GREENPEACE

STOP DEEP SEA MINING

THREATENED WHALES IN NORWAY'S PROPOSED DEEP SEA MINING AREA


18°W
8°W
2°E
12°E
22°E
78°N
73°N
68°N
63°N
53°N
Svalbard
Longyearbyen
Bear Island
Jan Mayen
Norway
Ålesund
NORWEGIAN SEA
ANIMAL SPECIES
Fin whale
Minke whale
Killer whale
Sperm whale
White-beaked dolphin
Northern bottlenose whale
Unidentified large whale
LEGEND
Designated deep-sea mining area
Route of the Greenpeace ship
0
250
500 km
N
Source: Greenpeace, Esri, GEBCO, NOAA, Garmin, and other contributors

INTRODUCTION

In the summer of 2024, Greenpeace and external scientists conducted a research cruise in the Norwegian Sea. The aim of the cruise was to better understand the distribution and behavior of cetaceans — whales, dolphins, and porpoises — in an offshore area identified by the Norwegian government for future deep sea mining. The survey combined visual observations with passive acoustic monitoring to gather data on cetaceans within the region. The findings, particularly the acoustic data, are a valuable addition to the body of data on regional cetacean distributions.

The researchers used the Greenpeace sailing yacht Witness to tow a hydrophone (underwater microphone) to make recordings during a ten-day period between July 30th and August 10th 2024[1]. The team focused on detecting deep diving whales, such as sperm whales (Physeter macrocephalus) as they are listed as Vulnerable by the International Union for Conservation of Nature (IUCN)[2]. Other species of interest were northern bottlenose whales (Hyperoodon ampullatus), which are a type of beaked whale. These deep diving whales are known to be highly sensitive to underwater noise[3] and could potentially be impacted by deep seabed mining, should it take place in the future[4].

The team were able to track some of the sperm whales that they encountered acoustically during their dives so that, as they resurfaced, the researchers could collect images of the tail flukes. These images can be compared to other catalogues and used to identify individuals - a little like a human fingerprint.

Figure 1 (opposite page). Map of cetacean detections during the Greenpeace research cruise with the sailing yacht Witness in 2024. The detections were visual or acoustic. The red area shows the area designated for deep sea mining by the Norwegian government. The white line shows the track line made by the Witness through the mining area, along which detections of different cetacean species, as shown through different symbols, were made within a ten day period.

MAIN FINDINGS

High encounter rates of deep-diving whales:

A total of 22 acoustic encounters with sperm whales were recorded, 18 of which occurred within the mining zone itself. These encounters included the distinctive 'creaks' produced by sperm whales, a sound associated with foraging behavior. This suggests that the area is a feeding ground for these whales, underscoring the ecological significance of the region to these animals .

Multiple cetacean species identified:

The survey confirmed the presence of several cetacean species in the mining area, reinforcing concerns about the potential risks of deep sea mining to these marine mammals. Six species were identified:

Sperm Whale *(Physeter macrocephalus)*: Eight sightings, 22 acoustic detections.

Northern Bottlenose Whale *(Hyperoodon ampullatus)*: Four acoustic detections.

White-Beaked Dolphin *(Lagenorhynchus albirostris)*: Six sightings, 15 acoustic detections. Some groups included juveniles.

Minke Whale *(Balaenoptera acutorostrata)*: Eight sightings.

Killer Whale *(Orcinus orca)*: One sighting, also detected acoustically.

Fin Whale *(Balaenoptera physalus)*: One sighting.

These findings highlight the biodiversity of cetaceans in the area, indicating that multiple species rely on the region for feeding, breeding, or other critical life functions.

Significant conservation concerns due to potential threats from deep sea mining:

Our results contribute to a growing body of research on cetaceans, particularly through the addition of acoustic data. The findings provide valuable insights into cetacean distribution within the designated mining area and strengthen the argument that Norway's deep sea mining plans could pose a serious threat to marine life. The noise generated by mining activities — both from machinery on the seabed and vessels at the surface — could impact upon cetaceans[5]. Noise pollution could interfere with the whales' ability to communicate, navigate, and forage effectively[6]. Noise can mask the sounds that whales use to communicate with each other.[7] In severe cases, loud sounds can even cause physical harm to whales if they are close enough to the noise source. Beaked whales can become startled by certain sounds, causing them to swim too quickly to the surface, which is dangerous to them and can lead them to later strand.

The environmental impact of mining operations could extend beyond noise disturbance - sediment plumes and the introduction of pollutants into the water could result from these activities. Pollutants like heavy metals or other toxic substances could accumulate in the food chain and the body tissues of whales and potentially cause long-term physiological harm.[8] It is very difficult to predict the impact of mining on cetacean food sources and the wider ecosystem. The potential for ecological harm further underscores the risks posed by deep sea mining.

Drone picture of a sperm whale *(Physeter macrocephalus)* taken during the Greenpeace research cruise in Norway's proposed deep sea mining area.

