



Management Plan

for Antarctic Specially Protected Area No. 101 TAYLOR ROOKERY, MAC.ROBERTSON LAND

Introduction

Taylor Rookery is an emperor penguin (*Aptenodytes forsteri*) colony located on the east side of Taylor Glacier, Mac.Robertson Land (67°27'S; 60°51'E, Map A). The site was originally designated as Specially Protected Area No. 1, through Recommendation IV-I (1966), after a proposal by Australia. A management plan for the Area was adopted under Recommendation XVII-2 (1992). In accordance with

Decision 1 (2002) the site was redesignated and renumbered as Antarctic Specially Protected Area (ASPAs) No. 101. Revised ASPA management plans were adopted under Measure 2 (2005), Measure 1 (2010) and Measure 1 (2015). Taylor Rookery is designated as an ASPA to protect the largest known colony of emperor penguins located entirely on land.

1. Description of values to be protected

There are now 61 known emperor penguin colonies around Antarctica. The first land-based colony was discovered at Emperor Island, Dion Islands, Antarctic Peninsula (67°52'S, 68°43'W) in 1948. About 150 breeding pairs occupied the island, but since the 1970s the population decreased and comprised only 22 pairs in 1999. No emperor penguins have been sighted at the Dion Islands since 2009 and the colony is likely to have become extinct. Another land-based colony was discovered at Taylor Glacier in October 1954. This colony is situated entirely on land throughout the breeding season. Because of this uncommon characteristic, the colony was designated as a Specially Protected Area in 1966, as was Emperor Island. In 1999, a third land-based colony with about 250 pairs was discovered in Amundsen Bay, East Antarctica.

The emperor penguin colony at Taylor Glacier is the largest known land-based colony (Map B), and as such of outstanding scientific importance. The Australian Antarctic Program has monitored the population at the Taylor Glacier colony intermittently from 1957 to 1987 and annually since 1988. Photographic censuses provide counts with high levels of accuracy. The number of adults at the colony

averaged about 3680 breeding pairs in the early years. In the 1988–2010 period, the population averaged 2930 pairs or 20.5% less than earlier years. In the period 2011–2019 the population averaged 2700, representing a further drop of 9% (unpublished data) (see Figure 1). The reasons for this decrease are still being investigated. Similar long-term records are available only for two other emperor penguin colonies, at Pointe Géologie Archipelago (ASPAs 120, 66°40'S, 140°01'E), and at Haswell Island (ASPAs 127, 66°31'S, 93°00'E), where both colonies decreased by about 43% in the 1970s. Population data are also available for a number of colonies in the Ross Sea region. However, the records of the latter are not continuous and do not include counts of the colonies in winter.

Each year the Australian Antarctic Program makes no more than three visits to Taylor Glacier. Small rocky hills surrounding the colony make it ideal for census work and enable observation of the penguins without entering the breeding area. Thus, since about 1988, human disturbance to the colony has been very low, and direct human interference can be excluded as a potential factor influencing the health of this population.

2. Aims and Objectives

Management of Taylor Rookery aims to:

- avoid degradation of, or substantial risk to, the values of the Area by preventing unnecessary human disturbance;
- allow research on the ecosystem and physical environment, particularly on the avifauna, provided it is for compelling reasons which cannot be served elsewhere;
- minimise the possibility of introduction of pathogens which may cause disease in bird populations within the Area;
- minimise the possibility of introduction of alien plants, animals and microbes to the Area;
- allow for the gathering of data on the population status of the emperor penguin colony on a regular basis and in a sustainable manner; and
- allow visits for management purposes in support of the aims of the management plan.



3. Management Activities

The following management activities will be undertaken to protect the values of the Area:

- visits shall be made to the Area as necessary (preferably not less than once every five years) to assess whether the Area continues to serve the purposes for which it was designated and to ensure that management activities are adequate: and
- the Management Plan shall be reviewed at least every five years and updated as required.

4. Period of Designation

Designated for an indefinite period.

5. Maps

Map A: Antarctic Specially Protected Area No. 101, Taylor Rookery, Mawson Coast, Mac.Robertson Land, East Antarctica. The inset map indicates the location in relation to the Antarctic continent.

