

RESEARCH NOTE

Observations of long-finned pilot whale (*Globicephala melas*) calves less than one year old, including neonates and a very recently born calf, in northern Norway

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Abstract

Long-finned pilot whales (*Globicephala melas*) are a widespread, highly social deep-diving cetacean species ranging from the sub-tropics to the High Arctic. Information on this species' life history at higher latitudes is limited. Opportunistic observations of pilot whale calves were made in the spring and summer of 2020, summer of 2022 and spring of 2023 from commercial whale-watching boat trips out of Andenes, on Andøya, about 300 km north of the Arctic Circle, in northern Norway. Eighteen observations were made of long-finned pilot whale groups where 14 neonates and 32 other calves less than one year old were present. Additionally, a neonate with deep foetal folds and a folded-over dorsal fin, indicating very recent birth, was observed within Bleik Canyon on 21 June 2020.

Keywords

Reproduction; life history; Andenes

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Introduction

The long-finned pilot whale (*Globicephala melas*) has a widespread distribution across the North Atlantic Ocean, from Portuguese waters in the south to Svalbard in Arctic Norway in the north (Olson 2018; Storrie et al. 2018; Bengtsson et al. 2022). There is no population estimate for the Norwegian Sea, but 187 individual pilot whales were identified using photo-identification between 2006 and 2009 off the Lofoten Islands (68.08°N, 14.57°E; Vester et al. 2017; Leonard & Øien 2020a, b). This species favours deep-water habitats along the continental shelf margin and submarine canyon systems (Bloch et al. 2003; Olson 2018). They are considered of Least Concern by the International Union for Conservation of Nature and are targeted by the annual shore-driven *grindadráp* hunt in the Faroe Islands and opportunistically for subsistence in Greenland (Zachariassen 1993; Minton et al. 2018; Mamzer 2021).

Long-finned pilot whales become sexually mature at approximately 12 years of age for males and between six and eight years for females (Martin & Rothery 1993; Olson 2018). Females can live for >60 years and males between 35 and 40 years (Martin & Rothery 1993; Olson 2018). Both sexes become physically mature at 25–30 years of age (Bloch et al. 1993; Martin & Rothery 1993). Females

have a birth interval of 5.1 years but rarely calve after 40 years (Martin & Rothery 1993; Oremus et al. 2013). Gestation lasts approximately 12 months and calving rates peak in the summer and autumn in the north-east Atlantic (Martin & Rothery 1993).

At birth, long-finned pilot whale calves measure on average 1.77 m and weigh 74 kg (Martin & Rothery 1993). Apart from their small size, newborns are readily distinguished by the deep foetal folds along the lateral sides of their bodies, folded-over dorsal fins and light brown colouration (Martin & Rothery 1993; Augusto et al. 2016). The foetal folds are lost after about one year, when the calves become grey in colour (Auger-Méthé & Whitehead 2006; Augusto et al. 2016). Calves are weaned after 6.5 months, by which time females are 2.22 m long and males 2.15 m in length (Desportes & Mouritsen 1993).

Whale-watching occurs year-round from Andenes, on Andøya Island in northern Norway, primarily targeting sperm whales (*Physeter macrocephalus*) that forage within the Bleik Canyon and surrounding areas since a prospecting research cruise in 1987 but other toothed and baleen whale species may be observed in the area (Lettevall et al. 2002; Rødland & Bjørge 2015; Cosentino 2016). This note reports observations of young long-finned pilot whales made during whale-watching tours in 2020,

2022 and 2023. Knowledge of the life history of pilot whales in this area, including reproductive rates in Subarctic waters, is lacking.

Data collection

Observations of long-finned pilot whales were opportunistically made from rigid inflatable boats operated by Whale2Sea during dedicated research and commercial whale-watching trips in the spring/summer of 2020, summer of 2022 and spring of 2023. The whales were located visually from the Andenes lighthouse (approximately 45 m a.s.l.) using 25 × 80 big-eye binoculars prior to trips or with the naked eye while at sea. Acoustic detections with a directional hydrophone also helped to find animals during trips.

