Type localities in Antarctica

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**Working paper submitted by Australia**

Summary

Recent Australian research has developed an inventory of type localities for terrestrial and freshwater species on the Antarctic continent and offshore islands within the Antarctic Treaty area, and has considered the extent to which those type localities occur within Antarctic Specially Protected Areas (ASPAs). This work can support implementation of the Environmental Protocol, including by providing information about areas that constitute the ‘type locality or only known habitat of any species’ and which, in accordance with Article 3.2(d) of Annex V, might warrant consideration for designation as ASPAs. Australia recommends that the Committee encourages Members to draw on this research, including when: reviewing management plans for existing ASPAs; planning, assessing and conducting activities; and considering the designation of new ASPAs within a systematic environmental-geographic framework. Australia also recommends that the Committee encourages Members to continue to support efforts to improve Antarctic biodiversity knowledge, including research to determine the distribution of species with type localities in the Antarctic Treaty area.

Introduction

Much effort has been devoted to making available scientific information to support implementation of Article 3.2 of Annex V to the Environmental Protocol, which calls for the identification of a series of ASPAs with a systematic-environmental geographic framework. Examples include the Environmental Domains Analysis for the Antarctic continent (ATCM Resolution 5 (2011)), Antarctic Conservation Biogeographic Regions (ATCM Resolution 6 (2012) and ATCM Resolution 3 (2017)), Important Bird Areas (ATCM Resolution 5 (2015)), and a database of wilderness and inviolate areas (ATCM XLIII/IP014).

To date there has been little information about areas that constitute the ‘type locality or only known habitat of any species’ and which, in accordance with Article 3.2(d) of Annex V, might warrant consideration for ASPA designation. The *Draft Report on the Status of the Antarctic Protected Area System* considered during the 2019 Joint SCAR/CEP Workshop on Further Developing the Antarctic Protected Area System (Attachment A to ATCM XLII/WP70), noted there are no ASPAs designated primarily to address this provision.

This paper summarises the findings of recent Australian research that developed an inventory of type localities on the Antarctic continent and offshore islands within the Antarctic Treaty area, and considered the extent to which those type localities occur within ASPAs.

Type localities – background

Species are one of the most recognisable and important components of biodiversity (e.g., Adélie penguin, Antarctic hair grass). In the process of formally naming a species, one or more individual specimens are designated as a ‘type’ to provide an objective standard of reference for application of the species name. A type locality is the geographic location from which the individual reference specimen (or specimens) is collected[[1]](#footnote-1).

The protection of type localities can contribute to protecting Antarctica’s environmental and scientific values, by affording protection to a species even if little is known about its geographic distribution or habitat preferences. Further, type specimens, which are critical to taxonomy and accurate knowledge of biodiversity, are sometimes lost and need to be replaced, preferably from the original collection locality.

The value of Antarctic type localities has long been recognised by the Antarctic Treaty Parties. The provisions of Article 3.2(d) of Annex V closely reflect ATCM Recommendation VII-2 (1972) which, following advice from SCAR, recommended that the series of Specially Protected Areas established under the Agreed Measures for the Conservation of Antarctic Fauna and Flora should include ‘areas which are the type locality or only known habitat of any plant or invertebrate species’.

Research to identify Antarctic type localities

Information required to identify Antarctic type localities is widely dispersed in the scientific literature, and was previously not readily available. Phillips et al. (2022) undertook an extensive review of the scientific literature, and compiled data on the type localities of all terrestrial and freshwater species described from the Antarctic continent and offshore islands south of 60°S. The study focussed on animals, lichens, bryophytes, and vascular plants. Fungi, algae, and cyanobacteria were excluded because Antarctic knowledge of soil and lake microbiotas is far from complete and is growing rapidly.

Records were grouped based on whether the type locality was identified with high (≤ 25 km2) spatial resolution (i.e. with geographic coordinates or small-scale place names) or coarse (> 25 km2) spatial resolution (i.e. older records that often use much broader locations such as Adélie Land).

The high resolution records were consolidated to generate a spatial layer representing Antarctic type localities. That layer was then overlaid with spatial polygons of the current ASPAs, to examine the number and distribution of type localities within (including less than 2.821 km from an existing ASPA boundary) and outside ASPAs.