Map B: Antarctic Specially Protected Area No. 101, Taylor Rookery: Topography and Emperor Penguin Colony.

Map C: Antarctic Specially Protected Area No. 101, Taylor Rookery: Vehicle and Helicopter Approach and Landing Site.

Map D: Antarctic Specially Protected Area No. 101, Taylor Rookery: ASPA Boundary Points All map specifications: Horizontal Datum: WGS84; Vertical Datum: Mean Sea Level

6. Description of the Area

6(i) Geographical co-ordinates, boundary markers and natural features

The Taylor Rookery ASPA is located approximately 90 kilometres west of Australia's Mawson research station and comprises the whole of the northernmost rock exposure on the east side of Taylor Glacier, Mac.Robertson Land (67°27'14"S, 60°53'0"E, Map B). Appendix 1 and Map D show the boundary coordinates for the Area. The Area boundary follows the coastline (at the low tide mark) from a point at the north-western corner of the Area at 67°27'4.9"S, 60°52'58.2"E (boundary point 1), in a roughly south-easterly direction to boundary point 6 (67°27'27.8"S, 60°53'7.7"E). The boundary then continues in a westerly and then northerly direction (roughly following the limit of the ice-free area) to boundary point 22 (67°27'18"S, 60°52'50.2"E) then follows the ice cliff north to boundary point 23 (67°27'5.3"S, 60°52'57.1"E) and then joins back to boundary point 1. The Area covers approximately 0.27 km². There are no boundary markers delimiting the site.

The emperor penguin colony is located on a low-lying rock outcrop in the south-west corner of a bay formed by Taylor Glacier to the west, the polar ice cap to the south and the islands of the Colbeck Archipelago to the east. Fast ice surrounds the Area to the north and east. There is ice-free terrain adjacent to the glacier on the western boundary, and to the south the rock rises steeply to meet the ice of the plateau. The rounded ridges of rock form a horseshoe around a central flat area of exposed rock and moraine. The average height of the ridges is about 30 metres. The

central area is covered with snow in winter and is occupied by the emperor penguins. A couple of small melt lakes form in late spring and a small stream exits to the north-east.

The Area also has a raised beach typical of several found along the coast of Mac.Robertson Land. The beach comprises locally derived pebbles, cobbles and boulders ranging in size from 1 cm to 1 m. From the shoreline, the beach slopes upwards to a well-defined platform several metres wide and 3–6 m above sea level. The Area is readily defined by its natural features.

Climate

Limited data exist for the meteorology of the Area. Conditions are probably similar to those of the Mawson station area, where the mean monthly temperatures range from +0.1°C in January to -18.8°C in August, with extreme temperatures ranging from +10.6°C to -36.0°C. The mean annual wind speed is 10.9 m per second; frequent prolonged strong south-easterly katabatic winds blow from the ice cap with mean wind speeds over 25 m per second and gusts often exceed 50 m per second. Other characteristics of the weather are high cloudiness throughout the year, very low humidity, low precipitation and frequent periods of strong winds, drifting snow and low visibility associated with the passage of major low-pressure systems.

Environmental Domains and Antarctic Conservation Biogeographic Regions

Based on the Environmental Domains Analysis for Antarctica (Resolution 3(2008)), Taylor Rookery is located within Environment D East Antarctic coastal geologic. Based on the Antarctic Conservation Biogeographic Regions (Resolution 3 (2017)), Taylor Rookery is located within Biogeographic Region 16 Prince Charles Mountains. Taylor Rookery is identified as Antarctic Important Bird Area 119 Taylor Rookery on the basis of the emperor penguin colony (Resolution 5 (2015)).

Geology and Soils

The garnet-biotite-quartz-felspar gneiss, granite and migmatite rocks at Taylor Rookery are metamorphic and probably formed from ancient metamorphic sedimentary rocks. The metamorphic rocks are intruded by Mawson charnockite with an isotopic age of 100 million years, thus defining a minimum age for the metamorphic rocks. Numerous shear zones intersect the banded metamorphic rocks and there are recognised traces of an old erosion surface at about 60 m altitude.