Photo-identification images were obtained using Canon 650D DSLR and Canon 90D camera with a 70–200 mm telephoto lens. Aerial videos were also made using a DJI Phantom 4 Pro multicopter quadcopter drone using the DJI Go 4 app (version 4.3.32) on a first generation 30 cm Apple iPad Pro. Sighting locations and the effort of the vessel were recorded using the Whale2Sea sightings form and a Garmin GPS 73. Detailed observational notes were made after unusual sightings. Whales were visually differentiated from one another during sighting days on the basis of dorsal fin notches, scarring and skin lesions.

Long-finned pilot whales that had been very recently born within days of their sighting were identified by their small size, brown colouration, deep foetal folds and folded-over dorsal fins (Augusto et al. 2016). Older neonates shared similar characteristics, but their dorsal fins were erect and their surfacing behaviour was more coordinated with their accompanying adult (Augusto et al. 2016). A calf less than one year old was noted when the foetal folds were still present, the skin colour had darkened, and the animal was larger than a neonate relative to its accompanying adult (Augusto et al. 2016). If the recorded neonate or older calf lacked identifiable features, the accompanying adult female was used as a reference to avoid recounting the same young animal during encounters.

Calf sightings

Long-finned pilot whales were sighted on seven different occasions over five days between 30 April and 21 June 2020. They were sighted by the author on 14 days between 23 May and 21 July 2022. They were seen on four days between 22 February and 8 April 2023 (Fig. 1, Table 1). Whale group sizes ranged from ca. 8 to >70

Table 1 Long-finned pilot whale neonate and < 1-year-old calf sightings in 2020, 2022 and 2023 off Andenes.

Date	Group size	No. of neonates	No. of < 1-year-olds	Location
30/04/2020	> 70	1	0	Bleik Canyon
13/06/2020	15	0	3	Andfjord
21/06/2020	> 60	1	> 4	Bleik Canyon
23/05/2022	50	2	5	Andfjord
02/06/2022	20	1	0	Bleik Canyon
03/06/2022	50	1	0	Continental shelf
09/06/2022	ca. 10	1	0	Continental shelf
12/06/2022	ca. 8	0	3	Continental shelf
26/06/2022	12	0	2	Continental shelf
26/06/2022	25	1	2	Continental shelf
27/06/2022	~8	0	1	Bleik Canyon
10/07/2022	30	0	1	Continental shelf
18/07/2022	40	4	5	Andenes in close
19/07/2022	15	1	ca. 2	Bleik Canyon
21/07/2022	ca.15	1	5	Bleiksøya offshore
22/02/2023	15	0	2	Andfjord
18/03/2023	ca.30	0	2	Andfjord
19/03/2023	11	0	1	Andfjord

individuals, and they were observed both close to shore in Andfjord and by Andenes and also offshore, in Bleik Canyon (Fig. 1). One very recently born pilot whale was observed on 21 June 2020, and an extremely small neonate (the dorsal fin was not flopped over but foetal folds were deep and extensive) was also seen on 19 July 2022. Neonates were seen on 10 occasions; during eight of these sightings, just one was observed within pods. Four neonates were noted on 18 July 2022. Ten sightings were also made of <1-year-old-calves; where these were observed, there were between one and five of them in the whale group (Fig. 2).

Very young neonate sighting in 2020

On the 30 April 2020, at least 17 long-finned pilot whale individuals (out of >70) approached the whale-watching vessel and a neonate calf was observed and filmed overhead with the drone. The neonate remained by the flank and tailstock of the presumed mother during the encounter, and it was located in the forward but central position of the subgroup, where it was able to maintain the same swimming speed as the group. Two adult males and two juveniles (>1 year old) were also present, the juveniles also remaining within the core of the group (Supplementary Fig. S1). Three other calves were noted in the distance, but it was not possible to determine their age class.

