



Finally seen: a rare sighting of Antarctic blue whale cow–calf pair off the west coast of South Africa

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Abstract

Blue whales are rarely sighted off the coasts of South Africa due to their low numbers and offshore habitat preference. Visual observations to search for marine mammals were conducted onboard a platform of opportunity during the Integrated Ecosystems Programme survey in November 2019. A cow–calf pair of blue whales *Balaenoptera musculus* was sighted offshore Kleinsee (30°05′02.4″ S, 14°24′53.2″ E) at a water depth of 1670 m on the west coast of South Africa in the southern Benguela Current System. The pair was identified as Antarctic blue whales *B. m. intermedia* based on the size of the cow (~29 m), “torpedo-shaped” body of the cow, known distribution ranges and recent acoustic data showing that pygmy blue whales *B. m. breviceauda* do not occur in these waters. The calf was likely born in the Benguela ecosystem given its relatively small size. This is the first sighting of Antarctic blue whale cow–calf pair in South African waters post whaling, indicating that animals might still use this area as a calving or nursing ground. Improved protection of this region in the low latitudes might benefit the recovery and conservation of the species.

Keywords Blue whale · Benguela ecosystem · Cow–calf pair · Occurrence · Calving ground · Rare sighting

Introduction

Two subspecies of blue whale *Balaenoptera musculus* are recognised in the Southern Hemisphere; Antarctic blue whale (*B. m. intermedia*; Burmeister 1871) and the pygmy blue whale (*B. m. breviceauda*; Ichihara 1966), whereas Chilean blue whale subspecies (*B. m. spp.*) remain an unrecognised subspecies pending further investigations (Committee on Taxonomy 2022). It is usually difficult to morphologically distinguish these subspecies at sea, although Antarctic

blue whales (growing up to around 30 m) are larger than pygmy blue whales (growing up to around 24 m) (Best 2007; Ichihara 1966). Antarctic blue whales are classified as “Critically Endangered” on the International Union for Conservation of Nature Red List of Threatened Species (Cooke 2018). The subspecies was exploited to near extinction during industrial whaling; however, there is some evidence abundance increases (Branch et al. 2004). It is estimated that about 0.3–1.3% of the pre-exploitation population remained by the time whaling (both legal and illegal) when all whaling on the subspecies stopped in the mid-1970s (Branch et al. 2004).

Dynamic and diverse migratory behavioural patterns have been reported in Antarctic blue whales, including the classical complete migration between feeding and breeding areas (Best 2007; Mackintosh and Wheeler 1929), demography linked differential migration (Kasamatsu et al. 1996), partial migration of a fraction of the population (Mackintosh and Wheeler 1929) and non-migratory or continuous presence patterns (Attard et al. 2016; Samaran et al. 2010; Thomisch et al. 2019; Letsheleha et al. 2022). Migration patterns of Antarctic blue whales remain poorly understood; with locations of breeding or nursing areas yet to be conclusively

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identified (Best 2007). Nonetheless, Namibian waters have been identified as a potential breeding and overwintering ground (Best 1998). Acoustic presence of Antarctic blue whales has been reported off Namibia and South Africa in the southeast Atlantic Ocean (Thomisch et al. 2019; Shabangu et al. 2019; Letsheleha et al. 2022), while confirmed blue whale sightings were recorded for South Africa (Barendse 2007) and Angola (Figueiredo and Weir 2014).

Substantial historical catches of probable Antarctic blue whales were made in the southwest African region (Best 1994). Taking of cow–calf pairs was prohibited by the first adopted International Whaling Convention from 1931 onwards (Kobayashi 2006) which limits historical records of calves; however, historical accounts suggest that calves were present in South African waters. For instance, Olsen (1914) reported thin females arriving with calves in early austral winter and a cow–calf pair taken along Saldanha Bay. Elsewhere in the general Benguela ecosystem, 47 possible maternally dependant calves and 5 cow–calf pairs were landed at Angolan whaling stations (Figueiredo and Weir 2014), while 7 calves were landed in Namibia (Best 1998). Thus, the region is of interest to post harvesting dynamics of the species. Post whaling era visual sightings remain scarce outside of the Antarctic, particularly in the Atlantic Ocean (Findlay et al. 2014). Here, we present the first sighting of Antarctic blue whale cow–calf pair off the west coast of South Africa post the whaling era, which suggests this region may be a breeding/nursing/calving area for the subspecies.

