



10. Marine Mammals and Marine Reptiles

10.1. Study Area Definition

This chapter of the Scoping Report describes the potential impacts arising from the construction, operation and maintenance, and decommissioning of the Eastern Green Link 3 (EGL 3) hereafter referred to as ‘the Project’ on marine megafauna receptors including marine mammals (Eurasian otter, cetaceans⁶, pinnipeds⁷) and marine turtles (chelonians⁸).

The Scoping Boundary for the Project extends from MHWS in England to MHWS in Scotland. It is nominally 1 km wide, 500 m either side of the centreline, but however, it widens in areas where there is still optionality in the design e.g., to allow for micro-routeing around potential seabed features. It is anticipated that the Marine Licence application boundary will ultimately be 500 m following refinement and rationalisation as the MEA and design process evolves.

There are two proposed Landfalls in England being considered at this stage of the environmental assessment process; Anderby Creek and Theddlethorpe. These options will be subject to further technical feasibility work and stakeholder consultation and will be refined to one preferred option for inclusion in the subsequent Marine Licence application for the Project.

The Study Area has been defined for each species based on the mobility of the species and its geographic extent, as outlined in Table 10-1. This is a precautionary maximum zone of influence that will be reviewed and refined for the MEA based on the final project description and the conclusions of Chapter 6 – Marine Physical Processes.

Kilometre Points (KPs) are used throughout this Chapter to provide context as to where within the Study Area a feature lies. KP 0 is defined at the Anderby Creek Landfall. As there are still alternative Landfalls being considered, KPs have been created along the longest route from the proposed English Landfall at Anderby Creek, around the Holderness Offshore Marine Conservation Zone (MCZ) to the proposed Scottish Landfall at Sandford Bay. The KPs for this route are referenced as KP0 – KP575.3. Alternative options, which branch off this longest route, are routed from the proposed English Landfall at Theddlethorpe to the point where it converges with the longest route (referenced as T_KP0 to T_KP18); and through Holderness Offshore MCZ, which is referenced as KP0 to H_KP40.

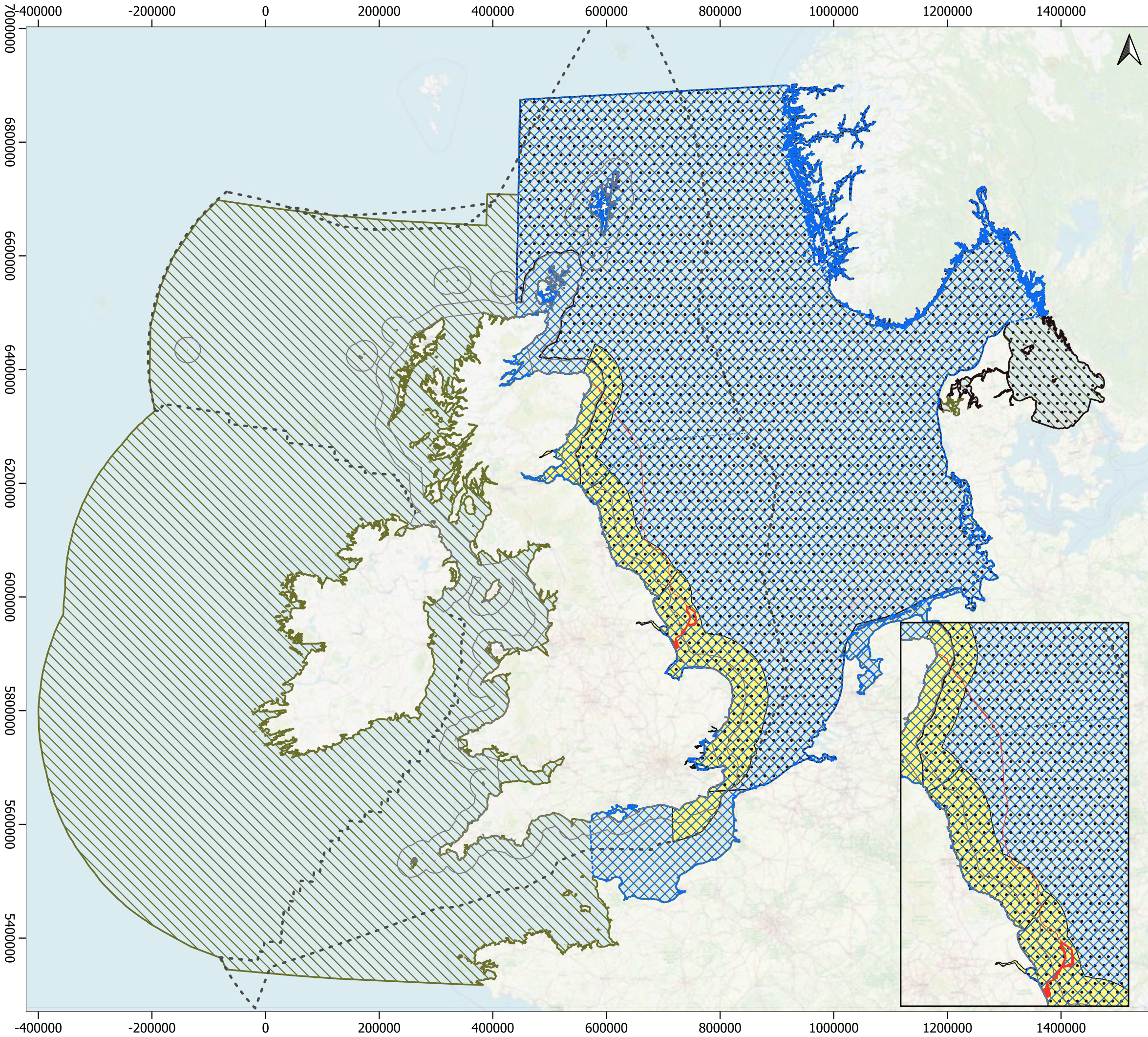
Table 10-1: Study Area for marine mammals and marine reptiles

| Receptor | Extent of Study Area England | Extent of Study Area Scotland | Justification |
|---|---|--------------------------------|--|
| Cetaceans (porpoises, dolphins and whales) | Management Units (MUs) | | Most cetaceans are wide-ranging, and individuals encountered within the North Sea form part of a much larger biological population whose range extends into the North Atlantic and North-West European waters. Management Units (MUs) have been agreed by the UK Statutory Nature Conservation Bodies (SNCBs) for seven of the common regularly occurring species, which provide an indication of the spatial scales at which effects of anthropogenic activities should be taken into consideration (IAMMWG, 2015). The relevant MUs have been used to define the Study Area. Figure 10-1 (Drawing C01494-EGL3-SPEC-001) illustrates the spatial scale of the management unit through which the Project passes. |
| Pinniped Grey seal (<i>Halichoerus gryphus</i>) | Assessment Units: South-East England, North-East England, | Assessment Units East Scotland | It is estimated that grey seal forage up to 100 km from haul-out sites on the coast. Telemetry data indicates that there is exchange of grey seals between colonies in the Netherlands, France, England, Wales, Scotland and Ireland (OAP, 2022). |
| Pinniped Harbour seal (<i>Phoca vitulina</i>) | 50 km radius from landfall and coastline | | Harbour seals are not known to make trips greater than 50 km from haul out sites (OAP, 2022). |
| Eurasian otter (<i>Lutra lutra</i>) | Up to 40 km along the coast | | Forage in a narrow zone close to the shore (<100 m) (Gov.uk, 2022). |
| Chelonians Sea turtles | North Sea | | Chelonians are wide ranging and infrequent visitors to UK waters. |

⁶ Definition of cetaceans is whales, dolphins and porpoises.

⁷ Definition of pinnipeds is seals, sea lions and walrus.

⁸ Definition of chelonians is sea turtles.



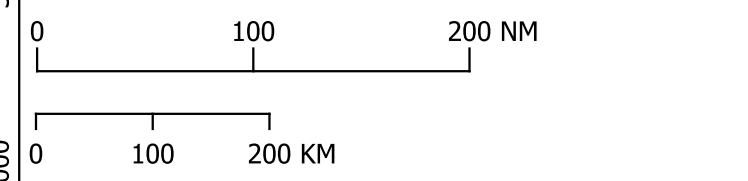
Marine Mammals Study Area

C01494-EGL3-SPEC-001-D



- Exclusive Economic Zone Limit (EEZ)
- 12NM Limit
- Scottish Adjacent Waters
- EGL 3 Scoping Boundary

- Marine Mammals Management Unit**
- ▨ North Sea, Harbour Porpoise
 - Greater North Sea (Bottlenose dolphin)
 - ▧ Celtic and Greater North Sea (Short-beaked dolphin, White-beaked dolphin and Minke whale)
 - OSPAR Seal Indicator Assessment Units



| | |
|--------------------------|-------------------------------------|
| Date | 06/10/2023 |
| Coordinate System | ETRS89 / UTM Zone 30N |
| Projection | Universal Transverse Mercator (UTM) |
| Unit | Meters |
| Scale at A3 | 1:6,500,000 |
| Created | EP |
| Reviewed | D Summers/ S Pearce |
| Authorised | A Farley |

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10.2. Data Sources

Data sourced for the baseline characterisation will be presented in accordance with relevant guidance for the topic. The datasets that will be used to inform the description of the baseline environment for the MEA are described in the following sub-sections.

10.2.1. Site-specific Survey Data

Extensive contemporary and historic information is available regarding abundance and distribution of marine mammals and marine reptiles in the North Sea. Following a detailed review to inform the scope of the data and assessment, as presented, no site-specific surveys are planned for this topic.

10.2.2. Publicly Available Data

Desk based review of publicly available data sources (literature and GIS mapping files) will be used to describe the baseline environment. Table 10-2 lists the key data sources which will be used in the assessment.

Table 10-2: Key publicly available data sources for marine mammals and marine reptiles

| Data Source | Description | Coverage | |
|--|--|--------------------|---------------------|
| | | English Study Area | Scottish Study Area |
| Natural England | Natural England Conservation Advice for Marine Protected Areas in England | ✓ | |
| NatureScot - SiteLink | SiteLink provides access to data and information on key Protected Areas across Scotland | | ✓ |
| Joint Nature Conservation Committee (JNCC) | JNCC Conservation Advice for Marine Protected Areas | ✓ | ✓ |
| Marine Scotland – National Marine Plan Interactive tool (NMPI) | An interactive tool that enables access to spatial information relating to the marine environment in Scotland | | ✓ |
| Marine Management Organisation (MMO) – Marine Activity Data | An interactive tool that enables access to spatial information relating to the marine environment in England | ✓ | |
| Magic Maps | An interactive mapping system developed by Defra that holds spatially referenced data on the natural environment for England | ✓ | ✓ |
| DECC (2022) | Offshore Energy Strategic Environmental Assessment 4 | ✓ | ✓ |
| Reid <i>et al.</i> (2016) | Atlas of cetacean distribution in northwest European waters | ✓ | ✓ |
| Hammond <i>et al.</i> (2021) | Estimates of cetacean abundance in European Atlantic waters in summer 2016 from the SCANS-III | ✓ | ✓ |
| Gilles <i>et al.</i> (2023) | Estimates of cetacean abundance in European Atlantic waters in summer 2022 from the SCANS-IV aerial and shipboard surveys | ✓ | ✓ |
| Joint Cetacean Data Programme (JCDP) (2022) | Joint Cetacean Data Programme (JCDP) - portal collating at-sea effort-related data collected via ship-based or aerial methods, under the JCDP. | ✓ | ✓ |
| Heinanen and Skov (2015) | The identification of discrete and persistent areas of relatively high harbour porpoise density in the wider UK marine area | ✓ | ✓ |
| Russell <i>et al.</i> (2017) | Updated seal usage maps: The estimated at-sea distribution of grey and harbour seals | ✓ | ✓ |
| Sea Watch Foundation | Sea Watch Foundation sightings data | ✓ | ✓ |