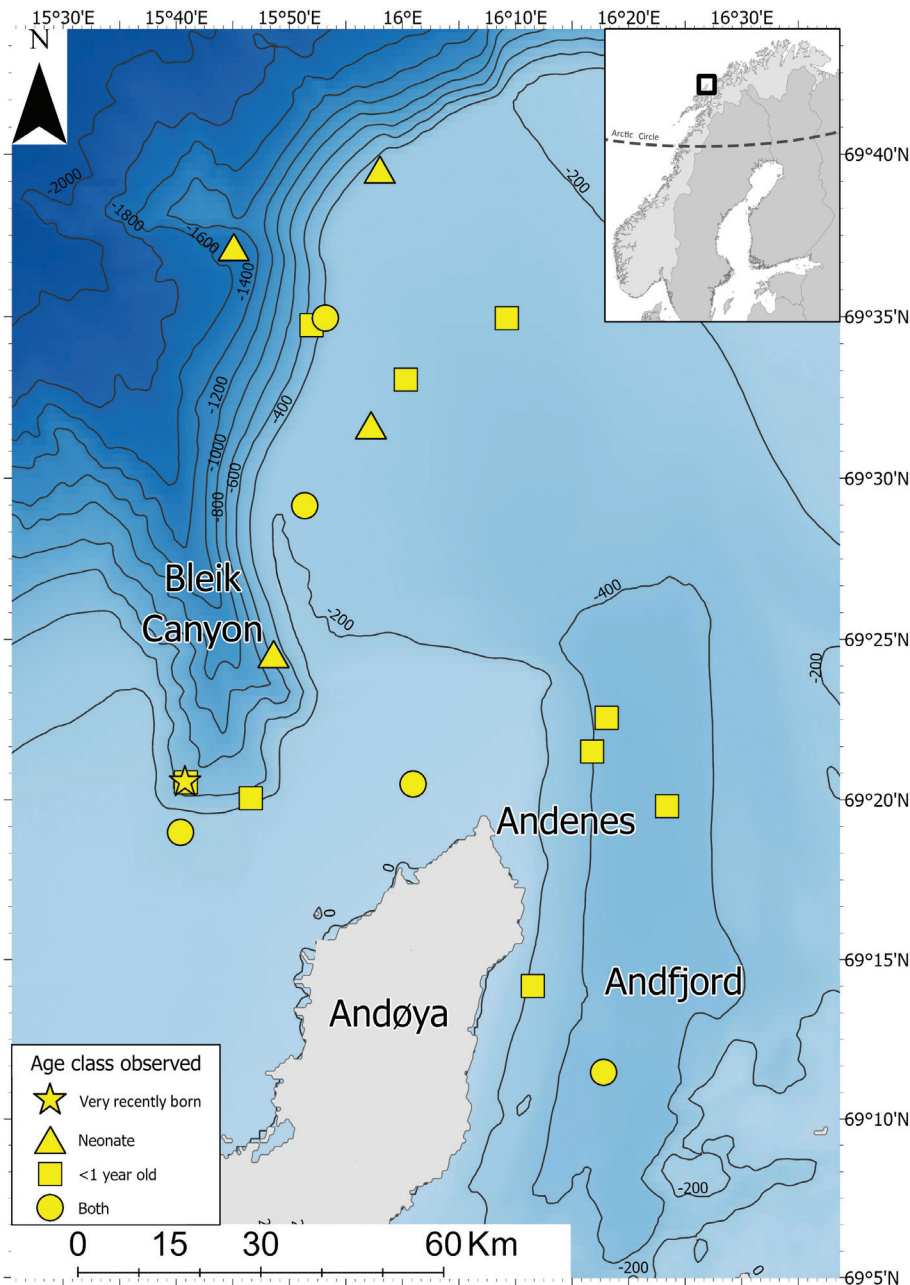


Fig. 1 Location of long-finned pilot whale neonate and <1-year-old calf sightings off Andøya, Norway, in 2020, 2022 and 2023.