Materials and methods

Visual observations to search for marine mammals were conducted from a platform of opportunity (RV Algoa), during the Integrated Ecosystems Programme survey from 19 to 28 November 2019 off the west coast of South Africa (Fig. 1). All visual observations (i.e. sighting effort) were conducted in “passing-mode” sighting effort, while the vessel was steaming between oceanographic sampling stations. A continuous watch was maintained during the day by an experienced observer (SAM) from the monkey island of the ship (a deck situated directly above the navigation bridge of the ship) positioned at 9.5 m above sea level. Sighting efforts were conducted in weather conditions of less than 25 knots wind speed and light conditions conducive for visual observations. Naked eye and Bushnell 8×42 H2O Porros binoculars, with 7.8° angle of view were used for searching for marine mammals. Photographs of sighted marine mammals were taken using a Canon EOS 80D camera with a SIGMA 100–400 mm 1:5–6.3DG Ø 67 lens.

The images were used to identify this encounter, aided by species identification guides such as Jefferson et al. (2015),

observer description of the encounter and with the assistance of blue whale experts. Discriminating the two subspecies of Southern Hemisphere blue whale at sea has been a contentious issue. Kato et al. (2002) proposed utilising blowhole morphology and relative body shape to discriminate the two. Succinctly, pygmy blue whales have (1) big head and small body (“tad-pole” shape) (2) extension of the median groove between the blowholes beyond the leading edge of the blowhole and (3) the presence of knobs on the caudal peduncle (Kato et al. 2002). Consideration was also given to the vocalisation records of blue whales off South African west coast (e.g. Shabangu et al. 2019). The size of the mother was estimated visually based on experienced observer (SAM) of working at sea with measurements of average adult hump back whale *Megaptera novaeangliae* (~ 14 m) on the west coast of South Africa. Individual blue whales can be distinguished primarily by their unique mottling pigmentation patterns on their flanks and secondarily by scars and deformities (Sears et al. 1990). Images of the cow–calf pair on which identifying features (e.g. mottling pattern) were visible (Fig. 2a) were shared with scientists responsible for the Antarctic blue whale photo-ID catalogue for matching with 517 known whales in the database (Olson et al. 2020). The right side of the calf containing the dorsal fin and mottling pattern (Fig. 2a) was used to compare to right-side profiles of 383 individuals in the Antarctic blue whale catalogue for the years 2018, 2019, and 2020 (Olson et al. 2020).

Results

The cow–calf pair was encountered in the offshore waters of South Africa (30°05'02.4"S, 14°24'53.2"E) on 22 November 2019 at a water depth of 1670 m and sea surface water temperature of 18.7 °C and under overcast weather conditions. Mottling pigmentation pattern seen in photographs confirmed that the cow–calf pair was blue whales. The pair was identified as Antarctic blue whales due to observer-noted smoothly tapered “torpedo-shaped” body form typical of Antarctic blue whales and not the “tadpole-like” body shape (wider head and shorter tail stock) characteristic of pygmy blue whale (Kato et al. 2002). Knobs were lacking on the caudal peduncle of the calf that showed its fluke (Fig. 2a, b). The size of the mother was estimated visually (~ 29 m) based on its enormous size (Fig. 2c), estimated to be almost twice the length of an average adult humpback whale (~ 14 m) on the west coast of South Africa. The calf was visually estimated to be less than half of the mother’s length. The pair was observed heading in the same direction as the ship (257.5°) and was observed for 10 min, thereby affording the observer an opportunity to investigate the sighting. These whales were moving at a slow pace, with the cow mostly at

