Antarctic minke whale © Lauren Peach

The State of Cetaceans 2026

> "For 25 years, **ORCA** has worked to better understand and protect cetaceans.... what started as a single survey has grown into a **global citizen science monitoring programme.**"

Common dolphin

Foreword

At a time when the health of our oceans is under immense and growing pressure, understanding the lives of the whales, dolphins and porpoises that inhabit them has never been more important or more urgent. These extraordinary animals are not only among the most powerful symbols of the wild ocean; they are also vital indicators of its health. They live in every ocean on Earth, often far from human view or study, yet they are increasingly exposed to the cumulative impacts of human activity, from climate change and overfishing to underwater noise, pollution, habitat disturbance and vessel strikes.

This anniversary edition of *The State of Cetaceans* marks a particularly important moment for ORCA. For 25 years, ORCA has worked to better understand and protect whales, dolphins and porpoises by placing trained observers where they can make a real difference: at sea. What began with surveys on a single ferry route has grown into a global citizen science monitoring programme, collecting data from ferries, cruise ships and expedition vessels across all of the world's oceans.

The scale of that achievement is remarkable. Since effort-based monitoring began in 2006, ORCA has completed more than 4,700 dedicated surveys and recorded 54 species of whales, dolphins and porpoises. But the importance of this work lies not simply in the numbers. It lies in what the data makes possible: identifying important habitats, detecting changes in distribution, supporting Marine Protected Area management, informing vessel strike reduction, and helping decision-makers understand where action is needed most.

This report shows that long-term citizen science is no longer a "nice to have" addition to marine conservation. It is essential. ORCA's repeated ferry-based surveys in UK and adjacent waters are now helping to provide fine-scale, year-to-year insight that complements major surveys such as SCANS. In the Southern Ocean, ORCA's work with IAATO is helping expedition teams collect more powerful and usable data through ORCA OceanWatchers, strengthening our understanding of where whales and vessels overlap in one of the most remote and rapidly changing marine environments on Earth.

None of this would be possible without ORCA's extraordinary community of volunteers, supporters, partners and staff. Their dedication has turned platforms of opportunity into platforms for conservation. Every watch kept from a bridge, every sighting recorded, every training session delivered and every dataset shared, contributes to a bigger purpose: creating safer ocean spaces for whales, dolphins and porpoises.

But what has been built is a start, not an end. There is still much to do. The pressures facing cetaceans are intensifying, and protection, let alone understanding, is not yet keeping pace. But this report offers both evidence and hope. It shows what can be achieved when science, collaboration and public engagement come together and why, after 25 years, ORCA's work is more vital than ever.

Sally Hamilton ORCA, CEO

Blue whale © Brennig Huges

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Report Summary

Despite growing awareness of human impacts on the ocean, the pressures facing cetaceans; whales, dolphins and porpoises continue to intensify. Shipping, fishing, offshore development, underwater noise, pollution and climate change are increasingly overlapping with the places these animals need to feed, breed, migrate and survive. Effective protection depends on good evidence: knowing where cetaceans are, how they use different habitats, and how this changes over time.

The State of Cetaceans 2026 is ORCA's ninth annual report summarising findings from cetacean surveys conducted from platforms of opportunity, including ferries and cruise ships, around the world. Published in ORCA's 25th anniversary year, this report reflects both the latest survey findings and the growing conservation value of the long-term dataset ORCA has built since effort-based monitoring began in 2006.

Over the past two decades, ORCA's work has grown from survey activity on a single ferry route into a global citizen science monitoring programme. Trained Marine Mammal Surveyors and Ocean Conservationists now collect data across all of the world's oceans, helping to identify important habitats, detect changes in distribution, support Marine Protected Area management and inform practical measures to reduce threats to whales, dolphins and porpoises.

Between 2006 and 2025, ORCA completed **4,731 dedicated surveys**, covering **1,848,758 kilometres** – equivalent to travelling more than **46 times around the Earth's equator**. Over that period, surveyors spent **60,059 hours and 30 minutes** actively searching for cetaceans: almost **seven years** of monitoring effort. The dataset now includes records of **54 species** of whales, dolphins and porpoises.

This year's report highlights how that evidence base is being used. A new analysis of ORCA's 20-year UK ferry dataset provides abundance estimates and distribution insights for six commonly recorded species: harbour porpoise, bottlenose dolphin, common dolphin, Risso's dolphin, white-beaked dolphin and minke whale. These findings complement major broad-scale surveys such as SCANS by adding fine-scale, repeated, year-to-year monitoring from ferry routes.

The analysis shows the particular value of long-term citizen science in detecting change. Harbour porpoise records reinforce the growing importance of the southern North Sea, while common dolphin records suggest continued changes in how this species is using the English Channel. These patterns can help shape conservation action, including the management of Marine Protected Areas and responses to changing human pressures.

The report also reflects ORCA's expanding international role. In the Southern Ocean, ORCA worked with the International Association of Antarctica Tour Operators (IAATO) to train expedition teams to collect marine mammal sightings through the ORCA OceanWatchers app as part of the V-CaPS programme. Across the Antarctic season, 25 vessels submitted data, recording 12,940 marine mammals, including more than 4,000 humpback whales, 33 blue whales, 166 beaked whales and multiple orca ecotypes. This information is helping identify where whales and vessels overlap and is feeding directly into vessel strike training and spatial risk-reduction work.

Together, the findings in this report show the power of sustained citizen science. ORCA's 20-year dataset is not simply a record of sightings; it is an evidence base for conservation. As pressures on the ocean continue to grow, ORCA's work shows that trained citizen scientists, working consistently and at scale, can make a major contribution to understanding and protecting whales, dolphins and porpoises around the world.

Creating Safe Ocean Spaces

The world's oceans are becoming ever busier. Shipping, fishing, offshore development, tourism, noise, pollution and climate-driven changes are increasingly overlapping with the places whales, dolphins and porpoises need to feed, breed, migrate and survive. Global vessel traffic alone is predicted to triple by 2050 (International Transport Forum, 2019), meaning that more of the world's biodiversity-rich marine hotspots will be exposed to growing human pressure.

When high densities of whales and dolphins, or critical marine mammal habitats, overlap with intense human activity, the risks can be severe. Vessel strike, underwater noise, disturbance, bycatch and habitat displacement can all undermine the recovery of populations already facing cumulative pressures. Creating safe ocean spaces therefore depends on knowing where animals are, how they use those areas, and how this changes over time.

Over the last decade, there has been a major international effort to identify and map Important Marine Mammal Areas (IMMAs) around the world, led by the IUCN Marine Mammal Protected Areas Task Force. These areas highlight critical habitats for marine mammals and provide an evidence base for governments, regulators, industry and conservation bodies to reduce human disturbance in the places that matter most. This work has also helped drive wider recognition of the need for practical spatial protection, including the establishment by the International Maritime Organization of the first Particularly Sensitive Sea Area focused specifically on reducing vessel strike risk to large whales in the northwestern Mediterranean.

ORCA's monitoring work is directly connected to this global effort. Since 2006, ORCA has collected effort-based cetacean sightings data from ferries, cruise ships and other platforms of opportunity, helping to build the long-term evidence needed to identify hotspots, track change and support better protection. What began with one ferry route and a small group of dedicated volunteers has grown into a major citizen science programme, with a network of highly trained Marine Mammal Surveyors and Ocean Conservationists collecting data in waters around the UK and across the world's oceans.

Since 2006, ORCA has completed 4,731 dedicated surveys. Its survey work broadly falls into two complementary forms of data collection. The first is line-transect distance sampling, used to estimate cetacean density and conducted from the bridge of ferries around the UK and from cruise ships further afield. The second is ORCA OceanWatchers, a more flexible survey protocol that enables data collection alongside public education and engagement on board ferries and cruise ships, helping to identify cetacean distribution and hotspots across a wider range of routes and regions.

This anniversary edition of *The State of Cetaceans* marks not only the expansion of ORCA's data collection, but the extraordinary value of citizen science. The majority of ORCA's sightings data is gathered by trained volunteers who give their time, expertise and commitment to support marine conservation. ORCA's responsibility is to ensure that this effort is translated into meaningful outcomes. That is why ORCA shares data with relevant organisations, government bodies, researchers and conservation partners across the regions where surveys operate. Open distribution of high-quality volunteer-collected data strengthens the evidence base for cetacean conservation and ensures that those hours spent watching the sea contribute directly to safer spaces for whales, dolphins and porpoises.

Cuvier's beaked whale

"The majority of **ORCA's** sightings data is gathered by **trained volunteers** who give their **time, expertise and commitment** to support marine conservation."

Worldwide survey coverage

ORCA's survey coverage has historically been concentrated in the northeast Atlantic and adjacent seas, reflecting its origins on UK and European ferry routes. Over time, that coverage has expanded dramatically. From one route, ORCA's work grew across the UK ferry network, before expanding further through partnerships with the cruise industry and the deployment of Ocean Conservationists on board vessels operating globally (Table 1).

Today, ORCA's surveys cover all of the world's oceans (Figure 1). North Atlantic survey effort remains central to ORCA's work, particularly because of the importance of UK and neighbouring waters for long-term monitoring, but coverage has progressively expanded into the Arctic Ocean, North Pacific Ocean, South Atlantic Ocean, Southern Ocean, South Pacific Ocean and Indian Ocean. Since 2023, ORCA has been gathering information from all of the world's oceans each year, helping to build a long-term picture of how whales and dolphins are using global waters.

This global reach matters. Cetaceans are widely recognised as indicators of ocean health. Changes in where they are found, how often they are seen, and which species are recorded can reveal broader shifts in marine ecosystems, whether driven by changing ocean conditions, prey distribution, human disturbance or climate change. Consistent, year-on-year monitoring across ocean regions therefore allows ORCA to detect emerging patterns and contribute evidence to conservation action at regional, national and international levels.

ORCA's long-term ferry routes remain especially important. Some routes are no longer surveyed regularly because services have changed, routes have ceased operation, or logistics have become more difficult. However, the historic data gathered from those routes remains highly valuable, contributing to ORCA's extensive database and helping to inform understanding of cetacean distribution and change over time (Figure 2).

In 2025, ORCA also achieved a major step forward in UK waters, conducting year-round monitoring for the first time through the expansion of Marine Mammal Surveyor ferry surveys into the winter months. Linked to the JNCC–ORCA pilot project, a partnership that brings together the Joint Nature Conservation Committee's (JNCC, the UK Government's advisory body on offshore marine environment) role in convening priorities for national monitoring and advice, and ORCA's proven model of delivering high-quality surveys at sea through trained surveyors and platforms of opportunity. This reflects growing recognition of ORCA's survey model as high-quality citizen science data collection capable of supporting statutory conservation needs.