| Data Source | Description | Coverage | |
|--|---|--------------------|---------------------|
| | | English Study Area | Scottish Study Area |
| The Marine Life Information Network (MarLIN 2023) | Species Information | ✓ | ✓ |
| National Biodiversity Network Gateway http://data.nbn.org.uk/ | Occurrence records for marine turtles, cetaceans, pinnipeds and Eurasian otter. | ✓ | ✓ |
| Waggitt <i>et al.</i> (2020) | Distribution maps of cetacean and seabird populations in the North-East Atlantic | ✓ | ✓ |
| Hague <i>et al.</i> (2020) | Provides a review of abundance estimates and distribution of marine mammals across the North Sea and Atlantic areas of Scottish waters | ✓ | ✓ |
| Special Committee on Seals (SCOS, 2022) | UK seals monitoring programme – annual report 2022 (or subsequent update if released) | ✓ | ✓ |
| Carter <i>et al.</i> (2020) | Habitat-based predictions of at-sea distribution for grey and harbour seals in the British Isles | ✓ | ✓ |
| Reeds (2004) | Provides a summary of turtle distribution data supplied by the Ocean Biodiversity Information Systems (OBIS), | ✓ | ✓ |
| Crawford (2010) | Fifth otter survey of England 2009 – 2010 | ✓ | |
| IAMMWG (2022) | Updated abundance estimates for cetacean Management Units in UK waters. JNCC Report No. 680 | ✓ | ✓ |
| Offshore Wind Farm Aerial Surveys | Offshore Wind Farms collect two years of aerial survey data to establish the baseline for marine mammals within the array sites. The following OWFs lie within the Study Area and data will be sought from the projects consent applications to inform the baseline: Hornsea Three, (England) Dogger Bank A, (England) Kincardine, (Scotland) Seagreen Alpha and Bravo (Scotland) Other applications will be monitored to see if any developments at the pre-consent phase release relevant information which can be used. Examples may include Dogger Bank South (England). | ✓ | ✓ |

10.2.3. Additional Studies

10.2.3.1. Electromagnetic Field (EMF) Study

A study will be undertaken to calculate the predicted electromagnetic fields to be generated by the submarine power cables due to the electric current flowing along the cables. The electric and magnetic field strengths would be highest where the cables are separated and/or partially unburied. The study would therefore focus on determining the maximum field strengths and the distance at which the fields dissipate to background values. This study would be used to determine the spatial extent over which electromagnetic changes could affect sensitive receptors including how they navigate.

10.3. Consultation

Consultation will be undertaken with relevant stakeholders to supplement the desktop review and studies. The following bodies will be consulted, as a minimum, to ensure that the most up-to-date information is collated:



Table 10-3: List of stakeholders to be consulted.

| England | Scotland |
|-----------------|------------|
| JNCC | JNCC |
| Cefas | Cefas |
| Natural England | NatureScot |

10.4. Baseline Characterisation

10.4.1. Introduction

This section has been split into the following sub-sections:

- General species information
- English baseline characterisation
- Scottish baseline characterisation

Due to the nature of cetaceans being wide ranging species and not being restricted by country boundaries, species descriptions are presented in a general section. The section is then divided to describe the baseline characteristics in the English and Scottish Study Areas respectively. The baseline characterisation sections include information on sightings data, designated sites, and protected species specific to the Study Areas of each country.

10.4.2. General Species Information

10.4.2.1. Overview

Large scale surveys to monitor the cetacean population size have been carried out in UK Waters by Small Cetacean Abundance in the European Atlantic and North Seas (SCANS) and Cetaceans Offshore Distribution and Abundance in the European Atlantic (CODA). Surveys were carried out in 1994, 2005, 2016 and 2022 by SCANS and 2007 for CODA. The Project passes through survey Block O in English waters and Block R in English and Scottish waters as designated in the SCANS III survey and renamed respectively Block NS-C and NS-D in the SCANS IV survey. Figure 10-2 illustrates the survey blocks used in the 2016 SCANS III survey and the 2022 SCANS IV survey.

The data showed that twenty-eight cetacean species have been recorded in UK waters, however, there are only eleven species that are regular visitors. The other recorded species are rare occasional visitors (DECC, 2022). Compared to other parts of the UK continental shelf, the North Sea has relatively low densities and numbers of species recorded.

The Sea Mammal Research Unit (SMRU) at the University of St Andrews provide annual reports on the state of the UK Seal populations through the Special Committee on Seals (SCOS). The most recently published report (dated 2021) looked at data from between 2016 and 2019 for the two species of seal, harbour seal (*Phoca vitulina*) and grey seal (*Halichoerus grypus*) (SCOS, 2022). These data showed an overall increase in the grey seal population between 2016 and 2019 of <1.5% in England and Scotland, however, there has been a decline in the population of harbour seal of up to 38% in some English waters. There is a similar decline in numbers off the east coast of Scotland, yet this does not appear to be the case on the west coast.

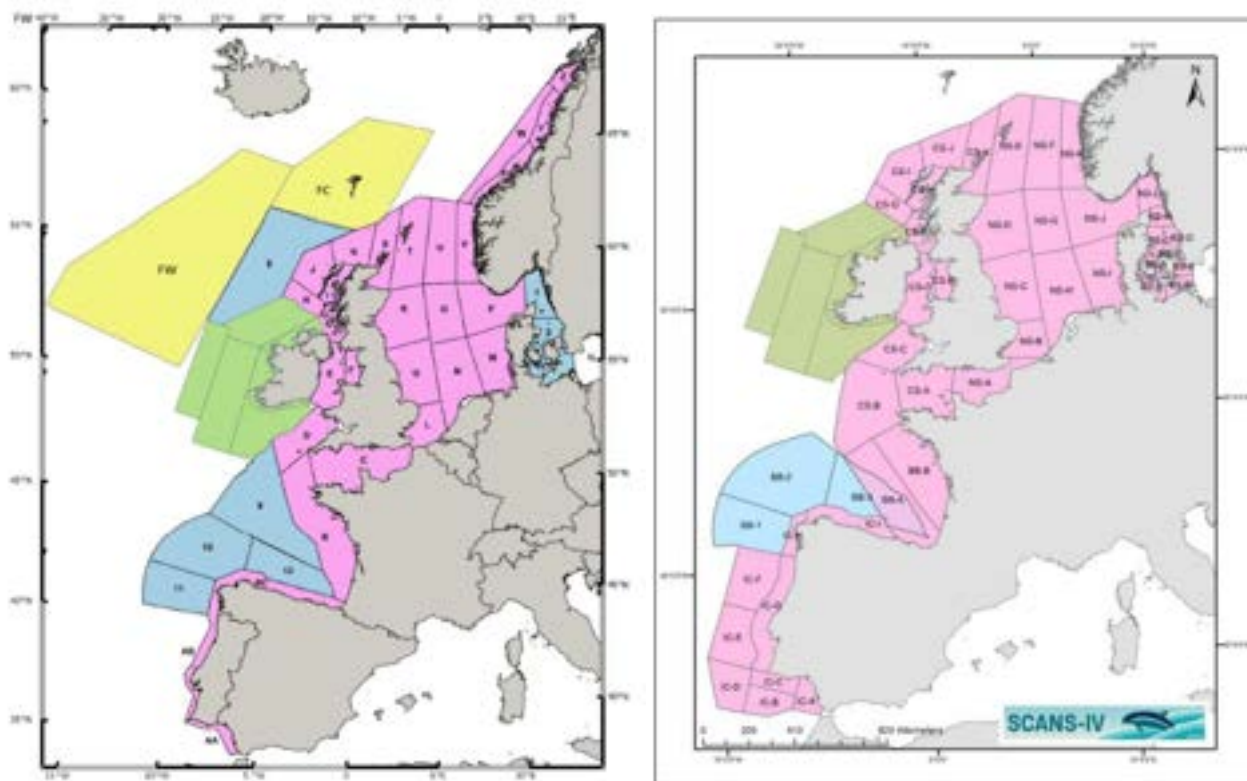


Figure 10-2: Left image - SCANS III survey blocks – blue areas surveyed by vessel and pink areas surveyed by air (from Hammond et al., 2021) Right image – SCANS IV survey blocks – blue areas surveyed by vessel and pink areas surveyed by air (from Gilles et al. 2023)

10.4.2.2. Cetaceans

Harbour porpoise (*Phocoena phocoena*)

The harbour porpoise is widespread around the UK. It is the smallest and most common cetacean found within the north-western European continental shelf waters. It is the most populous cetacean species in the North Sea.

Individuals can grow up to 1.6 m in length with the females being about 0.15 m larger than the male. Typically, they are found in small groups of 1 to 3 animals. They generally appear shy, avoiding other species and rarely interact with boats. Due to their size and nature, they are typically difficult to spot for survey purposes.

Though the harbour porpoise has been recorded all year round, they are more common in the summer when they move closer to the shoreline to breed. Individuals also tend to move further north during the summer months so are more frequently recorded in the English Study Area during winter (Hammond, 2021).

The mating season lasts from April to September (peaking in July and August). Calves are born between May and August (breeding season peaks in June).

Recent sighting data for this species are shown in Table 10-5 and Table 10-6.

Short-beaked common dolphin (*Delphinus delphis*)

The short-beaked common dolphin is easily identified at sea by the light-coloured hour-glass pattern on their lower flanks. This species can grow up to 2.4 m in length (MarLIN, 2022). They commonly breach and often bow-ride. Average group sizes observed are between 6 and 10 individuals, though large schools have been frequently recorded.

Although commonly seen off the west coast of Britain and Ireland they are only occasionally observed in the North Sea, mainly during the summer (June to September) (DECC, 2022).

Recent sighting data for this species are shown in Table 10-5 and Table 10-6.



White-beaked dolphin (*Lagenorhynchus albirostris*)

The white-beaked dolphin is recognisable by its short, often white, beak. It can grow up to 3.2 m in length (MarLIN, 2022a). This species frequently displays forward, vertical or side breaches and frequently bow-ride vessels. This species is also known to mix with other dolphins and whales to assist in co-operative food herding.

The white-beaked dolphin occurs over a large part of the northern European continental shelf and is frequently recorded in the central and northern North Sea but is only occasionally observed in the southern North Sea. Whilst present all year round it has been most frequently observed between June and October (DECC, 2022).

Recent sighting data for this species are shown in Table 10-5 and Table 10-6.

Bottlenose dolphin (*Tursiops truncatus*)

The bottlenose dolphin is the largest dolphin which frequents British waters, growing up to 4 m. They often display forward to sideways breaches, somersaults and tail slaps and frequently bow-ride. Like the white-beaked dolphin it is frequently seen mixing with other species. Group sizes are regularly between 2 and 25 animals, but individuals can travel in much larger groups, although this is most common in deep water (DECC, 2022).

There are resident populations of this species in Cardigan Bay, Wales and the Moray Firth, Scotland but animals are occasionally sighted in the North Sea (MarLIN, 2022b).

Recent sighting data for this species are shown in Table 10-5 and Table 10-6.

Atlantic white-sided dolphin (*Lagenorhynchus acutus*)

The Atlantic white-sided dolphin can reach up to 2.8 m in length. It is black to dark grey on the back from the upper beak to the tail, changing sharply to light grey on the sides. A distinct white band is visible on the flanks under the dorsal fin between the black and light grey colouration, which turns into an olive-yellow stripe towards the rear at the lower margin of the dark dorsal colouration. A dark line runs from the upper beak to, and surrounding, the eye (MarLIN, 2008).

Atlantic white-sided dolphins are usually found in large pods of up to several thousand individuals. Mixed schools with other species including white-beaked dolphin have been recorded. Their surface behaviour is typical of dolphins with acrobatic leaps; however bow-riding is uncommon. Around the UK its distribution is concentrated in offshore waters beyond the continental shelf edge off the west coast although it does occur in small numbers in the North Sea (Hammond et al., 2021).

There have been no recorded recent sightings in the last ten years of this species within the Study Area.

