Short Communication: Opportunistic cetacean survey of the Ross and Amundsen Seas

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ABSTRACT

Opportunistic visual surveys of the Ross Sea and the Amundsen Sea were conducted (25 January–18 February 2026), amounting to 1,015 nautical miles of search effort (83 hours), of which 763 nautical miles (62.4 hours) were south of 60°. Of 192 cetacean sightings, 153 were identified to species level: 69 humpback (n = 179), 34 fin (n = 90), 27 Antarctic minke (n = 71), 11 Antarctic blue (n = 21), seven killer (n = 40), one Arnoux's beaked (n = 25), and one sperm (n = 1) whale(s). Of the unidentified sightings, 36 were baleen whales and three were beaked whales. Blue whales with calves were recorded in coastal waters off Cape Adare.

KEYWORDS: BLUE WHALE; FIN WHALE; HUMPBACK WHALE; ANTARCTIC MINKE WHALE; DISTRIBUTION; RELATIVE ABUNDANCE

Owing to persistent pack ice, much of the Ross Sea and the entire Amundsen Sea have received limited survey coverage for cetaceans compared with most coastal seas worldwide (Ainley, 1985; Matsuoka *et al.*, 2003; Ainley *et al.*, 2007; Branch, 2007; Edwards *et al.*, 2015). The Ross Sea has been a summer whaling area from 1923 to 2018 (Ainley, 2010; IWC, 2026). An estimated 11,680 large whales were killed here from floating factory ships between 1923 and 1930 (Ainley, 2010). Most (n = 9,330) of the catch comprised blue whales (*Balaenoptera musculus intermedia*), followed by fin (*B. physalus*) (n = 1,451), humpback (*Megaptera novaeangliae*) (n = 890), and sperm whales (*Physeter macrocephalus*) (n = 8) (Ainley, 2010). Killer whales (*Orcinus orca*), southern bottlenose whales (*Hyperoodon planifrons*) and Arnoux's beaked whales (*Berardius arnuxii*) were also killed in the region until the early 1960s (Mikhalev, 2019). Between 1985 and 2018, a total of 21,968 Antarctic minke, 16 common minke (*B. acutorostrata*) and 18 fin whales were killed, mostly in the Ross Sea area (IWC, 2026).

The eastern Ross Sea and western Amundsen Sea have not been surveyed recently, while the last IWC-SOWER cruise was conducted in this area during 2000/2001 (Shabangu *et al.*, 2024). A summary of prior surveys suggests that blue, fin and humpback whales avoid the shallow shelf sea (< 500 m), while Antarctic minke and killer whales are abundant there (Ainley, 2010). Recent dedicated blue whale research cruises in 2013, 2015 and 2019 focused on the northwestern Ross Sea and Balleny Islands region (Andrews-Goff *et al.*, 2022; Calderan *et al.*, 2023; Miller *et al.*, 2024).

Whaling data and circumpolar surveys indicate that the Antarctic minke whale, comprising mostly pregnant females (Ichii *et al.*, 1998), occurs at high latitudes inside the Ross Sea (Matsuoka *et al.*, 2003). Information on humpback whales in the Ross and Amundsen Seas is limited (Matsuoka *et al.*, 2003; Ainley *et al.*, 2007), but satellite telemetry tracks of 10 individuals tagged off eastern Australia and New Zealand show dispersal offshore around 65°S (Riekkola *et al.*, 2020).

Using the private yacht *The World* as a platform of opportunity, we conducted visual surveys for cetaceans from deck 12 (27 m elevation), as it afforded unobstructed, outdoor and forward-facing views. The vessel did not deviate from its intended route to view cetaceans, but the course was determined by pack ice. As such,

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surveys were conducted in passing mode as the ship navigated from Bluff to Ushuaia, stopping *en route* at Cape Adare, Ross Island, Bartlett Inlet and Peter I Øy. Search effort, sightings, environmental conditions and the vessel's track were all recorded using the *Oceanwatchers* app[3] and later transcribed.

Environmental conditions that affect visual detection of cetaceans were recorded every 30 mins or when conditions changed: swell height (m), visibility (km), Beaufort sea state, glare (direction). Surveys were discontinued above Beaufort seven. Two observers kept continuous watch, breaking only to photograph cetaceans to assist with species identification and gather photo-ID images (Sony α7iii equipped with a FE 200–600mm f/5.6–6.3 G lens). Group counts were estimated by experienced observers and recorded as minimum group size. Photo-ID images were submitted to Happywhale.com, while suites of blue whale photo-ID images were also submitted to Paula Olson/Antarctic Blue Whale Catalogue.