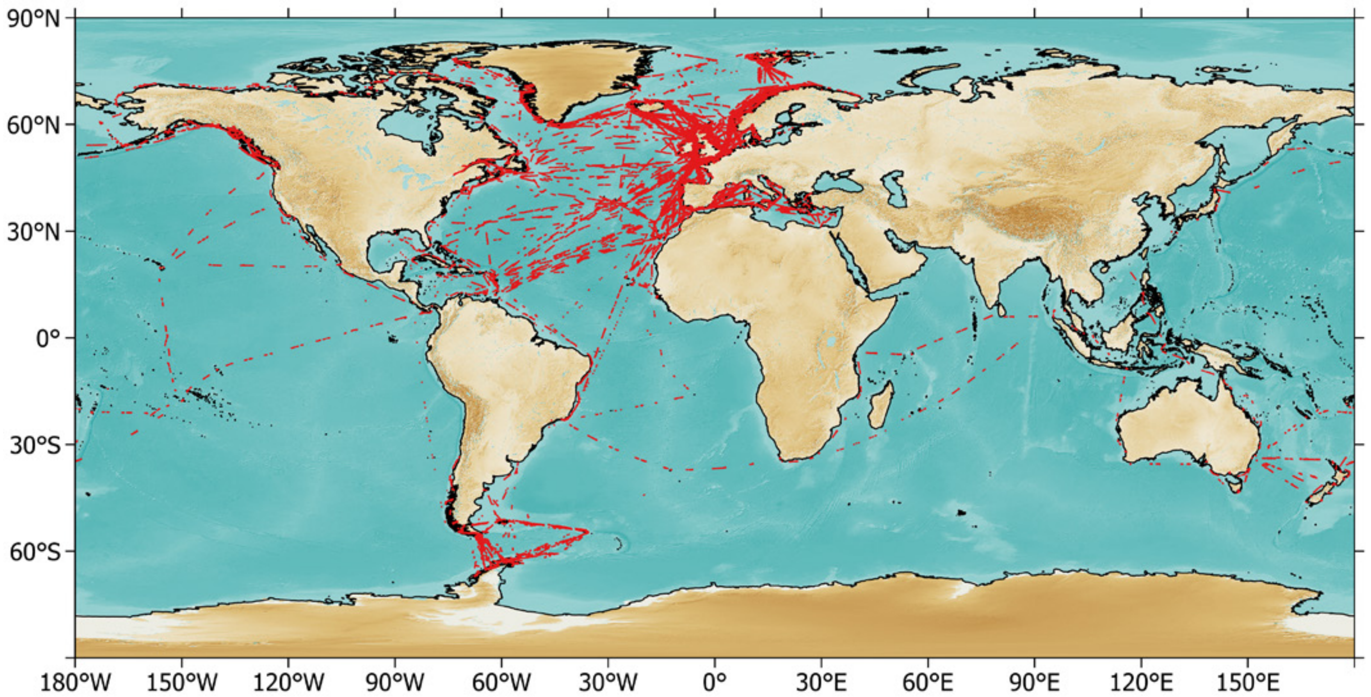


Figure 1: Global distribution of survey effort from ORCA dedicated surveys 2006-2025

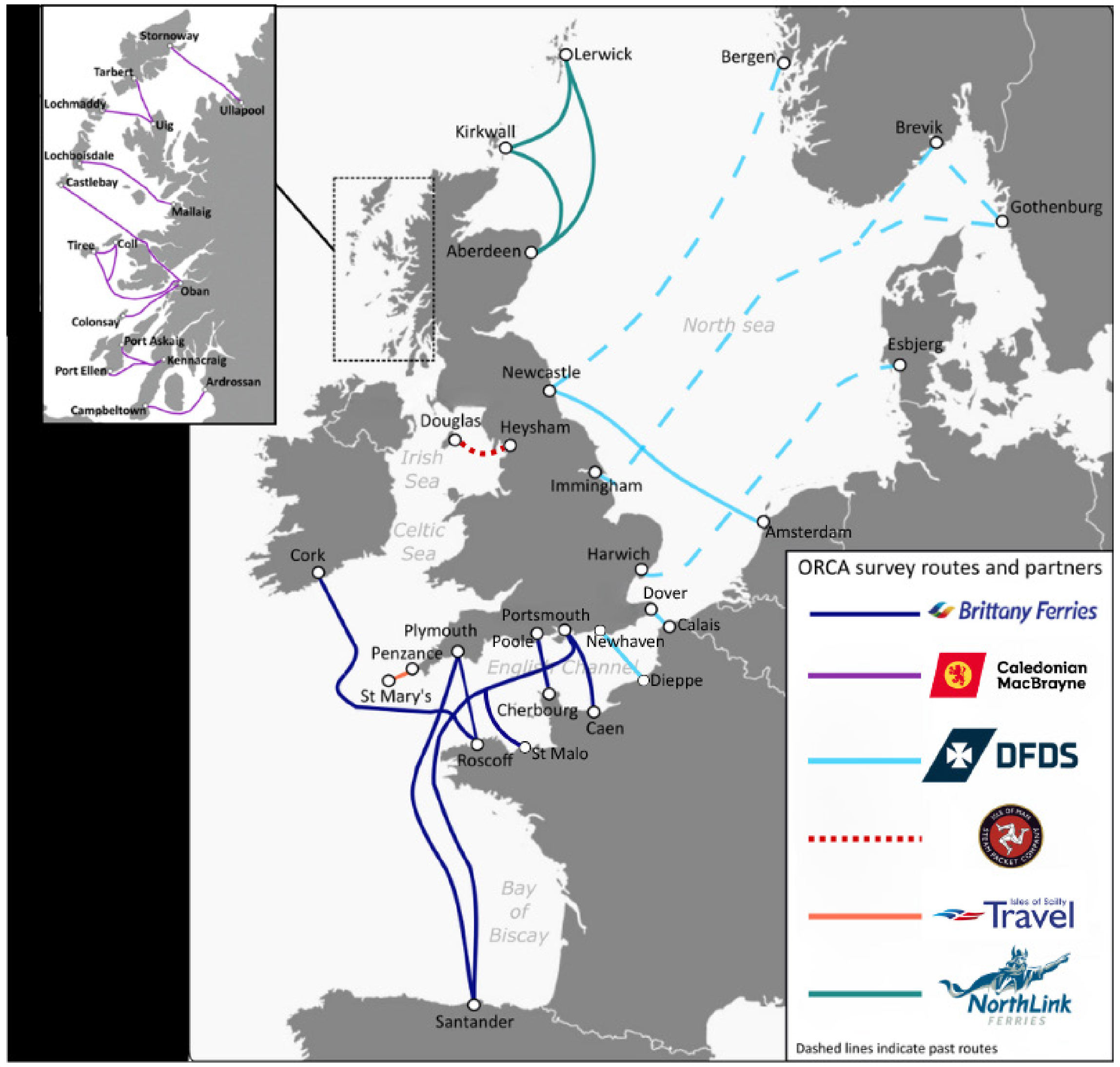


Figure 2: Ferry routes surveyed by ORCA using distance sampling methodology 2006-2025

SEA REGION	ROUTE	YEARS ACTIVE	COMPANY
North Sea	Aberdeen-Lerwick (UK)	2016-2019, 2023-2025	NorthLink Ferries
	Harwich-Esbjerg (UK – Denmark)	2008-2014	DFDS
	Immingham-Gothenburg-Brevik (UK – Sweden – Norway)	2015	DFDS
	Newcastle-Amsterdam (UK – The Netherlands)	2009, 2011-2019, 2022-2025	DFDS
	Newcastle-Bergen (UK – Norway)	2006-2008	DFDS
	Oslo-Frederikshavn-Copenhagen (Norway – Denmark)	2023-2024	DFDS
	Various cruises	2006, 2009-2019, 2021-2025	Ambassador Cruise Line, Cunard, Fred. Olsen Cruise Lines, HX, Noble Caledonia, P&O Cruises, Saga, Silversea
English Channel	Dover-Calais (UK – France)	2016-2020, 2023-2025	DFDS
	Lymington-Yarmouth (UK)	2015	Wightlink
	Newhaven-Dieppe (UK – France)	2018-2019, 2022-2025	DFDS
	Plymouth-Roscoff (UK – France)	2014-2019, 2022-2025	Brittany Ferries
	Plymouth-Roscoff-Cork (UK – France – Ireland)	2014-2019, 2021-2025	Brittany Ferries
	Poole-Cherbourg (UK – France)	2017-2019, 2022-2025	Brittany Ferries
	Portsmouth-Caen (UK – France)	2014-2019, 2022-2025	Brittany Ferries
	Portsmouth-Fishbourne (UK)	2015-2019	Wightlink
	Portsmouth-St Malo (UK – France)	2025	Brittany Ferries
	Southampton-Cowes (UK)	2016-2019	Red Funnel
	Various cruises	2006-2019, 2021-2025	Ambassador Cruise Line, Cunard, Fred. Olsen Cruise Lines, HX, Noble Caledonia, P&O Cruises, Saga, Silversea
Celtic Sea	Penzance-St Mary's (UK)	2009-2019, 2022-2025	Isles of Scilly Travel
	Various cruises	2007, 2009-2019, 2021-2025	Ambassador Cruise Line, Fred. Olsen Cruise Lines, HX, Noble Caledonia, P&O Cruises, Saga, Silversea
Irish Sea	Heysham-Douglas (UK)	2011-2013, 2015-2016	Isle of Man Steam Packet Company
	Various cruises	2008-2019, 2021-2025	Ambassador Cruise Line, Fred. Olsen Cruise Lines, HX, Noble Caledonia, Saga, Silversea
Minches and West Scotland	Ardrossan-Campbeltown (UK)	2019, 2022-2023	Caledonian MacBrayne
	Kennacraig-Port Ellen-Port Askaig (UK)	2025	Caledonian MacBrayne
	Mallaig-Lochboisdale (UK)	2023-2025	Caledonian MacBrayne
	Oban-Castlebay (UK)	2017-2019, 2022-2025	Caledonian MacBrayne
	Oban-Coll-Tiree-Colonsay (UK)	2017-2019, 2022-2025	Caledonian MacBrayne
	Uig-Lochmaddy-Tarbert (UK)	2019, 2022-2025	Caledonian MacBrayne
	Ullapool-Stornoway (UK)	2017-2019, 2022-2025	Caledonian MacBrayne
	Various Cruises	2009-2019, 2021-2025	Ambassador Cruise Line, Fred. Olsen Cruise Lines, HX, Noble Caledonia, P&O Cruises, Saga

SEA REGION	ROUTE	YEARS ACTIVE	COMPANY
Bay of Biscay and Iberian Coast	Plymouth-Santander (UK – Spain)	2006-2008, 2022-2025	Brittany Ferries
	Plymouth-Santander-Portsmouth (UK – Spain)	2009-2019	Brittany Ferries
	Portsmouth-Bilbao (UK – Spain)	2014-2019, 2023-2025	Brittany Ferries
	Portsmouth-Santander (UK – Spain)	2014-2019, 2021-2025	Brittany Ferries
	Rosslare-Bilbao (Ireland – Spain)	2023-2025	Brittany Ferries
	Various cruises	2007, 2010-2011, 2013, 2015-2019, 2022-2025	Ambassador Cruise Line, Celebrity Cruises, CFC Croisières, Fred. Olsen Cruise Lines, Noble Caledonia, P&O Cruises, Saga, Swan Hellenic
Arctic Ocean	Various cruises	2006,2009, 2011-2012, 2014-2019, 2021-2025	Ambassador Cruise Line, Atlas Ocean Voyages, Cunard, Fred. Olsen Cruise Lines, HX, Noble Caledonia, Oceanwide Expeditions, P&O Cruises, Saga, Silversea, Windstar Cruises
North Atlantic Ocean	Various cruises	2008, 2011-2012, 2014-2019, 2021-2025	Albatros Expeditions, Ambassador Cruise Line, Atlas Ocean Voyages, CFC Croisières, Explora Journeys, Fred. Olsen Cruise Lines, HX, P&O Cruises, Saga, Windstar Cruises
South Atlantic Ocean	Various cruises	2019, 2022-2025	Albatros Expeditions, Ambassador Cruise Line, Atlas Ocean Voyages, Celebrity Cruises, HX, Oceanwide Expeditions, PONANT
Indian Ocean	Various cruises	2023-2025	Ambassador Cruise Line, Celebrity Cruises, P&O Cruises
Mediterranean Sea	Various cruises	2007-2008,2010-2012, 2015-2019, 2021-2025	Ambassador Cruise Line, CFC Croisières, Emerald Cruises, Explora Journeys, Fred. Olsen Cruise Lines, P&O Cruises, Saga
North Pacific Ocean	Various cruises	2018-2019, 2022-2025	Ambassador Cruise Line, Celebrity Cruises, Crystal Cruises, Cunard, Explora Journeys, Fred. Olsen Cruise Lines, HX, Noble Caledonia, Silversea
South Pacific Ocean	Various cruises	2023-2025	Ambassador Cruise Line, Fred. Olsen Cruise Lines, Celebrity Cruises, HX, P&O Cruises
Southern Ocean	Various cruises	2019, 2021-2025	Albatros Expeditions, Atlas Ocean Voyages, Celebrity Cruises, Crystal Cruises, HX

Table 1: Routes and sea regions surveyed by ORCA dedicated surveys between 2006 and 2025

Distance surveyed and survey effort

YEAR	DISTANCE (KILOMETRES)	EFFORT (HRS AND MINS)
2006	10,402	290 hours and 20 minutes
2007	10,815	341 hours and 43 minutes
2008	12,057	329 hours and 45 minutes
2009	11,166	306 hours and 43 minutes
2010	10,788	359 hours and 44 minutes
2011	19,480	639 hours and 36 minutes
2012	16,019	508 hours and 56 minutes
2013	18,441	588 hours and 47 minutes
2014	94,960	2,408 hours and 43 minutes
2015	93,632	2,568 hours and 29 minutes
2016	84,533	2,490 hours and 26 minutes
2017	100,675	3,000 hours and 55 minutes
2018	103,813	2,983 hours and 17 minutes
2019	127,113	3,904 hours and 55 minutes
2020	6,727	220 hours and 55 minutes
2021	32,834	1,396 hours and 04 minutes
2022	179,486	6,446 hours and 34 minutes
2023	311,934	10,869 hours and 14 minutes
2024	377,612	13,267 hours and 55 minutes
2025	226,275	7,136 hours and 29 minutes
Total	**1,848,758 kilometres**	**60,059 hours and 30 minutes**

Table 2:
Survey effort during all dedicated ORCA surveys in kilometres and hours by year


ORCA citizen scientist

Since 2006, ORCA has achieved 1,848,758 kilometres of dedicated survey effort (Table 2). That is equivalent to travelling more than 46 times around the Earth's equator.

