

Editorial

Why do so few Antarctic Specially Protected Areas protect inland waters?

Antarctic Specially Protected Areas (ASPAs) remain a key instrument in protecting science, environmental and intrinsic values across the continent. There are 72 ASPAs currently designated by the Antarctic Treaty Consultative Parties. However, while there has been an increase in human activity across the continent in the last two decades (in terms of both science and tourism), the rate of ASPA designations has slowed. Indeed, at the time of this writing, no new ASPAs have been designated since 2014, although a new site centred on the Léonie Islands is proposed. This is despite concerns over the currently poor spatial coverage of ASPAs and their inability to meet the 'representativeness' requirement of the 1991 Protocol on Environmental Protection to the Antarctic Treaty (Hughes *et al.* 2016).

One clear example of a systematic failing in ASPA designations is in the protection of inland aquatic ecosystems, specifically melt streams, ponds and lakes. While liquid water is scarce on the continent, inland water bodies are nevertheless widely distributed across Antarctica, and many have characteristics found only in polar regions. These ecosystems have long been recognized as centres of inland biodiversity and biological production, often supporting species or strains that are unique on a continental or regional basis. Inland waters are acutely vulnerable to direct human activity, with National Programme Operations being the most significant causes of cumulative disturbance, particularly where infrastructure footprints overlap water bodies or their catchments. In addition, a significant threat also comes from non-native species invasions from outside of or from other parts of the continent, also facilitated by human activity, and furthermore, aquatic systems are highly sensitive to the consequences of climate change.

In spite of this, inland waters are grossly underrepresented in the current network of ASPAs. Only two of the current 72 ASPAs have been designated explicitly to protect inland aquatic systems (ASPAs 119 (Davis Valley and Forlidas Ponds, Dufek Massif) and ASPA 126 (Byers Peninsula, Livingston Island)). Eight additional ASPAs have included aquatic systems within their descriptions of values being protected, and a further three ASPAs mention inland aquatic systems as a secondary value for protection. Although inland waters of some sort occur within the boundaries of a further 21 ASPAs, these water bodies have not been selected on the basis of areal representativeness or special values and the descriptions of these ASPAs make no specific reference to these systems as values, nor do they recognize their intrinsic importance or specific management requirements.

In our view, the poor representation of inland aquatic ecosystems in the ASPA network is symptomatic of the failings of the current protected area regime. The protected area network for Antarctica has been described by others as inadequate, unrepresentative and at risk because most protected areas are near stations and hence not all Antarctic Conservation Biogeographic Regions (ACBRs) are included (Hughes *et al.* 2016). There is limited evidence of the systematic development of a protected area system that will protect representative aquatic habitats across the continent. We join others in advocating for an approach to ASPA design that is based around a rigorous assessment of representativeness and an expectation of an ability to maintain, over time, the designated values. We urge that this should specifically include recognition of inland water ecosystems with their high biodiversity and intrinsic scientific conservation value. Furthermore, in addition to listing inland waters as values in ASPAs and in Antarctic Specially Managed Areas (ASMAs) and providing guidance on management needs, it is worth considering the specific recognition of inland water bodies in ACBRs (Antarctic Treaty Consultative Meeting Resolution 6 (2012)), particularly as many ACBRs lack adequate coverage in the protected area system.

With projected rises in human activity and expectations of accelerating environmental change, it is timely to revisit the identification and designation of ASPAs to provide a systematic network that will prove resilient to climate change and that incorporates all elements of Antarctic biota and ecosystems.

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Reference

HUGHES, K.A., IRELAND, L.C., CONVEY, P. & FLEMING, A.H. 2016. Assessing the effectiveness of specially protected areas for conservation of Antarctica's botanical diversity. *Conservation Biology*, **30**, 113–120.