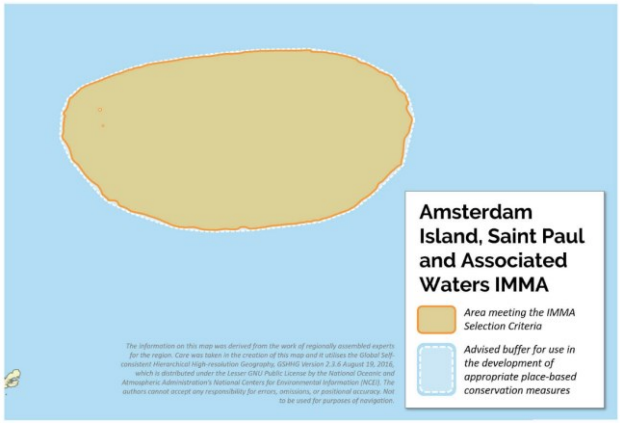

Area Size

1,431,225 km²

Qualifying Species and Criteria

Subantarctic fur seals – *Arctocephalus tropicalis*
Criteria C1, C2

Other Marine Mammal Species Documented

Balaenoptera musculus brevicauda, Mirounga leonina, Orcinus orca, Physeter macrocephalus

Summary

The Amsterdam and Saint Paul Islands are two small, volcanic islands in the French territorial waters of the transition area between the sub-antarctic and subtropical Southern Indian Ocean. The total landmass of the islands is less than 66 km², yet they host 11% of the world's breeding population of subantarctic fur seals (*Arctocephalus tropicalis*). Hunting during the 19th century almost extirpated the population, and fewer than 100 individuals were counted in 1956. However, by 1982, the population had recovered to 30,5000, and may now only be limited by available prey in the area. In addition to subantarctic fur seals, opportunistic sightings of other marine mammals around the islands include killer whales (*Orcinus orca*) , which are present year-round, and southern elephant seals (*Mirounga leonina*), which are regular visitors but do not appear to breed in the area. Additionally, sperm whales (*Physeter macrocephalus*) and pygmy blue whales (*Balaenoptera musculus brevicauda*) have been documented in the region.

Amsterdam Island, Saint Paul and Associated Waters IMMA

Description

Amsterdam and Saint Paul Islands are the northernmost French subantarctic territories in the eastern part of the Indian Ocean basin. Since 2006, the islands and part of the EEZ waters are listed as a French Natural Reserve (Biological Integral Reserve) and are administered by the French Ministry of the Terres Australes and Antarctique Francaises. The waters around the islands are part of the French EEZ and benefit from the protected status of the reserve. Amsterdam Island is 58 km² while Saint Paul, ca. 100km away, is 8 km². The small volcanic islands are located just north of the subtropical front, which is accepted as one of the northern limits of the Southern Ocean.

Several zones on the main island are open to scientific investigation, including the Plateau des tourbières and the Falaises de la Pointe d'Entrecasteaux, where the Polar Program 109 (Centre d'Etudes Biologiques de Chize CNRS UMR7372, France) has a long-term seal monitoring program. Saint Paul is also monitored annually by reserve agents.

The area hosts populations of subantarctic fur seals (*Arctocephalus tropicalis*). There have been opportunistic sightings of other marine mammals within the IMMA, including killer whales (*Orcinus orca*; present year-round) and southern elephant seals (*Mirounga leonina;* regular visitors, although no breeding has been reported). Additionally, sperm whales (*Physeter macrocephalus*) and pygmy blue whales (*Balaenoptera musculus brevicauda*) have been documented in the region (Branch et al., 2007; Samaran et al., 2010).

Criterion C: Key Life Cycle Activities Sub-criterion C1: Reproductive Areas

The population of subantarctic fur seals on Amsterdam Island is provides a useful example of

Recovery after almost complete decimation during the whaling era, with fewer than 100 individuals remaining by 1956 (Paulian, 1964). The population then increased to 30,500 adults by 1982 (Roux, 1978). A good marker of the health of the population can be found in the annual pup production, which recorded 6,334 pups in 1982, 6,414 pups in 1993 (Guinet et al., 1994) and 4,748 pups in 2018 (CEBC-CNRS, unpublished data). While the population increased throughout the 1990s, it is now thought to be stable or decreasing slightly. It has been suggested that this population has reached its carrying capacity and is now impacted by density-dependent effects (Chambellant et al., 2003). Pups are counted annually by the scientists of the Polar Program 109 (CNRS CEBC UMR7372, France), logistically supported by the French Polar Institute (IPEV) and the Natural Reserve.