Over the same period, ORCA surveyors have spent 60,059 hours and 30 minutes actively searching for whales, dolphins and porpoises. That equates to 2,502 days, or almost seven years, of continuous monitoring effort.

This growth has not been linear. Survey effort increased significantly from 2014, when effort-based data collection protocols were introduced on board ferries with Ocean Conservationists. Survey activity then dropped sharply in 2020 and 2021 because of the global pandemic, when travel restrictions and disruption to ferry and cruise operations greatly reduced opportunities for data collection. Since then, effort has rebuilt and expanded, with survey effort reaching its highest level in 2024, reflecting the growth of ORCA's work on board cruise ships globally.

The scale of this expansion is striking. Annual survey effort is now almost 22 times higher than it was in 2006. Ocean Conservationists have significantly increased ORCA's global survey reach, while Marine Mammal Surveyors have expanded coverage across the UK ferry network in both space and time. Together, these two strands of ORCA's work have transformed the organisation's monitoring capacity.

Historically, most ORCA survey effort has taken place in the North Atlantic Ocean (Table 3). This remains the region with the greatest overall effort – over 1.6 million kilometres surveyed since 2006 – reflecting ORCA's long-standing work in UK, Irish, Scottish, North Sea, English Channel and Bay of Biscay waters. However, the dataset has widened substantially. The Arctic Ocean was first incorporated in 2009, followed by the North Pacific and South Atlantic Oceans in 2018. The Southern Ocean was first surveyed in 2019, with data collection growing substantially since then. The South Pacific Ocean entered ORCA's dataset in 2021 and the Indian Ocean in 2023.

The Southern Ocean is becoming an increasingly important part of ORCA's conservation work. This is a region where recovering whale populations overlap with increased shipping activity, cruise tourism and expanding krill fisheries. ORCA's data is being used to map whale densities and identify high-use areas, helping to inform speed restrictions and other measures to reduce vessel strike risk at finer temporal and spatial scales. It also contributes to understanding the distribution and population status of recovering whale species in one of the most remote and rapidly changing marine environments on Earth.


Pacific white-sided dolphin © Richard Lovelock

	YEAR																				
OCEAN	**2006**	**2007**	**2008**	**2009**	**2010**	**2011**	**2012**	**2013**	**2014**	**2015**	**2016**	**2017**	**2018**	**2019**	**2020**	**2021**	**2022**	**2023**	**2024**	**2025**	**Total (km)**
Arctic Ocean				1,608	331	291	1,398	1,834	4,619	2,433	4,296	2,811	1,506	3,748	314	3,388	14,369	17,037	12,336	9,931	**82,249**
North Atlantic Ocean	10,402	10,815	12,057	9,558	10,457	19,189	14,621	16,607	90,341	91,199	80,237	97,864	100,400	115,995	6,412	28,108	152,966	266,924	334,707	199,982	**1,668,839**
North Pacific Ocean													1,409	6,303			7,099	12,390	5,930	4,302	**37,434**
Indian Ocean																		127	4,102	1,108	**5,337**
South Atlantic Ocean													498	733		579	3,050	5,924	10,548	5,775	**27,108**
South Pacific Ocean																161	640	6,651	6,472	1,043	**14,966**
Southern Ocean														334		598	1,361	2,882	3,517	4,134	**12,825**
Total (km)	**10,402**	**10,815**	**12,057**	**11,166**	**10,788**	**19,480**	**16,019**	**18,441**	**94,960**	**93,632**	**84,533**	**100,675**	**103,813**	**127,113**	**6,727**	**32,834**	**179,486**	**311,934**	**377,612**	**226,275**	**1,848,758**

Table 3: Survey effort during all dedicated ORCA surveys in kilometres by ocean region and year

Sightings and species recorded

Orca (© Maria Snell)

When ORCA began collecting effort-based data, annual records involved a few hundred animals and only a small number of species. Today, ORCA records tens of thousands of animals each year and its database includes 54 species of whale, dolphin and porpoise (Table 4).

The expansion in species recorded reflects the growth of ORCA's spatial coverage. In the early years, records were dominated by species found in the North Atlantic and adjacent seas. As survey effort expanded into new ocean regions, ORCA began recording a much wider range of cetaceans, from familiar UK species to tropical dolphins, Southern Hemisphere endemics, polar species and deep-diving whales that are rarely encountered at sea (Table 5).

Common dolphin is by far the most frequently recorded species in ORCA's dataset, with 192,851 individuals recorded since 2006. This is followed by harbour porpoise, with 22,881 individuals, and striped dolphin, with 21,845 individuals. Among the baleen whales, humpback whale is the most commonly recorded, with 7,894 individuals, closely followed by minke whale, with 7,572 individuals, and fin whale, with 6,183 individuals.

Some species have been recorded every year since ORCA's effort-based dataset began in 2006. These include harbour porpoise, bottlenose dolphin, common dolphin, striped dolphin, white-beaked dolphin, sperm whale, and minke whale. Over the past three years, 31 species have been recorded every year, demonstrating both the breadth of ORCA's coverage and the increasing consistency of its survey effort.

ORCA's trained observers have also recorded species that are rarely seen alive or are particularly difficult to study. Beaked whales, for example, spend much of their lives underwater, often in deep offshore habitats, and are among the least understood cetaceans. Sightings of species such as ginkgo-toothed beaked whale and Gray's beaked whale in 2024 demonstrate the value of platforms of opportunity in reaching data-poor areas. ORCA surveys have also recorded narwhal twice, in 2022 and 2025, highlighting the ability of wide-ranging survey coverage to capture unusual and important records.

ORCA's data can also contribute to conservation knowledge for critically threatened species. North Atlantic right whales have been recorded on three occasions during ORCA surveys. Given the severe conservation status of this species, every verified sighting is important. Sharing photographs and sighting information with relevant authorities helps strengthen knowledge of individual animals, their movements and the threats they face.

Not every sighting can be identified to species level, but these records still matter. Many cetaceans, including porpoises, dolphins, pilot whales, beaked whales and other cryptic species, can be difficult to identify in poor weather, at distance, or during brief encounters. In these situations, observers may only be able to classify an animal more broadly as a whale, dolphin or porpoise. Even without species-level certainty, these records help reveal patterns of persistent use, indicate potential hotspots and contribute to wider conservation assessments.

Most sightings in ORCA's dataset have been recorded in the North Atlantic (Table 5), reflecting the organisation's historic survey coverage and the growth of real-time reporting in UK and neighbouring waters. The Arctic Ocean, North Pacific Ocean and Southern Ocean also now make major contributions to the dataset. In the North Pacific Ocean, ORCA's monitoring can support work on whale–ship interactions and vessel strike risk, including in areas such as Alaska. In the Southern Ocean, ORCA's data is increasingly important for whale-density mapping, sustained monitoring around South Georgia and the Antarctic, and work with partners to reduce disturbance and collision risk in high-use whale areas. Sightings in the Indian Ocean remain lower, reflecting the fact that ORCA only began surveying there in 2023, but this region is expected to become increasingly important as coverage develops.

Bottlenose dolphin © Catherine Clark

Common dolphin

	YEAR																				
SPECIES	**2006**	**2007**	**2008**	**2009**	**2010**	**2011**	**2012**	**2013**	**2014**	**2015**	**2016**	**2017**	**2018**	**2019**	**2020**	**2021**	**2022**	**2023**	**2024**	**2025**	**TOTAL NO. OF ANIMALS**
Burmeister's porpoise *(Phocoena spinipinnis)*																			6	2	**8**
Dall's porpoise *(Phocoenoides dalli)*														625			188		112	171	**1,096**
Harbour porpoise *(Phocoena phocoena)*	155	127	114	144	170	359	340	490	1,450	1,056	1,240	827	1,655	2,957	45	504	2,250	3,178	4,114	1,706	**22,881**
Spectacled porpoise *(Phocoena dioptrica)*																			3		**3**
Unidentified porpoise																	24	30	29	63	**146**
Atlantic spotted dolphin *(Stenella frontalis)*												530	71	107	123		470	726	737	106	**2,870**
Atlantic white-sided dolphin *(Laegnorhynchus acutus)*	4	5				10	1,000	3	14	34	6	19	499	50			340	175	99	11	**2,269**
Bottlenose dolphin (common) *(Tursiops truncatus)*	77	122	116	147	74	150	127	141	455	866	421	571	629	806	10	156	696	1,149	1,663	914	**9,290**
Clymene dolphin *(Stenella clymene)*																			290	2	**292**
Commerson's dolphin *(Cephalorhynchus commersonii)*													2	38			110	19	81	34	**284**
Common dolphin *(Delphinus delphis)*	168	1,144	453	1,214	4,111	5,581	3,635	3,253	10,122	20,289	9,528	15,779	10,105	14,768	97	4,313	15,025	27,248	23,909	22,109	**192,851**
Dusky dolphin *(Lagenorhynchus obscurus)*													14				87	137	52	497	**787**
Dwarf sperm whale *(Kogia sima)*												2									**2**
False killer whale *(Pseudorca crassidens)*												11		5	7			41	63	33	**160**
Fraser's dolphin *(Lagenorhynchus hosei)*																			183		**183**
Hourglass dolphin *(Lagenorhynchus cruciger)*																	105	17	24	93	**239**
Indo-Pacific bottlenose dolphin *(Tursiops aduncus)*																			6		**6**
Long-finned pilot whale *(Globicephala melas)*	6	207	53	169		39	165	52	175	716	156	253	48	266		2	190	1,020	543	265	**4,325**
Short-finned pilot whale *(Globicephala macrorhynchus)*									14	18		16	2	11	25		401	139	216	102	**944**
Unidentified pilot whale		2	2		20	23		2	47	301	120	163	112	87	5	84	264	246	571	220	**2,269**
Northern right whale dolphin *(Lissodelphis borealis)*																	15			4	**19**
Orca *(Orcinus orca)*			1	1		18	10	5	100	52	57	18	16	92		14	278	340	293	257	**1,552**
Pacific white-sided dolphin *(Lagenorhynchus obliquidens)*														482			178	20	2	12	**694**
Pantropical spotted dolphin *(Stenella attenuata)*																		119	227	70	**416**
Peale's dolphin *(Lagenorhynchus australis)*													49	26		5	25	69	127	89	**390**
Pygmy killer whale *(Feresa attenuata)*																			12		**12**
Risso's dolphin *(Grampus griseus)*		17	3	9	5	12	23	3	33	32	74	107	69	53	4	75	78	236	146	109	**1,088**
Rough-toothed dolphin *(Steno bredanensis)*												2					5		14		**21**
Spinner dolphin *(Stenella longirostris)*																	6	18	557	13	**594**
Striped dolphin *(Stenella coeruleoalba)*	63	101	97	417	151	1,035	515	206	762	1,346	1,283	2,102	1,686	1,941	63	653	1,555	2,679	2,981	2,209	**21,845**
White-beaked dolphin *(Lagenorhynchus albirostris)*	12	61	9	5	1	184	64	281	656	51	440	228	954	253	7	73	919	1,188	1,093	420	**6,899**
Unidentified dolphin	125	317	227	1,021	494	1,253	788	472	2,046	5,022	2,157	3,542	2,699	3,103	69	582	2,974	8,122	6,853	4,476	**46,342**

Table 4: Total number of individual animals recorded per species during all dedicated ORCA surveys between 2006 and 2025