Vegetation

The flora of Taylor Rookery comprises at least ten species of lichen (Table 1) and an unknown number of terrestrial and freshwater algae. Mosses have not been recorded in the Area. Twenty-six species of lichen and three species of moss are found in the region, 20 of which occur on nearby Chapman Ridge, and 16 at Cape Bruce on the western side of Taylor Glacier. The rock types are not conducive to colonization by lichens. Most of the lichens occurring in the Area grow on the higher outcrops at the southern end where weathering is least.



Lichens	Common name	Characteristics
<i>Buellia frigida</i>		Endemic, epilithic
<i>Caloplaca citrina</i>	Firedot lichen	Crustose
<i>Candelariella flava</i>		Common, orange coloured
<i>Lecanora expectans</i>		Epibryophytic usually occupying mosses
<i>Lecidea phillipsiana</i>		Endolithic, common
<i>Pseudephebe minuscula</i>	Black-curly lichen	Crustose, dark brown
<i>Physcia caesia</i>	Blue-grey rosette lichen	Foliose lichenised fungus
<i>Rhizoplaca melanophthalma</i>	Rimmed navel lichen	Subcrustose, light grey
<i>Xanthoria elegans</i>	Elegant sunburst lichen	Lichenised fungus, circumpolar
<i>Xanthoria mawsonii</i>		Ornithocorprophilic

Table 1. Plants recorded from Taylor Rookery.

Birds

Emperor penguins

The breeding site of the emperor penguins is a north-facing amphitheatre formed by the tongue of the Taylor Glacier to the west and rocky hills to the east. The penguins occupy the areas that are level and covered with snow for most of the breeding season.

First hatchlings have been observed in mid-July indicating the onset of laying in mid-May. Fledglings depart the colony from mid-December to mid-January, usually leaving during the day when the weather is the warmest and the katabatic wind has subsided. Adult birds and fledglings generally head in N–NE towards a polynya 60–70 km from the colony. The fast ice extent reduces to approximately 25 km by mid-January but varies on an annual basis. The polynya appears to be a permanent feature of the Mawson Coast.

Following the commencement of the ongoing monitoring program in 1988, the penguins occupied the southern part of the Area until about 2010. In recent years, they have moved to the northern part where they now spend the winter. The colony still occupies the northern part of the Area during winter but chicks sometimes return to the southern part in November/December.

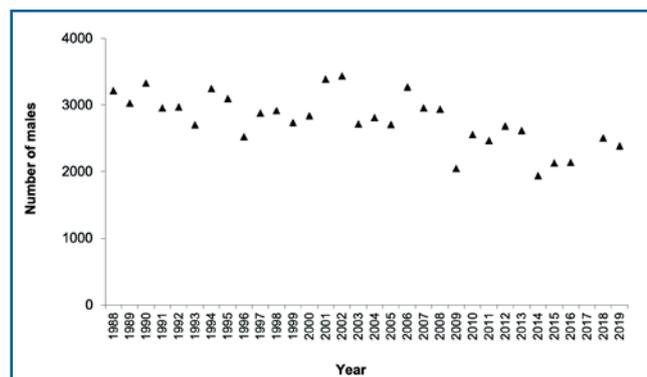


Figure 1. Numbers of adult male emperor penguins present in the colony during winter at Taylor Glacier, 1988–2019. Source: Robertson et al. (2014) and unpublished data.

Skuas

Skuas often appear in the penguin colony. It is unknown whether they breed in this location.

6(ii) Access to the Area

Travel to the Area by vehicle over sea ice has become increasingly difficult in recent years. It was generally possible from early May to mid-December. Since 2005, access has been possible only in the period from mid-June until early November. In 2017, poor sea ice conditions made a winter visit impossible. Access by aircraft may be possible in accordance with section 7(ii) of this plan.

6(iii) Location of structures within and adjacent to the Area

Two automated cameras were set up within the Area in 2011 on the rocky ridges surrounding the breeding area of the penguins (see Map B for camera locations; 67°27'24"S, 60°52'55"E and 67°27'12"S, 60°53'06"E). A four-berth refuge is located in the Colbeck Archipelago, approximately five kilometres to the north-east of the Area (see Map A – 67°26'17.9"S, 60°59'23.6"E). Mawson station (67°36'S, 62°53'E) is approximately 90 kilometres to the east.