SPERM WHALE
(Physeter macrocephalus)

Length: 10.5-16.5 m
Weight: ♂35 000 - 55 000 kg ♀10 000 - 20 000 kg
Maximum dive depth: typically to 1,200 m deep, deepest dive ~ 3,000m
Biggest toothed whale, largest brain of all animals

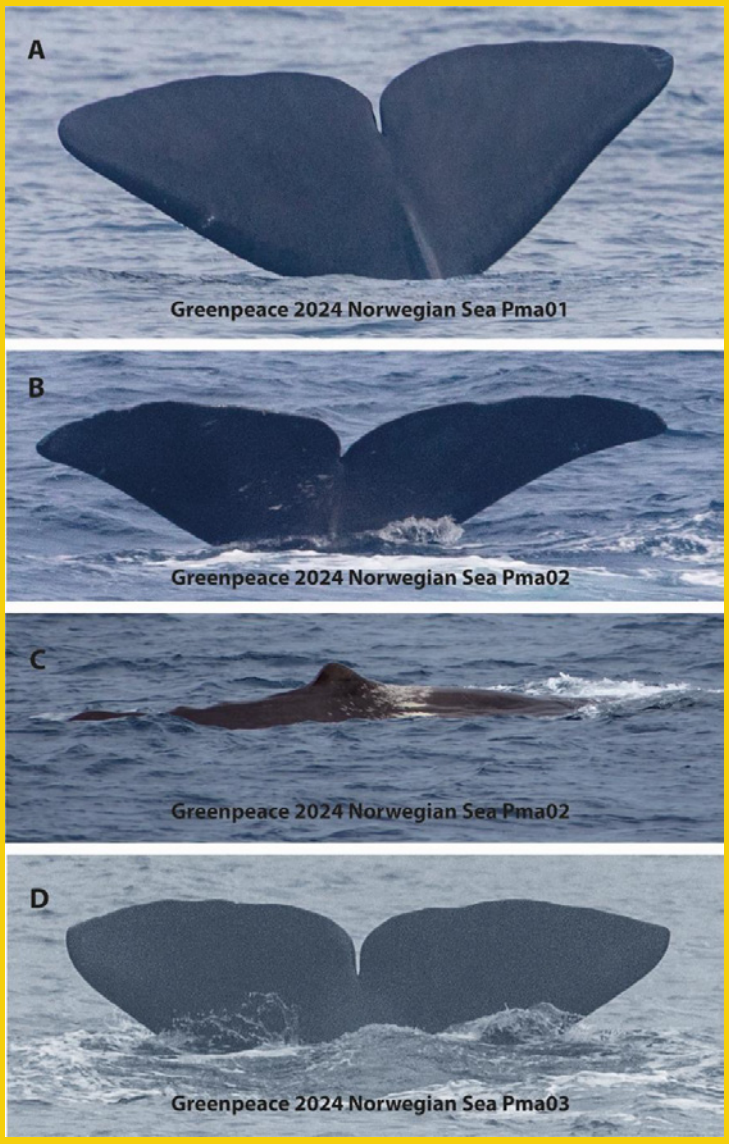


Figure 2. Sperm whale *(Physeter macrocephalus)* photo-identification images collected during the survey conducted by the sailing yacht Witness in 2024. Abbreviations Pma01, Pma02, Pma03 stand for the three different individuals that were identified.

NORTHERN BOTTLENOSE WHALE *(Hyperoodon ampullatus)*

Length: 7 – 9 m
Weight: ~ 7,000 kg
Maximum dive depth: more than 2,000 m
Among the deepest-diving whales, vulnerable to sonar

WHITE-BEAKED DOLPHIN *(Lagenorhynchus albirostris)*

Length: ~ 2-3 m
Weight: 180 - 275 kg
Maximum Dive depth: Unknown (one individual ~ 45 m)
Fast swimmers, often bow-riding ships

MINKE WHALE
(Balaenoptera acutorostrata)

