

# Proposed Ross Sea Marine Protected Area: The heart of an Antarctic MPA network?

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**Type:** May be proposed as an Antarctic Specially Protected Area (ASPA) or other type of international MPA offering protection to the neritic ecosystem and food web.

**Location:** Waters south of the 10,000 ft (3000 m) isobath, which extends from 69° S, 170° E (Cape Adare, Victoria Land) to 76° S, 155° W (King Edward VII Peninsula, Marie Byrd Land). Besides the shelf, included would be the continental slope, which jogs northward from Iselin Bank, to about 70° S, 178° W.

**Possible size of protected area:** 231,000 square miles (598,000 sq km).

**Cetacean species:** Antarctic minke whale, *Balaenoptera bonaerensis*; killer whale, or orca, *Orcinus orca* (including three ecotypes as described by Pitman and Ensor 2003); sei whale, *Balaenoptera borealis*; Arnoux's beaked whale, *Berardius arnuxii*. Seaward of the slope live the southern bottlenose whale, *Hyperoodon planifrons*, and, further north, the hourglass dolphin, *Lagenorhynchus cruciger*. Historically, before the intensive 20th century whaling, the blue whale, *Balaenoptera musculus*, and sperm whale, *Physeter macrocephalus*, occurred along the Ross Sea continental slope.

**Additional species and other features:** Measures of primary productivity indicate the Ross Sea to be the richest stretch of water of comparable size in the Southern Ocean. Middle-trophic-level species are, principally, crystal krill, *Euphausia crystallorophias*; and Antarctic silverfish, *Pleuragramma antarcticum* over the shelf; Antarctic krill, *E. superba*, and myctophids, *Electrona* spp., over the slope. About 943,000 pairs (38 % of the world population) of Adélie penguins, *Pygoscelis adeliae* and 52,000 pairs (26 %) of emperor penguins, *Aptenodytes forsteri*, nest along its shores. Several million Antarctic petrels, *Thalassoica Antarctica*, feed along the slope, one of the greatest concentrations in the Southern Ocean. Among seals, Ross Sea numbers contribute the following to the Pacific Sector: Weddell seal, *Leptonychotes weddellii*, 32,000 individuals (45 %); leopard seal, *Hydrurga leptonyx*, 8,000 (11 %); and crabeater seals, *Lobodon carcinophagus*, 205,000 (12 %). One of the major top predators are adult Antarctic toothfish, *Dissostichus mawsoni*, for which a fishery was recently initiated.

**Rationale:** To protect the largest, remaining minimally-changed, continental shelf ecosystem on Earth as a scientific laboratory to study the effects of climate change on Southern Ocean foodwebs. According to recent analysis by Halpern et al. (2008), the Ross Sea is the least affected stretch of shelf waters on Earth.

**Threats:** Currently, two fisheries are underway, one involves Antarctic toothfish, which CCAMLR (Commission for the Conservation of Antarctic Marine Living Resources) attempts to regulate in a knowledge vacuum. This is despite the species being of critical importance to the Ross Sea ecosystem and having demographic traits sensitive to adult mortality. *Dissostichus* stocks elsewhere in the Southern Ocean have largely been depleted. These fish are important prey of killer and sperm whales, and Weddell seals. The second fishery involves a "scientific" catch of Antarctic minke whales by the Japanese Research Program in the Antarctic (JARPA). JARPA has removed more than 4,500 whales - a third in the Ross Sea and vicinity - since 1988.



Three close-ups of killer whales, orcas, and an Antarctic minke whale (top right only) in the Ross Sea.  
 Photos by David Ainley.



