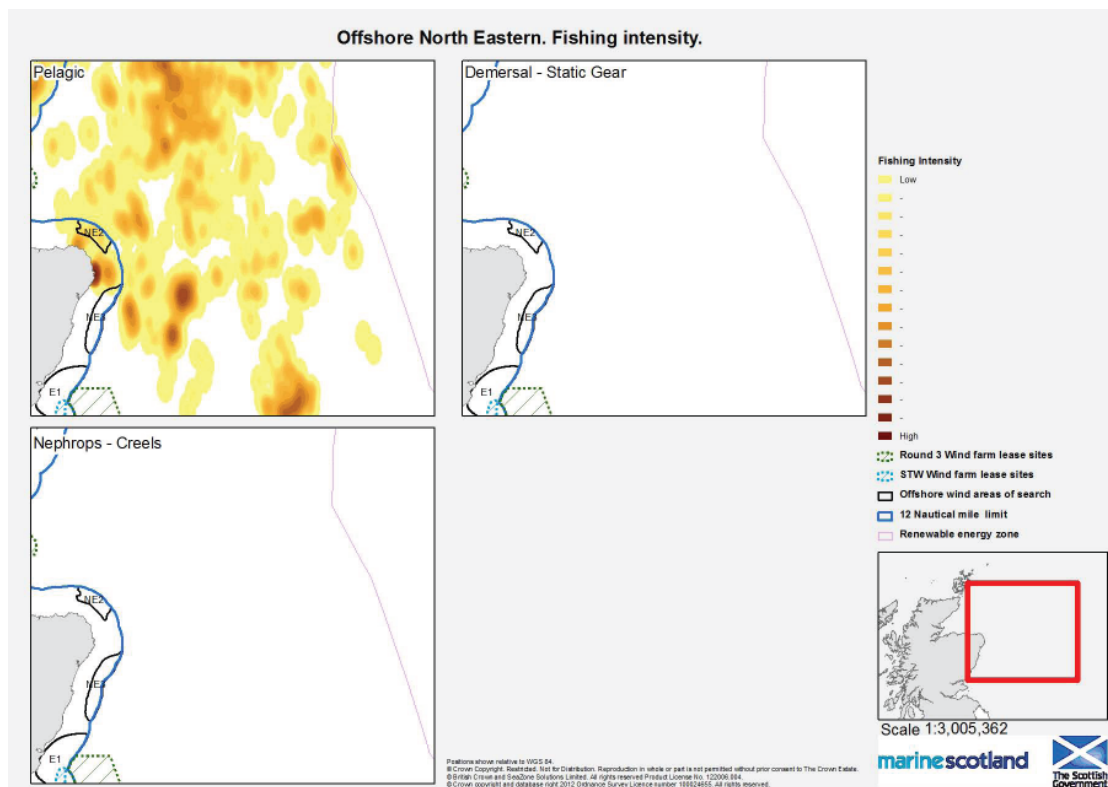
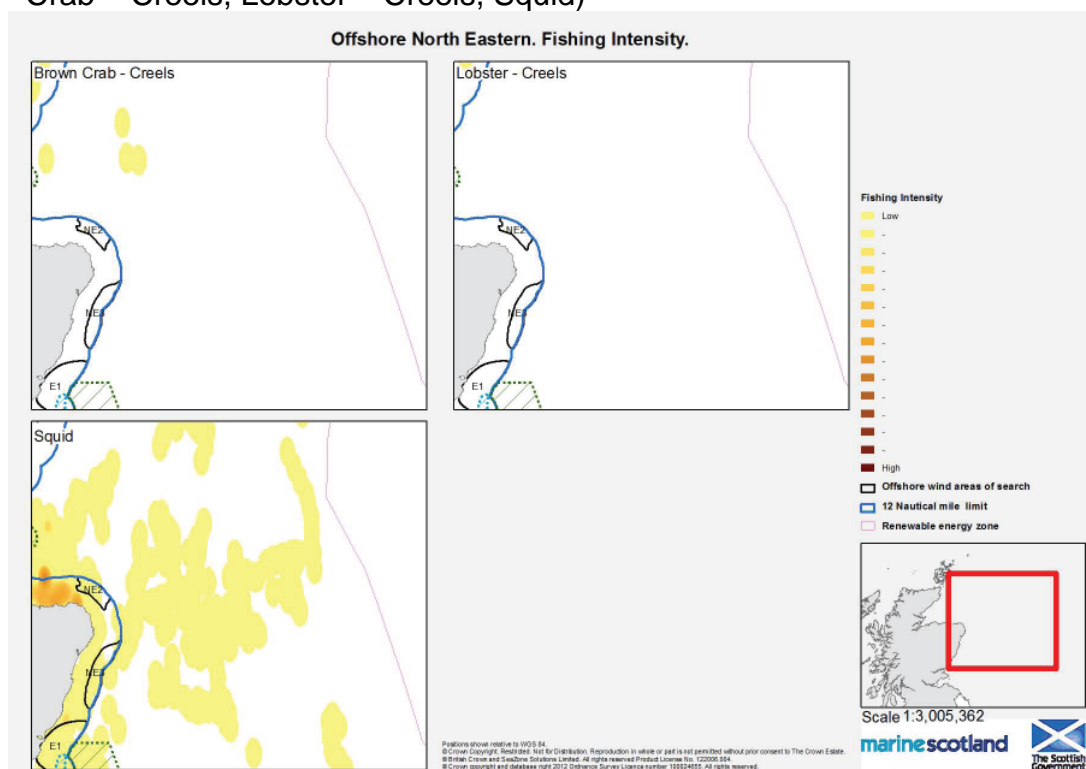


