

# **STATUS OF CETACEANS IN THE VICINITY OF THE ISLE OF SKYE**

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## INTRODUCTION

The waters around the Isle of Skye are some of the richest of any coastal region in the UK for cetaceans, and one of the most important regions in Northwest Europe (Evans, 1998). Sixteen species of cetaceans have been recorded in the vicinity of the Isle of Skye since 1980 (Table 1), eleven of which are either present throughout the year or recorded annually as seasonal visitors. Some (e.g. sperm whale, northern bottlenose whale, and Cuvier's beaked whale) are pelagic species that normally live along or west of the continental shelf edge, and rarely come close inshore. However, they may be attracted to the seas around Skye as they include some of the deepest waters in the British Isles, with depths to 230 metres between the island of Rum and the Sleat Peninsula, and to 316 metres in the Inner Sound between Raasay and the mainland. The status and seasonal occurrence of the eleven most common species are summarised below, along with distribution maps showing sightings plots. Overall, North Atlantic and UK status are taken from Evans *et al.* (2003), Reid *et al.* (2003), and Hammond *et al.* (2013) with updates as appropriate.

## DATA SOURCES

The Sea Watch Foundation has been running a sighting scheme from the mid 1970s, utilising volunteer observers all around the UK, including the west of Scotland (Evans, 1976, 1980; Evans *et al.*, 1986; Evans, 1990, 1998; Evans *et al.*, 2003). Since the 1990s this has been heavily supplemented by the Community Sighting Scheme, which the Mull-based Hebridean Whale & Dolphin Trust has been running. During the 1990's until the early 2000's, Sea Watch Foundation conducted dedicated cetacean surveys between May and October throughout the Minches and Sea of Hebrides, mainly aboard the motor sailing vessel "Marguerite Explorer", as well as more targeted studies of minke whale around the Small Isles (Rum, Eigg, Canna & Muck) (Evans, 1998; Boran *et al.*, 1999; Marubini *et al.*, 2009; Anderwald *et al.*, 2012). From 2003 onwards, the Hebridean Whale & Dolphin Trust has conducted dedicated surveys aboard the motor sailing vessel "Silurian", initially concentrating upon waters within Argyll, particularly around Mull and neighbouring islands, but more recently extending over a wider area encompassing the Sea of Hebrides and Minches (Booth, 2010; Embling *et al.*, 2010; HWDT, 2013). In addition, observers have been conducting surveys opportunistically aboard CalMac ferries along their routes (see, for example, Evans, 1998; Macleod *et al.*, 2005).

In July 1994, a wide scale dedicated abundance survey (SCANS) was conducted in the North Sea, Celtic Sea and English Channel, but it only covered the northern edge of the Minches (Hammond *et al.*, 2002). It was repeated in July 2005 (as SCANS II), this time covering all of the west coast (Hammond *et al.*, 2013). This provided overall abundance estimates for the commonest species although coverage in this particular region of Skye was limited. Effort-related sightings from 1980-1999 were integrated for a general analysis of cetacean distribution in Northwest European seas (Reid *et al.*, 2003). These formed the Joint Cetacean Database. This was updated and enlarged to form the Joint Cetacean Protocol for the same broad area, and analysed by Paxton *et al.* (2011, 2014, 2016).

Within the study area, survey effort has been best in the Sound of Sleat, around the Small Isles south of Skye, and further north in the vicinity of Gairloch and the waters north of South Rona. Three whale watching companies now operate out of Gairloch, although only of these routinely records cetacean sightings. Most observation effort in the region has been between April and October.

**Table 1. Summary of Sightings Records in Sea Watch Database for the Study Area (listed in descending order of number of individuals recorded)**

Species	No. of records	%	No. of Individuals	%
Short-beaked common dolphin	703	10.3	27,702	55.3
Harbour porpoise	3,587	53	16,036	32.0
Minke whale	1,957	29	2,770	5.5
Bottlenose dolphin	165	2.4	1,542	3.1
Killer whale	56	0.8	204	0.4
White-beaked dolphin	22	0.3	184	0.4
Risso's dolphin	28	0.4	166	0.3
Atlantic White-sided dolphin	12	0.2	148	0.3
Long-finned pilot whale	37	0.5	134	0.2
Northern bottlenose whale	31	0.5	60	0.1
Humpback whale	48	0.7	51	<0.1
Sperm whale	10	0.1	20	<0.1
Striped dolphin	2	<0.1	11	<0.1
Fin whale	6	<0.1	7	<0.1
Sei whale	3	<0.1	4	<0.1
Cuvier's beaked whale	1	<0.1	3	<0.1
Unidentified dolphin spp.	124	1.8	868	1.7
Unidentified common/striped dolphin	5	<0.1	92	0.2
Unidentified cetacean spp.	6	<0.1	60	0.2
Unidentified whale spp.	5	<0.1	8	<0.1
Unidentified small whale spp	1	<0.1	6	<0.1
Unidentified large whale spp.	3	<0.1	3	<0.1
Unidentified beaked whale spp.	3	<0.1	3	<0.1
Unidentified white-beaked/ white-sided dolphin	1	<0.1	2	<0.1
<b>Total</b>	<b>6,816</b>	<b>100</b>	<b>50,084</b>	<b>100</b>

### SPECIES ACCOUNTS

Of the sixteen species recorded alive in the study area since 1980, four species are seen most commonly: minke whale, harbour porpoise, short-beaked common dolphin, and bottlenose dolphin (Table 1). Their status and distribution will be described in some detail below with summaries for a further seven species that have been recorded regularly but in small numbers.

## a) MAIN SPECIES

### **MINKE WHALE *Balaenoptera acutorostrata***

Minke whales are common and widely distributed in all of the major oceans of the world from tropical to polar seas, though most abundant in relatively cool waters and on the continental shelf (in depths of 200 m or less). They occur in small numbers along the Atlantic seaboard of Europe mainly from Norway south to France, and in the northern and central North Sea, although abundance is greatest in the north.

The species is widely distributed along the Atlantic seaboard of Britain and Ireland, with numbers greatest off the west coast of Scotland and around the Hebrides (where aggregations of up to twenty have been recorded); it also occurs regularly in the northern and central North Sea as far south as Yorkshire, but is rare in the southernmost North Sea and eastern half of the English Channel (Evans *et al.*, 2003; Reid *et al.*, 2003; Hammond *et al.*, 2013; Paxton *et al.*, 2016). In the western English Channel, it is evenly distributed to the continental shelf edge, being largely absent from the deeper parts of the Bay of Biscay. In the Irish Sea, the species occurs mainly on the western side, south of the Isle of Man, as well as in the Celtic Deep (Baines & Evans, 2012).

Around Skye, peak numbers of sightings and of individuals occur in June – September (Fig. 12a). However, the species can be present year-round, though in apparently small numbers between November and April (Anderwald & Evans, 2007). It is widely distributed in the Minches and Sea of Hebrides (Anderwald *et al.*, 2012; see Fig. 10). In the vicinity of Skye, minke whales are commonly recorded between Gairloch and the northeast coast of Skye south to South Rona, and again in the southern part of the Sound of Sleat and between Skye and Eigg, Rum and Canna (Fig. 2). Effort-corrected data show a similar pattern (Fig. 10). Despite a lot of survey effort, the species has been rarely recorded in the northern part of the Sound of Sleat or in the Inner Sound east of Raasay (see Figs. 2, 10). However, west of Raasay, minkes have been recorded on occasions.

### **HARBOUR PORPOISE *Phocoena phocoena***

The distribution of the harbour porpoise is restricted to temperate and sub-arctic (mainly 11-14° C) seas of the northern hemisphere. In the eastern North Atlantic, it is common and widely distributed on the continental shelf (mainly at depths of 20-200 m) from the Barents Sea and Iceland south to the coasts of France and Spain (Evans *et al.*, 2003; Reid *et al.*, 2003). It is the most frequently observed (and stranded) cetacean in British waters where it is most abundant around Scotland, Eastern England, West Wales and Southwest England (Evans *et al.*, 2003; Reid *et al.*, 2003; Hammond *et al.*, 2013; Heinanen & Skov, 2015; Paxton *et al.*, 2016).

The harbour porpoise is the most common and widely distributed cetacean species in the Minches (Evans, 1998; Boran *et al.*, 1999; Evans *et al.*, 2003; Macleod *et al.*, 2005; Marubini *et al.*, 2009; Booth, 2010; Embling *et al.*, 2010) but because common dolphins typically occur in large groups, greater number of the latter have been recorded, particularly south of Skye. Peak numbers of porpoise sightings occur in June – September, with the number of individuals peaking in August – September (Fig. 12b).

Nevertheless, the species is present in the region throughout the year, although even with lower observation effort, numbers of sightings appear to be much lower between November and March. Harbour porpoises occur throughout the study area, even in the most inshore waters of Loch Alsh (Figs. 3), although sightings rates once corrected for effort are highest off north-east Skye, east of Raasay, and around the Small Isles (Fig. 11).

### **SHORT-BEAKED COMMON DOLPHIN *Delphinus delphis***

The common dolphin has a worldwide distribution in oceanic and shelf-edge waters of tropical, subtropical and temperate seas, occurring in both hemispheres. It is abundant and widely distributed in the eastern North Atlantic, mainly occurring in deeper waters from the Iberian Peninsula north to the Faroe Islands. Its distribution appears to be associated with the Gulf Stream in seas of 10-28° C surface temperature, although it generally occurs in shallower waters closer to the continental shelf edge than the striped dolphin.

On the UK continental shelf, the species is common in the western half of the English Channel and the southern Irish Sea (particularly around the Celtic Deep) and in the Sea of Hebrides and southern part of the Minch (Evans *et al.*, 2003; Reid *et al.*, 2003; Hammond *et al.*, 2013; Paxton *et al.*, 2016). It is also common south and west of Ireland, whilst off the edge of the continental shelf it can be found north to a latitude of about 65° N (though rare north of 62° N). In some years, the species occurs further north and east in shelf seas - in the northern Hebrides, around Shetland and Orkney, and in the northern North Sea. This has been the case particularly in the last decade (Evans *et al.*, 2003; Macleod *et al.*, 2005; Evans & Bjørge, 2013). It is generally rare in the central and southern North Sea and eastern portion of the English Channel, but is abundant in the Bay of Biscay.