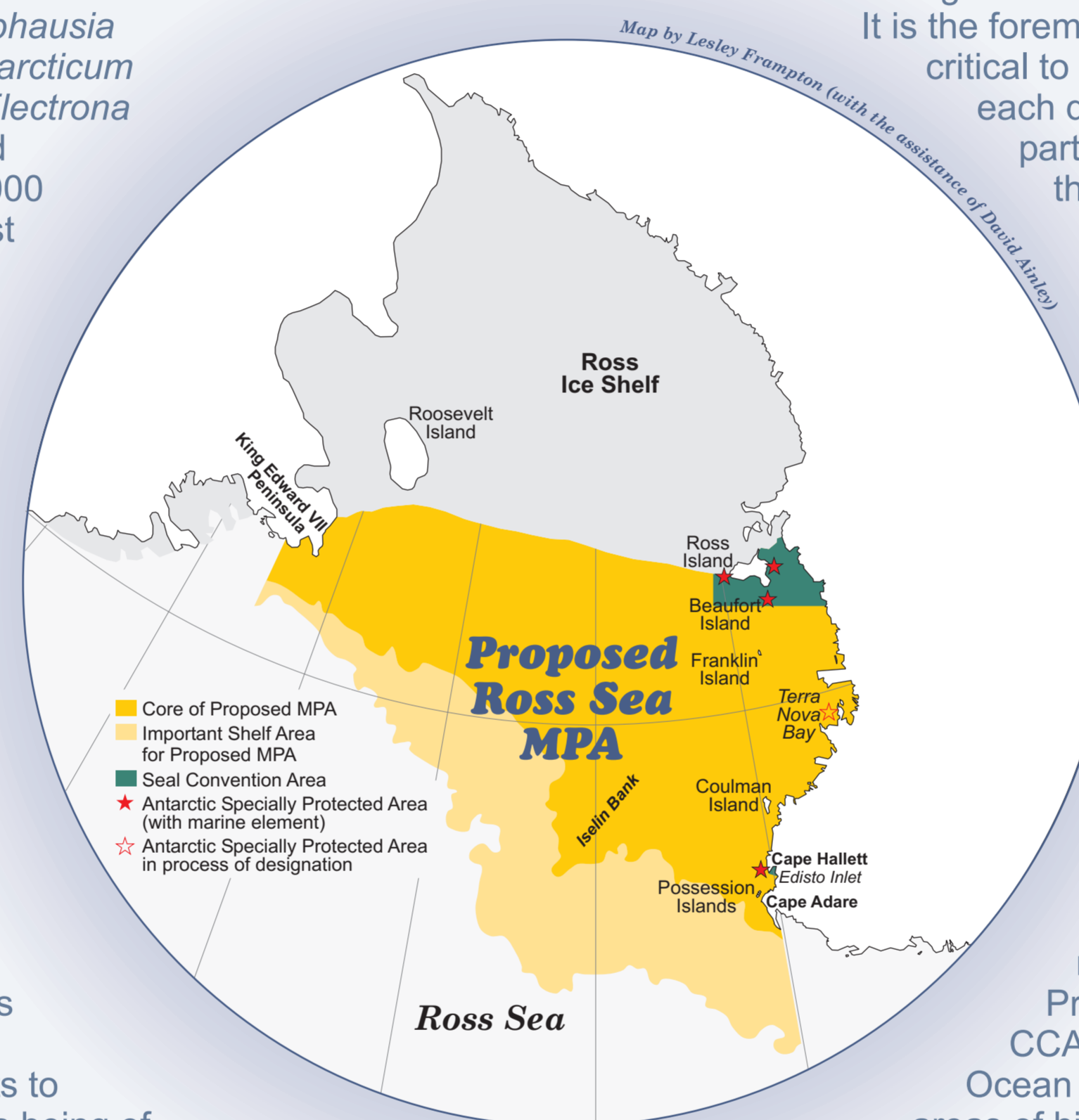
Portions of the Southern Ocean constitute Earth's largest marine mammal feeding ground. It is the foremost example of habitat that is critical to the survival of many species, each dependent on the health of a complex food web. Many species, particularly the large baleen whales that depend on krill, migrate to the region each year. Others, including dolphins, killer whales, beaked whales, sperm whales and some minke whales, rely on the region year-round.

Despite Antarctica's remoteness and harsh weather conditions, commercial interest in its living resources have been growing. While whales and fish were overexploited in the 20th century, krill fisheries are expected to explode in coming years, as krill is increasingly used for aquaculture food and nutraceutical industries. Biological prospecting for Antarctic organisms, whose parts can be used for commercial products, is also rapidly expanding.

The identification and subsequent designation of marine protected areas (MPAs) in the region, including critical habitat, will help to manage resources and protect whales, dolphins and other marine life. Antarctica and the Southern Ocean (south of 60° S.) were designated as "a natural reserve, devoted to peace and science" in the Environmental Protocol to the Antarctic Treaty. The Environmental Protocol and CCAMLR are crucial to protecting the waters of the Southern Ocean Sanctuary as important whale habitat. A recent effort to identify areas of high biodiversity and habitat heterogeneity (bio-regionalization) has been completed, but now action must follow. A network of MPAs would facilitate an ecosystem-based and precautionary approach to management.

ASOC's goal is to obtain international agreement on the Ross Sea as a high-seas MPA. The Ross Sea is one of the least disturbed ecosystems on Earth and is important as a feeding area for whales, seals, penguins, seabirds, fish and other marine species. As climate warms, it may be Earth's last refuge of sea ice and its associated biota. Measures of primary productivity, plankton stocks and top predators indicate the Ross Sea to be the richest stretch of water of its size in the Southern Ocean. Please join us in supporting the designation of the Ross Sea as an MPA. For more information, go to [www.asoc.org](http://www.asoc.org).

Full protection for the Ross Sea is a cornerstone of the Global Campaign for Marine Protected Areas initiated by WDCS, the Whale and Dolphin Conservation Society, as well as the Marine Biology Conservation Institute. These organizations are calling for a network of highly protected areas, including those for whales and dolphins, worldwide by 2012. The aim is to address the lack of critical habitat protection for whales and dolphins as well as to help fulfil international MPA targets. For more information, go to [www.whales.org](http://www.whales.org) and [www.cetaceanhabitat.org](http://www.cetaceanhabitat.org).



Antarctic minke whale (left) and a killer whale, or orca (above), in the Ross Sea.  
 Photos by David Ainley.

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Arnoux's beaked whales cruising off the fast ice edge in McMurdo Sound, Ross Sea.  
 Photo by Erin Heard.