Newborn sighting in 2020

A large group of long-finned pilot whales consisting of approximately 60 individuals was located on 21 June 2020 at 08:57 near the centre of Bleik Canyon in a Beaufort sea state of 4 and 1.5 – 2 m swell (Supplementary Fig. S2). The whales were spread out over >1 km and, when sighted by the two whale-watching boats, they were in within smaller groupings (<10 individuals) and

were moving south through water with depths ranging from 742 to 1006 m.

One large male (as determined by its overall size and dorsal fin) was frequently observed in proximity to one boat during the encounter. Its dorsal fin was extremely large and coated with a light brown diatom species and pseudo-stalked barnacles (likely *Xenobalanus globicipitis*) on the trailing edge of the fin made it easily recognisable (see Augusto et al. 2013; Visser et al. 2020).

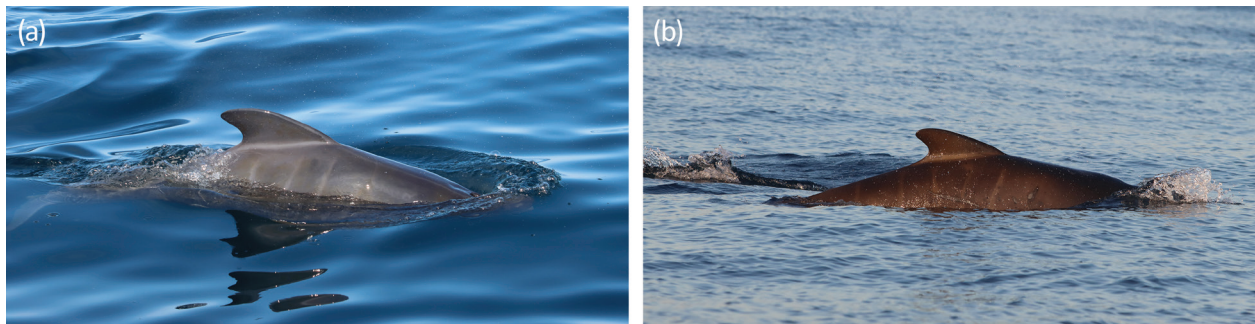


Fig. 2 (a) A neonate and (b) <1-year-old long-finned pilot whale observed off Andenes, Norway, in 2022. (Photos: Seán A. O'Callaghan.)

Spyhopping occurred frequently during this encounter, and on one occasion a female spyhopped and was immediately followed by a male in close contact; its visible erect penis suggested that this was a potential mating attempt. At least four calves, kept within the centre of the group, were observed throughout the sighting. The calves moved into a smaller group on one occasion and two swam upside down to pectoral fin slap. The sighting ended when the two whale-watching vessels left at 09:56.

A second whale-watching trip, involving one vessel, began at 12:05 on the same day. The area where the whales had previously been encountered was targeted to relocate them. Dense fog moving from the north reduced visibility to within 5 m of the vessel when approaching the first sighting's location and the directional hydrophone produced no acoustic detections. The search continued to the south, where there was no fog and where the whales were last seen travelling to. A small group of about 14 individuals (including four calves) was located at 13:24, 8.7 km to the south of the initial sighting location (Supplementary Fig. S2). They milled and stayed in the same location during the sighting, in water with depths of 456 – 506 m, on the southern side of Bleik Canyon. The large male with the distinctive dorsal fin was resighted three hours and 28 min after the first trip. The whales frequently approached the vessel, often at the stern.