Figure 9.39 Fishing Intensity in the North Eastern Offshore Area (Brown Crab – Creels, Lobster – Creels, Squid)



9.7 Oil and Gas

- 9.7.1 The bulk of offshore Oil and gas installations are found far off the North East coast with most of the platforms to be found between 50 and 150 nm from Aberdeen harbour which is the main British shipping nexus for vessels that work in this industry.
- 9.7.2 These structures radiate out in a north easterly direction from around 50 nm north east of Aberdeen till the separation line between British and Norwegian waters. These structures continue after that in Norwegian waters, however these are not shown on the RLG maps. Platforms then extend along this line northwards till 84 nm north east of Muckle Flugga in the Shetland Isles.
- 9.7.3 Platforms have been built also to the west of Shetland in lesser numbers, many of these identified discoveries have not yet been exploited.
- 9.7.4 To the west of Scotland there are very few oil fields compared to the east and north east.

Figure 9.40 Oil and Gas activities in relation to North Western Offshore Area

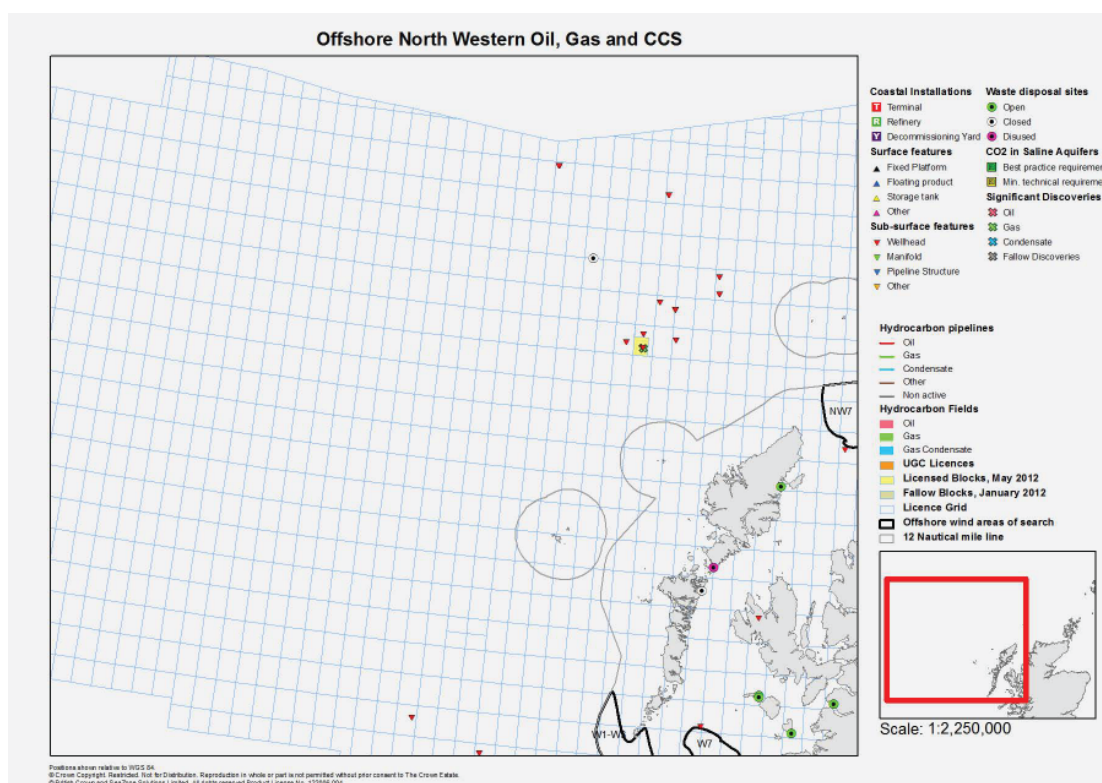


Figure 9.41 Oil and Gas activities in relation to Northern Offshore Area

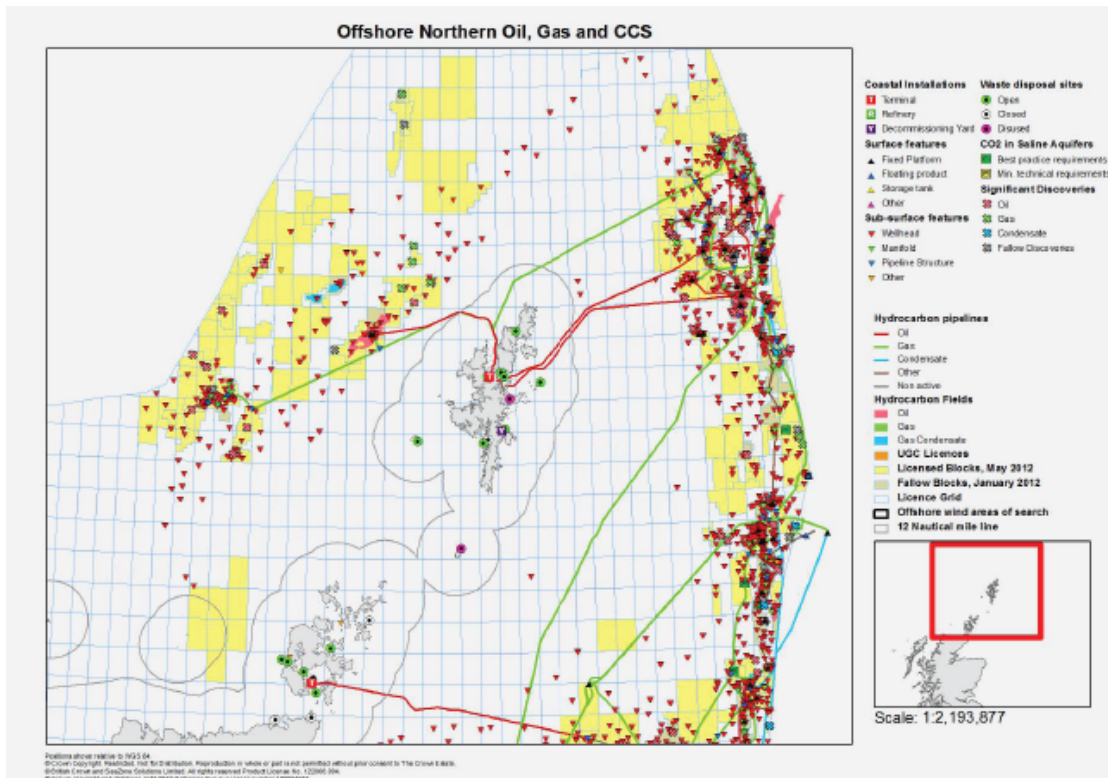
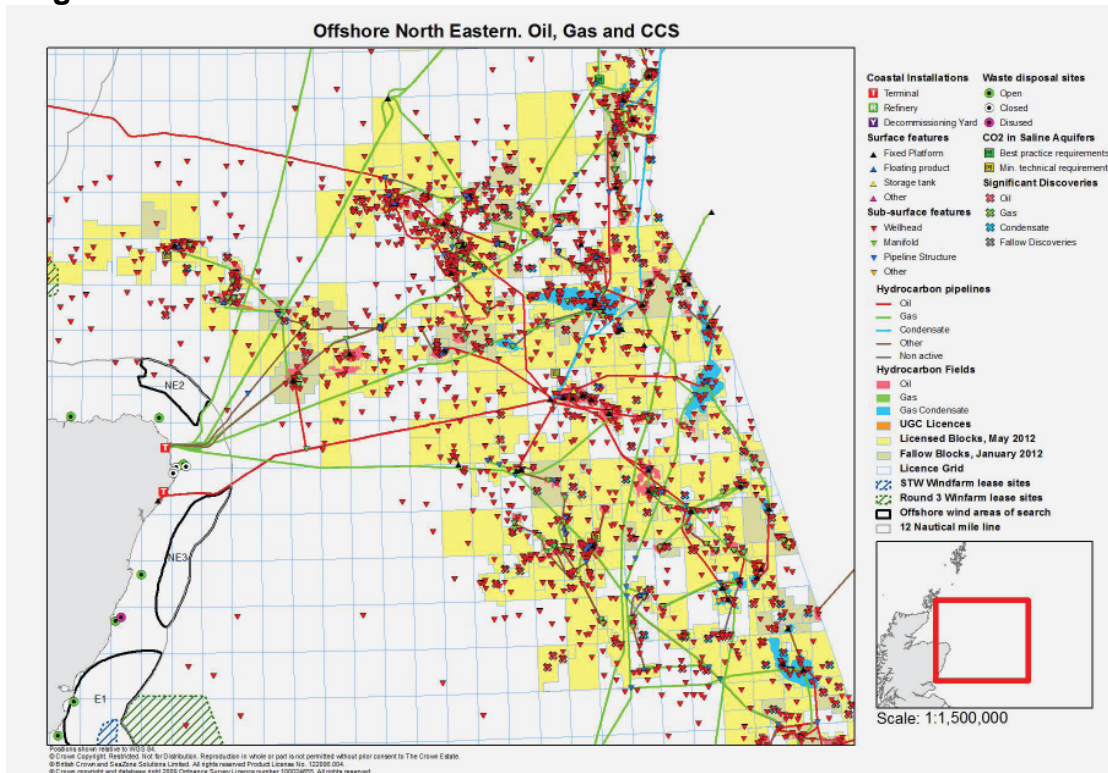