6(iv) Location of other protected areas in the vicinity

ASPANo. 102 Rookery Islands, Mac.Robertson Land (67°36'36" S and 62°32'01" E) is located approximately 80 kilometres east of Taylor Rookery (see Map A).

6(v) Special zones within the Area

There are no special zones within the Area.

7. Terms and conditions for entry permits

7(i) General permit conditions

Entry into the Area is prohibited except in accordance with a permit issued by an appropriate national authority. Conditions for issuing a permit to enter the Area are that:

- it is issued only for compelling scientific reasons that cannot be served elsewhere, in particular for scientific study of the avifauna and ecosystem of the Area, or for essential management purposes consistent with plan objectives, such as inspection, management or review;
- the actions permitted will not jeopardise the values of the Area;
- the actions permitted are in accordance with the management plan;;
- the permit, or an authorised copy, shall be carried within the Area;
- a visit report shall be supplied to the authority named in the permit;
- the permit shall be issued for a finite period; and
- the appropriate national authority shall be notified of any activities or measures undertaken that were not included in the authorised permit.



7(ii) Access to and Movement within or over the Area

Whenever possible, vehicle access to the Area should be from sea ice on the eastern side, west of Colbeck Archipelago to avoid crossing the penguins' pathways from the colony to the sea (see Map B). Vehicle entry to the Area is prohibited. Vehicles used for transport to the Area are to be left outside the Area, to the east, and entry to the Area must be by foot. The approach route for vehicles is marked on Map C.

The following conditions apply to the use of aircraft:

- disturbance of the colony by aircraft shall be avoided at all times;
- overflights of the colony are prohibited, except where essential for scientific or management purposes. Such overflights are to be at an altitude of no less than 930 m (3050 ft) for single-engine helicopters and fixed-wing aircraft, and no less than 1500 m (5000 ft) for twin-engine helicopters;
- fixed wing aircraft are not permitted to land inside the Area;
- fixed-wing aircraft used to approach the Area shall not land or take off within 930 m (3050 ft) or fly within 750 m (2500 ft) of the colony;
- helicopters shall approach the Area from the east over the sea ice and preferably, where sea ice conditions permit, land outside the Area at the point marked "H" on Map C (60°53'32.5"E, 67°27'6.1"S), with access to the Area being by foot;
- when landing outside the Area, single-engine helicopters should not land or take off within 930 m (3050 ft) or fly within 750 m of the colony, and twin-engine helicopters should not land, take off or fly within 1500 m (5000 ft) of the colony;
- if landing inside the Area is essential due to unsuitable sea ice conditions, only single-engine helicopters may land in the north-east of the Area at the point marked "H" on Map C (60°53'17.8"E, 67°27'6.8"S), where a headland to the south obscures the colony from view and noise;
- single-engine helicopters approaching to land in the Area should fly at the lowest safe height over the sea ice to avoid disturbing the colony; and
- refuelling of aircraft is not permitted within the Area.

Overflights of bird colonies within the Area by remotely piloted aircraft systems (RPAS) are prohibited, except where essential for compelling scientific or management purposes. Such overflights shall be undertaken in accordance with the *Environmental guidelines for operation of Remotely Piloted Aircraft Systems (RPAS) in Antarctica*.

There are no marked pedestrian routes within the Area. Unless disturbance is authorised by permit, pedestrians should keep well away from the colony area (at least 50 m) and give way to departing and arriving penguins. Pedestrians moving in and around the Area should avoid crossing the access routes of the birds if possible, or cross quickly without obstructing penguin traffic.

7(iii) Activities which are or may be conducted within the Area, including restrictions on time and place

Penguins may be in the Area in most months, and are particularly sensitive to disturbance during the following periods:

- from mid-May to mid-July, when they are incubating eggs; and
- from mid-July to mid-September, when adults are brooding chicks.

The Area may be accessed to conduct censuses of the emperor penguin colony. The colony is ideal for census work because it is possible without disturbing the birds. The best vantage point for viewing and photographing the penguins in winter are the rocky headlands that run adjacent to Taylor Glacier, on the western side of the colony, and on the eastern side of the Area. The ideal time for a census of adults is from 22 June to 5 July, since during this time most birds present are incubating males, each representing one breeding pair.