Criterion C: Key Life Cycle Activities Sub-criterion C2: Feeding

Subantarctic fur seals adjust their foraging behaviour according to both seasonal and annual changes in oceanographic conditions, which affect food availability (Georges et al., 1997; Beauplet et al., 2004). The fur seals exploit the subtropical front, but also exhibit large seasonal differences in their distributions ranging from short trips in restricted foraging areas during summer to visits to widely distributed foraging grounds during the winter, possibly reflecting a decrease in food availability close to the islands. The IMMA encompasses the largest foraging range measured (Fig. 1, Beauplet et al. 2004). Acoustic studies suggest that pygmy blue whales, one of the subspecies of blue whales in the Southern Ocean, also use the IMMA as a foraging area (Samaran et al., 2010).

Supporting Information

Beauplet, G., Dubrocal, L., Guinet, C., Cherel, Y., Dabin, W., Gagne, C., Hindell, M. 2004. Foraging ecology of subantarctic fur seals *Arctocephalus tropicalis* breeding on Amsterdam Island: seasonal changes in relation to maternal characteristics and pup growth. Marine Ecology Progress Series. 2004, 273, 211-225

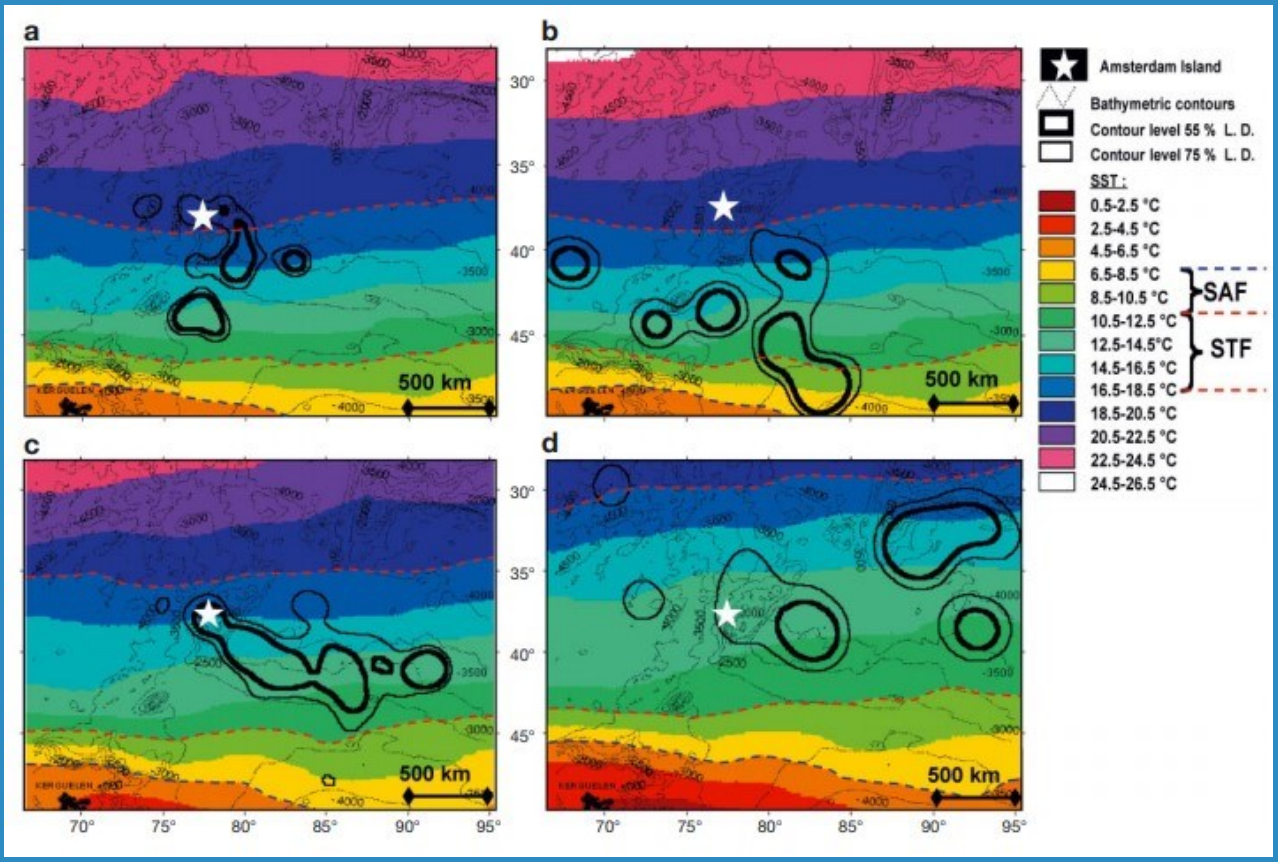

FIGURE 1: Seasonal core areas for female Subantarctic fur seals determined by Kernel analysis on Argos and geolocation data. Contour levels at 55 and 75% location densities are shown. Subtropical front limits are represented by dashed lines at top of graphs, Subantarctic Front limits by red and blue dashed lines at bottom of graphs. (a) summer 2002; (b) early autumn 2002; (c) late autumn 1999; (d) winter 1999 (from Beauplet et al., 2004).

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Acknowledgements

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