	YEAR																				
SPECIES	**2006**	**2007**	**2008**	**2009**	**2010**	**2011**	**2012**	**2013**	**2014**	**2015**	**2016**	**2017**	**2018**	**2019**	**2020**	**2021**	**2022**	**2023**	**2024**	**2025**	**TOTAL NO. OF ANIMALS**
Arnoux's beaked whale *(Berardius arnuxii)*																	2	3	12		**17**
Blainville's beaked whale *(Mesoplodon densirostris)*																	4	3	8		**15**
Cuvier's beaked whale *(Ziphius cavirostris)*	2	4	6	17	14	20	28	14	119	151	63	91	99	132		3	46	104	89	88	**1,090**
Gervais' beaked whale *(Mesoplodon europaeus)*															2						**2**
Ginkgo-toothed beaked whale *(Mesoplodon ginkgodens)*																			1		**1**
Gray's beaked whale *(Mesoplodon grayi)*																			13		**13**
Northern bottlenose whale *(Hyperoodon ampullatus)*		4	6		6	2	2		12	37	6	34	27	20			36	91	46	46	**375**
Southern bottlenose whale *(Hyperoodon planifrons)*																			7	1	**8**
Sowerby's beaked whale *(Mesoplodon bidens)*		3		3	3	9	2	2	10	4	7	6		21			11	18	23	20	**142**
Strap-toothed beaked whale *(Mesoplodon layardii)*																		4			**4**
True's beaked whale *(Mesoplodon mirus)*		3								3			2								**8**
Unidentified beaked whale	4	13	3		4	11	19	4	14	30	56	45	77	137	7	6	82	115	152	61	**840**
Sperm whale *(Physeter macrocephalus)*	4	4	2	8	14	20	2	21	21	47	37	68	14	35	29	7	109	120	196	124	**882**
Beluga *(Delphinapterus leucas)*							33	1		6	21		11	200			271	148	75	169	**935**
Narwhal *(Monodon monoceros)*																	10			10	**20**
Antarctic minke whale *(Balaenoptera bonarensis)*														34		7	4	15	6	73	**139**
Blue whale *(Balaenoptera musculus)*							4	10	4	1	25	1	6	28	1		40	24	23	8	**175**
Bowhead whale *(Balaena mysticetus)*														1				5		57	**63**
Bryde's whale *(Balaenoptera brydei)*												1					3		8	1	**13**
Fin whale *(Balaenoptera physalus)*		22	134	19	9	52	41	50	142	205	262	238	649	752	4	89	719	892	971	933	**6,183**
Gray whale *(Eschrichtius robustus)*														15				3		1	**19**
Humpback whale *(Megaptera novaengliae)*					1	11	4	25	47	65	43	127	41	747	1	97	1,108	1,298	1,699	2,580	**7,894**
Minke whale (common) *(Balaenoptera acutorostrata)*	4	9	10	15	19	40	67	45	157	62	89	124	165	353	9	145	419	4,812	560	468	**7,572**
North Atlantic right whale *(Eubalaena glacialis)*												1						1	3		**5**
Sei whale *(Balaenoptera borealis)*		1			3		3	4	10	3	9	23	31	36	9	3	37	173	105	278	**728**
Southern right whale *(Eubalaena australis)*																	4	5	6	16	**31**
Unidentified whale	16	33	55	6	8	41	56	47	144	356	535	422	477	1,161	25	100	1,568	2,787	2,269	1,570	**11,676**
Unidentified cetacean	6	3	5	1		14	12	14	116	104	214	159	114	182	14	237	464	755	735	417	**3,566**
Total no. of animals	**646**	**2,202**	**1,296**	**3,196**	**5,107**	**8,884**	**6,940**	**5,145**	**16,670**	**30,857**	**16,849**	**25,510**	**20,323**	**29,524**	**556**	**7,155**	**31,120**	**58,292**	**52,013**	**40,908**	**363,193**

Table 4: Total number of individual animals recorded per species during all dedicated ORCA surveys between 2006 and 2025

	OCEAN										
SPECIES	**Arctic Ocean**	**Baltic Sea**	**Mediterranean Sea**	**North Atlantic Ocean**	**North Pacific Ocean**	**Indian Ocean**	**South Atlantic Ocean**	**South China Sea**	**South Pacific Ocean**	**Southern Ocean**	**Total no. of animals**
Burmeister's porpoise									8		**8**
Dall's porpoise	3				1,093						**1,096**
Harbour porpoise	2,158	1,018	3	19,495	178	2				27	**22,881**
Spectacled porpoise							3				**3**
Unidentified porpoise	13			65	68						**146**
Atlantic spotted dolphin			2	2,867			1				**2,870**
Atlantic white-sided dolphin	32			2,237							**2,269**
Bottlenose dolphin (common)	12		675	8,048	124	121	25	4	281		**9,290**
Clymene dolphin				64			228				**292**
Commerson's dolphin							222		62		**284**
Common dolphin			6,637	184,854	1,024	21	2	23	290		**192,851**
Dusky dolphin							576		211		**787**
Dwarf sperm whale			2								**2**
False killer whale			2	122	3	9	12	4	8		**160**
Fraser's dolphin				36	17				130		**183**
Hourglass dolphin							134			105	**239**
Indo-Pacific bottlenose dolphin								6			**6**
Long-finned pilot whale	663		108	3,365			175		14		**4,325**
Short-finned pilot whale			31	815		12	86				**944**
Unidentified pilot whale	117		274	1,868			10				**2,269**
Northern right whale dolphin				4	15						**19**
Orca	722		11	295	225		24	12		263	**1,552**
Pacific white-sided dolphin					694						**694**
Pantropical spotted dolphin				75	273	59			9		**416**
Peale's dolphin							348		42		**390**
Pygmy killer whale						10	2				**12**
Risso's dolphin			151	890	16	27			4		**1,088**
Rough-toothed dolphin				8			13				**21**
Spinner dolphin				13	282	200	41		58		**594**
Striped dolphin			5,264	15,992	58	194			337		**21,845**
White-beaked dolphin	2,427			4,472							**6,899**
Unidentified dolphin	355	50	3,560	40,379	748	47	632	74	483	14	**46,342**

Table 5: Number of individual animals recorded per species and ocean region during all dedicated ORCA surveys between 2006 and 2025

	OCEAN										
SPECIES	**Arctic Ocean**	**Baltic Sea**	**Mediterranean Sea**	**North Atlantic Ocean**	**North Pacific Ocean**	**Indian Ocean**	**South Atlantic Ocean**	**South China Sea**	**South Pacific Ocean**	**Southern Ocean**	**Total no. of animals**
Arnoux's beaked whale							5			12	**17**
Blainville's beaked whale				13					2		**15**
Cuvier's beaked whale			51	1,026			2		9	2	**1,090**
Gervais' beaked whale				2							**2**
Gingko-toothed beaked whale									1		**1**
Gray's beaked whale							6		7		**13**
Northern bottlenose whale	101			274							**375**
Southern bottlenose whale							6		2		**8**
Sowerby's beaked whale	1		2	139							**142**
Strap-toothed beaked whale							4				**4**
True's beaked whale				8							**8**
Unidentified beaked whale	6		8	754	19	2	24		17	10	**840**
Sperm whale	130		47	654	8	13	13		8	9	**882**
Beluga	472			463							**935**
Narwhal	20										**20**
Antarctic minke whale							31		1	107	**139**
Blue whale	69			78	7		13		4	4	**175**
Bowhead whale	63										**63**
Bryde's whale				8		4			1		**13**
Fin whale	426		81	3,926	228		409		11	1,102	**6,183**
Gray whale	3				16						**19**
Humpback whale	1,667			787	1,373		980		38	3,049	**7,894**
Minke whale (common)	460		1	7,095	11		2		2	1	**7,572**
North Atlantic right whale				5							**5**
Sei whale	17		2	190	7		461		22	29	**728**
Southern right whale							25			6	**31**
Unidentified whale	781		128	7,193	473	5	1,255		49	1,792	**11,676**
Unidentified cetacean	196	24	139	2,931	174	4	70	2	13	13	**3,566**
Total no. of animals	**10,914**	**1,092**	**17,179**	**311,510**	**7,134**	**730**	**5,840**	**125**	**2,124**	**6,545**	**363,193**

Table 5: Number of individual animals recorded per species and ocean region during all dedicated ORCA surveys between 2006 and 2025

Creating safe ocean spaces through evidence

The core purpose of ORCA's monitoring is not simply to record sightings, but to ensure that evidence is available where it can make a difference. Long-term, effort-based survey data allows ORCA and its partners to identify areas of persistent cetacean use, detect changes in distribution, understand seasonal patterns and provide evidence for targeted conservation measures.

This is particularly important as pressures on whales, dolphins and porpoises intensify. In UK and European waters, monitoring can support better management of threats such as bycatch, vessel traffic, offshore energy development, underwater noise and habitat disturbance. In offshore and remote waters, ORCA's platform-of-opportunity model helps fill major data gaps in places that are otherwise difficult and expensive to survey. In polar and subpolar regions, continued monitoring is essential for understanding how recovering whale populations are responding to climate change, prey shifts, shipping, fisheries and tourism.

ORCA's work shows the power of sustained citizen science. Across 20 years of effort-based monitoring, trained volunteers and staff have built a dataset that now spans all oceans, includes 54 cetacean species, and represents nearly seven years of active observation time. This evidence is helping to turn sightings into science, science into policy, and policy into safer ocean spaces.

In summary, ORCA's survey coverage has grown from a single ferry route into a global monitoring programme. Its dataset now reflects two decades of effort-based cetacean observation, more than 1.8 million kilometres surveyed, over 60,000 hours of monitoring, and records of species ranging from harbour porpoises and common dolphins to narwhals, beaked whales and North Atlantic right whales. This expansion is more than an organisational milestone. It is a conservation achievement built by people watching carefully, recording consistently and ensuring that the evidence reaches those with the power to protect whales, dolphins and porpoises.

For ORCA's 25th anniversary year, this is the clearest message: safe ocean spaces are not created by good intentions alone. They are created through evidence, persistence, partnership and the dedication of people willing to stand watch for the ocean.

ORCA citizen scientists

Understanding Whale, Dolphin and Porpoise Distribution in UK Waters

Analysis of a 20 Year Dataset

For two decades, highly trained citizen scientists (ORCA volunteer Marine Mammal Surveyors) travelling on ferries have been gathering detailed information about whales, dolphins and porpoises in UK and adjacent waters. Because many of these routes are repeated year after year, the dataset provides a rare long-term view of how these species use the marine environment and how their distribution is changing. Information essential for informing cetacean conservation policy and decision-making.

To maximise impact data is collected using **standardised line-transect distance sampling** methodologies, which helps estimate not only the animals that were seen but also those that were present but missed – providing information on how many individual animals live in a specific region. To make these abundance estimates, **density surface modelling (DSM)** techniques are employed.

The application of the DSM technique is only appropriate when there have been enough sightings of a species to produce a reliable detection function. Therefore, this analysis focuses on the following six species commonly recorded during ORCA surveys:

Harbour porpoise, Bottlenose dolphin, Common dolphin, Risso's dolphin, White-beaked dolphin and Minke whale

The DSM technique identifies which parts of the ocean are most important for different species. It does this by looking at where animals were seen and then linking those sightings to features of the marine environment. The more environmental information included, the more accurate and meaningful the results become.

In this analysis, each sighting was linked to several **static environmental factors** – features that do not change from day-to-day:

- **Water depth** – how deep the sea is at that location
- **Slope** – how quickly the seafloor rises or falls between neighbouring areas
- **Aspect** – the direction the seafloor slope faces, measured in degrees from 0° to 360°
- **Distance to the coast** – how far the sighting was from land
- **Distance to the 50m isobath** – how far from where the seafloor reaches 50 metres deep

These factors help reveal why certain species prefer particular regions – for example, deeper waters, tidal currents or underwater features.

Future analyses can become even more powerful by adding **dynamic environmental data** – features that change over time, such as:

Chlorophyll-a concentration, which indicates how much microscopic plant life is in the water (a key part of the food chain). Sea surface temperature, which influences where prey species gather.

Including these changing conditions will allow for stronger, more detailed predictions across wider areas, helping us understand how whales, dolphins and porpoises use their habitats and how those patterns may shift in response to environmental change.

A key part of this work is the SCANS monitoring programme – Small Cetaceans in European Atlantic waters and the North Sea. These large-scale surveys carried out across European Atlantic waters produce the robust population estimates that countries, including the UK, need to meet conservation obligations such as the Habitats Directive and the Marine Strategy Framework Directive.

SCANS surveys are extremely comprehensive but are carried out over a short period of time, a five to six-week period during the summer months and infrequently, every six to ten years providing a "snapshot" of cetacean abundance across the region. Therefore long-term ferry-based monitoring complements these surveys exceptionally well. SCANS provides the **broad regional context**, while repeated ferry routes provide the **fine-scale, year-to-year detail** that large surveys cannot capture.