During the 1990s, short-beaked common dolphins were only rarely reported in the Minches, but probably in response to the warming of sea temperatures, the species is now being seen regularly north of the Isle of Skye, and in some numbers (Evans, 1998; Evans *et al.*, 2003; Macleod *et al.*, 2005; HWDT, 2013; Sea Watch, unpublished data; see also Fig. 4). Peak sightings and numbers of individuals occur between May and October, particularly early in the summer, in June (Fig. 13a). Sightings rates and individual rates, when corrected for effort, exhibit peaks at similar times (Evans *et al.*, 2003). Recently, there is evidence that the species is remaining in the region later in the summer, even to October. Previously, common dolphins were scarcely recorded in the region from August – April. Although common dolphin sightings occur annually in the Sound of Sleat and even between Skye and Raasay, this relatively pelagic species is recorded particularly between Gairloch and the northeast coast of Skye (Fig. 4).

### **BOTTLENOSE DOLPHIN *Tursiops truncatus***

The bottlenose dolphin has a worldwide distribution in tropical and temperate seas in both hemispheres. Along the Atlantic seaboard of Europe, the species is locally fairly common near-shore off the coasts of Spain, Portugal, North-west France, western Ireland, western and northeast Britain, and in the Channel. All those localities receive influence from the Gulf Stream. There may be two bottlenose dolphin ecotypes in the North

Atlantic, one that occupies the shelf edge, and the other primarily coastal, in British and Irish waters being most frequently sighted within 10 km of land, where it may be present throughout the year often favouring river estuaries, bays, headlands or sandbanks where there is uneven bottom relief and/or strong tidal currents (Lewis & Evans, 1993; Liret *et al.*, 1994; Wilson *et al.*, 1997; Wilson, 2008). Offshore in the North Atlantic the species occurs often in association with long-finned pilot whales, as far north as the Faroe Islands.

Bottlenose dolphins are present throughout the year in various bays in Western Ireland; in the Irish Sea (particularly Cardigan Bay); and from the Moray Firth south to the Firth of Forth (particularly the inner Moray Firth, Aberdeen area, and St Andrews Bay). The species is scarce in the central and southern North Sea, but it occurs seasonally along the south coast of England at particular localities.

Off the west coast of Scotland, there is a small population of bottlenose dolphins numbering around 45 individuals (Cheney *et al.*, 2013). Of those, c. 13-15 individuals appear to be more or less resident to the waters around the Sound of Barra (Cheney *et al.*, 2013; Van Geel, 2016). Bottlenose dolphins have been sighted in scattered locations all around Skye including innermost areas such as at the Kyle of Lochalsh (Fig. 5). The concentration of sightings in Loch Gairloch probably reflects higher survey effort there. Sightings occur anytime of year, but mainly between April and September (Fig. 13b).

## **b) OTHER REGULAR SPECIES**

### **KILLER WHALE *Orcinus orca***

The killer whale has a worldwide distribution in tropical, temperate and polar seas in both hemispheres (with greatest abundance at higher latitudes). Killer whales are widely distributed in the North Atlantic and in coastal northern European waters particularly around Iceland and western Norway.

In UK waters, the species occurs mainly around the Northern Isles (Shetland and Orkney) and the Hebrides (Evans, 1988, 1992; Evans *et al.*, 2003; Bolt *et al.*, 2009). Around the Hebrides there has been a long-standing pod numbering between 9 and 14 individuals, and occasionally other individuals pass through the region (HWDT & SWF unpublished data). Photo-ID studies, supported by genetic evidence, suggest that this population is distinct from the killer whales that visit the northern North Sea (particularly the Northern Isles) (Foote *et al.*, 2009, 2010), although west coast animals have been recorded also in the Moray Firth (Robinson *et al.*, 2016). Sightings of killer whales occur annually all around Skye but particularly off northeast Skye, around the Small Isles and in the southern Sound of Sleat (Fig. 6). The species has been recorded year-round, but most sightings occur between May and October, peaking between June and August (Fig. 14a).

### **WHITE-BEAKED DOLPHIN *Lagenorhynchus albirostris***

The white-beaked dolphin is restricted to temperate and sub-polar seas of the North Atlantic. It occurs over a large part of the northern European continental shelf (mainly in waters of 50-100 m depth, and around the British Isles almost entirely within the 200

metre isobath), its distribution extending northwards to northern Norway, Iceland, the Greenland Sea and central west Greenland, where it may occur in much deeper waters.

The species is common in British and Irish waters, and is found most abundantly in the central and northern North Sea across to north-west Scotland (particularly the north Minch and western Sea of Hebrides), although it also occurs in small numbers in Western and Southern Ireland, St George's Channel, English Channel, and northern Bay of Biscay (Evans *et al.*, 2003; Reid *et al.*, 2003; Hammond *et al.*, 2013; Paxton *et al.*, 2014, 2016). In the Minches, white-beaked dolphins were once abundant, but in recent years have become less common, except in the north. Around Skye, almost all records are from the Minch between the northeast coast and Loch Gairloch (Fig. 7). Sightings are confined to the months between May and September (particularly July and August) (Fig. 16b), and these are peak months for sightings rates and individual rates, when corrected for effort (Evans *et al.*, 2003).

#### **RISSO'S DOLPHIN *Grampus griseus***

The Risso's dolphin is widely distributed in tropical and temperate seas of both hemispheres. The species occurs in small numbers along the Atlantic European seaboard from the Faroe Islands and Northern Isles of Scotland south to the Iberian Peninsula and east into the Mediterranean Sea. The major populations in northern European waters occur in the Hebrides but the species is regular also in Shetland & Orkney, the Irish Sea, and off SW Ireland; it is rare in the North Sea and all but the western end of the English Channel although it has been seen increasingly in the northern North Sea (Evans *et al.*, 2003; Reid *et al.*, 2003; Paxton *et al.*, 2014, 2016).

In the Minches, peak numbers of sightings and individuals occur in August and September (Fig. 16a), and these are peak months for sightings rates and individual rates, when corrected for effort (Evans *et al.*, 2003). The species has only rarely been reported in the region between November and April. Most sightings around Skye have been between the northeast coast and Loch Gairloch, around the Small Isles, and in the southern part of the Sound of Sleat (Fig. 7; Evans *et al.*, 2003).

#### **ATLANTIC WHITE-SIDED DOLPHIN (*Lagenorhynchus acutus*)**

The distribution of Atlantic white-sided dolphins is restricted to temperate and sub-polar seas of the North Atlantic. This species is relatively abundant in mainly offshore waters from central West Greenland, Iceland and the southern Barents Sea south to Cape Cod and SW Ireland, but with greatest abundance in the north. In European waters, it is widely distributed mainly offshore along the shelf edge from Iceland and the western Barents Sea south to the Bay of Biscay. White-sided dolphins do range over shelf seas in Britain, mainly around the Hebrides, the Northern Isles and in the northern North Sea. There is some evidence that the species is shifting its range northwards, possibly due to climate change (Evans & Bjørge, 2013), and very few sightings were made offshore during the CODA Survey in July 2007 where previously the species has been regular (Reid *et al.*, 2003; Evans *et al.*, 2003; CODA, 2009).

Because of its normally pelagic habit, Atlantic white-sided dolphins have been recorded around Skye uncommonly, although these have tended to be in groups of relatively large size (numbering up to 60 animals). Sightings have occurred in scattered localities around Skye (Fig. 7). The species may sometimes enter sea lochs, a behaviour that has been exploited in drive fisheries in the Faroes and historically in Shetland. All sightings in the study region around Skye have been between June and August.

#### **LONG-FINNED PILOT WHALE (*Globicephala melas*)**

The long-finned pilot whale has a worldwide distribution in temperate and sub-polar seas of both hemispheres. The species is common and widely distributed in deep North Atlantic waters (mainly 200-3,000 m depth), but seasonally enters coastal areas such as the Faroe Islands, northern and northwest Scotland, western Ireland and the south-west Channel Approaches; it also occurs south to the Iberian Peninsula and is common in the Mediterranean (Evans, 1992; Evans *et al.*, 2003; Reid *et al.*, 2003; CODA, 2009). The species is most common in northern and western Scotland, but rare in the Irish, central and southern North Seas, and the English Channel.

Most sightings around Skye have occurred off the north and northeast coasts (Fig. 6), although as with Atlantic white-sided dolphin, pods may enter sea lochs (such as Loch Sligachan), where occasionally strandings may occur. The species has been recorded between April and July, with a peak in June (Fig. 15b).

#### **NORTHERN BOTTLENOSE WHALE (*Hyperoodon ampullatus*)**

The northern bottlenose whale is confined to the North Atlantic from warm temperate to arctic seas, particularly occurring in the vicinity of deep ocean abysses. Its main range in the west extends from Baffin Island and West Greenland south to New England, and in the east from Svalbard to the southern tip of the Iberian Peninsula. The main regions of concentration appear to be west of Norway, west of Svalbard, north of Iceland, in the Davis Strait off Labrador, off the Faroes, and in The Gully off eastern Canada. Around the British Isles, northern bottlenose whales are sighted primarily in waters exceeding 1,000 m, such as the Faroe-Shetland Channel, Rockall Trough, and southern Bay of Biscay (Weir *et al.*, 2001; Evans *et al.* 2003; Reid *et al.* 2003; CODA, 2009).

There have been a number of well-publicised sightings, mainly where one to two individuals have spent several days in inshore areas such as Lochs Bracadale, Slapin and Eishort on the south coast of Skye, and Broadford Bay on the north coast (Fig. 6). Sightings have been very seasonal, all between August and October (Fig. 15a).