Other activities which may be conducted in the Area:

- compelling scientific research which cannot be undertaken elsewhere and which will not jeopardise the avifauna or the ecosystem of the Area;
- essential management activities, including monitoring; and
- sampling which should be the minimum required for the approved research programs.

7(iv) Installation, modification or removal of structures

No new structures are to be erected within the Area, or scientific equipment installed, except for compelling scientific or management reasons and for a pre-established period, as specified in a permit. Scientific markers and equipment must be secured and maintained in good condition, clearly identifying the permitting country, name of principal investigator and year of installation. All such items should be made of materials that pose minimum risk of harm to fauna and flora or of contamination of the Area.

A condition of the permit shall be that equipment associated with the approved activity shall be removed on or before completion of the activity. Details of markers and equipment temporarily left in situ (GPS locations, description, tags, etc. and expected removal date) shall be reported to the permitting authority.

Temporary field huts, if permitted, should be placed well away from the penguin colony at the point to the north-east of the Area, where a headland to the south obscures the colony from view.

7(v) Location of field camps

A four-berth refuge is located in the Colbeck Archipelago, approximately 5 kilometres to the north-east of the Area (67°26'17.9"S, 60°59'23.6"E).

Camping is permitted within the Area and should be well away from the penguin colony, preferably at the point to the north-east of the Area where a headland to the south obscures the colony from view (as indicated on Map B).



7(vi) Restrictions on materials and organisms which may be brought into the Area

- No poultry products, including dried food containing egg powder, are to be taken into the Area.
- No depots of food or other supplies are to be left within the Area beyond the season for which they are required.
- Deliberate introduction of animals, plant material, microorganisms and non-sterile soil into the Area is prohibited. The highest level of precautions shall be taken to prevent the accidental introduction of animals, plant material, microorganisms and non-sterile soil from other biologically distinct regions (within or beyond the Antarctic Treaty area) into the Area.
- To the maximum extent practicable, clothing, footwear and other equipment used or brought into the Area (including backpacks, carry-bags and other equipment) shall be thoroughly cleaned before entering and after leaving the Area.
- Boots and sampling/research equipment and markers that come into contact with the ground shall be disinfected or cleaned with hot water and bleach before entering and after visiting the Area to help prevent accidental introductions of animals, plant material, micro-organisms and non-sterile soil into the Area. Cleaning should be undertaken either at the refuge hut or on station.
- Visitors should also consult and follow as appropriate recommendations contained in the Committee for Environmental Protection Non-Native Species Manual, and in the Scientific Committee on Antarctic Research (SCAR) Environmental Code of Conduct for Terrestrial Scientific Field Research in Antarctica.
- No herbicides or pesticides shall be brought into the Area. Any other chemicals, including radio- nuclides or stable isotopes, which may be introduced for scientific or management purposes specified in a permit, shall be removed from the Area at or before the conclusion of the activity for which the permit was granted.
- Fuel is not to be stored in the Area unless required for essential purposes connected with the activity for which the permit has been granted. All such fuel shall be removed at the conclusion of the permitted activity. Permanent fuel depots are not permitted.
- All material introduced shall be for a stated period only, shall be removed at or before the conclusion of that stated period, and shall be stored and handled so as to minimise the risk of environment impacts.

7(vii) Taking of, or harmful interference with, native flora and fauna

Taking of or harmful interference with native flora and fauna is prohibited, except in accordance with a permit. Where taking or harmful interference with animals is involved this should, as a minimum standard, be in accordance with the SCAR Code of Conduct for the Use of Animals for Scientific Purposes in Antarctica.

Ornithological research on the breeding birds present within the Area shall be limited to activities that are non-invasive and non-disruptive. If the capture of individuals is required, capture should occur outside the Area if at all possible to reduce disturbance to the colony.

7(viii) Collection and removal of anything not brought into the Area by the permit holder

Material may be collected or removed from the Area only in accordance with a permit and should be limited to the minimum necessary to meet scientific or management needs.

Material of human origin likely to compromise the values of the Area, and which was not brought into the Area by the permit holder or otherwise authorised, may be removed unless the impact of the removal is likely to be greater than leaving the material in situ. If such material is found, the permit issuing authority shall be notified, if possible while the field party is still within the Area.