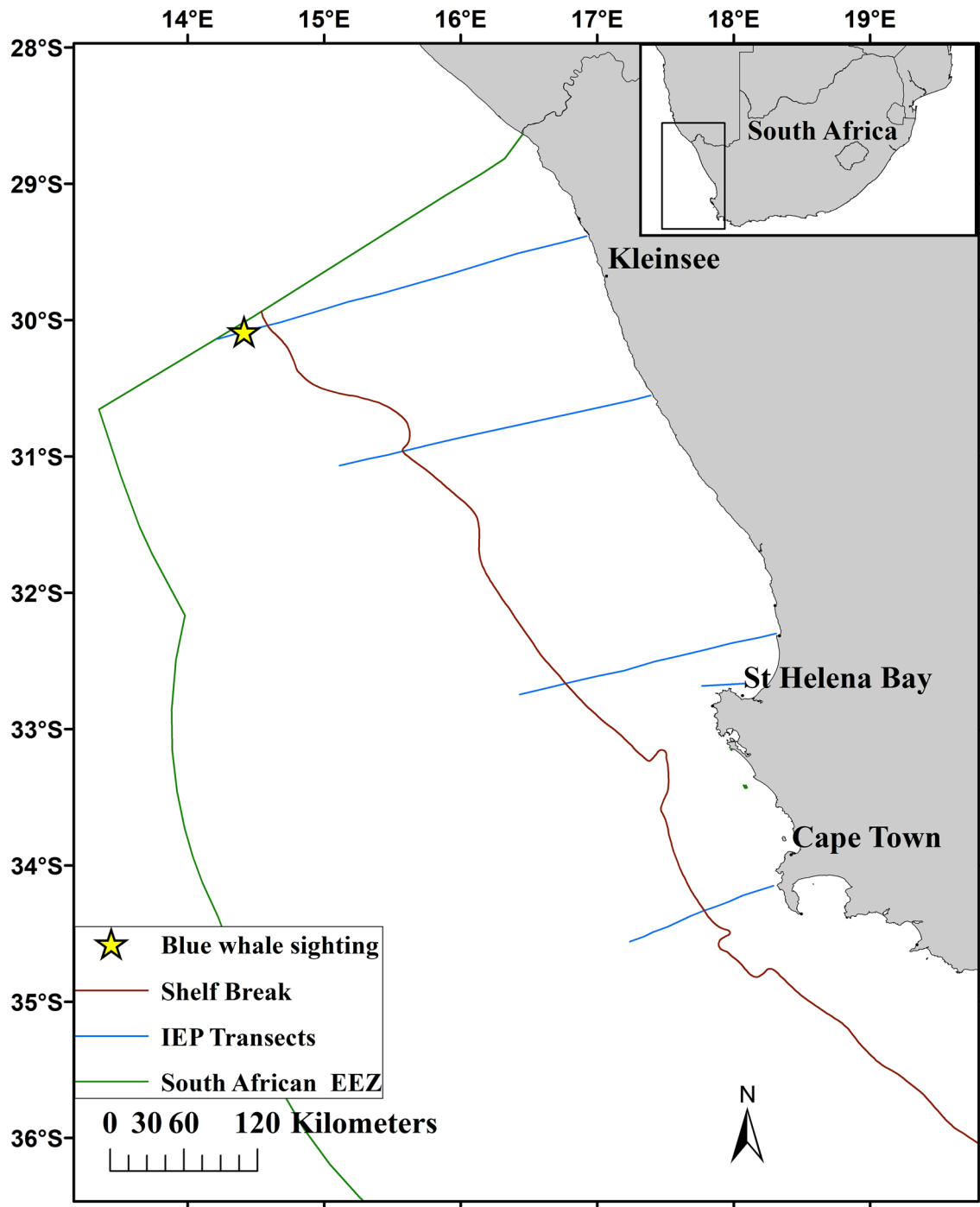


Fig. 1 Location (yellow star) of the Antarctic blue whales off northwest coast of South Africa. IEP is Integrated Ecosystems Programme; and the shelf break is positioned at approximately 550 m water depth relative to the sighting

the surface during the short observation period. The calf was comparatively more active at the surface, turning on its sides and occasionally lifting the tail (fluking), but kept close to the cow. Prior to the pair diving, the cow “spy hopped” for a few seconds.

A remora fish (*Remilegia australis*), also known as whalesucker, was observed on the back of the cow (Fig. 2d), which is similar to those of Antarctic blue whales (known to carry the most amount of remora fish than any other baleen whales) examined on the west coast of South Africa at Donkergat Whaling Station (Best 2007). Unlike with pygmy



Fig. 2 Photographs of the sighting taken on 22 November 2019 showing **(a)** calf arching prior to diving, **(b)** calf's caudal peduncle showing during play, **(c)** cow (left) and calf (right) **(d)**, blowhole arch

of the cow with remora fish attached on its back, **(e)** cow Antarctic blue whale showing some mottled patterns and **(f)**, right dorsal fin of the sighted calf used in matching

blue whales, no extension of the median groove could be seen between the blowholes beyond the leading edge of blowholes (Fig. 2d). There were no images of the adult that met the criteria for inclusion in the matching process within the Antarctic blue whale photo-ID catalogue (Fig. 2e). The right side of the calf (Fig. 2a, f) did not match any individuals contained in Antarctic blue whale catalogue.

Discussion

The low numbers and sparse distribution of Antarctic blue whales in the Southern Hemisphere makes it difficult to conduct regular visual monitoring efforts. Their occurrence in the southeast Atlantic (Gabon to South Africa) is derived chiefly from whaling records (Best 1994; Branch et al.