#### **HUMPBACK WHALE (*Megaptera novaeangliae*)**

The humpback whale has a worldwide distribution in all seas, occurring even occasionally to the ice edge. It is a highly migratory species, feeding in summer in high latitudes, and mating and calving in winter in tropical waters, although a few overwinter on the feeding grounds. The species shows strong individual fidelity to feeding areas; in the North Atlantic, these include the Gulf of Maine, Gulf of St Lawrence, Newfoundland/Labrador, Greenland, Iceland and Norway. Matching of photographically



and genetically identified individuals indicates that the eastern North Atlantic population migrates primarily to the West Indies (Stevick *et al.* 1998, 2006), although some animals winter in the Cape Verde Islands (Hazevout & Wenzel 2000; Jann *et al.*, 2003). Despite fidelity to specific feeding grounds, whales from all North Atlantic areas appear to mix spatially and genetically in the West Indies in winter.

In European waters, humpbacks occur around Iceland, Norway, the British Isles and Ireland. Sightings from around the British Isles and Ireland have increased markedly since the early 1980s; occurring in three main areas – the Northern Isles south to eastern Scotland; the northern Irish Sea north to West Scotland; and the Celtic Sea between Southern Ireland, Southwest Wales and Southwest England (Evans *et al.* 2003; Clapham & Evans 2008).

There have been many sightings in recent years around Skye, particularly on the northeast and east coasts and in the outer part of the Sound of Sleat (Fig. 8). Humpbacks have been recorded between June and January, with peak numbers of sightings and individuals in June (Fig. 14b); most sightings are of single individuals.

## **OTHER SPECIES**

Other cetacean species recorded in the western sector of the Minch include sperm whale *Physeter macrocephalus*, Cuvier's beaked whale *Ziphius cavirostris*, fin whale *Balaenoptera physalus*, sei whale *Balaenoptera borealis*, and striped dolphin *Stenella coeruleoalba* (Figs. 6-8). None of these is thought to be a regular inhabitant of the waters around Skye.

## **CONCLUSIONS**

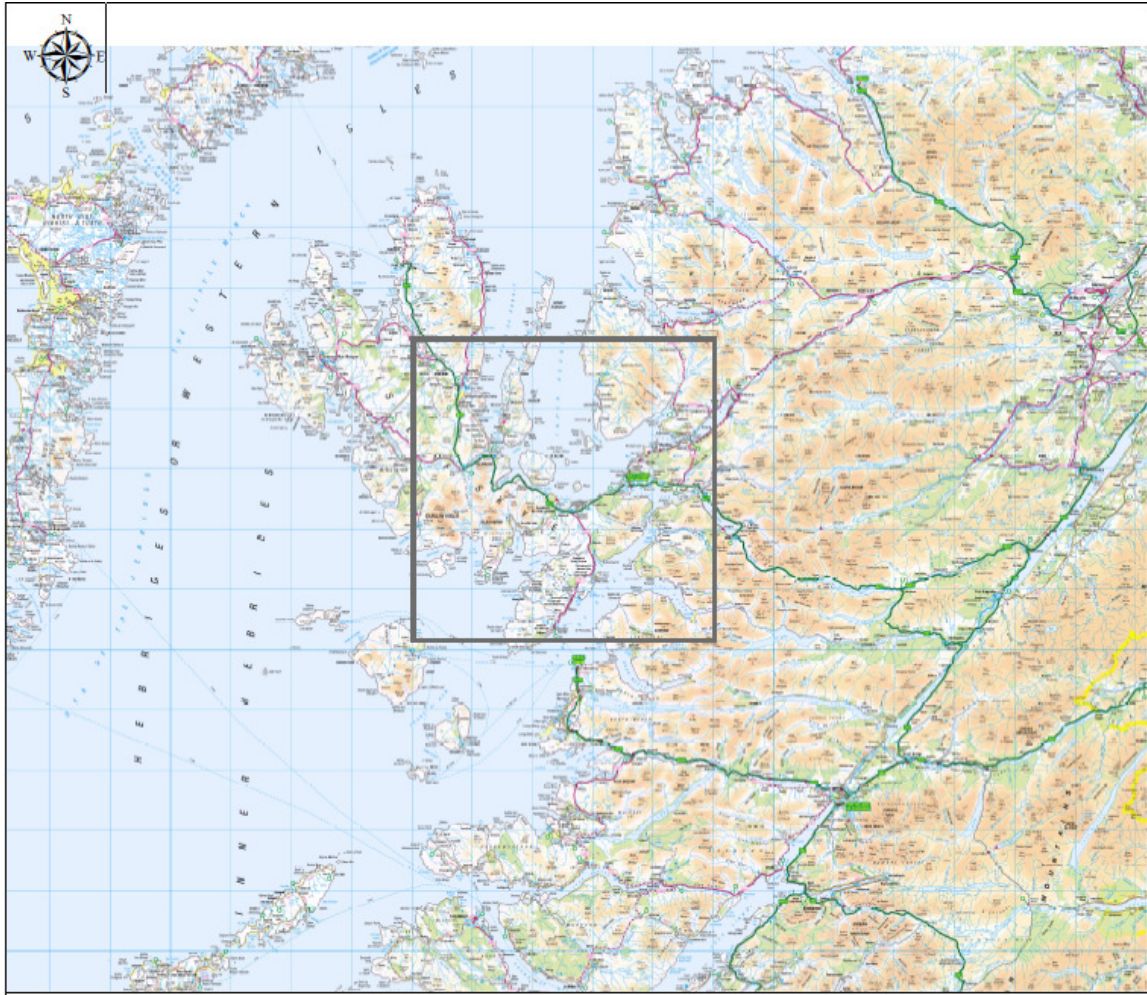
Although Hebridean waters are rich in cetacean species, only four (minke whale, harbour porpoise, short-beaked common dolphin and bottlenose dolphin) are likely to regularly occur within the area of interest around Skye. Unsurprisingly, the greatest number of cetacean sightings occur in the more open areas: between the north-east coast of Skye and Loch Gairloch in the north, and the outer Sound of Sleat and around the Small Isles in the south. Both harbour porpoise and minke whales are widely distributed, the former in particular occurring far inshore to the southern end of the Inner Sound, well into sea lochs, and through much of the Sound of Sleat. The more pelagic short-beaked common dolphin in recent years has been observed particularly between Gairloch and the northeast coast of Skye, as well as around the Small Isles and outer part of the Sound of Sleat. Bottlenose dolphins, on the other hand, may occur far inshore, including at the Kyle of Lochalsh. From mark-recapture photo-ID analysis, the population in this area is thought to be very small (c. 30 individuals) with small groups ranging all around Skye.