Figure 9.42 Oil and Gas activities in relation to North Eastern Offshore Area



9.8 Shipping

9.8.1 As would be predicted the density of all vessels decreases the further we move from land. In the North Sea even offshore there are opportunities for interactions as the British and Norwegian oil and gas industry is serviced by supply and stand-by vessels that sail from Aberdeen, Peterhead or from ports along the Danish and Norwegian coastline.

9.8.2 Intercontinental shipping lanes will have to be considered if and when offshore wind devices start overlapping these routes.

Figure 9.43 Shipping Activities in the North Western Offshore Area

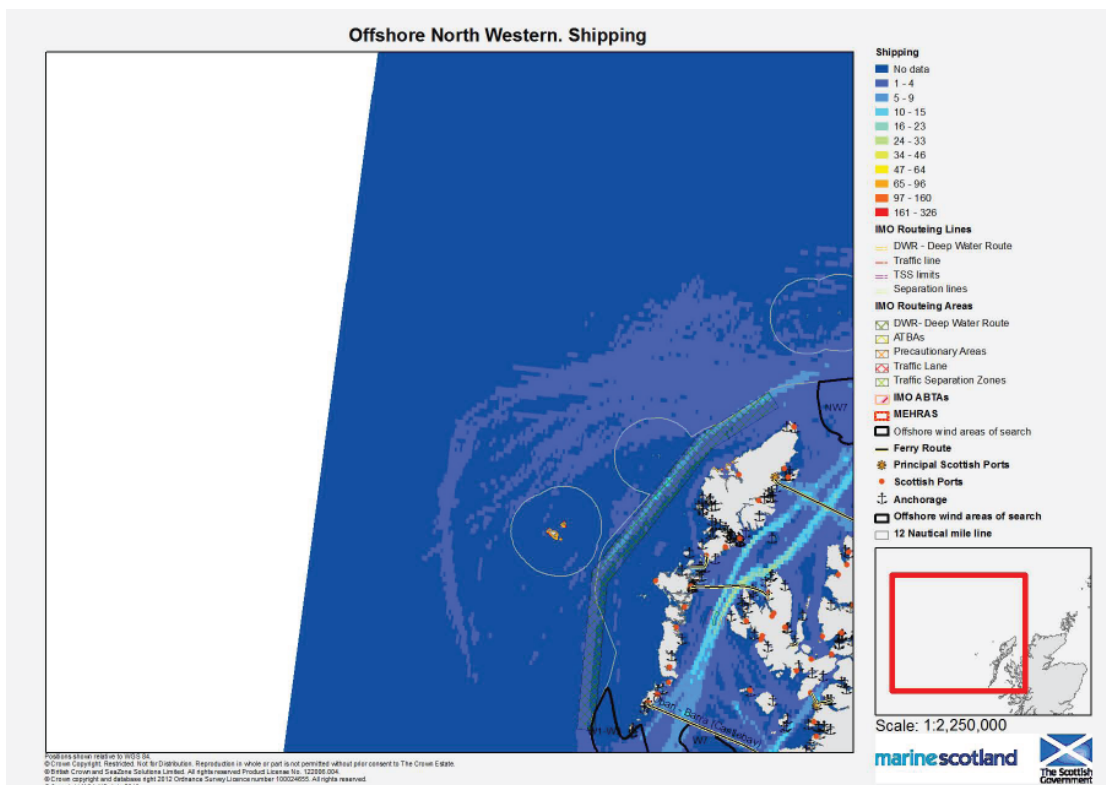


Figure 9.44 Shipping Activities in the Northern Offshore Area

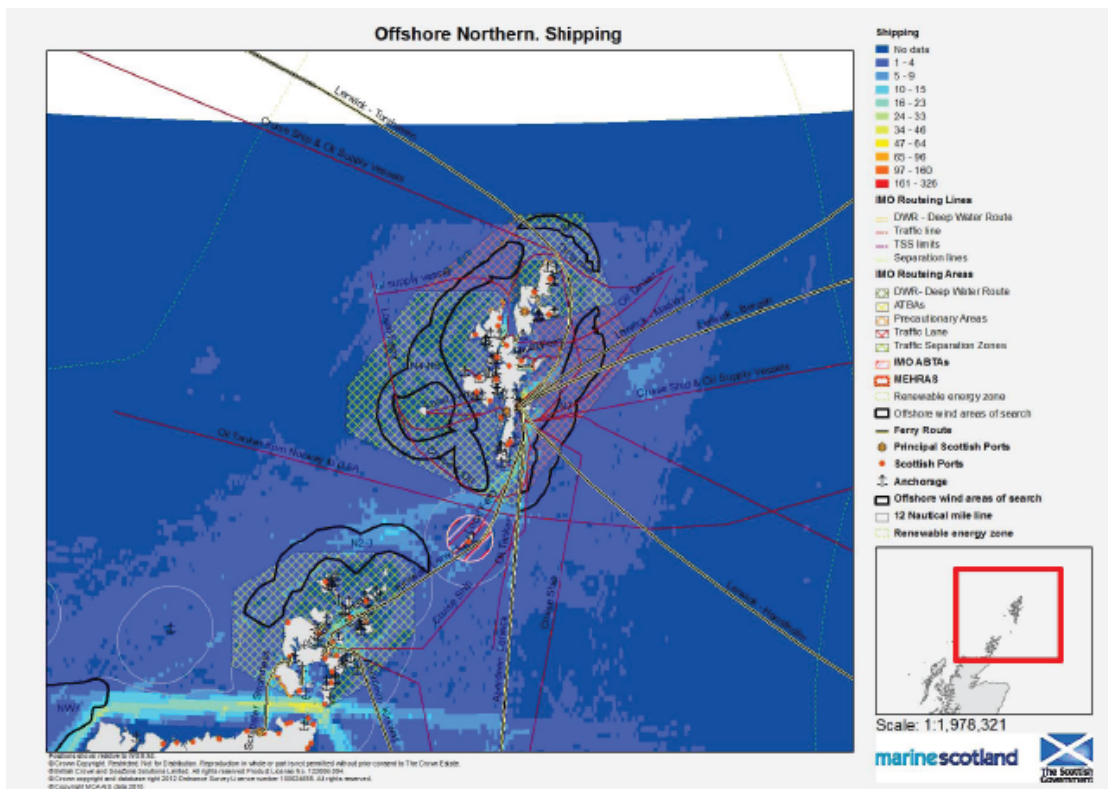


Figure 9.45 Shipping Activities in the North Eastern Area