7(ix) Disposal of waste

All wastes, including all human wastes, shall be removed from the Area. Wastes from field parties shall be stored in such a manner to prevent scavenging by wildlife (e.g. skuas) until such time as the wastes can be disposed of or removed. Wastes are to be removed no later than the departure of the field party. Human wastes and grey water may be disposed into the sea well outside the Area.

7(x) Measures that may be necessary to continue to meet the aims of the Management Plan

Permits may be granted to enter the Area to:

- carry out biological monitoring and Area inspection activities, which may involve the collection of samples for analysis or review;
- erect or maintain scientific equipment and structures, and signposts; or
- carry out other protective measures.

Any specific sites of long-term monitoring shall be appropriately marked and a GPS position obtained for lodgement with the Antarctic Data Directory System through the appropriate national authority.

Visitors shall take special precautions against the introduction of alien organisms to the Area. Of particular concern are pathogenic, microbial or vegetation introductions sourced from soils, flora or fauna at other Antarctic sites, including research stations, or from regions outside Antarctica. To minimise the risk of introductions, before entering the Area visitors shall thoroughly clean footwear and any equipment to be used in the Area, particularly sampling equipment and markers.

7(xi) Requirements for reports

The principal permit holder for each visit to the Area shall submit a report to the appropriate national authority as soon as practicable, and no later than six months after the visit has been completed. Such visit reports should include, as applicable, the information identified in the visit report form contained in the Guide to the Preparation of Management Plans for Antarctic Specially Protected Areas. If appropriate, the national authority should also forward a copy of the visit report to the Party that proposed the Management Plan, to assist in managing the Area and reviewing the Management Plan. Parties should, wherever possible, deposit originals or copies of such original visit reports in a publicly accessible archive to maintain a record of usage, for the purpose of any review of the Management Plan and in organising the scientific use of the Area.

A copy of the report should be forwarded to the Party responsible for development of the Management Plan (Australia) to assist in management of the Area, and the monitoring of bird populations.



8. Supporting Documentation

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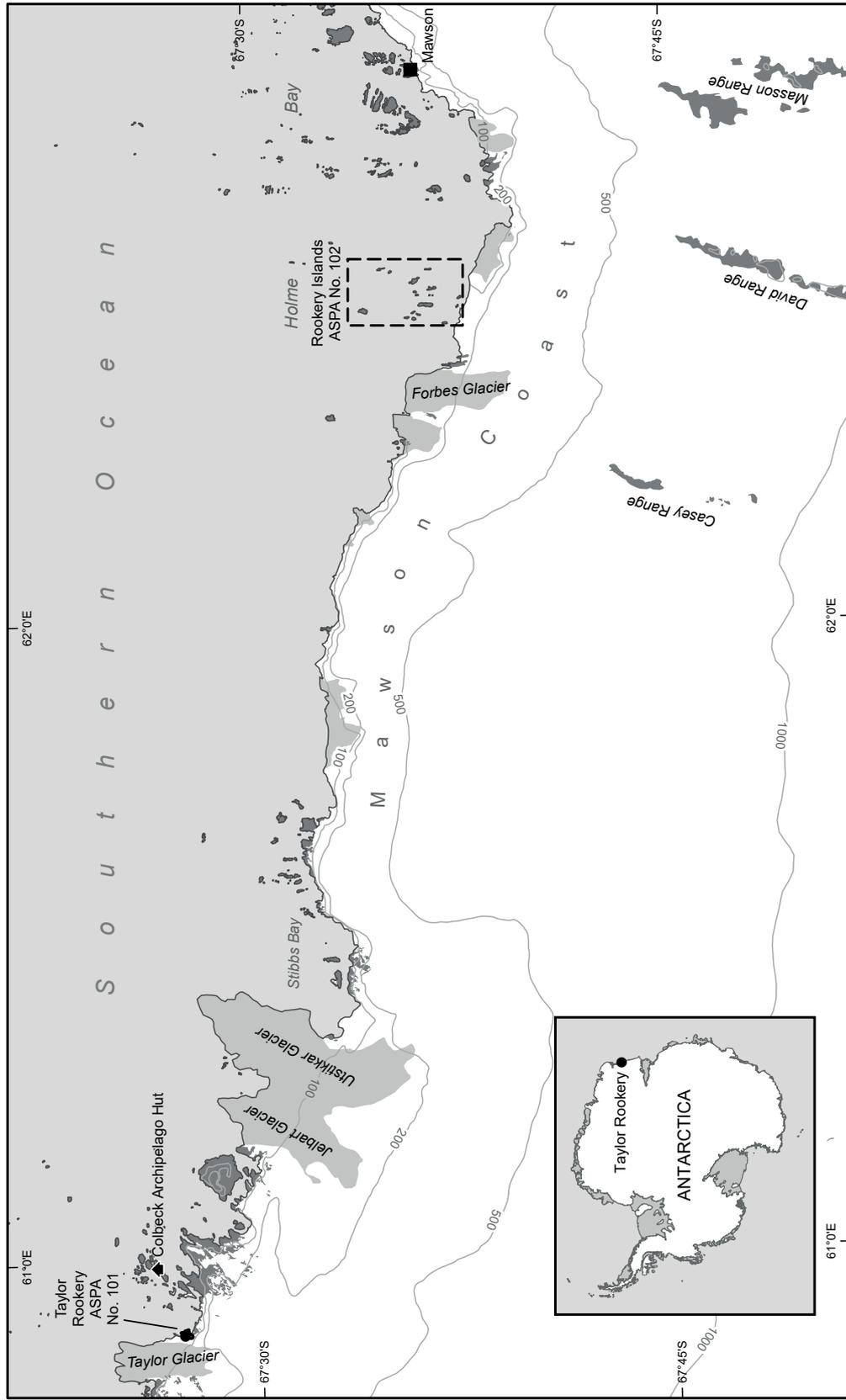
Appendix 1: Taylor Rookery, Antarctic Specially Protected Area No 101, boundary coordinates

