Antarctic wilderness and inviolate areas

Antarctic wilderness and inviolate areas

**Information Paper submitted by Australia, Netherlands and New Zealand**

Summary

This paper summarises the outcomes of a quantitative analysis of the extent of Antarctic wilderness, recently published in *Nature* (Leihy et al., 2020). The researchers assembled an extensive database of ground-based human activity across the Antarctic continent and offshore islands, comprising approximately 2.7 million records spanning 200 years. Using several global and Antarctic regional definitions they found that >99% of Antarctica can still be considered wilderness, with large-scale ‘Inviolate Wilderness Areas’ (>10,000 km2 with no record of historical human activity) representing approximately 32% of the continent. These findings are relevant to the work of the Committee for Environmental Protection (CEP), such as ongoing efforts to develop an agreed approach to understanding and protecting Antarctic wilderness, and to systematically develop the Antarctic protected area system including consideration of areas of outstanding wilderness value and areas kept inviolate from human interference.

Background

The Protocol on Environmental Protection to the Antarctic Treaty (Environmental Protocol) requires that protection of the Antarctic environment, including Antarctica’s wilderness values, shall be a fundamental consideration in the planning and conduct of all activities in the Antarctic Treaty area. Since its first meeting in 1998, the Committee for Environmental Protection (CEP) has regularly discussed how to understand and apply the concept of wilderness in the context of its role to provide advice and recommendations to the Antarctic Treaty Parties on implementation of the Environmental Protocol.

Areas of focus have included supporting consideration of Antarctica’s wilderness values in the environmental impact assessment (EIA) process, and identifying ‘areas of outstanding… wilderness value’ that may warrant inclusion in the series of Antarctic Specially Protected Areas (ASPAs) in accordance with Article 3.2(g) of Annex V to the Environmental Protocol. Discussions have also considered potential connections between wilderness areas and inviolate areas[[1]](#footnote-1), noting also that Article 3.2(a) of Annex V calls for the series of ASPAs to include ‘areas kept inviolate from human interference so that future comparisons may be possible with localities that have been affected by human activities’.

The most recent (2016) update to the *Guidelines for Environmental Impact Assessment in Antarctica* (the EIA Guidelines)provided additional guidance for considering potential impacts on wilderness values, highlighting the importance of making an assessment, to the extent possible, of the pre-activity wilderness state of the location of the proposed activity. As identified in the draft report on the State of the Antarctic Protected Area System forwarded by the CEP to ATCM XLII[[2]](#footnote-2), to date few ASPAs have been designated primarily to protect wilderness values (only ASPA 123 Barwick and Balham Valleys) or inviolate areas (only ASPA 129 Rothera Point and ASPA 165 Edmonson Point).

The CEP meeting agenda previously included a long-standing item related to consideration of wilderness values, and the CEP Five-Year Work Plan for many years included a priority issue dedicated to developing an agreed understanding of the term wilderness and methods for improved protection of wilderness. There remains no agreed definition of wilderness or wilderness values in the Antarctic context, with the EIA Guidelines noting that wilderness is ‘generally understood to represent a measure of the relative absence of evidence of, or impacts from, human activity’.

The subject of Antarctic wilderness continues to be raised at CEP meetings, including most recently at CEP XXII (2019). At that meeting, when considering the outcomes of discussions at a workshop on Antarctic tourism held in Rotterdam, the Committee ‘invited SCAR, in consultation with interested Parties, to further elaborate an understanding of the wilderness values with a view to their practical application’ (CEP XXII Final Report, para. 14).

To inform the Committee’s ongoing efforts to identify and protect Antarctic wilderness and inviolate areas, this paper summarises the findings of relevant research (Leihy et al., 2020), recently published in *Nature*.