Several patterns seen in ORCA's ferry-based dataset (2006-2025) mirror those documented by SCANS, strengthening confidence in the trends identified by citizen science surveys, and are detailed below.

White-beaked dolphin

"**ORCA's** dataset provides a rare long-term view of how **cetaceans** use the marine environment and how their **distribution is changing.**"

What the data reveals about different species

Harbour porpoise

From 2006 to 2025 harbour porpoises were most frequently recorded in the **North Sea**, with an estimated population of 4,128 individuals, followed by the **Northern Isles** (940), **English Channel** (929) and **Hebrides** (99). The sightings of porpoises between 2006 and 2025 used in the analysis are shown in Figure 3, along with the DSM results. The abundance estimates for the four separate regions are summarised in Table 6.

Region	Abundance	95% confidence limits	CV	Best model
Northern Isles	940	565 – 1,564	0.264	df = hz(cos); cov = x,y+dst50m
Hebrides	99	72 – 136	0.162	df = hz(na); cov = x,y+depth*
North Sea	4,128	3,144 – 5,420	0.140	df = hz(na); cov = x,y+dst50m
English Channel	929	570 – 1,515	0.253	df = hz(cos); cov = x,y+depth

Table 6: Abundance estimates for harbour porpoise derived using DSM (CV = coefficient of variation). df = detection function, na = no adjustment series, cos = cosine adjustment, cov = significant covariates, x,y = bivariate position, dst50m = distance to 50m isobath, depth = water depth. * denotes a region where density varies significantly between years

Harbour porpoise © Elfyn Pugh

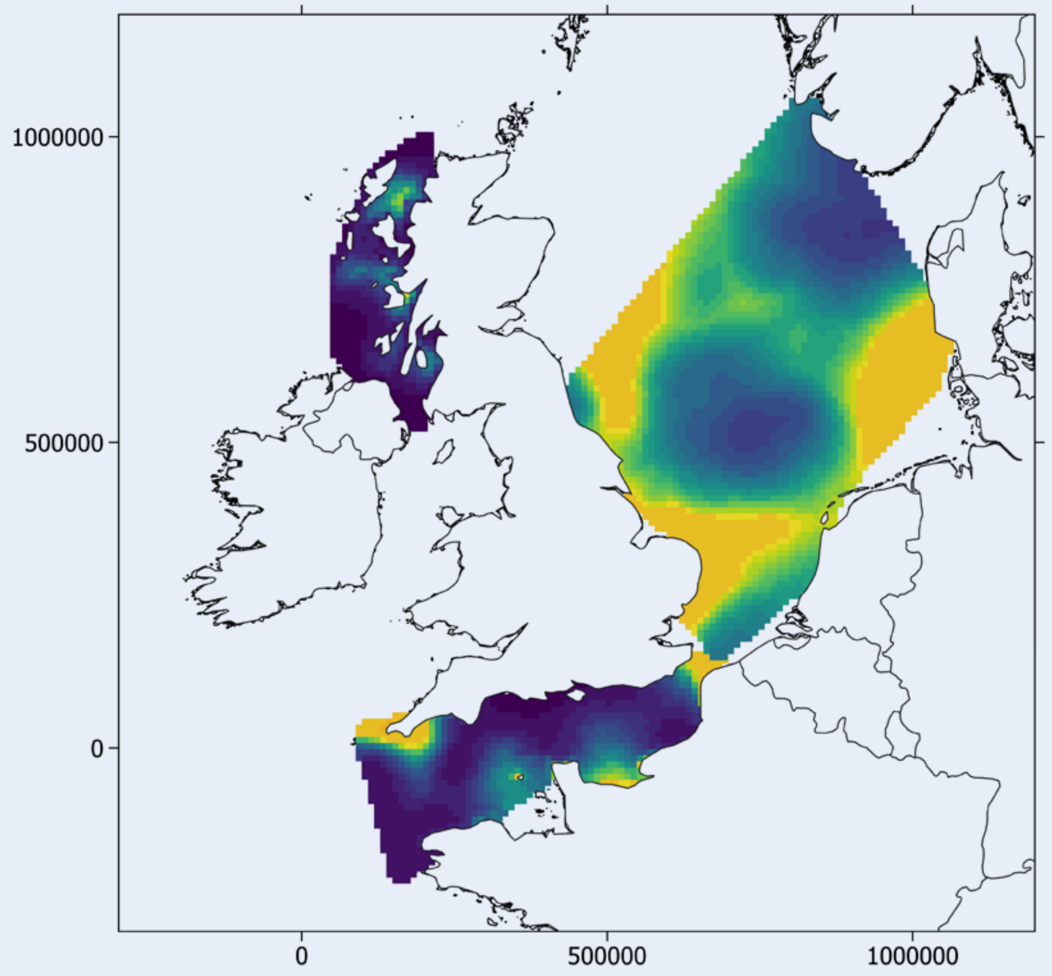
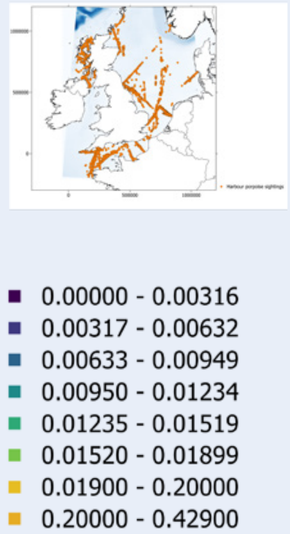


Figure 3: DSM results for harbour porpoises; regions with higher density are yellow, low density regions are dark blue. Density presented as animals per km². Indent map shows all distance sampling sightings between 2006 and 2025



In the North Sea, the highest porpoise densities were found in **shallow southern areas**, including waters off England, the Netherlands and Denmark. This pattern is consistent with previous large-scale studies, including the SCANS surveys (Hammond et al., 2017; Gilles et al., 2023). Earlier SCANS work showed a clear shift in porpoise distribution: high densities in the northern North Sea during the 1990s moved southwards by 2005 (Hammond et al., 2013). The **ORCA dataset reflects this southern concentration**, with DSM results closely matching those from SCANS-II (Hammond et al., 2013).

More recent research suggests that the **central North Sea** has become increasingly important for porpoises (e.g. Gilles et al., 2023). This trend does not appear strongly in the ORCA results, likely due to survey effort in the central region being limited. In addition, the DSM analysis combines sightings from the entire 2006–2025 period, so **year-to-year or decade-scale shifts** may be smoothed out.

The final DSM model identified **distance from the 50m isobath** as an important factor: porpoises in the North Sea were more likely to be found **away from the deepest waters**. Although ORCA's abundance estimate for the North Sea is much lower than those from SCANS (e.g. 164,556 individuals in Gilles et al., 2023), these figures are **not directly comparable**. SCANS surveys apply correction factors – often multiplying estimates by two or three to account for animals missed during surveys. ORCA's ferry-based estimates are lower because they do not yet include these correction factors – but the **spatial patterns** align strongly with SCANS.

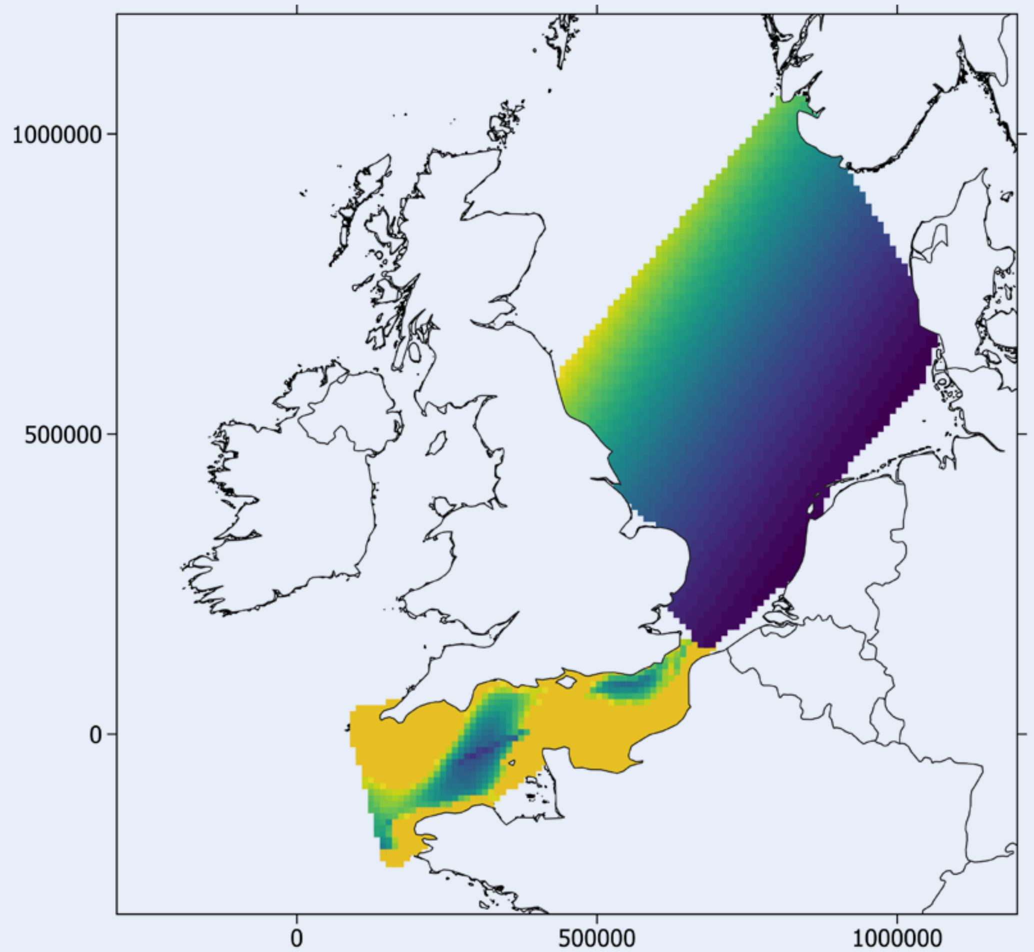
In the **English Channel**, although nearly 1,000 porpoises were estimated, the DSM highlighted the **shallow waters around the Isles of Scilly** as particularly important habitat.

In the **Northern Isles**, porpoises showed a strong association with the **50m depth contour**, typically occurring within 2km of this boundary. This means animals were more commonly encountered **close to Orkney and Shetland** rather than farther offshore.

In the **Hebrides**, porpoises were more frequently found in **deeper waters (100–250m)**. The region's complex underwater landscape likely plays a major role, with features such as **tidal fronts** creating productive feeding areas that attract porpoises (Benjamins et al., 2016).

Bottlenose dolphin

The ORCA dataset shows noticeably higher numbers of bottlenose dolphins in the **English Channel** than in the **North Sea**, with an estimated 1,053 dolphins in the Channel compared with 252 in the North Sea. Most sightings were close to the UK coastline, and these **concentrated "hotspots"** match patterns recorded during the SCANS surveys (Hammond et al., 2013; Hammond et al., 2017; Gilles et al., 2023) (Figure 4 and Table 7).



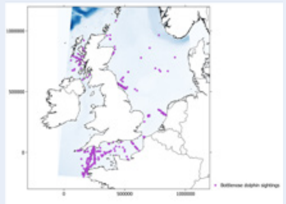


Figure 4: DSM results for bottlenose dolphins; regions with higher density are yellow, low density regions are dark blue. Density presented as animals per km². Indent map shows all distance sampling sightings between 2006 and 2025

Region	Abundance	95% confidence limits	CV	Best model
North Sea	252	94 – 680	0.540	df = hz(na); cov = x,y*
English Channel	1,053	151 – 7,328	1.290	df = hz(cos); cov = x,y

Table 7: Abundance estimates for bottlenose dolphins derived using DSM. df = detection function, na = no adjustment series, cos = cosine, cov = significant covariates, x,y = bivariate position. * denotes a region where density varies significantly between years

The ORCA estimate for the North Sea is lower than the figure reported in SCANS-III (2,616 dolphins; Gilles et al., 2023). However, unlike the SCANS abundance estimates, ORCA data has not been corrected to account for animals that were present but not detected during surveys, as previously detailed.