Risso's dolphin (*Grampus griseus*)

Risso's dolphin have a robust body up to 4 m in length and weigh up to 600 kg. The males of the species are larger than females. Their colouration varies individually and with age. Generally, adults are medium to dark grey on the back, paler on the flanks with a marked border and a white anchor shaped patch on their abdomen. This species is a deep-water species, only sighted close to shore where the continental shelf is narrow and around oceanic islands. They prefer tropical and warm temperate water migrating north in the summer months (MarLIN, 2005).

There have been no recorded recent sightings in the last ten years of this species within the Study Area.

Minke whale (*Balaenoptera acutorostrata*)

The minke whale is the most common and widely distributed of the baleen whales in British waters. They are recorded throughout the northern and central North Sea but are rare visitors in the southern North Sea (DECC, 2022).

The minke whale is one of smallest of the baleen whales, their length averages 8.5 m. Spy hopping and breaching are common for this whale which tend to form groups of about 3 animals (MarLIN 2022c). Although the species occurs year-round most sightings have been recorded between May and September (JNCC, 2003).

Recent sightings data for this species is shown in Table 10-5 and Table 10-6.

Humpback whale (*Megaptera novaeangliae*)

Humpback whales are present worldwide in tropical, temperate and polar seas of both hemispheres, typically favouring waters over and along the continental shelf edge and around oceanic islands. They migrate annually from high latitude, cold water, feeding grounds in summer to low-latitude, warm water, breeding grounds in winter. They are usually observed singly or in pairs and groups rarely exceed 4 or 5 individuals when not feeding or breeding. Humpback whale populations, including those in the North Atlantic, had been severely depleted by over-exploitation (DECC, 2022) however since the introduction of legal protection in 1955 their abundance has increased (Stevick et al, 2003). They are considered occasional visitors to UK waters.



The humpback whale is a baleen whale and can reach up to 16 m in length. It is a member of the rorqual family with the characteristic ventral pleats of skin under the eye and the relatively flat and broad jaw. At close range, it is one of the easiest whales to identify. It has extremely long distinctive flippers with a white colouration and knobs on the leading edge. The dorsal fin is low and usually sits on a hump. The head has a single ridge and is covered with numerous bumps. It is a grey-black colour dorsally and laterally and is white underneath (MarLIN, 2008a).

Recent sightings data for this species is shown in Table 10-5 and Table 10-6.

Long-finned pilot whale (*Globicephala melas*)

The long-finned pilot whale has a worldwide distribution in temperate and sub-polar seas of both hemispheres; it is common and widely distributed in deep north Atlantic waters, and also occasionally occurs in coastal areas. In UK and Irish waters, long-finned pilot whales occur mainly along the continental shelf slope, particularly around the 1,000 m isobath. They are frequently encountered along the shelf slope north and west of Scotland, and also in the western Celtic Sea where sightings are frequent along the shelf edge and southwards towards the French coast (DECC, 2022).

The long-finned pilot whale is a toothed whale. It is a member of the dolphin family with a characteristic prominent median notch in the flukes, a smooth crease-less throat and sharply pointed teeth. The long-finned pilot whale can reach up to 6.7 m in length. It has long and slender flippers and small tail flukes. The dorsal fin is low and broad-based and located on the forward third of the back. The head is conspicuously bulbous. It is very dark grey to black in colour above and on the sides but white underneath (MarLIN, 2008b).

Recent sightings data for this species is shown in Table 10-6.

Fin whale (*Balaenoptera physalus*)

The fin whale is a baleen whale. It is slender bodied whale and can reach up to 24 m in length. The small flippers are less than one-fifth of the body length. The fin whale has a dark dorsal and lateral colouration with light streaks and the belly is white. The left side of the head is grey, while much of the right side is white in colour. The fin whale is an open ocean whale, not often seen near the coast in north-west Europe. It can be found at the surface or diving down to over 230 m in depth. It is only occasionally seen of the coasts of north and north-western Scotland and southern Ireland (MarLIN, 2008c).

Recent sightings data for this species is shown in Table 10-5.

Northern bottlenose whale (*Hyperoodon ampullatus*)

The Northern bottlenose whale is a toothed whale. It is a member of the beaked whale family with the characteristic V-shaped crease on the throat and the short dorsal fin set relatively far back. It is a large beaked whale that can reach up to 10 m in length. The lower jaw has a single pair of teeth (exposed only in adult males). It has a very distinct beak and a very steep, often bulbous forehead. It has a dark grey to chocolate brown dorsal and lateral colouration and somewhat lighter below. Much of the face may be light grey in colour. Adults are often covered with scratches and scars. It may be seen breathing at the surface or diving down to a depth of up to 1,000 m. It has been recorded occasionally at several locations around the British Isles but is more likely to be observed off north-west Scotland (MarLIN, 2008d).

Recent sightings data for this species is shown in Table 10-6.

Killer whale (*Orcinus orca*)

The orca, (often referred to as killer whale) is the largest species in the dolphin family. They are fast swimmers, reaching speeds in excess of 30 knots, feed on squid, octopus, fish, seals and other smaller dolphins, and may eat seabirds and marine turtles occasionally. The killer whale is known for its black and white colouring. The distinctive, large dorsal fin can reach 1.8 m in length in males and 0.9 m in females. It has large paddle like flippers. Their snout is blunt with short, poorly defined beaks. Males can be in excess of 9 m in length, 6 m for females. They are usually found in deep water, although it may enter shallow water to catch prey. They have been recorded off the Shetlands, north and west Scotland, Irish coastline and south and west coasts of England and Wales (MarLIN, 2006).

This species is a rare visitor to the English and Scottish Study Areas and there have been no recorded sightings in the last ten years.

Sperm whale (*Physeter macrocephalus*)

The sperm whale is a toothed whale. It is an easily recognisable whale both at a distance and at close range due to its large and distinctly square upper jaw which projects above the narrow lower jaw. The body is black to charcoal grey in colour, while the inside of the mouth and the lips are white. The blowhole is positioned at the front of the head. A dorsal hump is present two-thirds down the body followed by a serrated midline. It can grow up to 18 m in length. The sperm whale is an oceanic deep-sea species that may dive down to a few kilometres in depth. Sightings have been recorded off the coasts of northern Scotland, in the north North Sea and off the western coasts of Ireland. (MarLIN, 2008e).

This species is a rare visitor to the English and Scottish Study Areas and there have been no recorded sightings in the last ten years.



10.4.2.3. Pinnipeds

Grey seal (*Halichoerus grypus*)

Grey seals, the larger of the two species of seal in the UK, spend most of their time at sea only coming to shore in autumn to form breeding colonies. They are amongst the rarest seals in the world and the UK population represents 36% of the global grey seal population (JNCC, 2022). Grey seals prefer to use remote islands, bays and caves as 'haul out' areas to give birth to their pups but also between foraging trips for food.

Grey seals are mainly distributed around and between haul-out sites and foraging areas and are more commonly seen in the central and northern North Sea. Foraging areas can be up to 100 km offshore and generally connected to haul-out sites by a corridor of higher use (DECC, 2016).

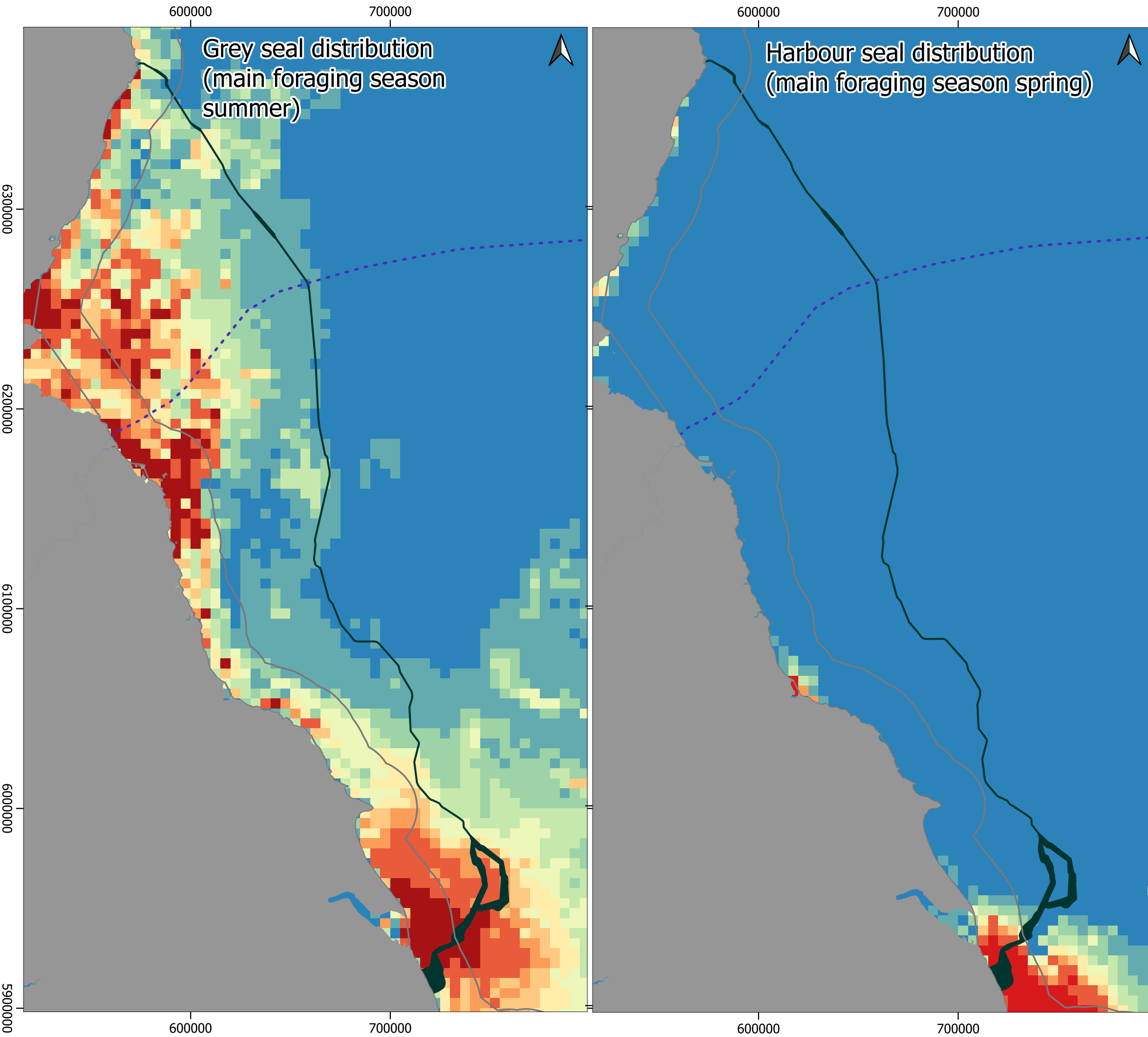
Breeding takes place in the autumn: August – December in Scotland - exact timings vary between locations and years, with pupping generally occurring in mid-October for the east coast of Scotland (SCOS, 2022); and November - December in eastern England. Gestation period is 11 months. A large proportion of the grey seal population will be on land and in waters close to colonies for several weeks from October to December during the pupping and breeding season, and again in December and April (Scotland) and February and March (England) during the annual moult. Densities at sea are likely to be lower during this period than at other times of the year (BEIS, 2022).

Harbour (Common) seal (*Phoca vitulina*)

The harbour or common seal is a species that is frequently found in British estuaries and on mudflats. Though they spend much of their time at sea they do require land for breeding purposes and therefore haul locations are important. The UK population represents 5% of the global harbour seal population (JNCC, 2022a). Unlike the larger grey seal, the harbour seal foraging area is within 40 – 50 km of their haul out site.