A total of 1,015 nautical miles of search effort was carried out over 83 hours between 25 January and 18 February 2026, of which 763 nautical miles and 62.4 hours were south of 60°. A total of 192 cetacean sightings were made, of which 153 were identified to species level: 69 humpback (n = 179), 34 fin (n = 90), 27 Antarctic minke (n = 71), 11 Antarctic blue (n = 21), seven killer (n = 40), one Arnoux's beaked (n = 25), and one sperm (n = 1) whales. Of the unidentified sightings, 36 were baleen whales, and three were beaked whales.

Although sample sizes were too small for statistical tests, in general, the shelf waters of the inner Ross Sea were dominated by minke whales, with a large group (minimum 12, maximum 20) recorded in the Bay of Whales (Fig. 1). This contrasts with Ainley (1985) who reported that Antarctic minke whales dominated the pelagic waters near dense pack ice. Blue whales were associated with the shallower side of shelf slopes, with a notable aggregation of whales 11–15 km from the coast east of Cape Adare in water averaging 250 m deep at the top of a submarine canyon off Possession Islands (Fig. 1). Similarly, another aggregation of blue whales was found atop a steep sloping area north of Cape Colbeck.

Fin whales were seen exclusively in abyssal waters and near deepwater seamounts (> 2,000 m deep). Two fin whales were found south of the pack ice band, inside the Ross Sea polynya, but the remainder were north of the pack ice. An apparent absence of fin whales over shallower ridges, such as the Iselin Bank, is consistent with acoustic monitoring conducted by Aulich *et al*. (2022). Humpback whales were apparently strongly associated with banks that were free of pack ice (e.g., Iselin Bank, mid-Ross Sea, Amundsen Ridge and Peter I Øy). Over Amundsen Ridge, it was observed that half the humpback and fin whale groups had flocks (up to 50) of moulting blue petrels (*Halobaena caerulea*) in close attendance. As some were feeding in the wake of whales, we interpret this as a possible means of foraging during a period of restricted flying ability (Ryan *et al.*, 2020).

Killer whales (types A, B1 and C, identified by photographing the eye patch) were encountered, with the latter two in coastal waters among dense pack ice. Arnoux's and unidentified beaked whales were seen away from pack ice and near banks (Iselin Bank and Amundsen Ridge). While neither sei nor southern right whales were confidently identified, there were possible records of both (recorded as unidentified baleen whales): 220 nm east of Balleny Islands and 150 nm northeast of Iselin Bank, respectively. A single sperm whale was seen in association with a seamount (570 m), 220 nm east of Balleny Islands.

Within the largest group of blue whales (n = 5), two mother-calf pairs were observed. This was unexpected in light of whaling records (1920s–1930s), indicating that the Ross Sea was dominated by males (Branch & Monnahan, 2021). Contemporaneously, the Ross Sea may be more important for female blue whales, as indeed it is for minke whales (Ichii *et al.*, 1998). Our observations of blue whales were much closer to the coasts of Cape Adare (and Cape Colbeck) than in previous surveys (Branch, 2007; Kelly *et al*., 2012), placing them within the foraging range of the ~450,000 pairs of Adelie penguins breeding between Cape Adare and Possession Islands (Lyver *et al*., 2011).

Our blue whale encounter rate (0.014 blue whale groups per nautical mile) was higher than the 1978–2005 IDCR/SOWER surveys (0.001), summarised by Branch *et al.* (2007) and also higher than the acoustic-guided encounter rate (0.010) during a 2013 blue whale survey of the Ross Sea (Double *et al.*, 2013). Our observations, although seasonally limited, are consistent with increased density of blue whales in the Ross Sea area. Furthermore, our observations of aggregations of humpback and fin whales offshore in the Amundsen Sea are