Despite this, the ORCA dataset provides valuable insight into how bottlenose dolphin distribution may be changing over time. The sightings show evidence of **shifts in density across the survey period**, with higher densities apparent in the North Sea in recent years, for example, when weighting for survey effort (Table 8). In this analysis, weighting involves standardising the number of sightings in each five-year period by expressing them as sightings per 1,000km of survey effort, adjusted by the total distance surveyed. This ensures that differences in density reflect genuine changes in dolphin occurrence rather than variation in how intensively different areas or time periods were surveyed. These **emerging patterns** suggest that bottlenose dolphin use of UK waters may be **evolving in response to environmental or ecological changes**.

Five year period	2006-2010	2011-2015	2016-2020	2021-2025
No. sightings per 1000km	0.026	0.045	0.155	0.251

Table 8: The number of bottlenose dolphin sightings in the North Sea for each five-year period in the ORCA dataset (expressed as the number of sightings per 1000km weighted by total survey effort)

Bottlenose dolphin

Common dolphin

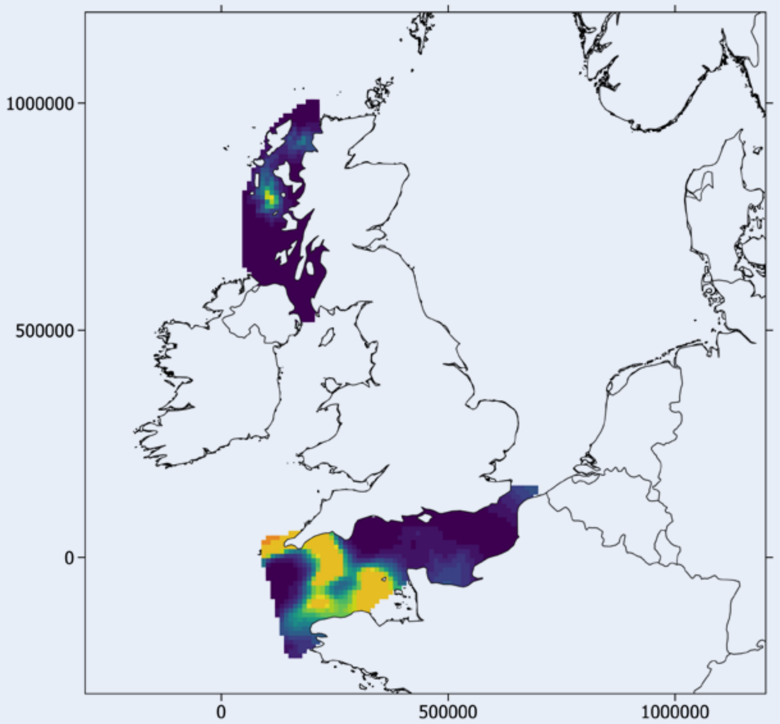
For common dolphins, there were too few sightings in the North Sea and Northern Isles to produce reliable population estimates. However, in the **English Channel**, the analysis estimated around **11,923 dolphins**, with a further **287** in the **Hebrides** (Table 9).

Region	Abundance	95% confidence limits	CV	Best model
Hebrides	287	223 – 369	0.129	df = hz(na); cov = x,y+dst0m*
English Channel	11,923	8,758 – 16,234	0.158	df = hz(cos); cov = x,y+dst0m

Table 9: Abundance estimates for common dolphins derived using DSM. df = detection function, na = no adjustment series, cos = cosine adjustment, cov = significant covariates, x,y = bivariate position, dst0m = distance to the nearest coast. * denotes a region where density varies significantly between years

Although the numbers cannot be compared directly, the English Channel estimate is broadly in line with the 18,406 dolphins reported in the SCANS-III survey (Gilles et al., 2023).

Common dolphin distribution appeared patchy, with the **highest densities** in the **western English Channel**, particularly around the **Isles of Scilly**. This pattern is visible in the DSM results (Figure 5), where yellow areas indicate higher densities and dark blue areas show lower ones.



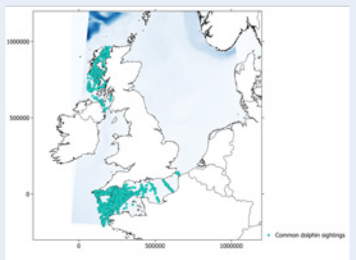


Figure 5: DSM results for common dolphins; regions with higher density are yellow, low density regions are dark blue. Density presented as animals per km². Indent map shows all distance sampling sightings between 2006 and 2025

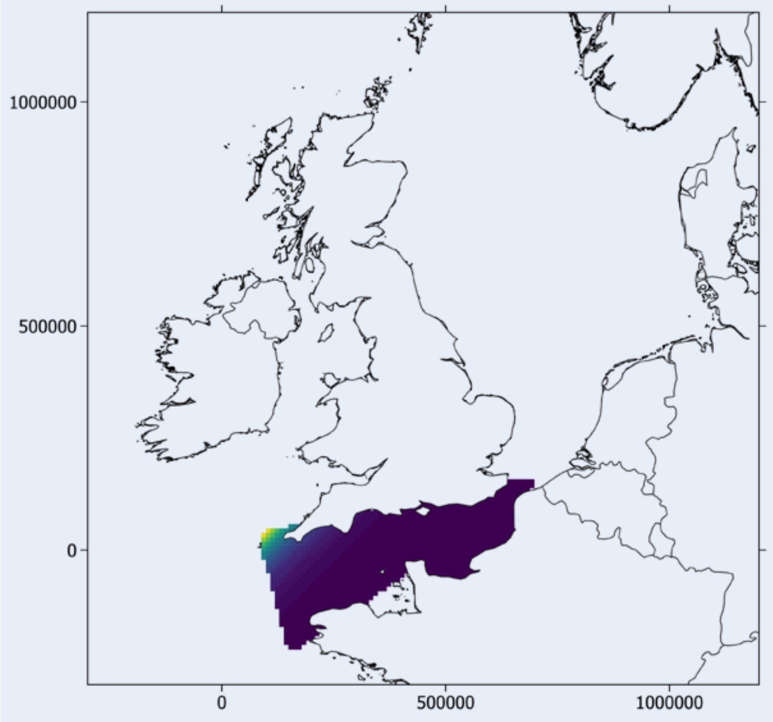
Interestingly, ORCA observers recorded **more common dolphin sightings in the eastern Channel** than SCANS-III, which reported very few dolphins east of Exmouth or Cherbourg. This difference suggests that **common dolphin use of the Channel may be changing**.

Further analysis of the ORCA dataset is needed to understand these shifts, especially in relation to SCANS findings that point to an **eastward movement of common dolphins** from the **North Atlantic** and **Bay of Biscay** into the **English Channel**. Understanding whether this trend is continuing, accelerating or stabilising will be important for future conservation management.

Risso's dolphin

Risso's dolphins were only seen often enough in the **English Channel** to allow a reliable estimate of their population. Most sightings occurred in the **western Channel**, particularly towards the **Isles of Scilly** (Figure 6). Based on these observations, the DSM analysis estimated **just 24 dolphins** in this region (Table 10).

No equivalent estimate is available from the most recent SCANS survey because too few Risso's dolphins were recorded to support a robust calculation (Gilles et al., 2023). This low sighting rate is typical for the species, which tends to occur in deeper offshore waters and is often encountered less frequently than other cetaceans during broad-scale surveys.



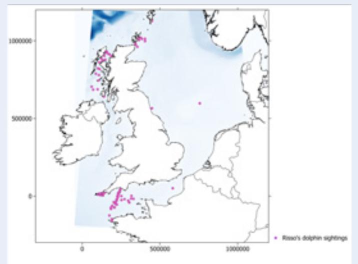


Figure 6: DSM results for Risso's dolphins; regions with higher density are yellow, low density regions are dark blue. Density presented as animals per km². Indent map shows all distance sampling sightings between 2006 and 2025

Region	Abundance	95% confidence limits	CV	Best model
English Channel	24	15 – 37	0.227	df = hn(cos); cov = x,y

Table 10: Abundance estimates for Risso's dolphins derived using DSM. df = detection function, cos = cosine adjustment, cov = significant covariates, x,y = bivariate position

Although the ORCA dataset is limited, these sightings still provide **valuable insight into** where **Risso's dolphins** are most likely to be found in the English Channel and highlight areas that may benefit from **continued or increased monitoring** in future years.

Risso's dolphins

White-beaked dolphin

White-beaked dolphins were recorded frequently enough only in the **North Sea** to allow a meaningful estimate of their population. Many of the sightings came from the western side of the North Sea (Figure 7), leading to an estimated **2,988 dolphins** in this region (Table 11). Despite this pattern of sightings, the DSM analysis suggested that the **southeast of the North Sea may provide important habitat** for white-beaked dolphins. In the model, waters approximately 10–50km from land were associated with a higher probability of occurrence. This mismatch between the raw sightings and the DSM results indicates that additional environmental covariates – beyond those included in the current model – may be influencing white-beaked dolphin distribution. Incorporating more environmental variables in future analyses is likely to improve model performance and provide a clearer understanding of habitat use in this region.

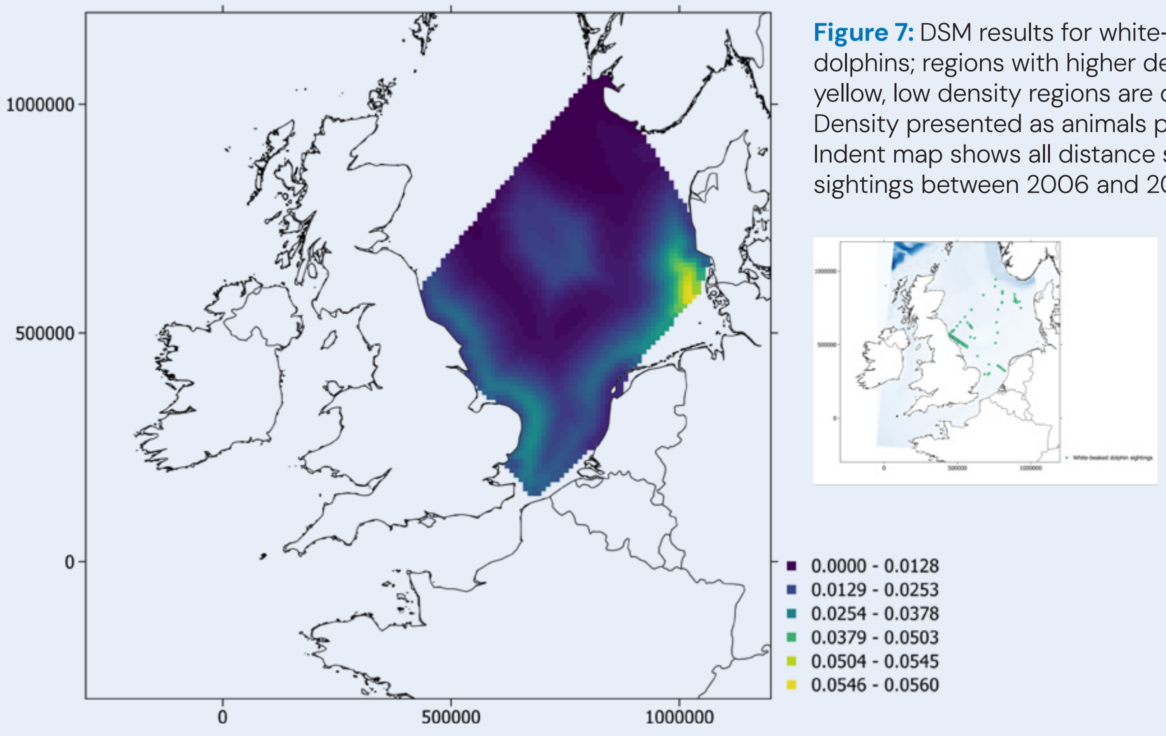


Figure 7: DSM results for white-beaked dolphins; regions with higher density are yellow, low density regions are dark blue. Density presented as animals per km². Indent map shows all distance sampling sightings between 2006 and 2025

Region	Abundance	95% confidence limits	CV	Best model
North Sea	2,988	2,243 – 3,981	0.147	df = hn(cos); cov = x,y+dst0m

Table 11: Abundance estimates for white-beaked dolphins derived using DSM. df = detection function, na = no adjustment series, cos = cosine adjustment, cov = significant covariates, x,y = bivariate position, dst0m = distance to the nearest coast

This **concentration of sightings**, particularly in the **southeastern North Sea** near Denmark, matches patterns seen in previous large-scale surveys, including SCANS (Hammond et al., 2013; Hammond et al., 2017; Gilles et al., 2023).

