



## Notes

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### Rare sightings of southern right whales (*Eubalaena australis*) on a feeding ground off the South Sandwich Islands, including a known individual from Península Valdés, Argentina

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Southern right whales (SRW, *Eubalaena australis*) were severely depleted throughout the 19th and 20th centuries but since protection in 1935, most populations are recovering (IWC 2012). Over the last few decades, they have been intensively studied during austral winter when they are on coastal calving grounds where researchers have documented their population dynamics, longevity, and birthing intervals (Payne 1986, Best 2000, Burnell 2001, Rowntree *et al.* 2001, Patenaude *et al.* 2007, Banister 2011, Carroll *et al.* 2011, IWC 2012, Galletti Vernazzani *et al.* 2014). However, little information is available on their current offshore movements and distribution during the 8–9 mo they are on their feeding grounds. Ensuring the full recovery of a species requires protection throughout its range. Whaling records provide information on former feeding grounds (Townsend 1935, Tormosov *et al.* 1998), but current feeding grounds are known mainly from opportunistic sightings made from ships that happen to travel through remote polar seas and from the tracks of about 25 satellite-tagged individuals (Best and Mate 2007, Best *et al.* 2015, Zerbini *et al.* 2015). Photo-identification of whales sighted offshore therefore provides valuable information on the movements of SRW in the remote polar seas. Here we report offshore sightings of 21 SRWs along the South Sandwich Islands, where the species has rarely been seen, and to the east of South Georgia, where sightings are more frequent (Moore *et al.* 1999). Photographs of 6 of the 21 whales were individually identifiable and were compared to catalogues of SRWs photographed on calving grounds off South Africa and Argentina.

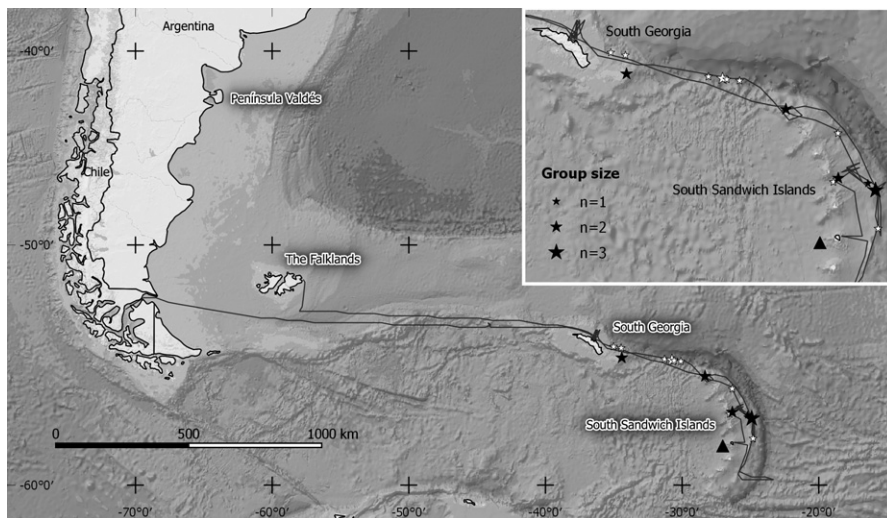
The whales were sighted from the R/V *Polarstern* during the PS81 (ANT-XXIX/4) expedition as part of a long-term study to document spatial and temporal changes in

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the at-sea distribution, dispersal movements, and aggregations of cetaceans, pinnipeds, and seabirds in the western South Atlantic Ocean (Joiris *et al.* 2015). Surveys were conducted along a transect that began at Punta Arenas, Chile, on 22 March 2013, proceeded to South Georgia along the North Scotia Ridge and the South Sandwich Trench before returning to the Falkland (Malvinas) Islands on 16 April 2013 (Fig. 1). Shipboard surveys ( $n = 365$ ) were conducted daily on a continuous basis (visibility permitting) from dawn to dusk from a height of 18 m above sea level. Observation time was partitioned into 30 min segments, with observers changing every 3 h to avoid fatigue. In addition, there were nine aerial surveys (height 1,500 ft, speed 80 kn) from a ship-based helicopter lasting about 2 h each (for details see Joiris *et al.* 2015). Surveys were suspended when the ship was stationary (station list in Bohrmann 2014). Data recorded for each whale sighting included: location, species, group size, group composition, and any unusual behavior. Whales were photographed opportunistically when they were close enough to the ship or helicopter and conditions allowed. Since the main objective of the ANT-XXIX/4 expedition was to investigate hydrothermal activity, the transect path was fixed and could not be diverted to photograph individual animals.