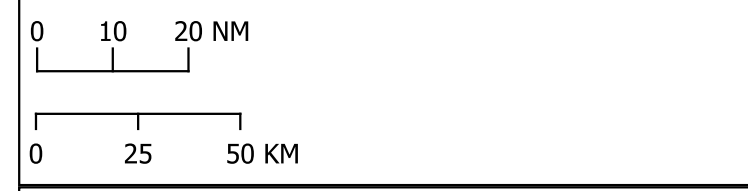
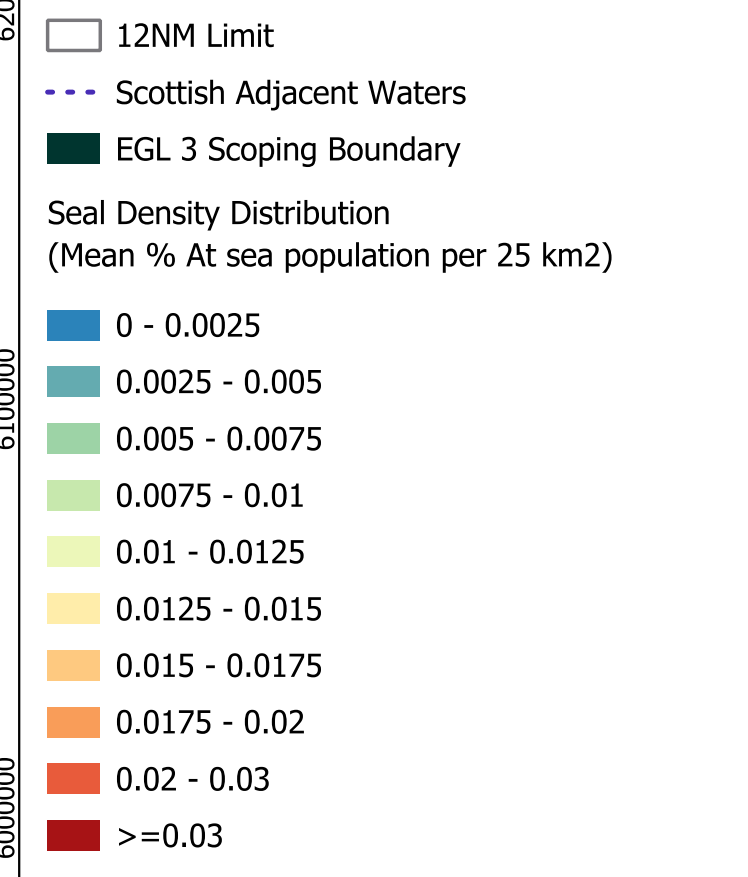
The harbour seal has a slightly shorter gestation period than the grey seal of 10 months. Pupping occurs on land from June to July while the moult is centred around August and extends into September (BEIS, 2022). Therefore, from June to September harbour seals are ashore more often than at other times of the year.

Figure 10-3 (Drawing C01494-EGL3-SPEC-002) illustrates the grey seal and harbour seal population density estimates within the Study Area.



Grey Seal and Harbour Seal Densities within the Study Area

C01494-EGL3-SPEC-002-C



| | |
|--------------------------|-------------------------------------|
| Date | 06/10/2023 |
| Coordinate System | ETRS89 / UTM Zone 30N |
| Projection | Universal Transverse Mercator (UTM) |
| Unit | Meters |
| Scale at A3 | 1:1,850,000 |
| Created | EP |
| Reviewed | D Summers/ S Pearce |
| Authorised | A Farley |

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10.4.2.4. Chelonians

Leatherback turtle (*Dermochelys coriacea*)

Although not indigenous to the UK, sea turtles are the only marine reptiles to be found in UK waters. The leatherback turtle is the most widely distributed turtle species and is the largest, growing up to 1.7 m in length, being found in all oceans except the Southern Ocean.

Within the North Atlantic its range extends from the tropics to the polar region right across to Europe's north-easterly fringe (Seamap 2022).

Leatherback turtles are pelagic feeders and their presence in UK waters is part of this species' wide-ranging migration in response to food distribution, notably jellyfish and other gelatinous zooplankton.

10.4.2.5. Eurasian Otter

The Eurasian otter (*Lutra Lutra*) is a largely solitary semi-aquatic mammal, which occurs in a wide variety of aquatic habitats such as rivers, streams, lakes, estuaries and on the coast. Coastal dwelling populations use shallow, inshore marine areas for feeding but they also require access to fresh water for bathing and terrestrial areas for resting and breeding. Their foraging range in the marine environment is limited to coastal areas (JNCC 2022b).

An otter's foraging range is highly dependent on the quality of its habitat and food. There is evidence that some male otters will travel as far as 80 km, but it is more usual for them to range between 10 and 40 km along the coast line (Gov.uk, 2022). Coastal otters can hunt as far as 100 m from shore in water up to 10 m deep, but most feeding is done much closer to shore in water that is less than 3 m deep (The Otter Consultancy, 2009).

Sightings for the Eurasian otter peak in May to June, and September to October, although they can be seen all year round (NBN Atlas, 2023).

10.4.2.6. Protected Species

Table 10-3 lists the protection afforded to species which have been identified within the Study Areas. This list includes historical and recent sightings. Marine mammals are protected by several national and international conventions including:

- Convention on International Trade in Endangered Species of Wild Fauna and Flora – CITES. Whose aim is to protect endangered plant and animal species from illegal trade and over-exploitation.
- Convention for the Protection of the Marine Environment of the North-East Atlantic – OSPAR Convention. The OSPAR Convention aims to protect the marine environment of the North-East Atlantic.
- International Union for Conservation of Nature and Natural Resources- IUCN. The IUCN Red Data list catalogues and highlights those animals and plants at high risk of global extinction.
- The Conservation of Habitats and Species Regulations 2017 (as amended).
- The Conservation of Offshore Marine Habitats and Species Regulations 2017 (as amended).
- Natural Environment and Rural Communities (NERC) Act.
- Wildlife and Countryside Act 1981 (as amended in 1985).



Table 10-4: Protected species

| Species | International | | | UK | | England | Scotland | |
|------------------------------|---------------|-------------|-----------------|------------------------------|---|--|----------------------------|--------------------------|
| | OSPAR | CITES | IUCN | Wildlife and Countryside Act | Conservation of Offshore Habitats and Species Regulations | Species of Principal Importance ⁹ | Scottish Biodiversity List | Priority Marine Features |
| Cetaceans | | | | | | | | |
| Harbour porpoise | Yes | Appendix II | Least Concern | Schedule 5 | Annex II & Annex IV | Y | Y | Y |
| Common dolphin | | Appendix I | Least Concern | Schedule 5 | Annex IV | Y | Y | Y |
| Bottlenose dolphin | | Annex A | Least Concern | Schedule 5 | Annex IV | Y | Y | Y |
| White-beaked dolphin | | Appendix I | Least Concern | Schedule 5 | Annex II & Annex IV | Y | Y | Y |
| Atlantic white-sided dolphin | | Appendix I | Least Concern | Schedule 5 | Annex IV | Y | Y | Y |
| Risso's Dolphin | | Appendix I | Least Concern | Schedule 5 | Annex IV | Y | Y | Y |
| Minke whale | | Appendix I | Least Concern | Schedule 5 | Annex IV | Y | Y | Y |
| Humpback whale | | Appendix II | Least Concern | Schedule 5 | Annex IV | | Y | |
| Long-finned pilot whale | | Appendix II | Least Concern | Schedule 5 | Annex IV | Y | Y | Y |
| Fin whale | | Appendix I | Vulnerable | Schedule 5 | Annex IV | Y | Y | Y |
| Northern bottlenose whale | | Appendix I | Near threatened | Schedule 5 | Annex IV | | Y | Y |
| Killer whale | | Appendix I | Data deficient | Schedule 5 | Annex IV | Y | Y | Y |
| Sperm whale | | Appendix I | Vulnerable | Schedule 5 | Annex IV | Y | | Y |
| Pinnipeds | | | | | | | | |
| Grey seal | | | Least Concern | | Annex II | | | Y |
| Harbour (Common) seal | | | Least Concern | | Annex II | Y | | Y |
| Otters | | | | | | | | |
| Eurasian otter | | Appendix I | Near Threatened | Schedule 5 | Annex II & Annex IV | | | Y |
| Chelonians | | | | | | | | |
| Leatherback turtle | Yes | | Vulnerable | Schedule 5 | Annex IV | Y | Y | |

⁹ As listed in Section 41 of the Natural Environment and Rural Communities (NERC) Act (NERC, 2006)



10.4.3. English Baseline Characterisation KP 0 to KP 431.4

10.4.3.1. Sightings Data

Cetaceans, pinnipeds and marine turtles

Table 10-5 is a list of recent marine mammal sightings within the English Study Area along with their relevant management unit, seasonality and frequency. Five data sources have been used in Table 10-5:

- Sea Watch Foundation - an organisation which collates sightings data from scientists and members of the public. Sightings for a rolling twelve-month period are typically publicly available. The period referenced for this Scoping Report was March to August 2023 which was the data time period shown on the site at the time of Scoping Report preparation. As SeaWatch is a voluntary organisation it does not follow standard data periods.
- National Biodiversity Network (NBN) Atlas - holds species data back to the 1900's for some species. Data for the period 2018 to 2022 was used for this Scoping Report.
- Data has been reviewed from two recent Offshore Windfarm (OWF) projects where aerial marine mammal surveys have been undertaken, namely Hornsea 3 OWF (surveys between 2016 to 2017) and Dogger Bank (survey in 2013).
- The species density estimates are taken from the SCANS III survey undertaken in 2016 and SCANS IV survey undertaken in 2022. The Project passes through SCANS III survey Blocks O and R and SCANS IV survey Blocks NS-C and NS-D (see Figure 10-2).

Table 10-5: Species and Sightings within the English Study Area

| Species | Relevant MU | Seasonality | Frequency | Sightings Data | | | | |
|-----------------------------|------------------------------|-------------|------------|--|--------------------------------|--|-----------------------------------|--|
| | | | | Density estimate individuals per km ² | | SeaWatch Foundation Sightings Mar - - Aug 2023 * | NBN Atlas - Sighting 2018 - 2022† | OWF observations |
| | | | | 2016 ^ | 2022 | | | |
| Harbour porpoise | North Sea | All year | Common | Block O – 0.888 Block R 0.599 | NS-C – 0.6027 NS-D – 0.5985 | 23 sightings with a max group size of 10 | 47 sightings | 1007 sightings in 20 months** 365 sightings in 2 months # |
| Short-beaked common dolphin | Celtic and Greater North Sea | Summer | Occasional | - | NS-C – 0.0032 | 3 sightings with a max group size of 10 | - | - |
| Bottlenose dolphin | Greater North Sea | All year | Occasional | Block R 0.0298 individuals per km ² | NS-C – 0.0419 | 71 sightings with a max group size of 18 | 40 sightings | - |
| White-beaked dolphin | Celtic and Greater North Sea | Summer | Occasional | Block O – 0.002 Block R 0.243 | NS-C – 0.0149 NS-D - 0.0799 | 3 sightings with a max group size of 50 | - | 5 sightings in 20 months** 5 sightings in 2 months # |
| Minke whale | Celtic and Greater North Sea | Summer | Rare | Block O – 0.010 Block R 0.387 | NS-C – 0.0068 NS-D – 0.0419 | 3 sightings with a max group size of 1 | 9 sightings | 1 sighting in 20 months** 16 sightings in 2 months # |
| Humpback whale | n/a | - | Rare | n/a | - | 2 sightings with a max group size of 1 | - | - |
| Fin Whale | n/a | - | Rare | n/a | NS-D – 0.0009 | - | 1 sighting | - |
| Grey seal | n/a | - | Common | - | - | 3 sightings with a max group size of 6 | 172 sightings | 6 sightings in 20 months* |



| | | | | | | | | |
|-----------------------|-----|---|--------|---|---------------|---------------------------------------|------------------------|---------------------------|
| Harbour (Common) seal | n/a | - | Common | - | - | 1 sighting with a max group size of 1 | 54 sightings | 1 sighting in 20 months * |
| Leatherback turtle | n/a | - | Rare | - | NS-D – 0.5985 | - | 4 sightings since 1998 | - |

Sources:

^ Hammond (2021)

* (Seawatch, 2023)

† (NBN, 2023)

** (Orsted, 2018)

(WUR.nl, 2014)

+ Gilles et al (2023)

Eurasian otter

Although the Eurasian otter is found along the UK coastline there have only been rare recent sightings recorded within the English Study Area. Figure 10-4 illustrates a 40 km buffer from the proposed English landfall site and the number of sightings between 2012 and 2022.