Research to quantify the extent of Antarctic wilderness

The researchers compiled an extensive database of the available, high-resolution (25 km2) records of ground-based human activity in Antarctica spanning 200 years (~2.7 million activity records, from 363 sources). To accommodate different perspectives, the researchers quantified the extent of Antarctica’s wilderness using several global and Antarctic regional definitions of wilderness (see Figure 1), and found that:

* Using criteria to identify globally-significant wilderness areas, the entire Antarctic continent qualifies as a large, intact, ‘Globally Significant Wilderness’ area due to the absence of urban, industrial or agricultural land-use, and the very low human population density (<0.0004 people per km2). This makes Antarctica one of the largest remaining terrestrial wildernesses on Earth.
* Using definitions of wilderness that exclude areas with human infrastructure (‘Undeveloped Antarctic Wilderness’), or areas within sight of infrastructure (‘Visibly Pristine Antarctic Wilderness’), 99.99% or 99.57% of the Antarctic land area qualifies as wilderness, respectively.
* Under a definition recognising that repeated human activity, such as for scientific research or tourism, may also affect the wilderness value of sites because of the sensitivity of Antarctic landscapes to disturbance, 99.62% of Antarctica qualifies as a ‘Negligibly Impacted Wilderness Area’, where human visitation is likely to have been negligible or non-existent. Sites around scientific stations and in ice-free areas, especially around the Antarctic Peninsula and on offshore islands, are largely excluded from this wilderness category.
* Using more stringent criteria to identify large areas (≥ 10,000 km2) with no human activity records in the historical activity dataset, and so which might present outstanding wilderness value, ‘Inviolate Wilderness Areas’ cover 31.74% of the continent, mostly in the inland region of East Antarctica (see Figure 2).
* Sites with well-established biodiversity value (e.g. Important Bird Areas, places with biodiversity records, and Antarctic Specially Protected Areas designated to protect biodiversity and ecosystems) were poorly represented in the Negligibly Impacted Wilderness Area, because human activity has been most extensive in such areas (e.g. ice-free areas) and because visitation has often been necessary to determine the biodiversity value of sites. For these reasons, no sites with high biodiversity value were represented in the Inviolate Wilderness Areas.

Conclusions

This research shows that, using several global and Antarctic regional definitions, many areas of the Antarctic continent can be considered wilderness. While some historical human activities have not been documented, digitized, or were not captured in the literature search, the freely accessible database (Leihy et al. 2020b) developed through this research represents the most comprehensive record of historical human activity and the finest resolution currently possible for these data at a continental scale. The inclusion of additional spatially-explicit data for both historical and ongoing human activities could further refine the wilderness estimates.

These data and findings can support the activities of the CEP and Parties, including by:

* informing and supporting ongoing efforts to develop an agreed understanding of Antarctic wilderness and to develop methods for improved protection of Antarctica’s wilderness values;
* supporting the planning and conduct of activities, including consideration of potential impacts on wilderness values and inviolate areas in the environmental impact assessment process; and
* providing further spatial layers that could be used consistently and in conjunction with other tools agreed within the Antarctic Treaty system (e.g. Environmental Domains Analysis, Antarctic Conservation Biogeographic Regions, Important Bird Areas) to help develop and identify areas that could be designated as ASPAs, within the systematic environmental-geographic framework referred to in Article 3(2) of Annex V of the Protocol.

References

Leihy, R.I., Coetzee, B.W.T., Morgan, F. *et al*. Antarctica’s wilderness fails to capture continent’s biodiversity. *Nature* **583**, 567–571 (2020a). <https://doi.org/10.1038/s41586-020-2506-3>

Leihy, R. I. *et al*. Antarctica’s wilderness fails to capture continent’s biodiversity. <https://doi.org/10.26180/5c32bf1b041ea> (2020b).

Diagram

Description automatically generated with medium confidence

Figure 1. Antarctic wilderness areas (from Leihy et al., 2020a)

Map

Description automatically generated

Figure 2. Inviolate Antarctic Wilderness areas (from Leihy et al., 2020a)

1. For example, CEP XV Final Report paras. 152 and 154 and CEP XVII Final Report para. 178. [↑](#footnote-ref-1)
2. See CEP XII Final Report para. 184 and Attachment A to ATCM XLII/WP70. [↑](#footnote-ref-2)