SRWs can be individually identified by the shape and placement of distinctive markings on their heads (callosities) and white or gray pigmentation patterns on their backs (Payne *et al.* 1983, Schaeff *et al.* 1999). Photographs were sent to the holders of catalogs of SRWs photo-identified on calving grounds off South Africa (1,680 individuals, Peter Best) and Península Valdés (PV), Argentina (3,031 individuals, Ocean Alliance/Instituto de Conservación de Ballenas), who searched the catalogs for matches. Searches in both catalogs used the computer-assisted photo-identification



*Figure 1.* Survey track (solid line) of the ANT-XXIX/4 expedition to South Georgia and the South Sandwich Islands. The map also shows the SRW calving ground off Península Valdés, Argentina, where whale #A0262 was first sighted (1972). The stars indicate locations of SRW sightings and the star size indicates the group size. Black stars = the locations of photo-identified SRW; white stars = the locations of the non-identifiable SRW; black triangle = the location of whale #A0262.

system developed by Hiby and Lovell (2001). All matches were scored for picture quality, distinctiveness of pattern and certainty of identity (IWC 1990, p. 9).

Twenty-one SRWs were sighted during the expedition including 10 during ship-board surveys, three while the ship was stationary and nine during helicopter surveys (Fig. 1). Six whales were photographed in sufficient detail to be individually identifiable (Fig. 2) (four during helicopter surveys and two when the whales approached the ship while it was stationary). No matches were found in the South African catalog or among SRWs photo-identified off South Georgia by Moore *et al.* (1999), but one whale, SS0882, matched whale #A0262 in the Argentine catalog. The match is unambiguous owing to the distinctive pattern of gray pigmentation on the whale's back. Whale #A0262 was first seen at PV in 1972, but not again until the present observation on 6 April 2013 (Fig. 3). This represents a southeastward movement of approximately 3,090 km.

Four of the animals seen during the aerial surveys were close to a free-drifting iceberg. It remains unclear whether the whales were logging in the protection of the