Figure 10-4: Eurasian otter sightings between 2012 and 2022 at the proposed English Landfall site. Source NBN Atlas (2023)

10.4.3.2. Designated Sites

Southern North Sea SAC

The Scoping Boundary crosses through the Southern North Sea SAC for approximately 47 km, which is an area of importance for harbour porpoise. This European site stretches from the central North Sea (north of Dogger Bank) to the Straits of Dover in the south, covering an area of 36,951 km² (JNCC, 2019). It is estimated the site supports 17.5% of the UK North Sea Management Unit population (JNCC, 2023). The population size for the Southern North Sea SAC was estimated to be between 11,864 and 28,889 in 2019 (JNCC, 2019a). Animals are thought to move latitudinally between preferred summer and winter grounds within the SAC. The Scoping Boundary for the Project crosses both the harbour porpoises’ summer and winter grounds for 47 km and 5 km, respectively. The conservation objective for the site is to maintain the favourable conservation status of the species.

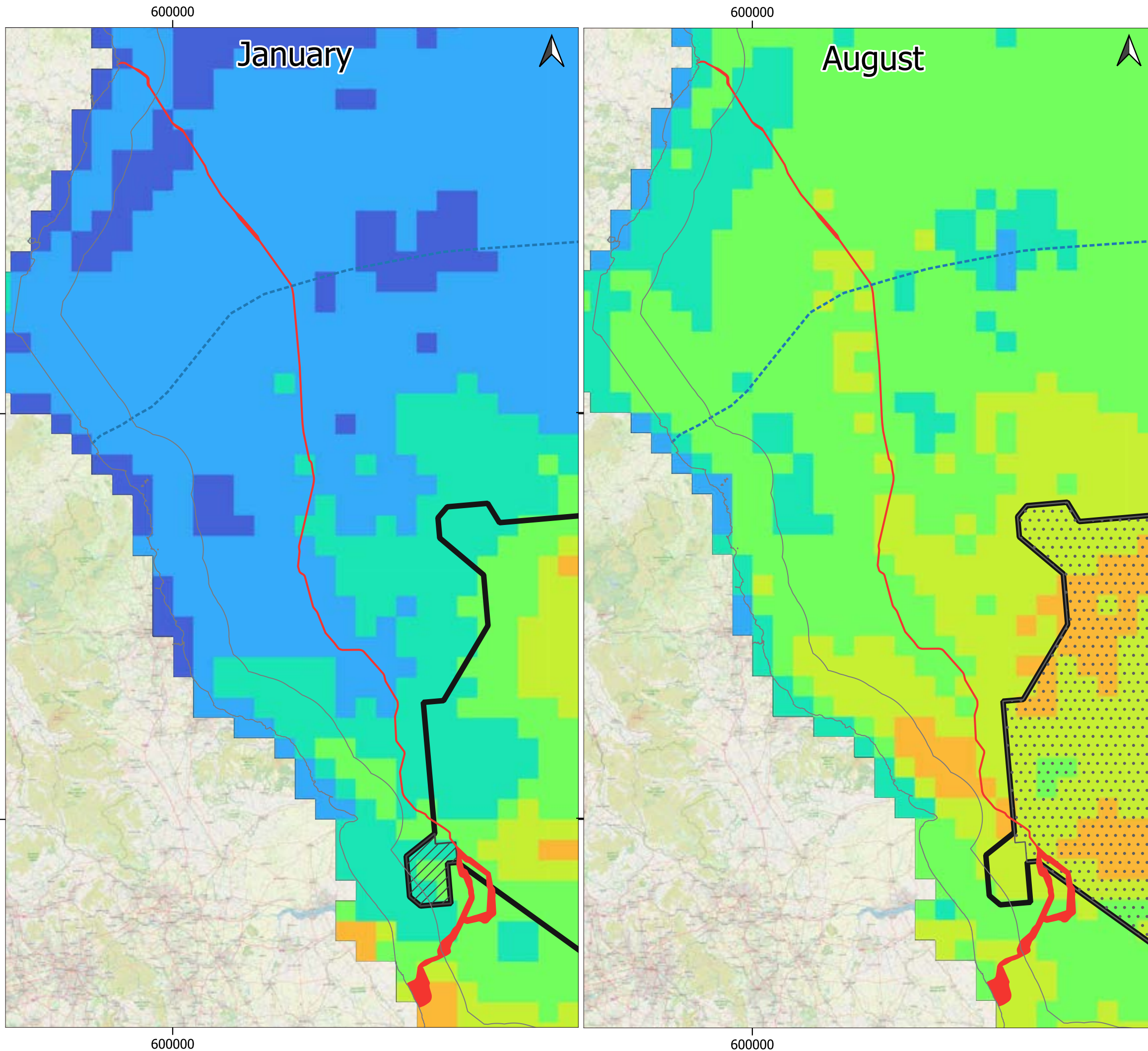
Figure 10-5 (Drawing C01494-EGL3-SPEC-003) illustrates both the summer and winter grounds for the harbour porpoise in the Southern North Sea SAC.

Humber Estuary SAC

The Scoping Boundary lies approximately 4.26 km from the Humber Estuary SAC. The site extends for 366.57 km² and includes the second largest coastal plain Estuary in the UK. Grey seals are listed as a qualifying feature of this SAC. The range of salinity, substrate and exposure to wave action influences the estuarine habitats and the range of species that utilise them; these include a breeding bird assemblage, winter and passage waterfowl, river and sea lamprey, grey seal, vascular plants and invertebrates (Natural England,



2014). The main haul out site used throughout the year by grey seal on the Lincolnshire coast is Donna Nook (Humber Nature Partnership, 2023). In 2018 there was an estimated pup count of 2,066 with a total population counted of 6,288 (SCOS, 2022). However, in recent years the grey seal population has decreased by nearly 40% to 3,897 in 2021. The conservation objective for the site is to maintain and/or restore the favourable conservation status of the species.

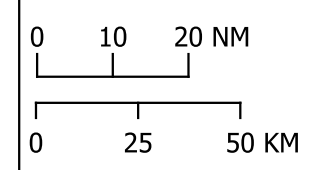
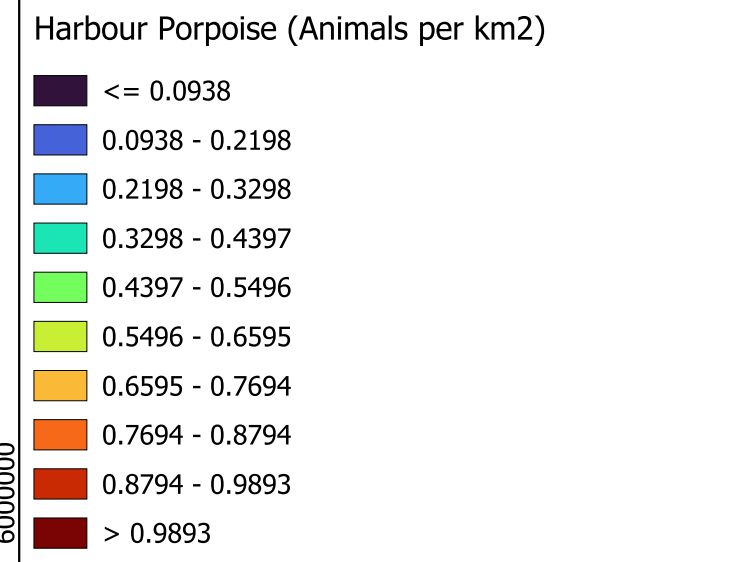


Harbour Porpoise Summer and Winter Grounds within Southern North Sea SAC

C01494-EGL3-SPEC-003-C



- 12NM Limit
- Scottish Adjacent Waters
- EGL 3 Scoping Boundary
- Southern North Sea Special Area of Conservation (SAC)
- Summer Area (Southern North Sea SAC)
- Winter Area (Southern North Sea SAC)



| | |
|--------------------------|-------------------------------------|
| Date | 06/10/2023 |
| Coordinate System | ETRS89 / UTM Zone 30N |
| Projection | Universal Transverse Mercator (UTM) |
| Unit | Meters |
| Scale at A3 | 1:1,850,000 |
| Created | EP |
| Reviewed | D Summers/ S Pearce |
| Authorised | A Farley |

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The Wash and North Norfolk Coast SAC

The Scoping Boundary lies approximately 16.6 km from The Wash and North Norfolk Coast SAC. The SAC encompasses the largest embayment in the UK covering an area of 1,078 km². The extensive intertidal flats here and on the North Norfolk Coast provide ideal conditions for harbour seal breeding and hauling-out. This site is the largest colony of harbour seal in the UK, with some 7% of the total UK population. The Study Area falls within the foraging range of Eurasian otter from within The Wash and North Norfolk Coast SAC. Otters occur along the North Norfolk coast and can be found in a variety of freshwater and coastal habitats. The conservation objective for the site is to maintain and/or restore the favourable conservation status of the species.

Berwick and Northumberland Coast SAC (also partly in Scotland)

The Scoping Boundary lies approximately 64.7 km from the Berwick and Northumberland Coast SAC. The SAC stretches from Fast Castle Head in Scotland to Alnmouth in England, encompassing both Lindisfarne and the Farne Islands. The site is 652.26 km² in size. The site supports a breeding colony of grey seal which supports around 2.5% of annual UK grey seal pup production (JNCC, 2023a). The conservation objective for the site is to maintain and/or restore the favourable conservation status of the species.

Seal Haul out sites

The main breeding and haul out sites within the English Study Area for grey seal is Donna Nook on the Lincolnshire coast, which is 7.9 km away from the Scoping Boundary, and further up the coast in Northumberland at the Farne Islands, Lindisfarne and Coquet Islands.

The main harbour seal haul-out site is located in The Wash on the Lincolnshire/Norfolk coast. Harbour seals have also been observed hauling-out at Donna Nook in Lincolnshire.

10.4.4. Scotland Baseline Characterisation KP 431.4 to KP 575.3

10.4.4.1. Sightings Data

Table 10-6 is a list of recent marine mammal sightings within the Scottish Study Area along with their relevant management unit, seasonality and frequency. Five data sources have been used in Table 10-6:

- Sea Watch Foundation – an organisation which collates sighting data from scientists and members of the public. Sightings for a rolling twelve-month period are typically publicly available. The period referenced for this Scoping Report was March to August 2023 which was the data time period shown on the site at the time of Scoping Report preparation. As SeaWatch is a voluntary organisation it does not follow standard data periods.
- National Biodiversity Network (NBN) Atlas – holds species data back to the 1900's for some species. Data for the period 2018 to 2022 were used for this Scoping Report.
- Data have been reviewed from two recent OWF projects where aerial marine mammal surveys have been undertaken, namely Seagreen Alpha and Bravo Wind Farms in 2017 and Kincardine OWF during 2013 and 2014.
- The species density estimates are taken from the SCANS III survey undertaken in 2016 and SCANS IV survey undertaken in 2022. The Project passes through SCANS III survey Block R and SCANS IV survey Block NS-D (see Figure 10-2).