[3] *https://play.google.com/store/apps/details?id=uk.org.orcaweb.app&hl=en_GB*

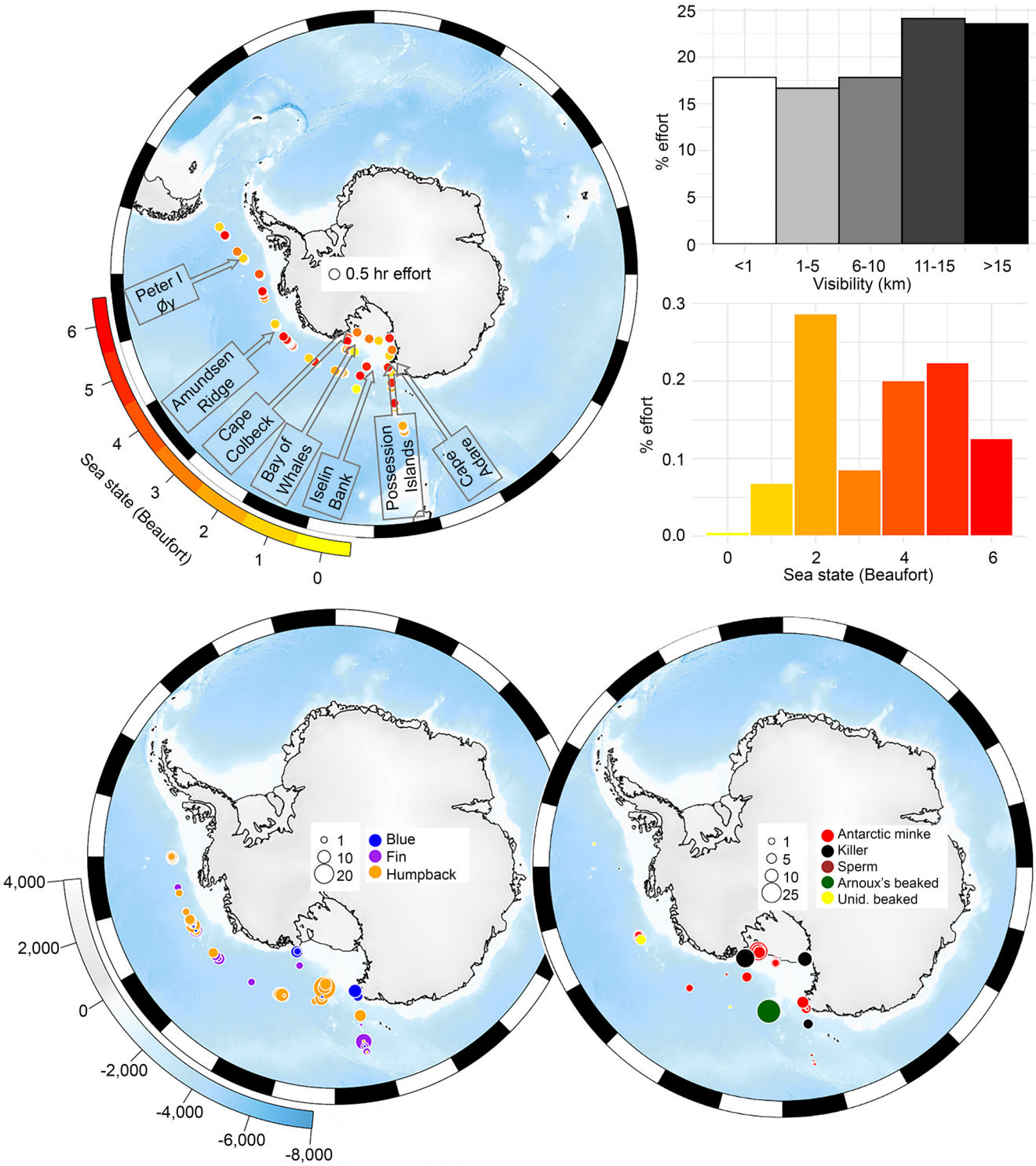

Figure 1. Above, maps showing the placenames mentioned in the text (top left) and the distribution of search effort by environmental conditions during the survey (top left and right). Below, maps show the distribution and group sizes of large baleen whales (bottom left) and Odontocetes and small Mysticetes (bottom right).

in marked contrast to previous surveys, e.g., in 1994 when not a single fin or humpback whale was observed in surveys of the same area (Ainley *et al.*, 2007). Later, between 1996 and 2009, a low number of humpback whale acoustic detections were made in the central Ross Sea while the species was more abundant north of the Iselin Bank (Shabangu *et al.*, 2024). Coupled with our observations of humpback whales in the Ross and Amundsen Sea areas (Fig. 1), this could indicate post-whaling recovery, a distribution change, or both. Variation in pack-ice extent and distribution may be another contributing factor.

The possible spatial niche segregation among baleen whales in the Ross and Amundsen Seas merits further investigation. The mean frequency of latitude among our 141 baleen whale records was: –74.5° in Antarctic minke whale, –72.3° in Antarctic blue whale, –70° in humpback whale, and –69.4° in fin whale. Body size does not explain this trend; however, preference for prey species (e.g., *Euphausia superba, E. crystallorophias E. frigida,* or *Thysanoessa macrura*) may do so (Tamura & Komishi, 2009). With more sighting records, future analyses could further investigate whether depth, bathymetry slope and distance to sea ice also give rise to an apparent spatial segregation among these closely related krill predators.

In summary, our observations demonstrate that platforms of opportunity, such as *The World*, can be used as a low-cost way to conduct non-invasive research on cetaceans in a data-poor region of the Southern Ocean Whale Sanctuary. We highlight apparent spatial niche segregation among baleen whales, the occurrence of blue whales with calves in coastal waters of the Ross Sea, and large aggregations of Antarctic minke whales in the world's southernmost bay (Bay of Whales).

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