Key findings included:

* 447 species have type localities on the Antarctic continent or offshore islands within the Antarctic Treaty area. Fifteen of these species have multiple localities, giving a total of 481 type localities. Of these, 386 are ‘high resolution’.
* Of the 386 high resolution type localities, 108 lie within (30 localities) or overlap with (78 localities) an existing ASPA[[2]](#footnote-2) (Figure 1, Attachment A).
* Type localities occur in 41 of the 66 current2 terrestrial ASPAs, with most of these ASPAs protecting multiple type localities (mean: 2.6; maximum: 19 localities per ASPA).
* In management plans for terrestrial ASPAs, type localities are mentioned in the description of the values for only 4 Areas (106, 121, 138 and 154), and in the description of the Area for 2 others (103, 143) [[3]](#footnote-3).
* 278 identified type localities do not occur within the current series of ASPAs. At least 24 of these are close to human infrastructure[[4]](#footnote-4), and 207 are situated more than 10 km from the nearest ASPA.

Mapa

Descripción generada automáticamente

**Figure 1. Antarctic type localities located within or in close proximity to (green points) and outside (purple points) the current series Antarctic Specially Protected Areas (ASPAs).**

Observations and opportunities

The research described here provides the first inventory of type localities for the Antarctic continent and offshore islands within the Antarctic Treaty area. It can support efforts by the CEP and Parties to advance the objectives of the Environmental Protocol, including through the environmental management of human activities to protect the environmental and scientific values associated with Antarctic type localities.

The findings represent the best available science in relation to Article 3.2 (d) of Annex V, and should be drawn on to inform the management of existing ASPAs, and the consideration of type localities in ongoing work to further develop the Antarctic protected area system within a systematic environmental-geographic framework. For example, as outlined in an Information Paper submitted to CEP XXIV on *Research to inform CEP discussions about further development of the Antarctic protected area system*, Australian researchers are using relevant scientific datasets (including the Antarctic type localities) and conservation planning software to identify a suite of example scenarios for how a series of terrestrial protected areas might address the provisions of Article 3.2 of Annex V.

The database of Antarctic type localities is freely available for use and can be appropriately updated with new information. Noting that some species may have been missed, because species descriptions are provided in widely dispersed scientific works, and because the process of describing species is ongoing, the database represents a starting point for further development and use. Future work could refine the spatial accuracy for coarse resolution localities and verify that species still exist at localities where the types are from old collections.

Recommendations

Australia recommends that the CEP encourages Members to:

1. Draw on this recent Australian research that has compiled and mapped Antarctic type localities, and has considered the extent to which those type localities occur within ASPAs, to support their efforts to advance the objectives of the Environmental Protocol, including when:

* reviewing ASPA management plans (e.g., to reflect type localities in the description of values, to include management provisions to protect type localities, and to consider whether revisions to Area boundaries might be warranted to incorporate type localities);
* planning, assessing and conducting activities (e.g., consider type localities during the EIA process for proposed activities, and when developing or updating environmental management arrangements for existing facilities);
* considering the designation of new ASPAs, including considering type localities in ongoing efforts to further develop the Antarctic protected area system within a systematic environmental-geographic framework.

1. Continue to support efforts to improve Antarctic biodiversity knowledge, including research to determine the distribution of species with type localities in the Antarctic Treaty area (e.g., to consider whether such species are widespread or localised, based on current records and species distribution models, both now and under future conditions).

References

Phillips, L.M. et al. 2022. Improving species-based area protection in Antarctica. *Conservation Biology* <https://doi.org/10.1111/cobi.13885>

1. International Code of Zoological Nomenclature 2012, and International Code of Nomenclature for algae, fungi, and plants 2018. [↑](#footnote-ref-1)
2. The research was conducted prior to the designation in 2021 of ASPAs 176, 177 and 178. Subsequent review by the research team identified that: type localities are not mentioned in the management plans for these Areas; a type locality for the lichen *Bryonora peltate* is recorded within ASPA 177 – this species is mentioned in the management plan as a lichen that may occur in the Area; and a type locality is recorded within ASPA 178 (for the mite *Stereotydeus ineffabilis*) and not mentioned in the management plan. [↑](#footnote-ref-2)
3. Three of these are type localities for plant groups not considered by the study (the management plans for ASPAs 121 and 138 refer to algae, and the management plan for ASPA 143 refers to a choanoflagellate). [↑](#footnote-ref-3)
4. Based on Brookes et al. (2019), who mapped infrastructure footprint in Antarctica, as summarised in ATCM XLII/IP041 *Footprint in Antarctica*. [↑](#footnote-ref-4)