Table 10-6: Species and Sightings within the Scottish Study Area

| Species | Relevant MU | Seasonality | Frequency | Sightings Data | | | | |
|-----------------------------|------------------------------|-------------|------------|--|---------------|--|-----------------------------------|---|
| | | | | Density estimate individuals per km ² | | SeaWatch Foundation Sightings Mar - - Aug 2023 * | NBN Atlas – Sighting 2018 - 2022† | OWF observations |
| | | | | 2016 ^ | 2022 | | | |
| Harbour porpoise | North Sea | All year | Common | Block R 0.599 individuals per km ² | NS-D – 0.5985 | 21 sightings with a max group size of 3 | 25 sightings | 89 sightings in 17 months** 95 sightings in 2x 2-day surveys # |
| Short-beaked common dolphin | Celtic and Greater North Sea | Summer | Occasional | - | NS-C – 0.0032 | 1 sighting with a max group size of 8 | - | - |
| Bottlenose dolphin | Greater North Sea | All year | Occasional | Block R 0.0298 individuals per km ² | NS-C – 0.0419 | 33 sightings with a max group size of 25 | 1146 sightings | - |



| Species | Relevant MU | Seasonality | Frequency | Sightings Data | | | | |
|---------------------------|------------------------------|-------------|------------|--|---------------|--|-----------------------------------|---|
| | | | | Density estimate individuals per km ² | | SeaWatch Foundation Sightings Mar - - Aug 2023 * | NBN Atlas – Sighting 2018 - 2022† | OWF observations |
| | | | | 2016 ^ | 2022 | | | |
| White-beaked dolphin | Celtic and Greater North Sea | Summer | Occasional | Block R 0.243 | NS-D - 0.0799 | - | - | 9 sightings in 17 months ** 2 sightings in 2x 2-day surveys # |
| Minke whale | Celtic and Greater North Sea | Summer | Rare | Block R 0.387 | NS-D – 0.0419 | - | 3 sightings | 3 sightings in 17 months ** 13 sightings in 2x 2-day surveys # |
| Humpback whale | n/a | - | Rare | n/a | - | - | 1 sighting | - |
| Fin Whale | n/a | - | Rare | n/a | NS-D – 0.0009 | - | 1 sighting | - |
| Long-finned pilot whale | n/a | - | Rare | | | 1 sighting with a max group size of 7 | | |
| Northern bottlenose whale | n/a | - | Rare | | | | 1 sighting | |
| Grey seal | n/a | - | Common | - | - | | 111 sightings | 9 sightings in 17 months ** |
| Harbour (Common) seal | n/a | - | Common | - | - | | 9 sightings | 1 sighting in 17 months ** |
| Leatherback turtle | n/a | - | Rare | - | - | - | 2 sightings since 2011 | - |

Sources:

^ Hammond (2021)
 ** (Atkins, 2016)

* (Seawatch, 2023)
 # (Seagreen, 2018)

† (NBN, 2023)
 + Gilles et al (2023)



Eurasian otter

Although the Eurasian otter is found along the UK coastline there have been 241 sightings recorded within the Scottish Study Area between 2012 and 2022. It should be noted that many of these sightings are inland rather than coastal. Figure 10-6 illustrates a 40 km buffer from the proposed Scottish landfall site and the number of sightings between 2012 and 2022.



Figure 10-6: Eurasian otter sightings between 2012 and 2022 at the proposed Scottish Landfall site. Source: NBN Atlas (2023)

10.4.4.2. Designated Sites

Southern Trench MPA

The Scoping Boundary crosses the Southern Trench MPA which is an area of importance for minke whale. The Scoping Boundary crosses the MPA for approximately 8 km. The Southern Trench MPA lies off the Aberdeenshire coast, from Buckie in the west to Peterhead in the east and has an area of 2,536 km². A key feature of the site is the 250 m deep trench which runs parallel to the coast. Due to the trench depth, there is a dynamic mixing zone of warm and cold waters, known as a front, that attracts shoals of herring, mackerel and cod to the area. The soft sands covering much of the seabed also provide abundant habitat for sandeel. The presence of these key prey species in turn draws top predators like minke whale, a protected feature of the site (NatureScot, 2020a).

The conservation objectives of the Southern Trench MPA are that protected features, if already in favourable condition, remain in such condition or so far as not already in favourable condition, be brought into such condition, and remain in such condition.

Figure 10-7 illustrates the known and modelled distribution of minke whale within the Southern Trench MPA created using the Marine Scotland NMPI tool.

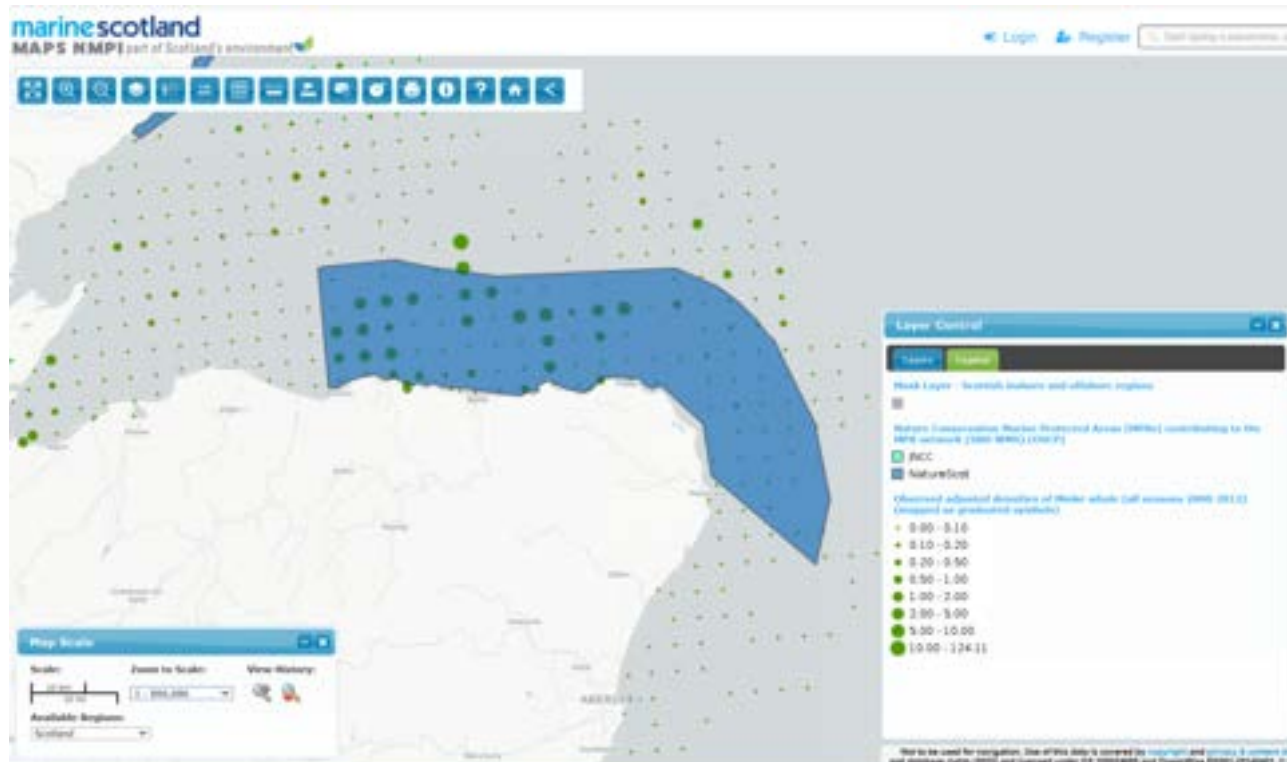


Figure 10-7: Distribution map of minke whale in the Southern Trench MPA between 2000 and 2012. Source: MarineScot (2023)

Seal Haul out sites

The main breeding and haul out sites for grey seal within the Scottish Study Area are breeding colonies in the Firth of Forth which is approximately 135 km away from the Scoping Boundary and a haul out site at the Ythan River which lies 25.7 km away from the Scoping Boundary.

Within the Scottish Study Area, the Firth of Tay and Eden Estuary SAC has been designated for harbour seals that utilise the sandbanks for breeding (JNCC, 2015) however this site is 122 km away from the Scoping Boundary and therefore the Project is unlikely to have any significant effect on this site.

10.5. Proposed Assessment Methodology

The marine mammal and marine reptile MEA will follow the approach set out in Chapter 4 of this Scoping Report, using the project-wide assessment matrix. The assessment of potential effects will be established using the standard Source-Pathway-Receptor approach. The MEA chapter will be prepared in accordance with the following guidance:

- Technical guidance for assessing the effects of anthropogenic sound on marine mammal hearing (NOAA, 2018)
- Marine Mammal Noise Exposure Criteria: Updated Scientific Recommendations for Residual Hearing Effects. (Southall et al., 2019)
- Sound Exposure Guidelines for Fishes and Sea Turtles (Popper et al., 2014)
- Guidance for assessing the significance of noise disturbance against Conservation Objectives of harbour porpoise SACs (England, Wales & Northern Ireland) (JNCC, 2020)
- The protection of Marine European Protected Species from injury and disturbance. Guidance for Scottish Inshore Waters (Marine Scotland, 2020).
- Guidance on the Offence of Harassment at Seal Haul-out Site (Marine Scotland, 2014).

Results from other topic chapters, such as marine physical processes, fish and shellfish and intertidal and subtidal benthic ecology would be used to establish the potential impacts on supporting habitat and prey species for marine mammals and marine reptiles. Where impacts are not predicted to be significant, simple assessments, using an evidence-based approach that is proportionate to the anticipated level of significance would be undertaken.



Underwater noise impacts from vessels and equipment and the potential for mortality, permanent and temporary injury and behavioural disturbance would be assessed using the latest peer-reviewed impact thresholds reported in Southall et al. (2019) and Popper et al. (2014), to provide a quantitative prediction of the number of animals at risk. This information would take into account the best available scientific evidence on the movement and behaviour of marine mammals, both under baseline conditions and would calculate the probability of animals being exposed to sufficient noise levels to cause injury or behavioural disturbance.

The details of the assessment methodology will be refined as information becomes available on the project description, the physical site conditions (bathymetry and substrate types) and the construction programme. An estimation of the numbers of animals at risk will be given for the Project alone and in-combination with other projects in the area. The proposed methodology will be discussed and agreed with Cefas, JNCC, NatureScot and Natural England.

Where significant effects are identified, mitigation measures will be proposed, and residual effects presented.

10.6. Scope of Marine Environmental Appraisal

A range of potential impacts on marine mammals and marine reptiles have been identified which may occur during the construction, operation and maintenance, and decommissioning phases of the Project. Table 10-7 describes the potential impacts identified and provides justification as to whether they will be scoped in or out of the MEA. A precautionary approach has been taken and where there is no strong evidence base, or the significance is uncertain at this stage, the impact has been scoped 'in' to the MEA. Where there is a clear evidence base that the effect from the impact will not be significant, either alone or in combination with other plans and projects, the impact has been scoped 'out' of the MEA.