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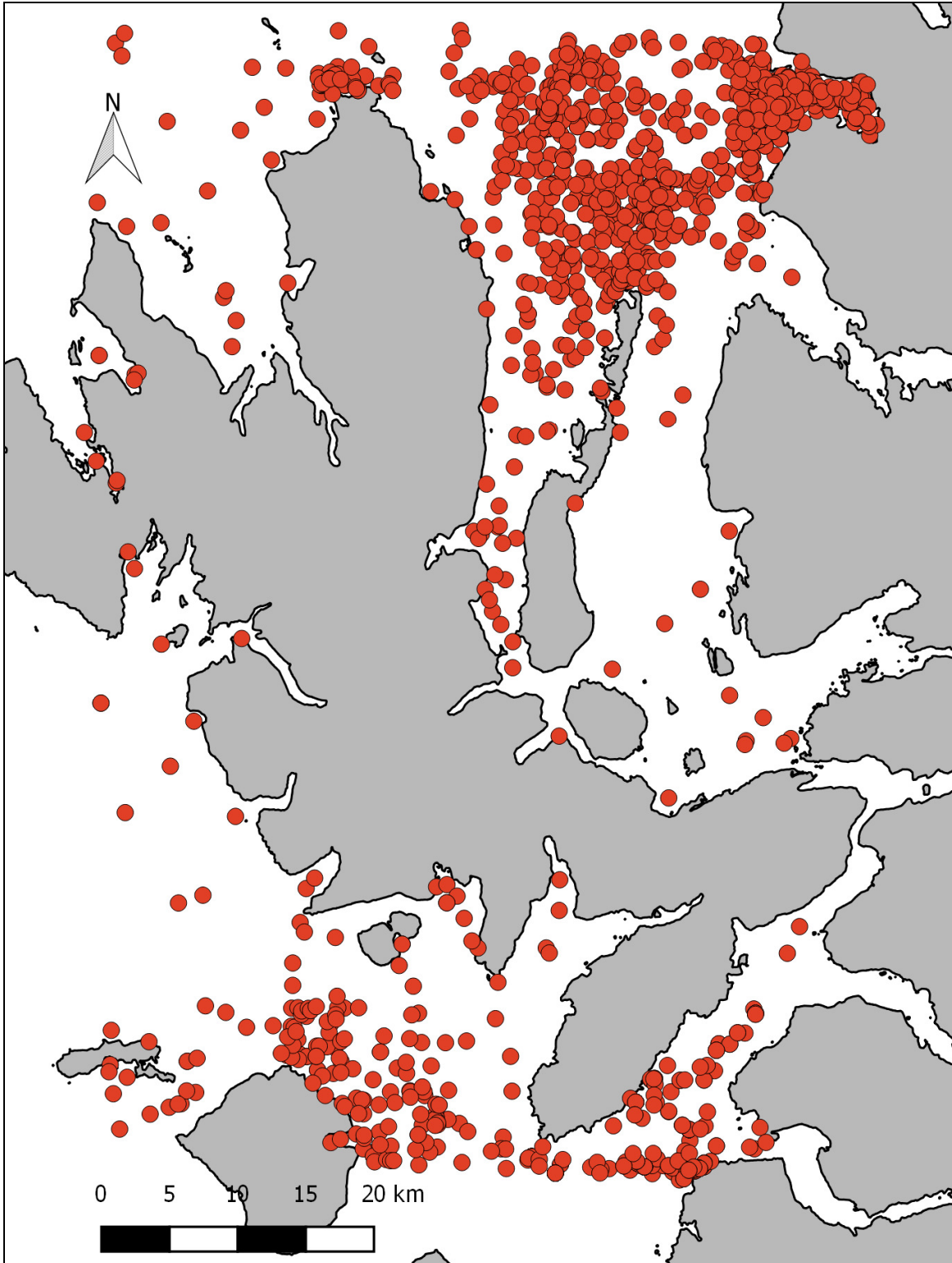
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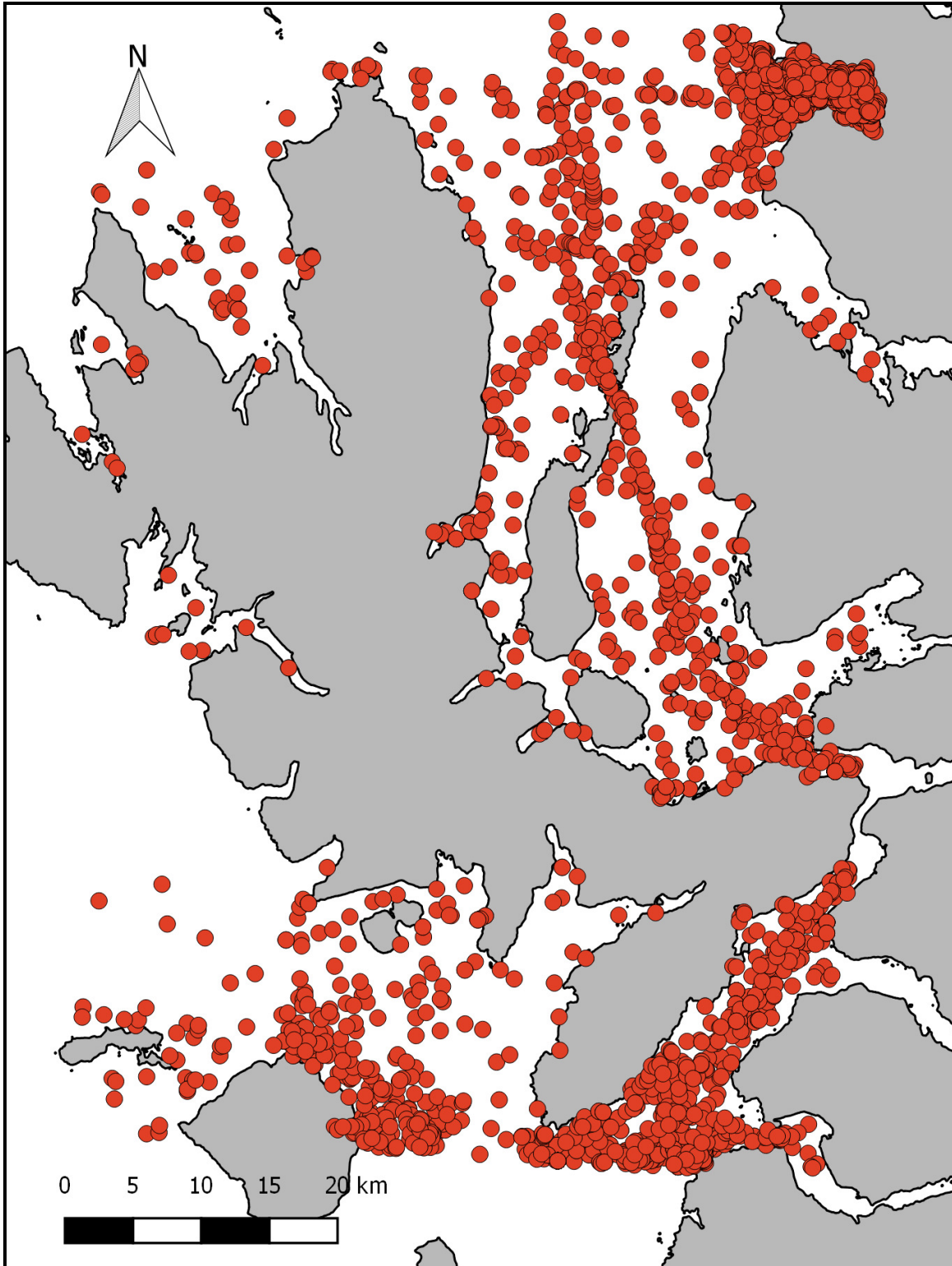


**Fig. 1.** Map of Hebrides with main study area boxed.

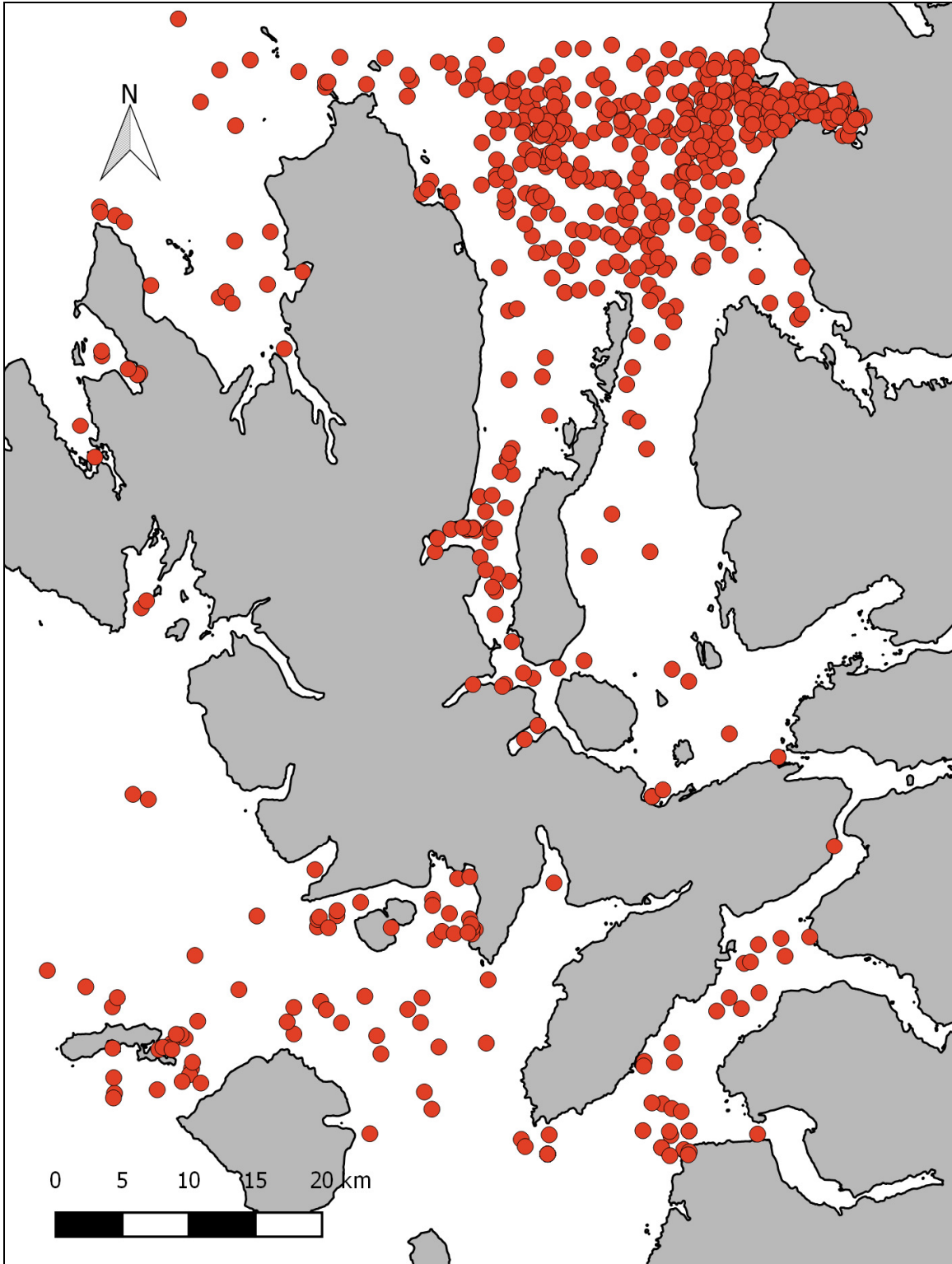
For a better understanding of the distribution of cetaceans in the region, and the potential for occurrence in the main study area, sightings are depicted over a wider region