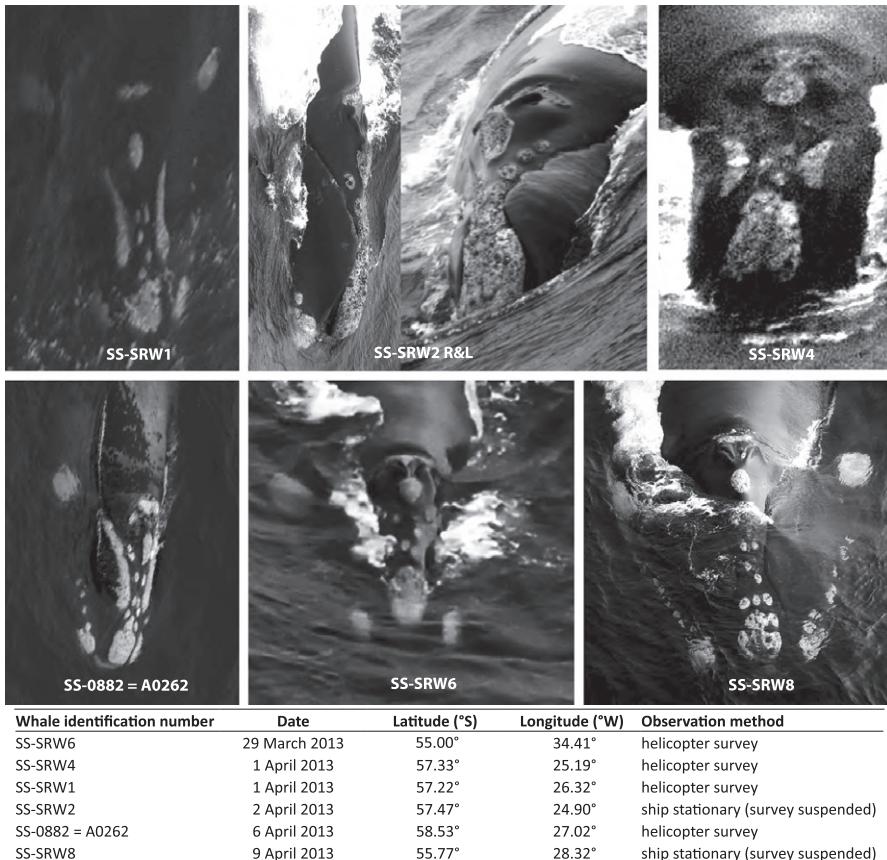


Figure 2. Southern right whales photographed between 29 March and 9 April 2013 off South Georgia and the South Sandwich Islands. For further details see Joiris *et al.* 2015. Photos: G. Nijs/PoLE and H. Robert/PoLE.

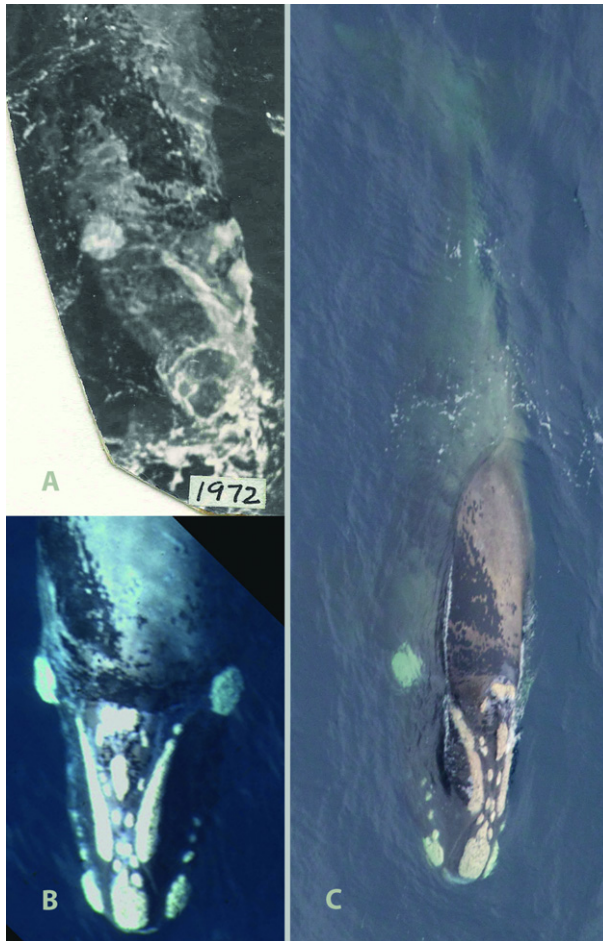


Figure 3. (A, B) Southern right whale #A0262 photographed off Península Valdes in 1972 at 42°S, 64°W (Ocean Alliance/Instituto de Conservación de Ballenas); (C) #A0262(SS0882) photographed west of Montagu Island at 58.53°S, 27.02°W on 6 April 2013. This gray-morph whale shows a distinctive splatter of black markings over the right shoulder, making it easy to photo-identify. Photo: G. Nijs/PolE.

iceberg or were attracted by a higher local prey abundance caused by an upwelling resulting from melting water (Smith *et al.* 2007, Kaufmann *et al.* 2011, Joiris *et al.* 2015). The whales showed no active feeding behavior during the time of observation. The three whales that were sighted while the ship was stationary showed inquisitive behavior, approaching the ship and swimming up to CTD equipment that was being winched out of the water. One whale was observed actively feeding around the ship, closing its mouth before surfacing every 2–5 min to breathe. The whale was closely followed by a raft of chinstrap penguins (*Pygoscelis antarcticus*) that appeared to be feeding on prey surrounding the surfacing whale.