Table 10-7: Scoping assessment of impacts on marine mammals and marine reptiles

| Potential Impacts | Project Activities | Sensitive Receptors | Scoping Justification | | |
|--------------------------------|--|-------------------------|---|---|---|
| | | | Construction | Operation (including repair and maintenance) | Decommissioning |
| Underwater noise changes | Presence of project vessels and equipment (including cable trenching) | Cetaceans and pinnipeds | <p>OUT - The presence of project vessels and equipment used to install the cables will generate underwater noise. The Oslo and Paris (OSPAR) Convention (2012) considered that sound associated with the construction, removal or operation of submarine cables is less harmful compared to impulsive sound activities such as seismic surveys, military activities or construction work involving pile driving (OSPAR Convention 2012). Animals would need to remain in close proximity (<100 m) to the source continuously for 24 hours to be exposed to levels sufficient to cause auditory injury (Barham and Mason 2019, Orsted 2019). For all auditory hearing groups, the noise levels from these activities are low enough that there is negligible risk. Therefore, this impact pathway has been scoped out of the MEA.</p> <p>It should be noted that geophysical surveys are exempt from requiring a Marine Licence under the MCAA, provided they meet certain conditions. The MEA will not consider the effects of the pre- and post-installation surveys. Instead, survey contractors will be required to provide Screening for Appropriate Assessment and a European Protected Species Assessment to ensure they meet the required conditions for an exempt activity. Entries into the UK Marine Noise Registry will be made as appropriate.</p> | <p>OUT - If the cable is installed correctly the likelihood of it requiring maintenance and repair is significantly reduced. However, there remains the potential that localised repair works, or remedial external cable protection may be required.</p> <p>In these circumstances, the significance of the effect will be of lower magnitude than during installation and has therefore been scoped out of the MEA for the same reasons.</p> | <p>OUT - The significance of the effect during decommissioning is similar or of lower magnitude than installation and has therefore been scoped out of the MEA for the same reasons.</p> |
| Changes in prey availability | Pre-sweeping of sand waves Cable burial and trenching Deposit of external cable protection | Cetaceans and pinnipeds | <p>IN – Changes in prey availability is a potential indirect impact which could arise during any phase of the project life cycle if the Project has a significant effect on fish species such as sandeel and Atlantic herring which are important prey species. Disturbance of the seabed during the spawning season for species with a demersal life stage could have a direct impact on the spawning biomass for a specific year group, leading to a shortage of prey species. The impact pathway has been scoped IN under the fish and shellfish topic with respect to sandeel and Atlantic herring habitat. Relevant studies need to be undertaken to rule out any significant indirect effects on marine mammals therefore the impact has been scoped IN to the MEA.</p> | | |
| Collision with project vessels | Presence of project vessels and equipment | Cetaceans and pinnipeds | <p>OUT – There are known incidents of marine mammals colliding with fast moving vessels. However, it is largely recognised that the key factors contributing to collision between marine mammals and vessels are the presence of both in the same area and vessel speed (see Schoeman <i>et al.</i> (2023) for review). Injuries to marine mammals from vessel strikes are species-dependent but generally are more severe at higher impact speeds (Wang <i>et al.</i>, 2007).</p> <p>Laist <i>et al.</i> (2001) conclude that fatal collisions with marine mammals occur at vessel speeds of 14 knots or more. Vessels involved in the Project are likely to be either stationary or travelling slowly (circa 5 knots) during construction, maintenance or decommissioning activities, thus allowing both the vessel and any animal in the area time to avoid collision. During transit times, project vessels will be travelling at speeds greater than 5 knots. However, project vessels will follow the shipping routes within the Study Area. Cetaceans and pinnipeds in the area are exposed to vessels of all sizes on a regular basis due to the density of shipping in the North Sea. Therefore, the collision risk posed by project vessels associated with the Project is likely to be significantly lower than that posed by commercial shipping activity. No significant effects are predicted. This impact pathway has therefore been scoped out of the MEA.</p> | | |



| Potential Impacts | Project Activities | Sensitive Receptors | Scoping Justification | | |
|---|--------------------|-------------------------|-----------------------|--|-----------------|
| | | | Construction | Operation (including repair and maintenance) | Decommissioning |
| Electromagnetic changes / Barrier to species movement | Presence of cables | Cetaceans and pinnipeds | N/A | <p>OUT – No evidence of magnetic sensitivity has been reported for pinnipeds (BOEMRE 2011). It is acknowledged that cetaceans use magnetic cues, such as the earth’s geomagnetic field, to navigate. The mechanism for how this is achieved is still unknown (BOEMRE 2011). Calculations of EMF fields for similar specification HVDC cables to the Project show rapid attenuation of the magnetic fields to background levels within 10 m - 50 m of the cables (National Grid and Energinet 2017, BOEMRE 2011). This localised change in the magnetic field may temporarily affect sensitive species as they cross the cables or pass alongside their length and may temporarily reduce their navigational ability within the zone of effect. However, Gill (2005) reports that there have been no impacts to the migration of cetaceans over existing interconnector cables and Walker (2001) note harbour porpoise migration across the Basslink has been observed unhindered despite several crossings of operating sub-sea HVDC cables. Given the rapid attenuation of the magnetic field, the lack of evidence of effects on cetaceans, and the predominantly pelagic existence resulting in separation with the change in field, cetaceans have a relatively low likelihood of being affected by EMF. The impact pathway has been scoped out of the MEA.</p> | N/A |
| Temperature increase | Presence of cables | Cetaceans and pinnipeds | N/A | <p>OUT – During the operation of an HVDC cable heat losses occur because of the resistance in the cable/conductor. This can cause localised heating of the surrounding environment (i.e., sediment for buried cables, or water in the interstitial spaces of external cable protection). There are no specific regulatory limits applied to temperature changes in the seabed, although a 2 °C change between seabed surface and 0.2 m depth is used as a guideline in Germany.</p> <p>Conservative calculations undertaken for Viking Link (which crosses German waters) concluded that heating in excess of 2 °C at 20 cm sediment</p> | N/A |



| Potential Impacts | Project Activities | Sensitive Receptors | Scoping Justification | | |
|---|---|-------------------------|---|--|-----------------|
| | | | Construction | Operation (including repair and maintenance) | Decommissioning |
| | | | | <p>depth will only occur if cables are bundled and buried to less than 0.75 m (National Grid and Energinet 2017).</p> <p>Any temperature changes will be localised to the immediate environment surrounding the cable and undetectable against natural temperature fluctuations in the surrounding sediments and water column. No significant effects are predicted. This impact pathway has therefore been scoped out of the MEA.</p> | |
| Accidental Spills <i>(Hydrocarbon & PAH contamination)</i> | Presence of project vessels and equipment | Cetaceans and pinnipeds | <p>OUT - Project vessels and contractors will comply with the International Convention for the Prevention of Pollution from Ships (MARPOL) 73/78 which relate to pollution from oil from equipment, fuel tanks etc and release of sewage (black and grey water). It is a legal requirement that all vessels have a SOPEP. Compliance with Regulations will be sufficient to minimise the risk to the environment.</p> | | |
| Visual disturbance | Presence of project vessels and equipment | Cetaceans and pinnipeds | <p>OUT – The physical presence of the project vessels and equipment during all phases of the Project has the potential to disturb marine mammals. Pinnipeds are more sensitive to anthropogenic disturbance when hauled out. Wilson (2013) presents a review of such studies, and concludes that as an overall generalisation, unless habituation has been established by frequent non-intrusive visits, a safe boat distance for harbour and grey seals (i.e., one at which there is a low risk of significant numbers of seals flushing) is about 200 m. There are no seal haul-out sites within 1 km of the Project. The nearest haul out site is Donna Nook with is 7.9 km away from the English Scoping Boundary.</p> <p>The region is already used by large ships and ferries and animals are therefore habituated to a certain degree to the presence of vessels. The presence of project vessels will be temporary and transient, restricted to discreet activities and periods and will not increase the shipping baseline other than briefly. Vessels will be moving slowly (circa 5 knots) whilst within the proposed submarine cable corridor. Therefore, no significant disturbance effects are predicted from the presence of project vessels and the impact pathway has been scoped out of the MEA.</p> | | |



10.7. References

- Atkins (2016) Kincardine Offshore Windfarm Environmental Statement. Available at: https://pilot-renewables.com/wordpress/wp-content/uploads/2020/03/KOWL_EnvironmentalStatement_Issued_v2.pdf
- Barham and Mason (2019), Underwater noise modelling at the Teesside A offshore wind farm, Dogger Bank. Available at: Underwater noise modelling at the Teesside A offshore wind farm, Dogger Bank
- BEIS (2022) UK Offshore Energy Strategic Environmental Assessment 4 (OESEA4) - Appendix 1a.8 Marine mammals. Available at: https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/1061613/Appendix_1a_8_-_Marine_mammals.pdf
- BOEMRE (2011) Effects of EMFS From Undersea Power Cables on Elasmobranchs and Other Marine Species. Available at: <https://www.boem.gov/sites/default/files/environmental-stewardship/Environmental-Studies/Pacific-Region/Studies/2011-09-EMF-Effects.pdf>
- Carter, M. I. D., Boheme, L., Duck, C. D., Grecian, W.J., Hastie, G. D., McConnell, B. J., Miller, D. L., Morris, C. D., Moss, S. E. W., Thompson, D., Thompson, P. M. & Russell, D. J. F. (2020) Habitat-based predictions of at-sea distribution for grey and harbour seals in the British Isles. Sea Mammal Research Unit, University of St Andrews, Report to BEIS, OESEA-16-76/OESEA-17-78. Available at: https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/959723/SMRU_2020_Habitat-based_predictions_of_at-sea_distribution_for_grey_and_harbour_seals_in_the_British_Isles.pdf
- Crawford (2010) Fifth otter survey of England 2009 – 2010. Available at: chrome- <https://ptes.org/wp-content/uploads/2015/06/National-Otter-Survey.pdf>
- DECC (2016). Offshore Energy Strategic Environmental Assessment 3. Department of Energy and Climate Change. March 2016.
- DECC (2022) Offshore Energy SEA 4. Appendix 1 Environmental Baseline – Marine Reptiles: Available at: https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/1061671/Appendix_1a_6_-_Marine_reptiles.pdf
- Gill, A.B., Gloyne-Phillips, I., Neal, K.J. & Kimber, J.A. (2005) The potential effects of electromagnetic fields generated by sub-sea power cables associated with offshore wind farm developments on electrically and magnetically sensitive marine organisms – a review. Available at: https://tethys.pnnl.gov/sites/default/files/publications/The_Potential_Effects_of_Electromagnetic_Fields_Generated_by_Sub_Sea_Power_Cables.pdf
- Gilles, A., Authier, M., Ramirez-Martinez, N.C., Araújo, H., Blanchard, A., Carlström, J., Eira, C., Dorémus, G., Fernández-Maldonado, C., Geelhoed, S.G.V., Kyhn, L., Laran, S., Nachtsheim, D., Panigada, S., Pigeault, R., Sequeira, M., Sveegaard, S., Taylor, N.L., Owen, K., Saavedra, C., Vázquez-Bonales, J.A., Unger, B. and Hammond, P.S. (2023). Estimates of cetacean abundance in European Atlantic waters in summer 2022 from the SCANS-IV aerial and shipboard surveys. Final report published 29 September 2023. 64 pp. Available from: <https://tinyurl.com/3ynt6swa>
- Gov.uk (2022) Guidance on managing woodlands with otter in England. Available at: INTERIM GUIDANCE (publishing.service.gov.uk)
- Hague, E.L., Sinclair, R.R. and Sparling, C.E. 2020. Regional baselines for marine mammal knowledge across the North Sea and Atlantic areas of Scottish waters. Scottish Marine and Freshwater Science, 11(12). Marine Scotland Science.
- Hammond (2021) Estimates of cetacean abundance in European Atlantic waters in summer 2016 from the SCANS-III aerial and shipboard surveys. Available at https://scans3.wp.st-andrews.ac.uk/files/2021/06/SCANS-III_design-based_estimates_final_report_revised_June_2021.pdf
- Heinänen, S. & Skov, H. (2015). The identification of discrete and persistent areas of relatively high harbour porpoise density in the wider UK marine area, JNCC Report No. 544, JNCC, Peterborough, ISSN 0963-809. Available at: <https://hub.jncc.gov.uk/assets/f7450390-9a89-4986-8389-9bff5ea1978a>
- Humber Nature Partnership (2023) Grey Seals. Available at: Grey seals:: Humber Nature Partnership
- IAMMWG (2015) Management Units for Cetaceans in UK waters (January 2015). JNCC report No. 547, JNCC, Peterborough. Available at: <https://data.jncc.gov.uk/data/f07fe770-e9a3-418d-af2c-44002a3f2872/JNCC-Report-547-FINAL-WEB.pdf>
- IAMMWG. (2022) Updated abundance estimates for cetacean Management Units in UK waters (Revised 2022). JNCC Report No. 680, JNCC Peterborough, ISSN 0963-8091. Available at: <https://hub.jncc.gov.uk/assets/3a401204-aa46-43c8-85b8-5ae42cdd7ff3>
- JCDP (2022) Joint Cetacean Data Programme - ICES, Copenhagen, Denmark. Available at: <https://cetaceans.ices.dk>
- JNCC (2003) Atlas of Cetacean distribution in north-west European waters. Available at: <https://data.jncc.gov.uk/data/a5a51895-50a1-4cd8-8f9d-8e2512345adf/atlas-cetacean-distribution-web.pdf>