**Fig. 2.** Distribution of Sightings of Minke Whale from SWF database



**Fig. 3.** Distribution of Sightings of Harbour Porpoise from SWF database

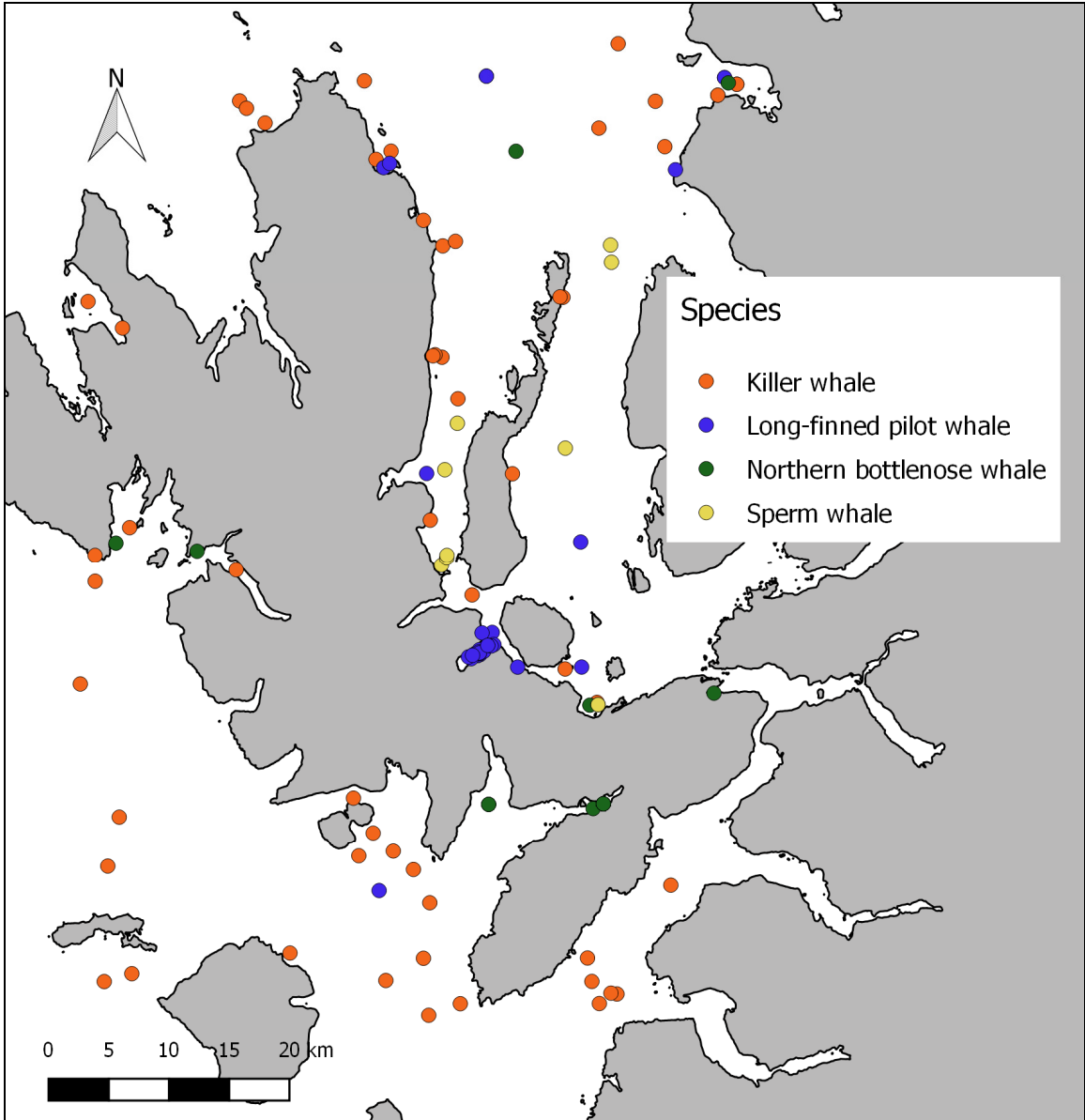


**Fig. 4.** Distribution of Sightings of Short-beaked Common Dolphin from SWF database

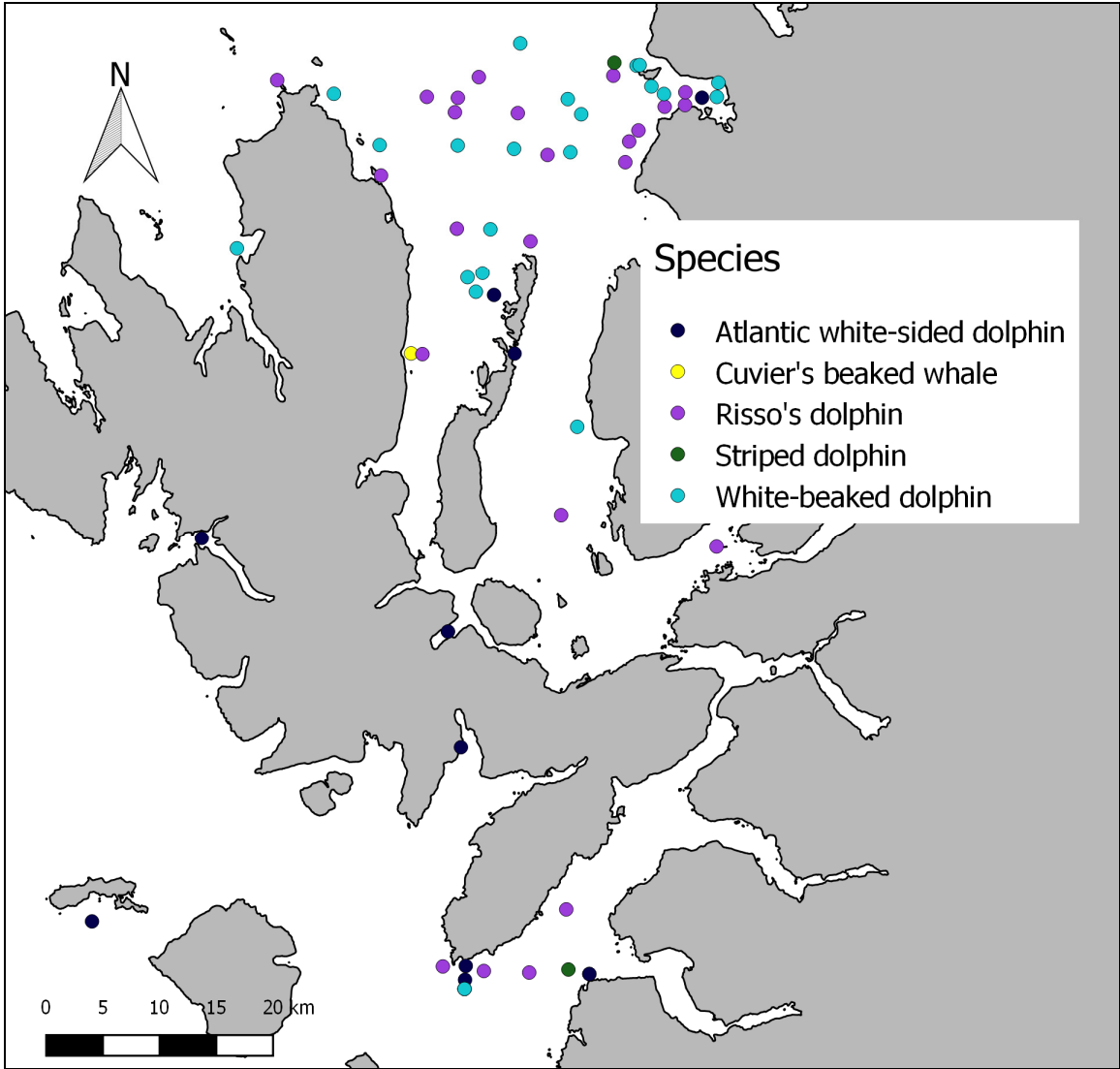




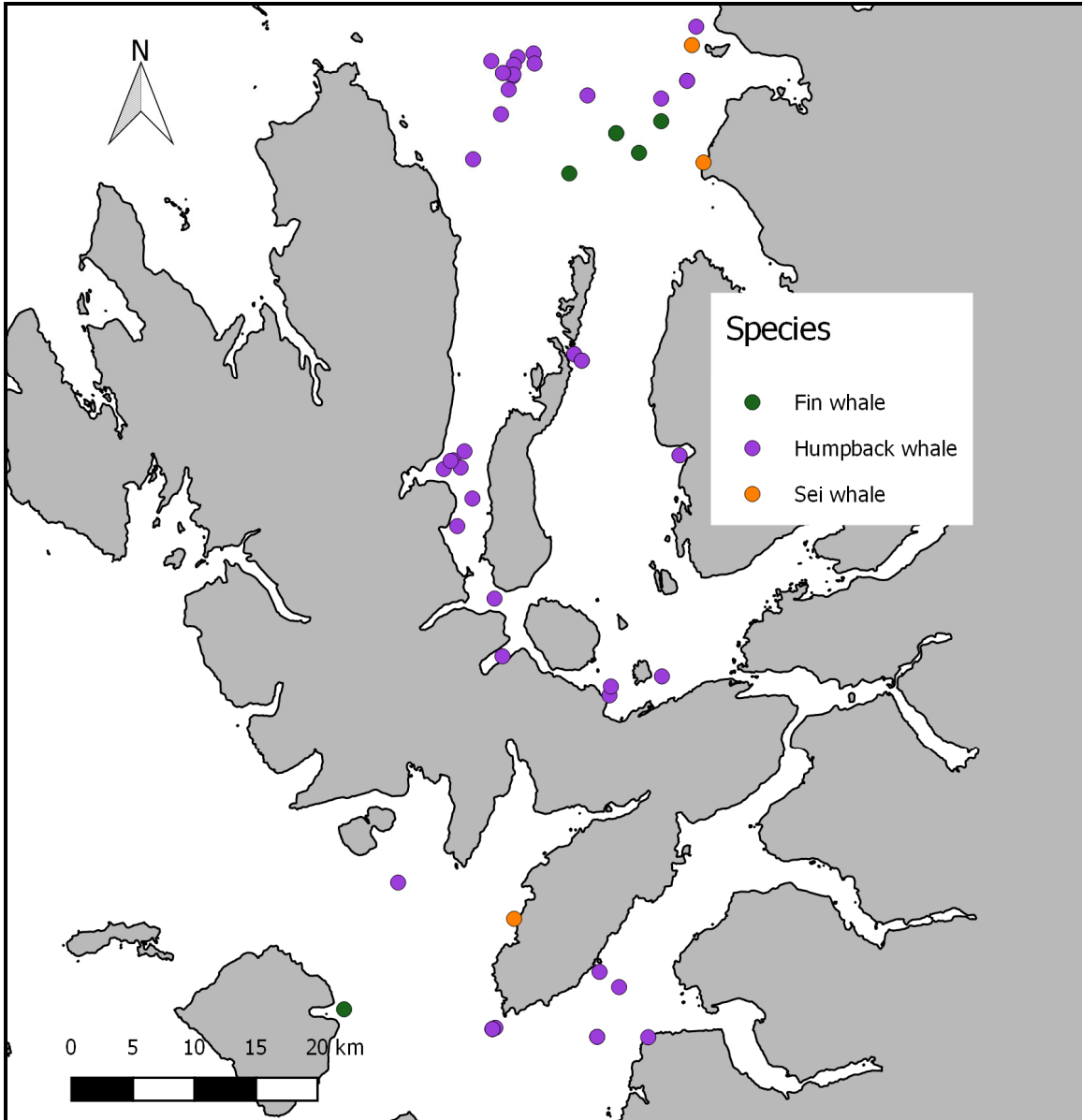
**Fig. 5.** Distribution of Sightings of Bottlenose Dolphin from SWF database



