

Antarctic Affairs. Vol 4 (2017) 1-8

ISSN: ISSN 2451-7755 (Print) - Journal homepage: www.antarcticaffairs.org

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PROTECTING THE WEDDELL SEA

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ABSTRACT

In 2009, CCAMLR members committed to create a “representative MPA network within the Convention Area for 2012” (CCAMLR 2009). The proposed Marine Protected Area in the Weddell Sea, formulated by Germany and presented by the European Union in 2016, will be an important component of this protection system. The Weddell Sea is currently being threatened by climate change and the fishing industry which can dramatically alter its unique environment. The Weddell Sea region MPA proposal defined conservation objectives and large no-take areas. Whilst some aspects of the proposal could be strengthened, the proposed MPA is a strong starting point for protecting the Weddell Sea region.

KEY WORDS

Weddell Sea, Marine Protected Area, CCAMLR, Southern Ocean, Antarctica

THE WEDDELL SEA REGION

The Weddell Sea region encompasses a large, deep bay encompassed by the eastern Antarctic Peninsula and extending above Queen Maud Land and is one of the most intact ecosystems in the world (Halpern et al. 2008; Figure 1). The region is highly productive and extremely icy, providing ideal habitat for krill, which in turn feeds other mammals, fish and seabirds. Despite its harsh conditions, the Weddell Sea supports an array of biodiversity from the shallow shelf down to the deep sea. Since its discovery in 1823, it has been largely unaffected by extractive industries due to the almost impassable sea ice - something the polar explorer Ernest Shackleton could easily attest to.

However, the Weddell Sea is now under threat. The western Weddell Sea closest to the Antarctic Peninsula is warming rapidly with resulting decreases in sea ice. Conversely, the eastern Weddell Sea region is cooling and is experiencing expanding sea ice. Predicting the effects of changes in temperature, sea ice and other climate-related impacts is difficult, but studies suggest life in the Weddell Sea will suffer. In other regions of Antarctica, penguin colonies are declining potentially due to climate change. In the Weddell Sea region, this puts Emperor and Adélie penguin colonies at risk. Likewise, Weddell, crabeater, leopard, Antarctic fur, Ross, and elephant seals can expect to experience changes in prey species availability and habitat.

While harsh sea ice conditions have made fishing historically difficult in the Weddell Sea region, the area is facing increasing pressure. In the eastern Weddell Sea commercial fishing for toothfish commenced in 2004 and has continued at a low level of around 200-400 tonnes/year. In contrast, the western Weddell Sea has never experienced commercial fishing, but minimal research fishing (for commercial purposes) for toothfish commenced in 2013. Fishing effort may be currently low, but toothfish support a lucrative international fishery and some CCAMLR member states are pushing for more fishing in the Weddell Sea region. Due to the threat posed by climate change and increasing fishing pressure, protecting the unique, ecologically-intact and diverse regions of the Weddell Sea with a large-scale marine protected areas (MPA) that includes no-take zones would ensure its rich benthic biodiversity, krill populations and large predators continue to thrive.

In this article, we describe the existing proposal to establish a marine protected area in the Weddell Sea region, and suggest ways it could be strengthened to enhance its conservation benefits.

CURRENTLY PROPOSED WEDDELL SEA MARINE PROTECTED AREA

In October 2016, the European Union, based on work by Germany, presented a proposal for a Weddell Sea MPA (WSMPA) to the thirty-fifth meeting of the Commission for the Conservation of Antarctic Marine Living Resources (CCAMLR), the international body responsible for conserving Antarctic marine living resources. The proposal was the product of an extensive period of discussion and assessment, which started in 2012 and was part of a larger discussion at CCAMLR since 2002 regarding a Southern Ocean network of MPAs. For the MPA planning, the Weddell Sea region is defined as extending further east of the Weddell Sea proper (CCAMLR MPA planning Domain 3), including parts of the Queen Maud Land region (CCAMLR MPA planning Domain 4).

The total proposed WSMPA, as proposed in October 2016, is 1,797,438 km² and is made up of a General Protection Zone, a Special Protection Zone, and a Fisheries Research Zone with each zone allowing a different level of human activity (Figure 1). The proposed MPA seeks to protect a range of habitats and marine life, including:

- representative examples of pelagic and benthic ecosystems, biodiversity, and habitats;
- protection at various geographical scales, which is key to the functional integrity and viability of local ecosystems and processes;
- establishment of scientific reference areas to monitor the effects of climate change, fishing and other human activities; and
- protection of essential habitats as refugia for top predators such as marine mammals and seabirds, fish and other ice-dependent species to maintain and/or enhance their resilience and ability to adapt to the effects of climate change.

The proposal was developed using Marxan modelling (CCAMLR 2016), an accepted approach to spatial protection in CCAMLR and more globally (CCAMLR 2008). Analyses included incorporating the best available evidence into data layers which were then documented, with metadata, in the proposal. The WSMPA is proposed to be in effect indefinitely, with a suggested review period of 10 years.