The most recent SCANS estimate for the North Sea was 5,006 dolphins (Gilles et al., 2023), which is higher than the uncorrected ORCA estimate. However, once similar availability corrections are applied to the ORCA data, the two estimates are likely to be much more closely aligned.

Minke whale

Minke whale density estimates were possible in **three regions** – the **North Sea**, the **English Channel** and the **Hebrides**. In all three areas, the estimated numbers were relatively small, with only a few dozen animals in each region (Table 12).

Region	Abundance	95% confidence limits	CV	Best model
Hebrides	13	9 – 17	0.160	df = hn(na); cov = x,y+dst50m*
North Sea	129	55 – 302	0.456	df = hn(cos); cov = x,y+dst0m
English Channel	54	26 – 110	0.379	df = hn(cos); cov = x,y

Table 12: Abundance estimates for minke whales derived using DSM. df = detection function, na = no adjustment series, cos = cosine adjustment, cov = significant covariates, x,y = bivariate position, dst0m = distance to the nearest coast, dst50m = distance to 50m isobath. * denotes a region where density varies significantly between years

For the North Sea, the most recent SCANS survey reported a much higher estimate of 2,111 whales (Gilles et al., 2023). However, the confidence around that figure was low, and importantly, the **ORCA estimate overlaps** with the lower end of the SCANS-III 95% confidence interval (238 whales).

The DSM analysis highlighted the **importance of distance to land or the 50m isobath** (Figure 8). Minke whales in the North Sea were typically encountered close to the coast. This aligns with what is known about the species in the region, favouring coastal feeding grounds where prey such as small, schooling pelagic fish are more abundant (Robinson et al., 2023). In the Hebrides however, minke whales were more commonly encountered in deeper, more **open waters**, such as the Sea of the Hebrides.

Survey year also had a significant influence on the final model for the Hebrides. When the encounter rate for each five-year period was adjusted to reflect how much survey effort was carried out, the results suggested an **increase in minke whale encounters** in more recent years (Table 13). Weighting the data in this way ensures that any apparent rise represents a genuine change in how often minke whales were recorded, rather than differences in how extensively the area was surveyed. This emerging pattern aligns with findings from other local research initiatives (Hartny-Mills et al., 2024).

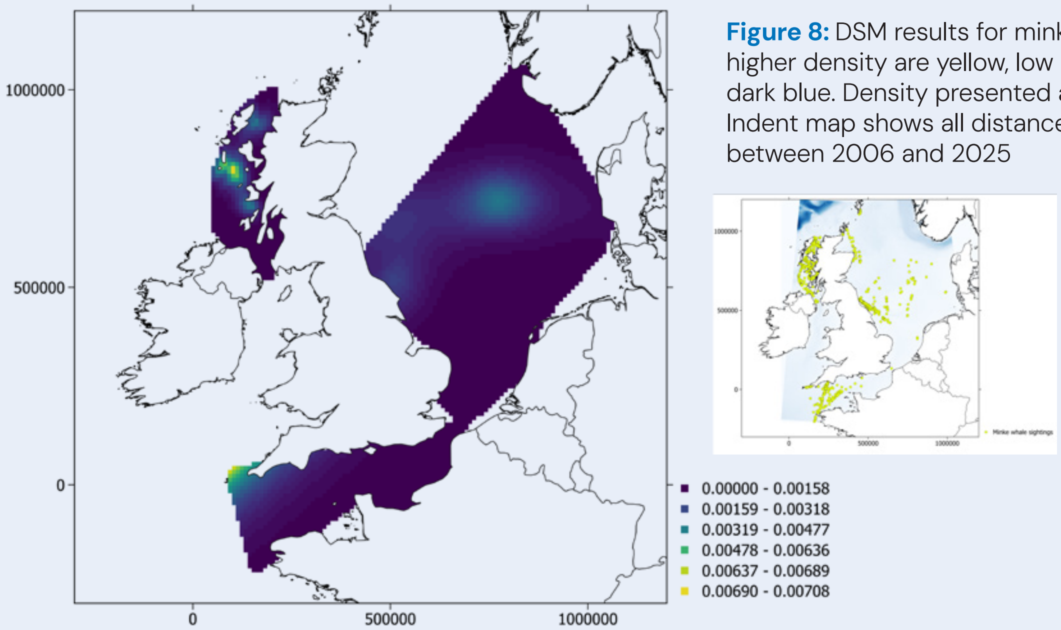


Figure 8: DSM results for minke whales; regions with higher density are yellow, low density regions are dark blue. Density presented as animals per km². Indent map shows all distance sampling sightings between 2006 and 2025

Five year period	2011-2015	2016-2020	2021-2025
No. sightings per 1000 km	0.111	0.870	1.629

Table 13: The number of minke whale sightings in the Hebrides for each five-year period in the ORCA dataset (expressed as the number of sightings per 1000km weighted by total survey effort)

Summary

As this work develops, future analyses will be able to include more detailed environmental information, such as chlorophyll-a and sea surface temperature, which will strengthen the models and improve our understanding of how cetaceans use these wider regions.

For now, direct comparisons with other major surveys are difficult. This analysis uses the **full 2006–2025 ORCA dataset as one block**, so it does not show year-to-year changes. That matters for species like **harbour porpoise**, which are known to shift their distribution over time. The current estimates also do **not yet correct for animals missed during surveys**, meaning the numbers presented here are likely **underestimates**.

Even with these early limitations, the results clearly show the **value of ORCA's long-term ferry-based monitoring**. The dataset reveals important patterns in where whales, dolphins and porpoises are found – information that is vital for conservation, especially where ORCA survey routes overlap with Marine Protected Areas (MPA). In the English Channel, for example, **every ORCA-surveyed ferry route passes through at least one MPA** (Figure 9), highlighting the importance of continued monitoring in these busy and ecologically significant waters.

Together, these findings show that ORCA's long-term citizen science led monitoring is not only helping us understand the present state of cetacean populations, but is also laying the groundwork for stronger, more informed conservation decisions in the future.

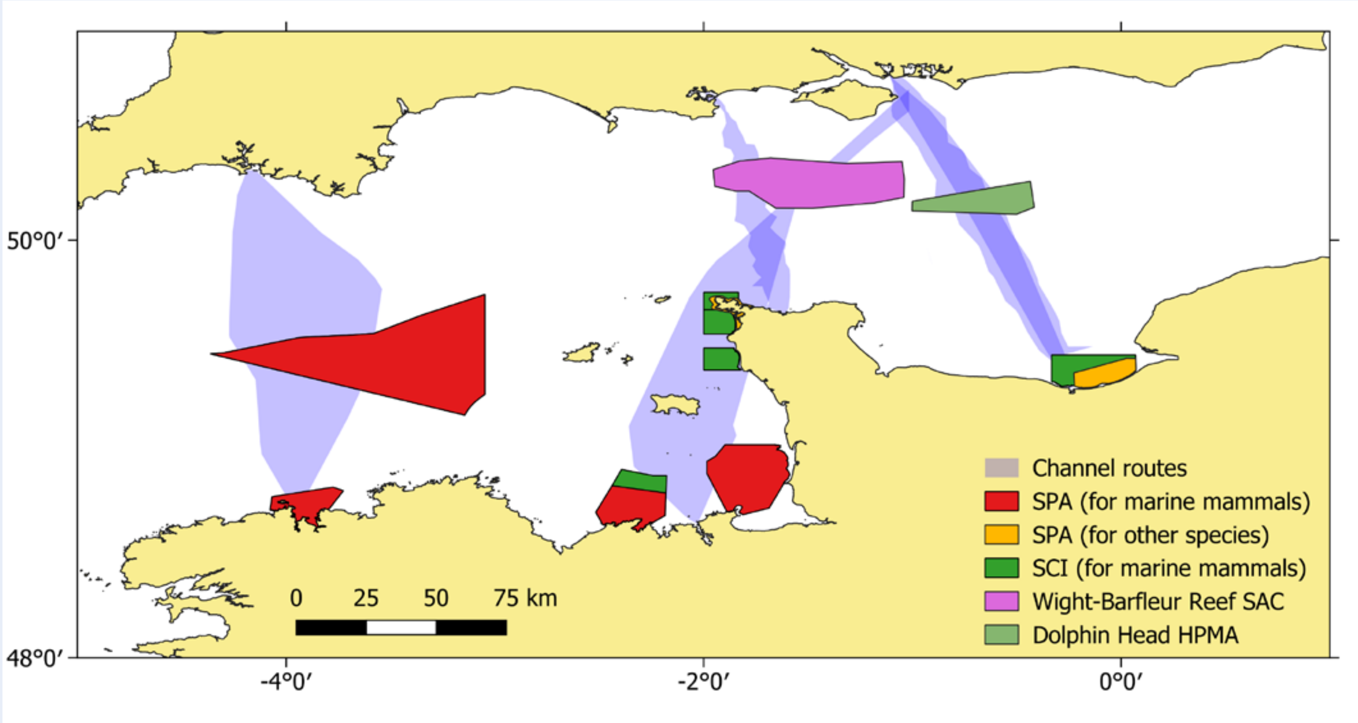


Figure 9: Marine Protected Areas that overlap ORCA survey routes in the English Channel. SPA = Special Protection Area, SCI = Site of Community Importance, SAC = Special Area of Conservation, HPMA = Highly Protected Marine Area

Minke whale

A closer look: Porpoises shifting south in the North Sea

Harbour porpoise

Scientists have known for some time that harbour porpoises in the North Sea have changed where they spend most of their time. Earlier studies showed that during the 1990s, porpoises were more common in the **northern North Sea**, but by 2005 their distribution had shifted **southwards** (Hammond et al., 2013). To explore whether ORCA's long-term ferry surveys show the same pattern, porpoise sightings from the last 20 years were examined in more detail.

To do this, the North Sea was divided into **bands of latitude** – from around **Dover (51°N)** up to **Shetland (61°N)** – and porpoise sightings were calculated per **1,000km of survey effort** for each band and each year. Weighting the data in this way helps account for years or areas where fewer surveys took place.

The results show a clear trend

From around **2013 onwards**, porpoise encounter rates in the **southern North Sea (south of 55°N)** began to rise considerably (Table 14). Although sightings also increased in the northern part of the North Sea, the change was far smaller. One striking example is the latitude band **54°–55°N**, where encounter rates in 2024 were **more than 300 times higher** than in 2009 – the first year porpoises were recorded by ORCA surveys in the region.

Because ORCA's distance-sampling data only commenced in 2006, the earlier shift seen in the 1990s (Hammond et al., 2013) cannot be examined directly. However, the ORCA dataset clearly reflects the **growing importance of the southern North Sea** for harbour porpoises during the 2010s, matching findings from other studies (Peschko et al., 2016; Nachtsheim et al., 2021). The trend also continues into the 2020s, suggesting that this **southward movement is persistent and ongoing.**

This pattern has important conservation implications. Several **Marine Protected Areas (MPAs)** in the North Sea, such as the **Southern North Sea Special Area of Conservation**, were designated specifically because of their importance for harbour porpoises. ORCA's long-term monitoring provides valuable evidence to support the management of these protected areas and helps ensure that conservation measures reflect how porpoise distribution is changing over time.

Long-term, repeated surveys, such as those conducted by ORCA volunteer Marine Mammal Surveyors from platforms of opportunity (ferries) provide a unique window into how marine mammals use UK waters. These insights help:

- identify important habitats
- detect changes in distribution linked to environmental change
- support the management of Marine Protected Areas
- guide conservation action for vulnerable species
- complement large-scale surveys like SCANS with fine-scale, year-to-year detail

Together, these datasets create one of the most powerful tools available for understanding and protecting whales, dolphins and porpoises in European waters.