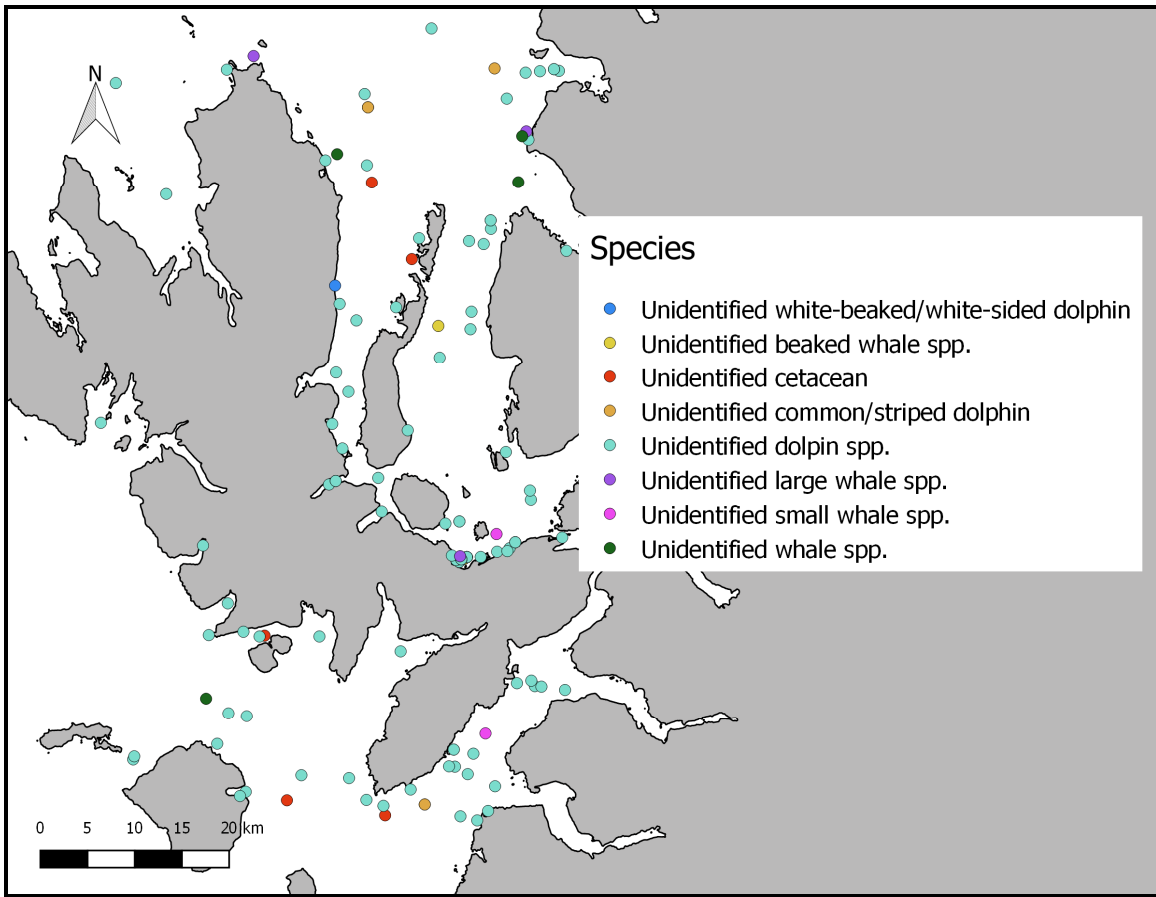
**Fig. 6.** Distribution of Sightings of Large Odontocetes from SWF database



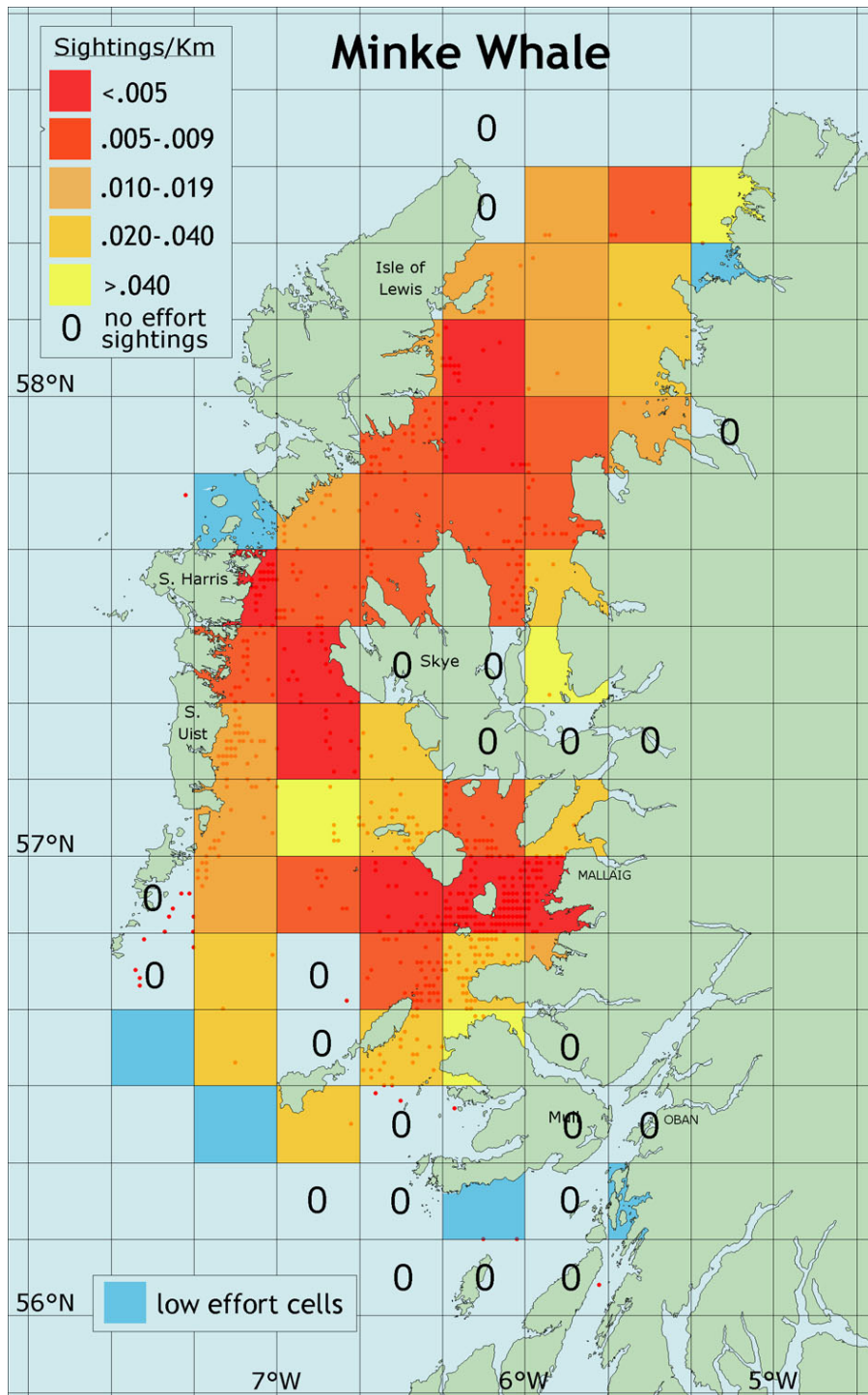
**Fig. 7.** Distribution of Sightings of Small Odontocetes from SWF database



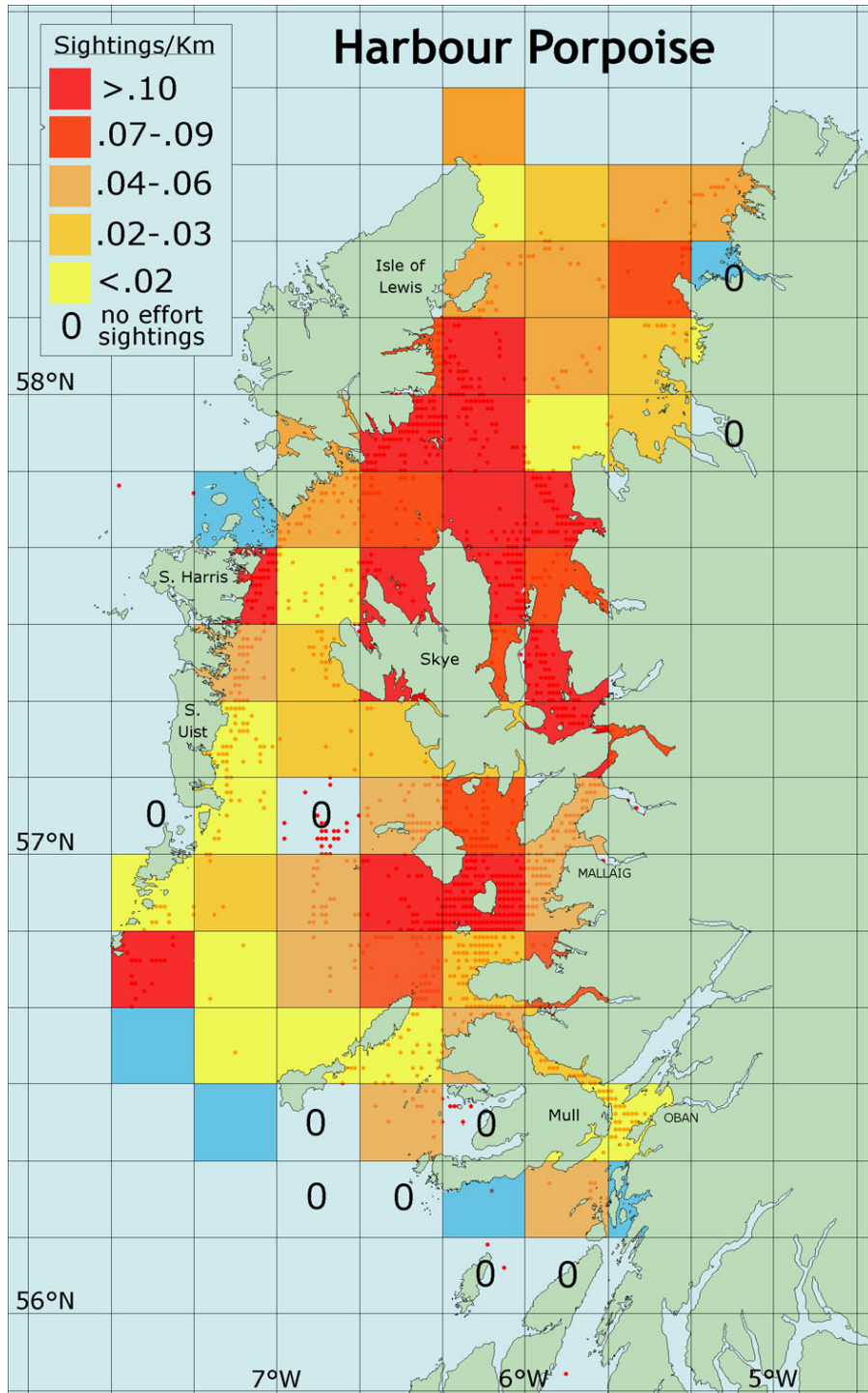
**Fig. 8.** Distribution of Sightings of Mysticetes from SWF database