Whaling data indicate that the waters around South Georgia were historically known as a major feeding ground for large whales during the austral summer (Kemp

and Bennett 1932, Matthews 1938, Tormosov *et al.* 1998, Moore *et al.* 1999). Between 1965–1966 and 1981–1982 Japanese scouting boats operating in the South Atlantic found SRWs to be most abundant to the southeast of South America (70°W–30°W, 35°S–45°S), but they found no SRWs between 70°W–30°W and 50°S–60°S, as reported here, even though they frequented this region (Ohsumi and Kasamatsu 1986). They did sight 48 SRWs in January between 30°W–30°E and 50°S–55°S, but none south of 55°S (Ohsumi and Kasamatsu 1986). Most of their sightings occurred between 35°S and 50°S, *i.e.*, generally north of the Antarctic convergence. The only other record of SRWs on a feeding ground off the South Sandwich Islands (700 km south of South Georgia), are two whales taken by Russian whalers in January 1966 to the east of the islands (57.7°S, 23.4°W) (Tormosov *et al.* 1998). SRW populations are slowly recovering from whaling with most stocks increasing at a rate of 6%–8% per year (IWC 2001, 2012). During a 1997 shipboard survey of cetaceans that included the historically rich large whale feeding ground off South Georgia (56.5°W–35°W, 53°S–54.5°S), SRWs were the most frequently sighted large whale species, with most sightings occurring northwest and north of the Island (Moore *et al.* 1999). The addition of 21 more SRW sightings southeast of South Georgia and along the South Sandwich Islands suggest that SRWs may be slowly reclaiming some of their historic feeding grounds and extending them farther to the south.

Aside from the resighting of Argentine whale #A0262 reported here, the only other direct link between right whale calving and summer feeding grounds in the western South Atlantic comes from three individuals identified at Península Valdés and later resighted on feeding grounds off South Georgia and Shag Rocks (Best *et al.* 1993, Moore *et al.* 1999, Rowntree *et al.* 2001).

The resighted whale, #A0262, is unusual because of its distinctive body coloration, being predominately gray with a splatter of black pigmentation over the right shoulder (Fig. 3) described by Schaeff *et al.* (1999) as a gray-morph phenotype. Individuals of this type appear white with black splatterings at birth, but the white skin darkens to gray over the next year or two (Payne *et al.* 1983; Best 1990; VJR, personal observation).

Gray-morph phenotypes are rare, comprising 0.3% of cow and 3.6% of calf SRWs off South Africa, and 0% and 1% off Argentina (Schaeff *et al.* 1999). Gray-morph males are much more common than females which more often show a partial gray-morph phenotype (predominantly black skin, with white patches that turn gray with age) (Schaeff *et al.* 1999). Whale #A0262 is assumed to be a male based on the fact that most of the sexed gray-morph individuals are male (Schaeff *et al.* 1999).

Although right whales are believed to have a lifespan of at least 60 yr (Hamilton *et al.* 1998), it has been suggested that gray-morph males may have shorter sighting histories than normal black males (Schaeff *et al.* 1999). Right whale #A0262 was at least 2 yr old when photographed off PV in 1972 as judged by the darkness of gray skin. Thus, it must have been at least 43 yr old when photographed off the South Sandwich Islands in 2013.

The observations reported here extend the current known foraging range of western South Atlantic right whales in a region of the Southern Ocean where Antarctic krill are especially abundant (Atkinson *et al.* 2004). This population appears to be sensitive to periods of low krill abundance (Leaper *et al.* 2006) and therefore seems likely to benefit from the South Georgia and South Sandwich Island Marine Protected Area, which was established in 2012 (GSGSSI 2012). However, most of the sightings reported here were outside the protected 12 nmi perimeter of the islands, suggesting

that further limitation of krill fishing in the region, spatially and/or temporally, might help to protect this population and other recovering species of large whales.

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