- JNCC (2020). Guidance for assessing the significance of noise disturbance against Conservation Objectives of harbour porpoise SACs Wales & Northern Ireland) 8091. JNCC Report No. 65 4 (England, JNCC, Peterborough, ISSN 0963
- JNCC (2022) 1364 Grey seal. Available at: <https://sac.jncc.gov.uk/species/S1364/>
- JNCC (2022a) 1365 Harbour Seal. Available at: <https://sac.jncc.gov.uk/species/S1365/>
- JNCC (2022b) Distribution of SACs/SCIs/cSACs containing species 1355 Lutra lutra. Available at: <https://sac.jncc.gov.uk/species/S1355/map>
- JNCC (2023) Southern North Sea MPA. Available at: <https://jncc.gov.uk/our-work/southern-north-sea-mpa/#:~:text=The%20Southern%20North%20Sea%20SAC%20lies%20along%20the%20east%20coast,of%20harbour%20porpoise%20Phocoena%20phocoena>
- JNCC (2023a) Berwickshire and North Northumberland Coast. Available at: <https://sac.jncc.gov.uk/site/UK0017072>
- JNCC, (2019) Harbour Porpoise (Phocoena phocoena) Special Area of Conservation: Southern North Sea Conservation Objectives and Advice on Operations. Available at: Southern North Sea MPA: Conservation Objectives And Advice On Operations (jncc.gov.uk)
- JNCC, (2019a) Standard form for Southern North Sea. Available at: <https://jncc.gov.uk/jncc-assets/SAC-N2K/UK0030395.pdf>
- JNCC. 2015. Natura 2000 – Standard Data Form for sites within the 'UK national site network of European Sites'. UK0030311 Firth of Tay and Eden Estuary. JNCC, Peterborough.
- Laist, D., Knowlton, A. R. & Mead, J. G., (2001) Collisions between ships and whales. Available at: https://www.researchgate.net/publication/235768458_Collisions_between_ships_and_whales#:~:text=According%20to%20Laist%20et%20al,length%20or%20more.%20
- Marine Scot (2023) NMPI tool showing Minke Whale density. Available at: <https://marinescotland.atkinsgeospatial.com/nmpi/>
- Marine Scotland (2014). Guidance on the Offence of Harassment at Seal Haul-out Sites. Available at https://consult.gov.scot/marine-environment/possible-designation-of-a-seal-haul-out-site/user_uploads/guidance-on-the-offence-of-harassment-at-seal-haul-out-sites.pdf-1
- Marine Scotland (2020) The Protection of Marine European Protected Species from Injury and Disturbance: Guidance for Scottish Inshore Waters. Available at: <https://www.gov.scot/binaries/content/documents/govscot/publications/advice-and-guidance/2020/07/marine-european-protected-species-protection-from-injury-and-disturbance/documents/marine-european-protected-species-guidance-july-2020/marine-european-prote>
- MarLIN (2008) Atlantic White-sided dolphin. Available at: <https://www.marlin.ac.uk/species/detail/116>
- MarLIN (2022) Species list Short-beaked common dolphin (Delphinus delphis). Available at: <https://www.marlin.ac.uk/species/detail/2082>
- MarLIN (2022a) Species list White-beaked dolphin (Lagenorhynchus albirostris). Available at: <https://www.marlin.ac.uk/species/detail/117>
- MarLIN (2022c) Species list Minke whale (Balaenoptera acutorostrata). Available at: <https://www.marlin.ac.uk/species/detail/1994>
- MarLIN (2023) The Marine Life Information Network. Available at: <https://www.marlin.ac.uk/>
- MarLIN, (2005). Risso's Dolphin. Available at: <https://www.marlin.ac.uk/species/detail/2134>
- MarLIN, (2006). Killer Whale. Available at: <https://www.marlin.ac.uk/species/detail/1540>
- MarLIN, (2008a) Humpback Whale. Available at: <https://www.marlin.ac.uk/species/detail/106>
- MarLIN, (2008b). Long-finned pilot whale. Available at: <https://www.marlin.ac.uk/species/detail/113>
- MarLIN, (2008c) Fin whale. Available at: <https://www.marlin.ac.uk/species/detail/105>
- MarLIN, (2008d) Northern bottlenose whale. Available at: <https://www.marlin.ac.uk/species/detail/111>
- MarLIN, (2008e) Sperm Whale. Available at: <https://www.marlin.ac.uk/species/detail/112>
- MarLIN, (2022b) Species list Bottle-nosed dolphin (Tursiops truncatus). Available at: <https://www.marlin.ac.uk/species/detail/1674>
- National Grid and Energynet (2017), Viking Link Environmental Statement, Appendix H EMF Report. Viking Document VKL_07_30_J800_15



- National Marine Fisheries Service (2018) Technical Guidance for Assessing the Effects of Anthropogenic Sound on Marine Mammal Hearing (Version 2.0) Underwater Thresholds for Onset of Permanent and Temporary Threshold Shifts. Available at : [https://media.fisheries.noaa.gov/dam-migration/tech_memo_acoustic_guidance_\(20\)_pdf_508.pdf](https://media.fisheries.noaa.gov/dam-migration/tech_memo_acoustic_guidance_(20)_pdf_508.pdf)
- Natural England (2014) Citation for Special Area of Conservation (SAC) Humber Estuary. Available at: <http://publications.naturalengland.org.uk/publication/5009545743040512>
- NatureScot (2020) Scottish Biodiversity List. Available at: <https://www.nature.scot/doc/scottish-biodiversity-list>
- NatureScot (2020a) Southern Trench MPA(NC) – MPA Site Summary. Available at: <https://sitelink.nature.scot/site/10477>
- NBN Atlas (2023) Eurasian Otter. Available at: <https://species.nbnatlas.org/species/NBNSYS0000005133>
- NBN, (2023) Sightings data. Available at: <https://nbnatlas.org/>
- NERC (2006) Section 41 of the Natural Environment and Rural Communities Act. Available at: <https://www.legislation.gov.uk/ukpga/2006/16/section/41>
- OAP (2022) Seal Abundance and Distribution. Available at <https://oap.ospar.org/en/ospar-assessments/intermediate-assessment-2017/biodiversity-status/marine-mammals/seal-abundance-and-distribution/>
- Orsted (2018) Annex 4.1 Marine Mammal Technical Report - Hornsea 3 Offshore Windfarm. Available at: [EN010080-000576-HOW03_6.5.4.1_Volume_5_-_4.1_-_Marine_Mammal_Technical_Report.pdf\(planninginspectorate.gov.uk\)](EN010080-000576-HOW03_6.5.4.1_Volume_5_-_4.1_-_Marine_Mammal_Technical_Report.pdf(planninginspectorate.gov.uk))
- Orsted (2019) Hornsea Project Four: Preliminary Environmental Information Report (PEIR) Volume 4, Annex 4.5: Subsea Noise Technical Report. Available at: [peir-volume-4-annex-45-subsea-noise-technical-report-03309165a1.ashx\(azureedge.net\)](peir-volume-4-annex-45-subsea-noise-technical-report-03309165a1.ashx(azureedge.net))
- Oslo and Paris (OSPAR) Convention (2012) Guidelines on Best Environmental Practice (BEP) in Cable Laying and Operation. Available at: https://www.gc.noaa.gov/documents/2017/12-02e_agreement_cables_guidelines.pdf
- Reeds, K.A. 2004. Dermochelys coriacea Leatherback turtle. In Tyler-Walters H. and Hiscock K. Marine Life Information Network: Biology and Sensitivity Key Information Reviews, [on-line]. Plymouth: Marine Biological Association of the United Kingdom. [cited 16-04-2023]. Available from: <https://www.marlin.ac.uk/species/detail/1534>
- Reid, D. G., Breen, P. A., Brown, S. L. & Rogan, E. (2016) Modelling cetacean distribution and mapping overlap with fisheries in the northeast Atlantic. Available at: https://www.researchgate.net/publication/309171637_Modelling_cetacean_distribution_and_mapping_overlap_with_fisheries_in_the_northeast_Atlantic
- Russel D. J. F., Jones, E. L. & Morris C. D. (2017) Updated Seal Usage Maps: The Estimated at-sea Distribution of Grey and Harbour Seals. Available at: <https://data.marine.gov.scot/sites/default/files/SMFS%200825.pdf>
- Schoeman, R.P., Patterson-Abrolat, C. and Plön, S. (2020) A Global Review of Vessel Collisions with Marine Animals. Available at: <https://www.frontiersin.org/articles/10.3389/fmars.2020.00292/full>
- SCOS (2022) Scientific Advice on Matters Related to the Management of Seal Populations: 2022. Available at: <http://www.smru.st-andrews.ac.uk/files/2023/09/SCOS-2022.pdf>
- Seagreen, (2018) Boat based Survey Summer 2017 Seagreen Alpha and Bravo Wind Farms – EIA Report . Available at: https://marine.gov.scot/sites/default/files/chapter_10_marine_mammals.pdf
- SeaMap (2022) State of the Worlds Sea Turtles. Available at: <https://seamap.env.duke.edu/swot>
- Seawatch, (2023) Recent sightings. Available at: <https://www.seawatchfoundation.org.uk/recent sightings/>
- Southall, B.L., Finneran, J.J., Reichmuth, C., Nachtigall, P.E., Ketten, D.R, Bowles, A.E., Ellison, W.T., Nowacek, D.P. and Tyack, P.L. (2019), “Marine Mammal Noise Exposure Criteria: Updated Scientific Recommendations for Residual Hearing Effects.” Aquatic Mammals. Available at: https://sea-inc.net/wp-content/uploads/2019/10/Southall-et-al_2019_MM-Noise-criteria-update-with-errata_Aq-Mammals.pdf
- Stevick, Peter & Allen, Judith & Clapham, PJ & Friday, N & Katona, Steven & Larsen, F. & Lien, J & Mattila, David & Palsbøll, Per & Sigurjónsson, Jóhann & Smith, Tim & Øien, Nils. (2003). North Atlantic humpback whale abundance and rate of increase four decades after protection from whaling. Available at: https://www.researchgate.net/publication/250217977_North_Atlantic_humpback_whale_abundance_and_rate_of_increase_four_decades_after_protection_from_whaling
- The Otter Consultancy, (2009) OTTER (Lutra lutra) ACTIVITY ON THE OPEN COAST & ISLANDS WITHIN THE PEMBROKESHIRE MARINE SPECIAL AREA OF CONSERVATION. Available at: https://www.pembrokeshiremarinesac.org.uk/wp-content/uploads/2022/06/PM-SAC-otters-open-coast-2008_e.pdf



Waggitt et al. (2019) Distribution maps of cetacean and seabird populations in the North-East Atlantic. Available at: <https://besjournals.onlinelibrary.wiley.com/doi/full/10.1111/1365-2664.13525>

Walker (2001) Available at: Review of Impacts of High Voltage Direct Current Sea Cables and Electrodes on Chondrichthyan Fauna and Other Marine Life Basslink Supporting Study No. 2
https://www.researchgate.net/publication/262232923_Basslink_project_review_of_impacts_of_high_voltage_direct_current_sea_cables_and_electrodes_on_chondrichthyan_fauna_and_other_marine_life_Basslink_Supporting_Study_No_29_Marine_and_Freshwater_Resource#pf

Wang, Y., Helden, A. V., Sutaria, D., Secchi, E., Sanino, G. P., Iñiguez, M., Gedamke, J., Félix, F., Baker, A. N. & Waerebeek, K. V. (2007) Vessel collisions with small cetaceans worldwide and with large whales in the Southern Hemisphere, an initial assessment. Available at: <https://www.lajamjournal.org/index.php/lajam/article/view/263>

Wilson, S.C. (2013) The impact of human disturbance at seal haul-outs. A literature review for the Seal Conservation Society

Wur.nl (2014) Marine Mammal Survey in wider Dogger Bank Area Summer 2013. Available at: [Marine mammal surveys Dogger Bank \(wur.nl\)](#)