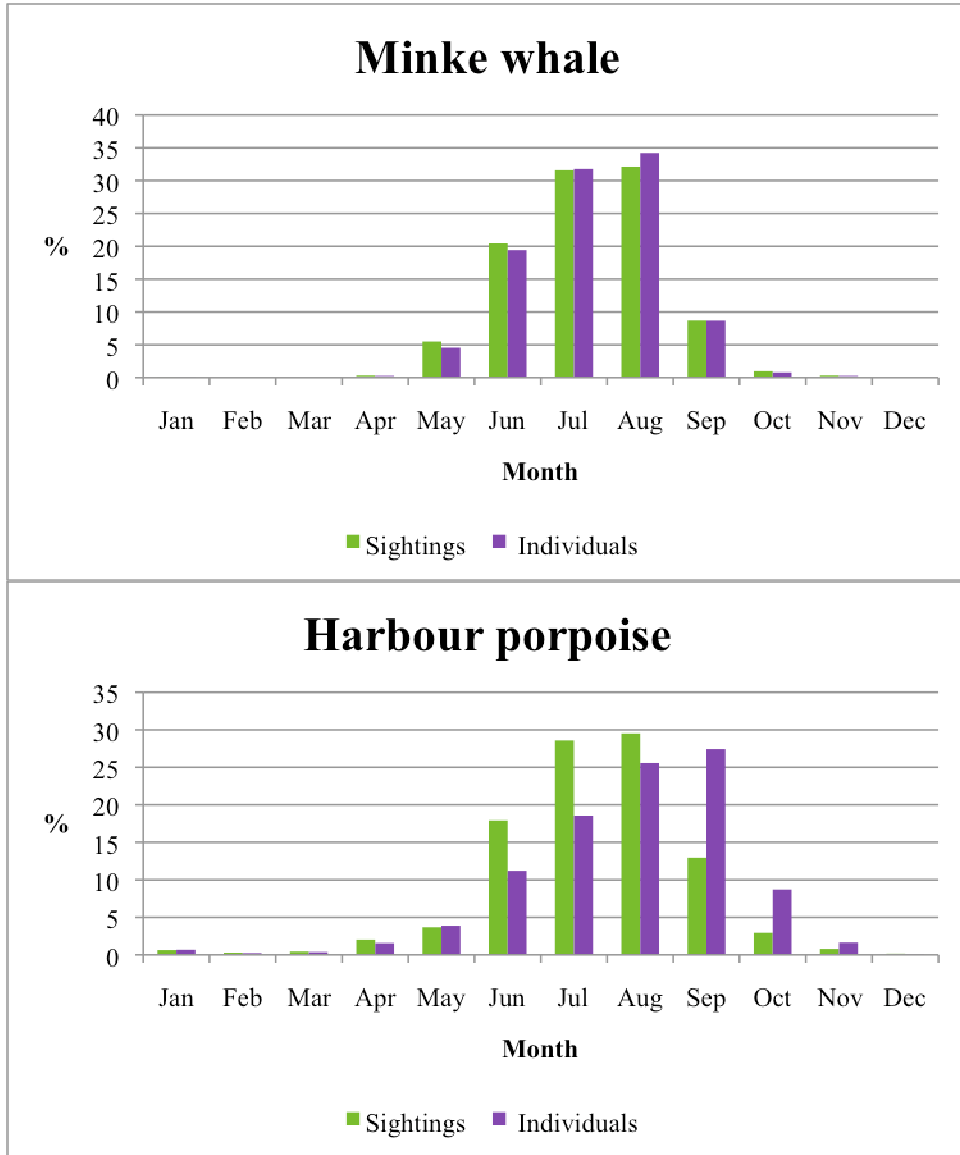
**Fig. 9.** Distribution of Sightings of Unidentified Cetaceans from SWF database



**Fig. 10.** Map showing visual detections per unit effort of minke whale between 1990 and 1997 from “Marguerite Explorer” (source: Boran *et al.*, 1999)

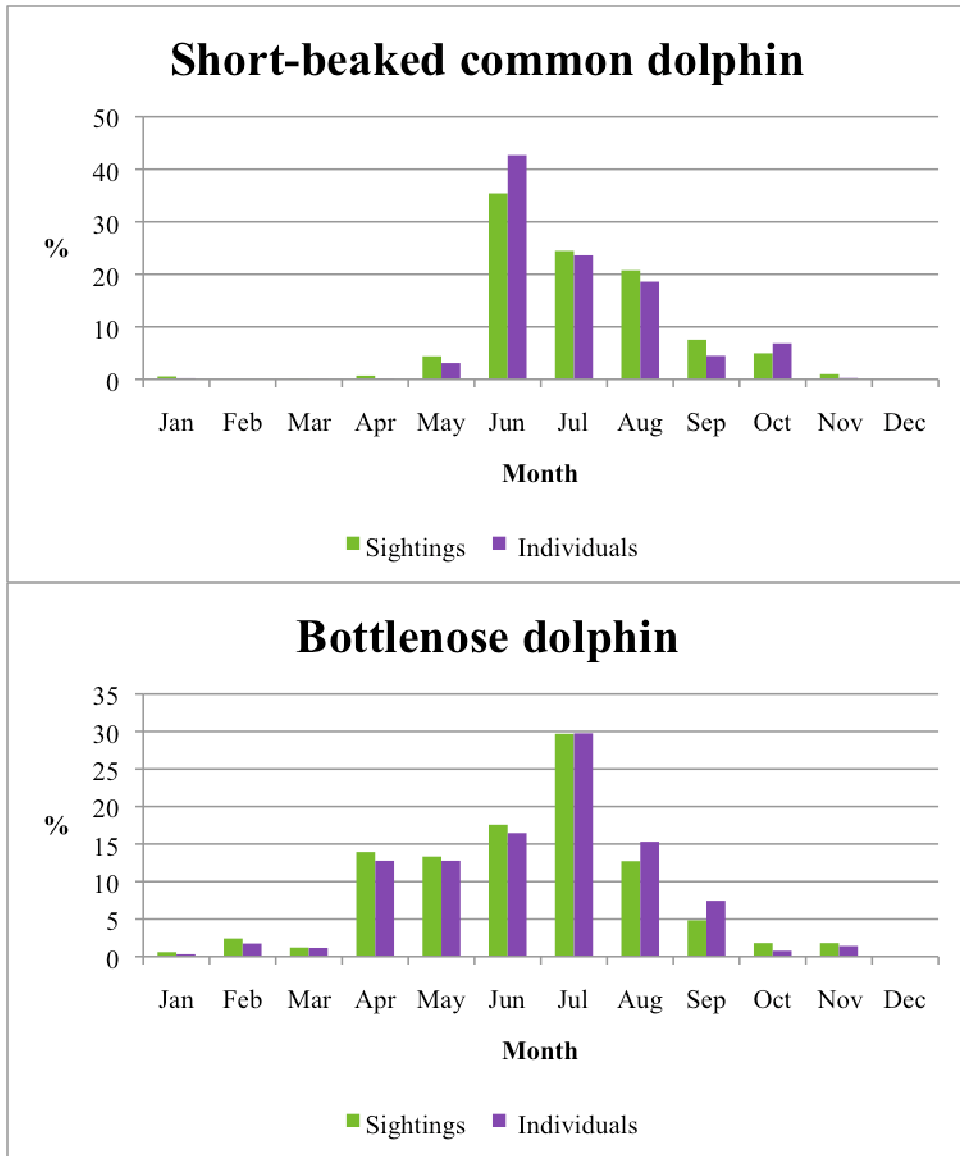


**Fig. 11.** Map showing visual detections per unit effort of harbour porpoise between 1990 and 1997 from “Marguerite Explorer” (source: Boran *et al.*, 1999)