STRENGTHENING THE WEDDELL SEA MPA PROPOSAL

The General Protection Zone (GPZ), which prohibits commercial fishing but allows for research fishing, encompasses most of the proposed MPA. This region would afford a high level of protection for the area, including the eastern region encompassing Astrid Ridge, Maud Rise and nearby seamounts. The GPZ also includes deep-sea areas that have been incorporated into the eastward extension, off the tip of the Antarctic Peninsula, and a northern extension of the boundary in CCAMLR subareas 48.5 and 48.6. Designing this MPA with large no-take areas, and with an indefinite duration, is consistent with best practices in delivering conservation outcomes (Edgar et al. 2014).

The proposed Special Protection Zone (SPZ), in which all fishing activities are banned (including research fishing), is constrained to a minimum area based on current knowledge of known nesting sites and vulnerable marine ecosystems (VMEs; e.g., seamounts, hydrothermal vents, cold water corals and sponge fields). To be more precautionary, it should be enlarged by using processes such as bioregionalization to designate protection of other likely, but unverified, VMEs. Likewise, the SPZ should include unique, rare, biodiverse and/or endemic habitats and features. To achieve this, the SPZ should be expanded in CCAMLR subarea 48.6 to protect additional sponge habitat and include unique features such as underwater canyons and seamounts.

The proposed Fisheries Research Zone (FRZ), which would allow for directed commercial and research fishing for toothfish, encompasses 90 percent of habitat at the depth range of toothfish in CCAMLR subarea 48.6. Having this large area potentially open to toothfish fishing accommodates current commercial fishing in the area as well as any future fishing at the expense of protection

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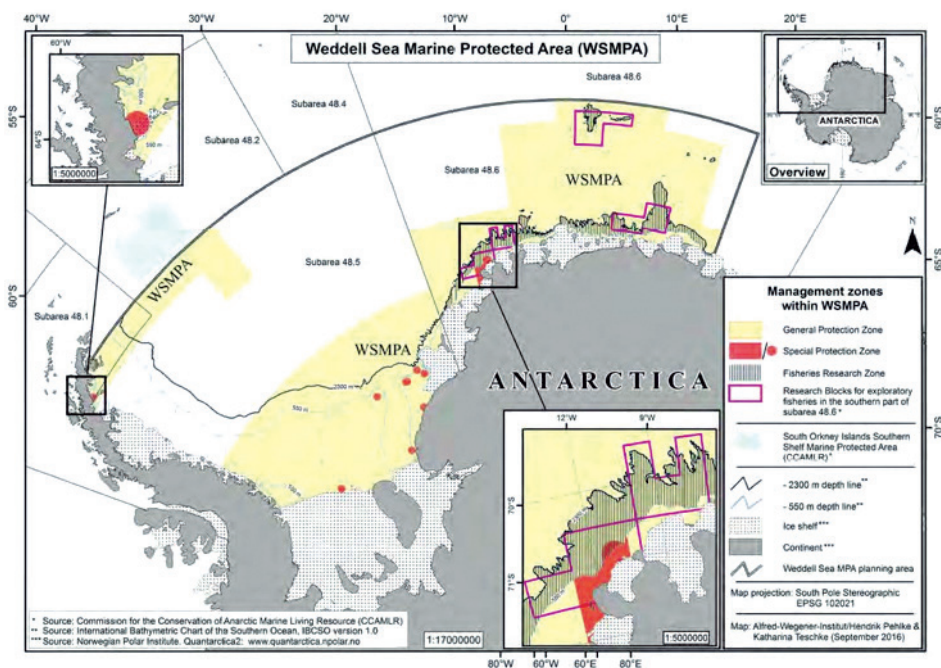


Figure 1. *Weddell Sea region and marine protected area proposal showing the different zones: General Protection Zone in brown, Special Protection Zone in red and Fisheries Research Zone in yellow; map credit K. Teschke/H. Pehlke from AWI 2016.*

of the ecosystem. Given the ecological importance of toothfish as the Southern Ocean’s top fish predator, a significant proportion of toothfish habitat should be designated as off-limits to fishing.

CONCLUSION

In 2009 CCAMLR members committed to putting in place a “representative system of MPAs within the Convention Area by 2012” (CCAMLR 2009). The WSMPA will be an important element of that protective system. The proposal made in 2016 has clearly defined conservation benefits, including large no-take areas. While some aspects of the proposal could be strengthened, it is a robust starting point for protecting the Weddell Sea region. Past experiences at CCAMLR demonstrates that MPA proposals suffer from a drawn-out diminution in ambition of protection over successive years, as the proposal is discussed and refined to accommodate the interests of various members (Brooks et al. 2016). The WSMPA proponents need to heed this experience, and ensure that any revised WSMPA proposal retains sufficient conservation ambition and achieves its objectives of protecting the Weddell Sea ecosystem.

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