Thirteen minutes after relocating the whales, a very young newborn was observed, close to its mother, surfacing within the group. Its small size of ca. 1.5 m, fresh neonatal folds, collapsed dorsal fin, enlarged bulbous head and 'rocketship' surfacing behaviour (exposing its entire head to breathe) indicated that it was very recently born (Augusto et al. 2016; Hill et al. 2017). Its colouration along the lateral and dorsal surfaces was a light brown, which was darkest along its dorsal surface. Its respiration rate was frequent (approximately two or three times per minute) as it followed its mother.

Other adult members of the group spyhopped often, including multiple animals at once (three very close together). One individual was seen pectoral fin slapping at the same time as another whale tail slapped. The distinctive male was never seen close to the newborn and appeared to lead the group towards the south-west. After 36 min, the encounter ended when the vessel concluded the trip.

While the available photographs and films from these encounters were reviewed thoroughly, there were undoubtedly individual whales that were not recorded during encounters involving large groups spread out over a wide area. The recorded numbers of neonates and <1-year-old-calf records are therefore a minimum numbers (Table 1).

Discussion

Behavioural observations of cetacean parturition and mating in the wild are difficult to make given their fleeting occurrence (Ralls & Mesnick 2019). Documenting such events and recording calf survival rates outside of captive environments is crucial to the study of a species' life history (Ralls & Mesnick 2019). Previous Norwegian pilot whale calf records come from limited stranding records from the literature (Jørgensen 2000; Stenløkk 2013; Svyrtsen 2017). An approximately 2 m long calf live stranded in April 2010 at Borestranda, in southern Norway (ca.58.79°N, 5.54°E), while a 2.5–3 m calf stranded at Oppedal (61.58°N, 05.05°E) in April 1989 (Christensen 1990; Jørgensen 2000; Stenløkk 2013). One pilot whale stranding was reported in Andøya: a 4 m individual in the spring of 1977, at Bø (69.03°N, 15.31°E; Jørgensen 2000). Between 1942 and 1975, 1986 long-finned pilot whales were killed in Norway through commercial whaling, wherein 1065 catches were made between 1958 and 1961); numbers of calves caught were not noted (Jonsgård 1977).

The first sighting on 21 June 2020 included observations of one apparent mating attempt and may indicate that the aggregation was a meeting of multiple whale pods to

socialise and mate, as has been described elsewhere (Oremus et al. 2013; Olson 2018). Multiple mating attempts were also observed on 10 July 2022 in a group of 30 whales.

Once the very young newborn calf was observed, the frequent spyhopping, in addition to the pectoral fin slapping, tail slapping and erratic surfacing motions, may have been the group's efforts to discourage the vessel from nearing the newborn (Visser et al. 2016). Similar observations of group aerial behaviour were made during the birth of a false killer whale (*Pseudorca crassidens*) off Morocco (Notarbartolo di Sciara et al. 1997).

These neonates and <1-year-old calf whale sightings demonstrate that the species mates and calves in high-latitude waters. The neonates were observed within the expected calving time for the species in the north-east Atlantic (Martin & Rothery 1993). This suggests that Norwegian waters may be a suitable location for young calves to develop in the absence of the large predators (such as sharks) at lower latitudes, but it is not known if this species is resident or transient in this region. Killer whales (*Orcinus orca*) are not known to prey on pilot whales in Norway but mainly feed on fish such as Atlantic herring (*Clupea harengus*), lumpfish (*Cyclopterus lumpus*) and Atlantic mackerel (*Scomber scombrus*) in addition to harbour seals (*Phoca vitulina*) and harbour porpoises (*Phocoena phocoena*) (Cosentino 2015; Remili et al. 2023). Pilot whales have been noted to chase killer whales in Norway and Iceland on occasion (Selbmann et al. 2022).

This study adds to our knowledge of pilot whale life history in Norwegian waters and behaviours associated with parturition in this species. Increased research effort is required to fill in the large gaps in our understanding of the species' life history and its seasonal dynamics in Norwegian waters.

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The author reports no conflict of interest.

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