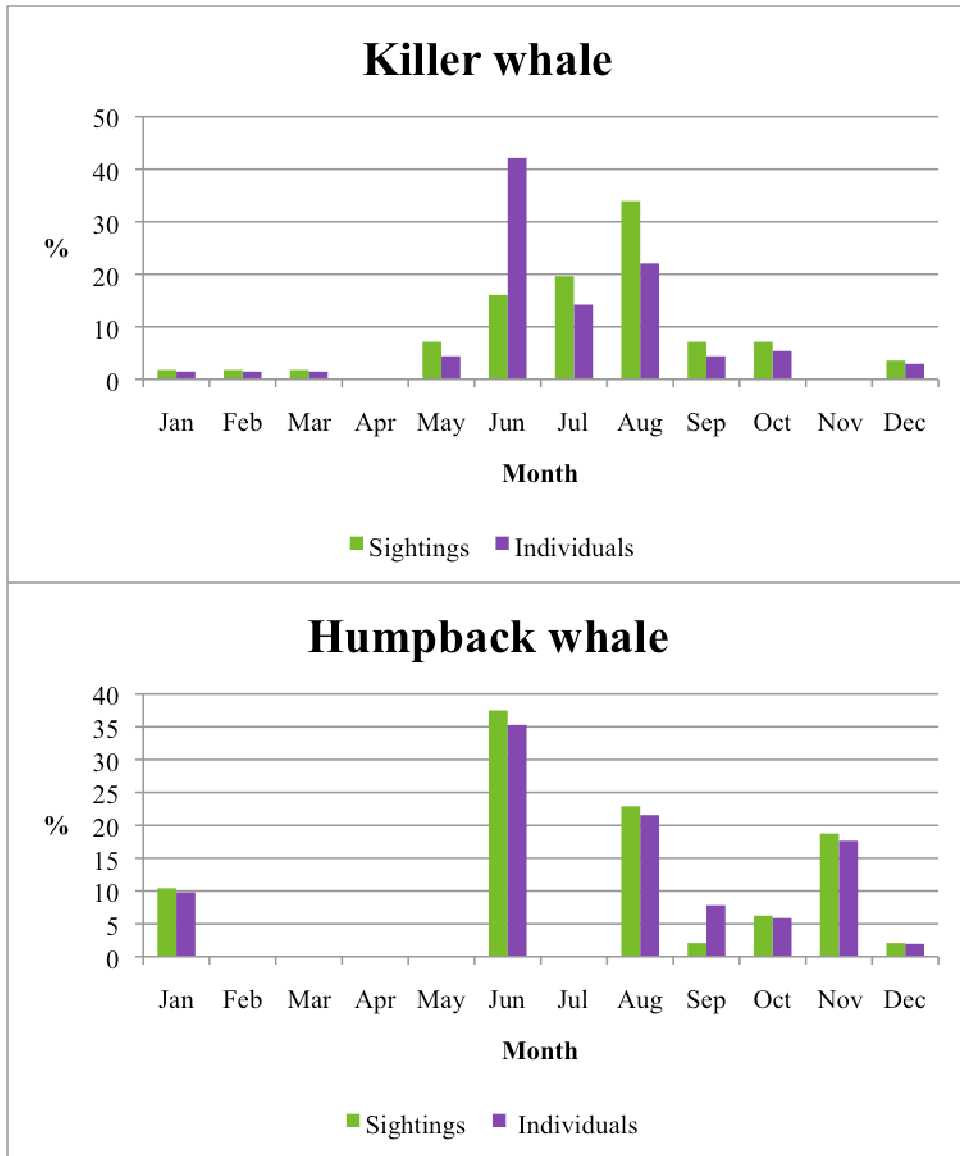


**Fig. 12.** Seasonal Histograms of a) Minke Whale and b) Harbour Porpoise from Sea Watch database

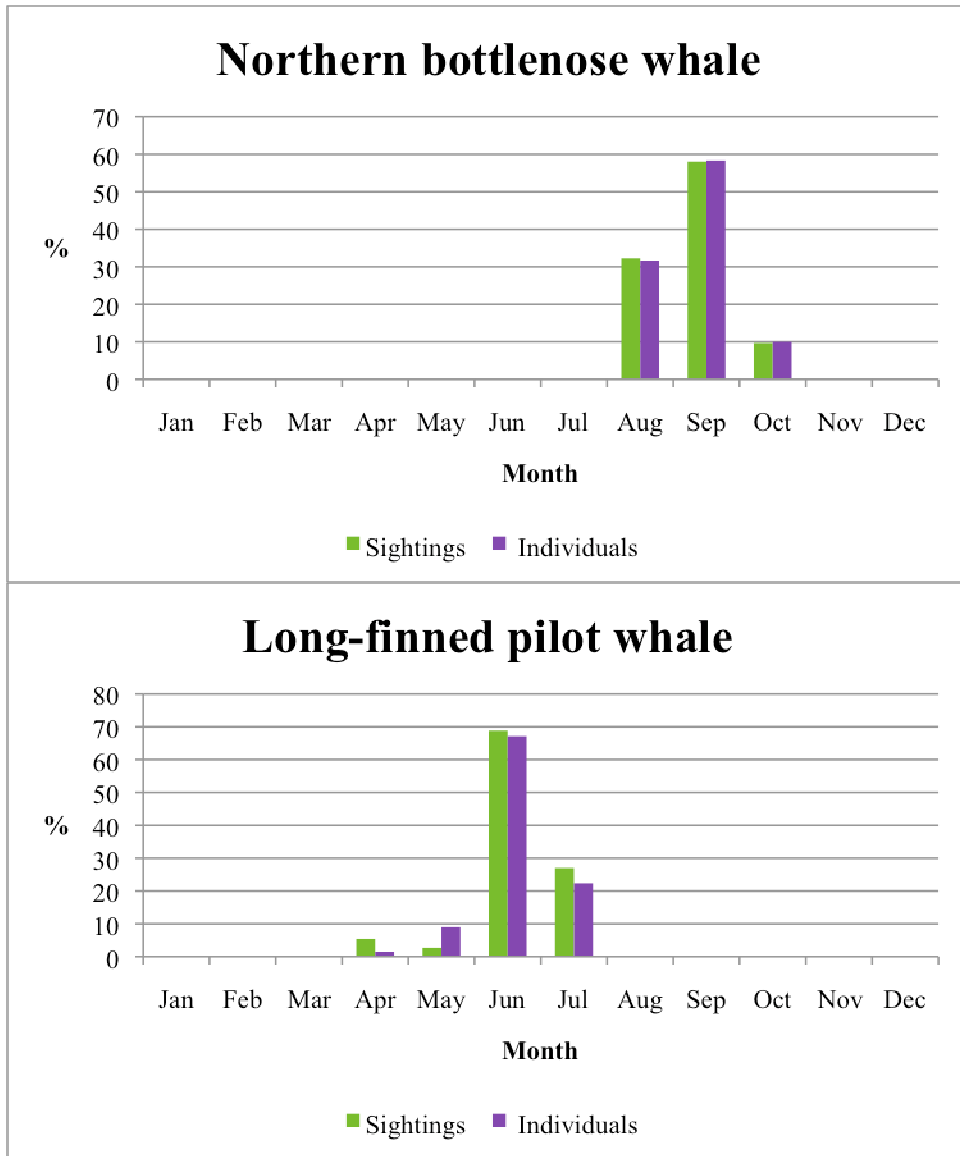




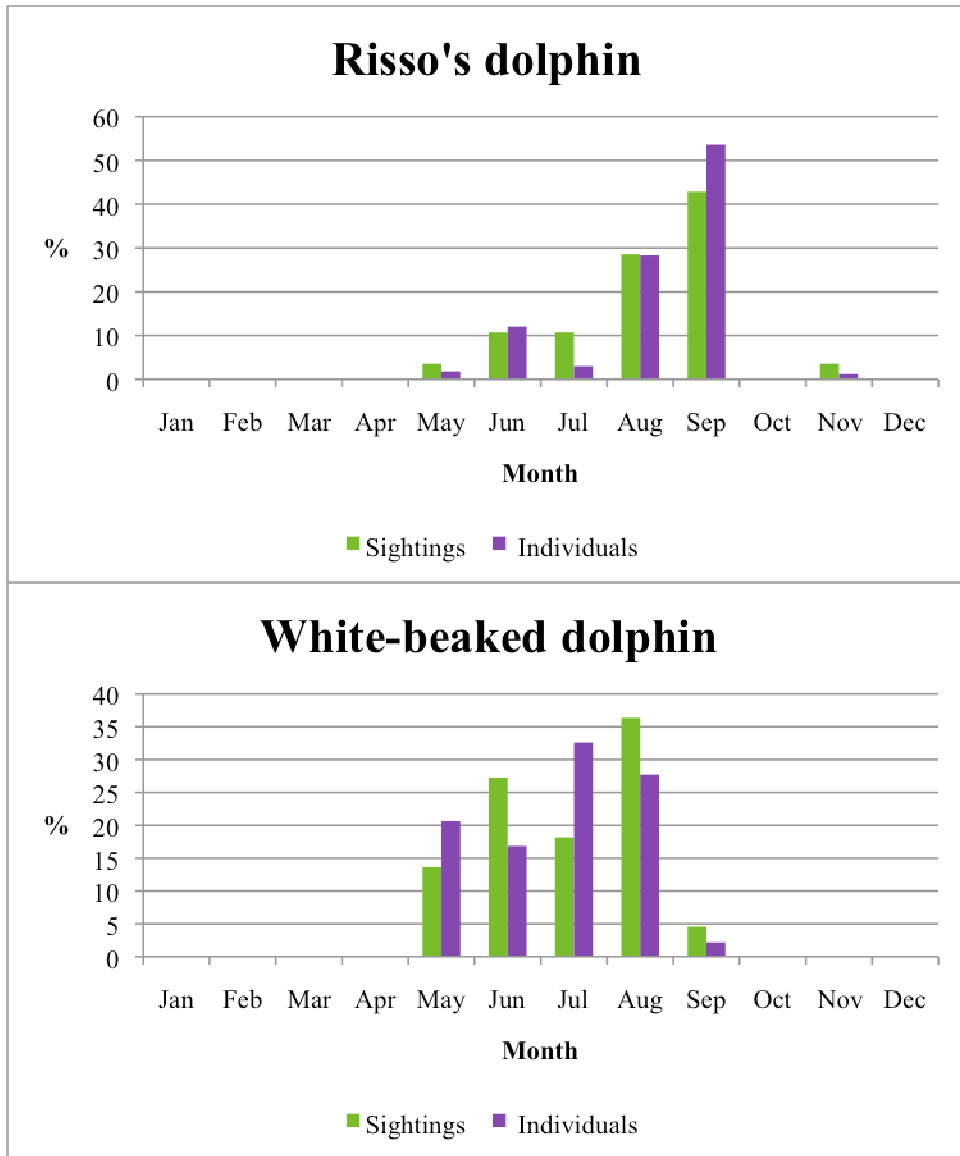
**Fig. 13.** Seasonal Histograms of a) Short-beaked Common Dolphin and b) Bottlenose Dolphin from Sea Watch database



**Fig. 14.** Seasonal Histograms of a) Killer Whale and b) Humpback Whale from Sea Watch database



**Fig. 15.** Seasonal Histograms of a) Northern Bottlenose Whale and b) Long-finned Pilot Whale from Sea Watch database



**Fig. 16.** Seasonal Histograms of a) Risso’s Dolphin and b) White-beaked Dolphin from Sea Watch database