Table 14: Harbour porpoise encounter rates (porpoise groups per 1,000km of survey effort) subdivided by year and latitude band; rates are weighted by the total survey effort for the entire dataset to account for those years and/or latitude bands that received less survey effort

	YEAR																				
LATITUDE BAND	**2006**	**2007**	**2008**	**2009**	**2010**	**2011**	**2012**	**2013**	**2014**	**2015**	**2016**	**2017**	**2018**	**2019**	**2020**	**2021**	**2022**	**2023**	**2024**	**2025**	**TOTAL**
60°–61°				0.00			0.00					0.03	0.00	0.01		0.01	0.00	0.03	0.02	0.01	**0.12**
59°–60°	0.02	0.01	0.00	0.01	0.01	0.01		0.00	0.01		0.01	0.09	0.10	0.02		0.04	0.01	0.06	0.02	0.02	**0.43**
58°–59°			0.01	0.01	0.00					0.00	0.01	0.02	0.05	0.06		0.07	0.06	0.09	0.01	0.02	**0.42**
57°–58°		0.00	0.02	0.01		0.00			0.01		0.05	0.09	0.05	0.02			0.01	0.14	0.02	0.02	**0.44**
56°–57°	0.04	0.02			0.02	0.01	0.02	0.00	0.02	0.00	0.01	0.00		0.04		0.01		0.01	0.00		**0.20**
55°–56°	0.09	0.02	0.02		0.00	0.00	0.06	0.07	0.10	0.00	0.07	0.03	0.03	0.01		0.03	0.07	0.04	0.01	0.00	**0.67**
54°–55°				0.00		0.03	0.04	0.20	0.68	0.15	0.23	0.21	0.79	1.03		0.05	0.57	0.92	1.09	0.66	**6.66**
53°–54°					0.02	0.00	0.02	0.02	0.07	0.00	0.01	0.06	0.05	0.13	0.02	0.02	0.10	0.08	0.15	0.05	**0.80**
52°–53°			0.00			0.14	0.10	0.28	0.52	0.09	0.53	0.38	0.25	0.40	0.01		0.42	0.59	0.69	0.73	**5.13**
51°–52°								0.00	0.01	0.00		0.01						0.02	0.01	0.04	**0.09**
Total	**0.14**	**0.05**	**0.05**	**0.03**	**0.05**	**0.19**	**0.24**	**0.58**	**1.41**	**0.26**	**0.92**	**0.92**	**1.34**	**1.74**	**0.04**	**0.22**	**1.24**	**1.98**	**2.02**	**1.56**	**14.97**

ORCA citizen scientists

Stopping Ships Colliding with Whales

Vessel strike remains one of the most immediate and preventable threats facing large whales globally.

Recent large-scale analyses continue to show that this risk is highly concentrated: a relatively small proportion of the ocean accounts for the majority of collision risk, driven by the overlap between increasingly congested shipping routes and whale habitat (Nisi et al., 2024). At the same time, shipping activity is intensifying, with traffic projected to grow substantially in the coming decades (Sardain et al., 2019), increasing both the frequency and geographic spread of risk.

In parallel, the policy landscape is shifting. Efforts led by the National Oceanic and Atmospheric Administration (NOAA) are increasingly exploring whether advances in detection technology, including passive acoustic monitoring, satellite imagery and AI-assisted systems could play a greater role in reducing vessel strike risk. NOAA is investing heavily in near real-time monitoring networks and emerging detection tools to track whale presence and inform management responses.

There is no doubt that these technologies represent a significant scientific advance. Acoustic monitoring networks can now detect whale presence across large areas, while machine learning approaches are improving the speed and accuracy of detection in complex environments. However, a critical gap remains between **detecting a whale** and **avoiding a collision**.

For large commercial vessels, the operational reality is stark. Once a whale is detected at close range, there may be insufficient time or manoeuvrability to take effective action. This challenge is compounded by environmental conditions, detection uncertainty, and the behaviour of the whales themselves, particularly species that spend extended periods at or near the surface but show limited avoidance response to oncoming vessels.

This raises a fundamental question that remains unresolved: can detection systems reliably identify whales early enough and at sufficient range to enable large vessels to respond safely and effectively? At present, the evidence suggests that this threshold is highly variable and, in many real-world scenarios, unlikely to be met consistently.

Crucially, this comes at a time when some regulatory approaches are beginning to reconsider the role of mandatory speed reduction. Proposals to modify or weaken vessel speed rules for North Atlantic right whales, a species with fewer than 400 individuals remaining (NOAA, 2026), risk shifting the balance away from the only mitigation measure consistently shown to reduce both the likelihood and severity of collisions.

The science on this point remains clear. Slower vessel speeds significantly reduce the probability of fatal injury in the event of a collision and increase the time available for both whales and vessels to respond. Detection technologies, by contrast, are still evolving and are likely to be context dependent, in other words effective in some regions or conditions, but not yet capable of replacing proven mitigation measures at scale.

This creates a growing risk of misplaced confidence. Over-reliance on emerging technologies, without fully understanding their operational limitations, could lead to reduced emphasis on preventative measures particularly in high-risk areas where vessel speeds remain the most critical factor.

What is needed now is not a substitution of approaches, but a rebalancing. Detection technologies should be seen as a complementary tool supporting situational awareness and informing dynamic management rather than a replacement for measures that reduce risk at its source.

ORCA's research is focused on addressing this gap directly. By placing scientists on the bridge of large commercial vessels and analysing real world whale-ship interactions, we are working to better understand the distances, timings and behaviours that determine whether a collision can be avoided. This evidence is essential in ensuring that future mitigation strategies are grounded not just in technological capability, but in operational reality.

Southern right whale

"A relatively **small proportion of the ocean** accounts for the majority of collision risk, driven by the **overlap between increasingly congested shipping routes** and whale habitat."

Alaska – studying whale and ship interactions

In Alaska, ORCA research scientists have been analysing whale and ship interactions by tracking humpback whales as they approach vessels from the horizon and calculating the closest point of approach (CPA). Any manoeuvres made by either the whales or the vessel are recorded, helping to improve understanding of how close encounters develop in real operating conditions.

The analysis highlights a key challenge: for large vessels, the opportunity to take effective avoidance action may be extremely limited once a whale is detected at close range. This underlines the fact that the value of visual observation or detection technology depends not only on spotting whales, but on spotting them early enough for a particular vessel to respond safely and effectively.

Our findings have shown it is not possible by visual observation or technology for a large vessel (approx. 300m length) to take effective avoidance action for whales detected closer than 1,000m ahead of them. The only option when a whale is detected <1,000m to the vessel is to slow down to less than 10 knots.

These findings strengthen a growing body of evidence from ORCA's work: while detection is important, the most effective way to reduce collision risk is to minimise the chances of whales and ships coming into dangerous proximity in the first place.

Bay of Biscay – studying whale behaviour during close encounters

Understanding how whales behave around vessels is also fundamental to reducing the risk of collision and ORCA's work is now providing some of the clearest insights to date.

Through our partnership with Brittany Ferries, we are capturing fine-scale behavioural data on fin whales in the Bay of Biscay using a combination of direct observation and a two-tiered camera system positioned both inside the bridge and externally beneath the bridge wings. This allows researchers to record, in unprecedented detail, how whales respond as vessels approach and pass. A consistent pattern is emerging: some species, particularly fin whales, may show limited or delayed avoidance responses to large vessels, a critical factor in understanding why collisions occur.

Complementary work placing trained research scientists on the bridge of cruise vessels in Alaska is further strengthening this evidence base, enabling real-time analysis of whale-ship interactions during close encounters. Across both regions, these findings point to a clear conclusion. While improving detection and understanding behaviour is essential, it is not enough on its own. The most effective way to reduce vessel strike risk is to prevent close encounters from happening in the first place.

This is where ORCA's wider work is delivering tangible change.

Southern Ocean

In the Southern Ocean, our collaboration with the British Antarctic Survey (BAS) and HX is translating data into action. Using at sea observations collected by ORCA's research scientists on board expedition vessel HX MS Fram, detailed whale density maps have been developed, identifying high use feeding areas with a level of precision not previously available. These outputs are now being used to inform geofenced areas enabling expedition operators to slow down in the most sensitive habitats and reduce disturbance in this globally significant ecosystem.

This shift from understanding presence to predicting risk represents a major step forward in protecting whales at sea.

Small, practical changes to vessel operations are already proving effective. Adjustments to routes and itineraries can significantly reduce overlap between ships and whales, lowering the likelihood of collision without major disruption to operations. Increasingly, industry leaders are recognising this.

Taken together, this work reinforces a clear and consistent message: the future of vessel strike mitigation lies in combining behavioural insight with spatial data to inform smarter decision making at sea. Keeping whales and ships apart through data-driven routing, dynamic management and collaboration with industry remains the single most effective way to protect these animals in an increasingly busy ocean.

Seafarer training

In 2025, thousands of seafarers received ORCA's vessel strike mitigation training, underlining the growing recognition that crew awareness is critical to reducing collisions between ships and whales.

Preventing collisions depends not just on policy, but on the decisions made at sea. Training helps bridge crews and itinerary planners understand whale hotspots, recognise risky conditions and behaviours, and take practical action – including route adjustments, increased vigilance and slower speeds where needed.

ORCA has now worked with a wide range of international shipping companies, reaching thousands of crew operating across key shipping routes worldwide, from polar waters to the Mediterranean Sea and across the Atlantic, Pacific and Indian Oceans. This matters because effective mitigation relies heavily on seafarer understanding, engagement and compliance.

As interest grows in new detection technologies, it is vital these are not seen as an alternative to measures already proven to work. The evidence remains clear: avoiding high-risk areas and reducing vessel speed are still the most effective ways to cut collision risk. Training is essential to reinforcing that message and supporting good decision-making on the bridge.

ORCA delivers vessel strike mitigation training through its e-learning platform, face-to-face sessions with experts, and integration into company training systems, helping embed whale-safe practices across a global industry.

The companies and associations that have undergone our training in 2025 include the Arctic Expedition Cruise Operators (AECO), Columbia Cruise Services, Disney Cruise Line, Explora Journeys, Just BE Maritime, MSC Cruises, Precious Shipping, Villa Vie Residences and Virgin Voyages.

Our work in the polar regions

ORCA's work with the association of Arctic Expedition Cruise Operators (AECO) and the International Association of Antarctica Tour Operators (IAATO) is helping turn polar vessel strike mitigation from principle into practice.

Our tailored training for expedition cruise vessels operating in Arctic and Antarctic waters equips bridge teams and expedition staff to recognise and respond to collision risk in some of the most important habitats on Earth for large whales.

It is no longer just about building awareness among crews; it is generating one of the strongest operational datasets yet on marine mammal presence in polar waters, and using that evidence to improve how vessels respond to collision risk.

During this last Antarctic season (25/26) in partnership with IAATO, we trained expedition teams to use the ORCA OceanWatchers app to record their marine mammal sightings as part of IAATO's V-CaPS programme. This training is increasingly being reinforced by real-world monitoring on an unprecedented scale.

Recording sightings using our OceanWatchers app meant effort data was collected for the very first time as part of the IAATO V-CaPS programme, increasing the power and usability of the data set. Across the season 25 vessels submitted data demonstrating how trained crews are becoming active partners in conservation.

In total, 12,940 marine mammals were recorded over the season, including more than 4,000 humpback whales, ecotypes A, B1, B2, C and D orcas, 1,218 crabeater seals, 166 beaked whales, 33 blue whales and 16 Ross seals. The programme also achieved its broadest geographic coverage to date, with observations spanning the Antarctic Peninsula, Bellingshausen, Amundsen and Ross Seas, Terre Adélie, Scotia Sea, Drake Passage, South Atlantic and the wider Southern Ocean.

These records do more than demonstrate the scale of wildlife using polar waters. They help identify where whales and vessels overlap, strengthen the evidence base for mitigation, and feed directly back into ORCA's vessel strike training and wider spatial risk-reduction work.

A record Antarctic season

- **25 vessels** contributed to ORCA's voluntary marine mammal monitoring programme
- **12,940 marine mammals** recorded between 1 November 2025 and 15 March 2026
- **4,000+ humpback whales** logged
- Observations submitted across the **widest geographic range yet**
- Data collected through the programme is now helping refine future vessel strike mitigation training and spatial risk-reduction

Humpback whale

Atlantic spotted dolphin © Richard Lovelock

Thank You

An overwhelming gratitude of thanks goes to every one of our members and supporters for all their time, support and joy they have given us over many years.

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However, the biggest shoutout goes to our incredible network of over 700 volunteer Marine Mammal Surveyors, who practically run the UK offshore monitoring programme. Each one of you has played a role in this vital monitoring work, which can only take place thanks to your contribution – whether in the past, present or future.

We must also not forget one of our most treasured and longstanding ferry partnerships' – Brittany Ferries who not only allow us on board across their fleet of ships but provide us with invaluable donated office space – Thank you.

Lastly we would also like to extend our thanks to the ORCA patrons Mark Carwardine, Chris Packham, Nigel Marvin and Lizzie Daly for all their continued support.

Mark Carwardine

"If we can't look after animals as awe-inspiring, enigmatic and downright remarkable as cetaceans, what can we do?"

Mark Carwardine
ORCA patron, zoologist, conservationist

Long-finned pilot whale

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*active in 2025

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Corporate members

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