Boundary Point	Latitude (S)	Longitude (E)	Boundary Point	Latitude (S)	Longitude (E)
1	67°27'4.9"	60°52'58.2"	14	67°27'27.9"	60°52'49.3"
2	67°27'17.1"	60°53'29.5"	15	67°27'28.7"	60°52'48.8"
3	67°27'17.7"	60°53'31.0"	16	67°27'28.9"	60°52'47.7"
4	67°27'21.6"	60°53'27.5"	17	67°27'28.9"	60°52'46.5"
5	67°27'22.4"	60°53'19.3"	18	67°27'28.3"	60°52'46.0"
6	67°27'27.8"	60°53'7.7"	19	67°27'24.9"	60°52'45.4"
7	67°27'29.1"	60°53'4.9"	20	67°27'20.7"	60°52'50.1"
8	67°27'29.8"	60°53'2.6"	21	67°27'19.3"	60°52'49.9"
9	67°27'30.1"	60°53'0.5"	22	67°27'18.0"	60°52'50.2"
10	67°27'29.8"	60°52'57.1"	Follows ice cliff north		
11	67°27'29.3"	60°52'55.5"	23	67°27'5.3"	60°52'57.1"
12	67°27'28.0"	60°52'54.6"			
13	67°27'27.4"	60°52'51.5"			



Map A: Antarctic Specially Protected Area No 101, Taylor Rookery, Mawson Coast, Mac.Robertson Land, East Antarctica

Australian Government
 Department of Agriculture,
 Water and the Environment
 Australian Antarctic Division



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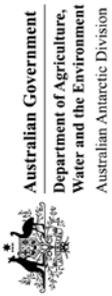
0 5 10 15 20 Kilometres
 Horizontal Datum: WGS84
 Projection: UTM Zone 41

■ Station
 — Contour (metres)
 ■ Ice-free area
 ■ Ice shelf,
 ■ ice tongue

--- Rookery Islands ASPA No. 102
 The islands within this area
 □ Taylor Rookery ASPA No. 101



Map C: Antarctic Specially Protected Area No. 101, Taylor Rookery Vehicle and Helicopter Approach and Landing Site



Cliff
 Contour (5m interval)
 Index contour (25m interval)
 Helicopter landing area
 Emperor penguin colony (Oct - Jan)
 Emperor penguin colony (Apr - Sep)
 ASPA
 Lake
 Ice-free area

0 40 80 120 160 Metres
 Horizontal Datum: WGS84
 Projection: UTM Zone 41

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