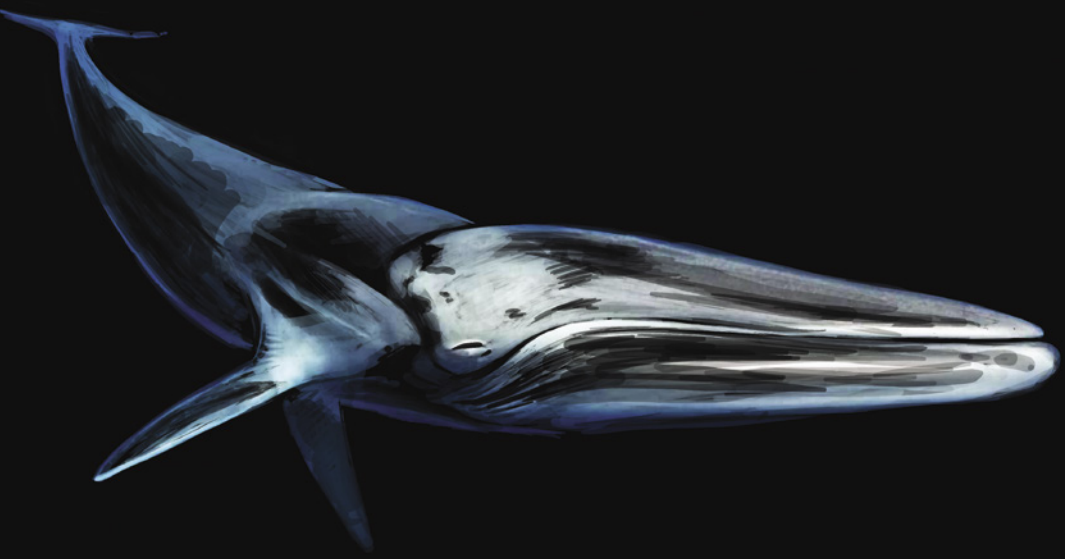
Length: 7.5–9.5m
Weight: 350-450 kg
Maximum Dive Depth: 300-400 m
One of the smallest baleen whales, still commercially hunted

KILLER WHALE / ORCA *(Orcinus orca)*

Length: 7-9 m
Weight: up to 6,000 kg
Maximum dive depth: ~ 1,000 m (but frequently 100-200 m)
Top predator known to even hunt great white sharks

FIN WHALE
(Balaenoptera physalus)

Length: 18-23 m
Weight: up to 90,000 kg
Maximum Dive depth: Typically 100-200 m depending on location, max ~ 475m
Second-largest whale species, very fast swimmer



CONCLUSION AND NEXT STEPS:

The survey provides compelling evidence of the importance of the designated mining area as habitat to several cetacean species, including sperm whales and northern bottlenose whales. The survey strengthens the argument for canceling all current mining plans to safeguard marine life and preserve the integrity of vulnerable ecosystems.

In the summer of 2025 Greenpeace plans to return to the designated mining area to test a suite of new tools to investigate biodiversity. We will test a drifting hydrophone that is designed to detect northern bottlenose whales more effectively and also underwater cameras to investigate fish diversity. The SY Witness will spend around two weeks in the region, building upon our survey from 2024.

Two Greenpeace activists holding a 'Stop Deep Sea Mining'-Banner on the Greenpeace sailing vessel Witness in Norway's proposed deep sea mining area

Endnotes

1 Webber, T., Gillespie, D., Lewis, T., Gordon, J., Ruchirabha, T., & Thompson, K. F. (2022). Streamlining analysis methods for large acoustic surveys using automatic detectors with operator validation. Methods in Ecology and Evolution, 13(8), 1765-1777. https://doi.org/10.1111/2041-210X.13907

2 Taylor, B.L., Baird, R., Barlow, J., Dawson, S.M., Ford, J., Mead, J.G., Notarbartolo di Sciara, G., Wade, P. & Pitman, R.L. 2019. Physeter macrocephalus (amended version of 2008 assessment). The IUCN Red List of Threatened Species 2019: e.T41755A160983555. https://dx.doi.org/10.2305/IUCN.UK.2008.RLTS.T41755A160983555.en. Accessed on 14 April 2025.

3 Williams, R., Erbe, C., Duncan, A., Nielsen, K., Washburn, T., & Smith, C. (2022). Noise from deep-sea mining may span vast ocean areas. Science, 377(6602), 157-158. https://doi.org/10.1126/science.abo2804

4 Thompson, K. F., Miller, K. A., Wacker, J., Derville, S., Laing, C., Santillo, D., & Johnston, P. (2023). Urgent assessment needed to evaluate potential impacts on cetaceans from deep seabed mining. Frontiers in Marine Science, 10. https://doi.org/10.3389/fmars.2023.1095930

5 Christiansen, B., Denda, A., & Christiansen, S., (2020). Potential effects of deep seabed mining on pelagic and benthopelagic biota. Marine Policy 114, 103442. https://doi.org/10.1016/j.marpol.2019.02.014

6 Williams, R., Erbe, C., Duncan, A., Nielsen, K., Washburn, T., & Smith, C. (2022). Noise from deep-sea mining may span vast ocean areas. Science, 377(6602), 157-158. https://doi.org/10.1126/science.abo2804

7 Thompson, K. F., Miller, K. A., Wacker, J., Derville, S., Laing, C., Santillo, D., & Johnston, P. (2023). Urgent assessment needed to evaluate potential impacts on cetaceans from deep seabed mining. Frontiers in Marine Science, 10. https://doi.org/10.3389/fmars.2023.1095930

8 Das, K., Debacker, V., Pillet, S., & Bouquegneau, J.-M. (2003). Heavy Metals in Marine Mammals. In Toxicology of Marine Mammals (pp. 135–154).

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Scan here to find the identified whales in a global database.