2007). Until now, there were only four documented blue whale sightings in South African waters since 1964 when whaling stopped in these waters (Branch et al. 2007). Olsen (1914) reported an Antarctic blue whale giving birth to a 7.03 m calf in Saldanha Bay, South Africa; unfortunately, the pair was harpooned thereafter. Another blue whale cow–calf was caught off the same area in 1922 (International Whaling Commission Catch Statistics provided by Dr Isidora Katara-June 2022). Young blue whales (0–2 year old) were caught off the west coast of South Africa, suggesting that this region was a calving ground for Antarctic blue whales (Branch et al. 2007). Shabangu et al. (2019) seasonally detected Antarctic blue whales with a peak acoustic presence in winter months off the west coast of South Africa, while Letsheleha et al. (2022) also reported a blue whale peak occurrence in winter but with year-round presence from the same region, indicating that the subspecies uses this region for more than just overwintering, breeding and possibly feeding but also as a year-round habitat. To date, no pygmy blue whale calls have been detected in Namibian (Thomisch et al. 2019) or South African waters (Shabangu et al. 2019; Letsheleha et al. 2022). This latest sighting was in the latter part of spring, suggesting that the calf was still maternally dependent.

This rare sighting of Antarctic blue whale cow–calf pair in South African waters may be indicative of a return to the use of these waters as a calving or nursing ground. In the broader Benguela ecosystem context, a cow–calf pair that was sighted off Angola in August 2012 (Figueiredo and Weir 2014), together with this encounter are encouraging for a species recovering from extensive exploitation. A fatally wounded adult Antarctic blue whale from a ship strike stranded in Namibia (Jordan 2021), which may indicate that their current distribution covers the three Benguela Current System states (Angola, Namibia and South Africa).

The locality of the sighting is associated with the shelf in the oceanic Benguela ecosystem, which is one of the most biologically productive large marine ecosystems in the world (Shannon 2006). Discrete upwelling areas in this region are influenced by a combination of shelf width and coastal topography (Hutchings et al. 2009). The sighting's environment is in the region of the Benguela ecosystem that is characterised by a wider shelf with elevated biomass and production extending further offshore (Demarcq et al. 2007). Long-term changes in zooplankton communities have been reported for the southern Benguela ecosystem (Verheyne et al. 2016). These changes have led to a suspected increase in the biomass of euphausiids that drive the recently discovered low latitude coastal feeding ground for humpback whales (Cade et al. 2021; Findlay et al. 2017)). Both blue and humpback whales feed on *Euphausia spp* in Antarctic waters (Werth 2000; Nemoto 1962). The productivity of the southern Benguela ecosystem combined with availability of

their preferred prey can provide feeding opportunities for blue whales migrating through, calving, residing or overwintering in the Benguela.

Historical catch data suggest that Namibia is a possible breeding and overwintering ground (Best 1998), while acoustic research suggest year-round area use (Thomisch et al. 2019). Our record indicates that blue whales might be utilising South African waters as a nursing ground. A lack of matches of the sighted calf to individuals in the Antarctic blue whale catalogue may suggest that the calf may have been born in the Benguela region and/or photographed for the first time. The proximity of the locality to South Africa–Namibia border lends support to proposed importance of the Benguela ecosystem to Antarctic blue whales. Given that detection ranges of Antarctic blue whale calls can range from tens to thousands of kilometres (Shabangu et al. 2020; Letsheleha et al. 2022), acoustic data add to the better understanding of their seasonality (e.g. Shabangu et al. 2019; Letsheleha et al. 2022), but do not confirm locality from a single omni-directional hydrophone. Some monthly offshore distribution survey effort is therefore required within the offshore Benguela ecosystem. These could include a combination of methods including passive acoustics, vessel-based surveys and aerial surveys where possible. Upon determination of important blue whale areas from surveys, priority should be given to deployment of satellite tracks to investigate blue whale's true distribution and migration paths.

Conclusions

This is the first sighting of a blue whale cow–calf pair in the southern Benguela ecosystem post whaling. We here contribute a new image of a calf towards the Antarctic Blue Whale Catalogue, and document the first “spy hopping” behaviour of this subspecies in this region. In addition to findings of acoustic research that found the west coast of South Africa to be an important habitat of Antarctic blue whales used for overwintering, opportunistic feeding, breeding, year-round habitat, and migration route, our study reflects that whales might also calf and nurse within this region. The above information might be useful for the protection and management of the species. This study further improves our knowledge about the species occurrence and behaviour in the southern Benguela ecosystem.

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Author's contributions SMS designed the study, acquired funding, provided resources, analysed, validated photos and wrote the manuscript; PGHK provided resources, analysed and validated photos and wrote the manuscript; NCG analysed and validated photos and wrote the manuscript; NS analysed and validated photos, conducted the fieldwork and wrote the manuscript; FWS analysed and validated photos and wrote the manuscript; SAM conducted the fieldwork, provided resources, analysed, validated photos and wrote the paper. All authors read and approved the final manuscript.

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Data availability The datasets used and/or analysed during the current study are available from the corresponding author on reasonable request.

Declarations

Conflict of interest The authors declare that they have no conflict of interest.

Ethical approval Not applicable.

Consent for publication Not applicable.

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