Management Plan

for Antarctic Specially Protected Area No. 164 SCULLIN AND MURRAY MONOLITHS, MAC.ROBERTSON LAND

Introduction

Scullin Monolith (67°47'37"S, 66°43'8"E) and Murray Monolith (67°47'3"S, 66°53'17"E) (Map A) were designated as Antarctic Specially Protected Area (ASPA) No 164 under Measure 2 (2005), following a proposal by Australia. Revised management plans for the Area were adopted under Measure 13 (2010) and Measure 16 (2015). The Area is primarily designated to protect the greatest concentration of breeding seabirds in East Antarctica. Seven species occupy territories in the Area: five species of petrel (Antarctic petrels *Thalassoica antarctica*, Cape petrels *Daption capense*, southern fulmars *Fulmarus glacialoides*, snow petrels *Pagodroma nivea*, Wilson's storm petrel *Oceanites oceanicus*), one penguin (Adélie penguin *Pygoscelis adeliae*) and one larid (south polar skua *Catharacta maccormicki*).

Scullin and Murray monoliths are visited infrequently, and with the one known exception, all visits have been brief (less than a day). Scullin and Murray monoliths were first visited on 13 February 1931 during the second British, Australian and New Zealand Antarctic Research Expedition (BANZARE) voyage.
Sir Douglas Mawson named both monoliths during this visit. Murray Monolith was named after Sir George Murray, Chief Justice of South Australia, Chancellor of the University of Adelaide and a patron of the Expedition, while Scullin Monolith was named after James H. Scullin, Prime Minister of Australia from 1929–31.

On 26 February 1936, personnel from the R.R.S. *William Scoresby* briefly visited the site, and ascended Scullin Monolith to a height of several hundred metres. The Norwegian explorer Lars Christensen visited Scullin Monolith on 30 January 1937. Australian Antarctic Program personnel occasionally visit the Area from Mawson research station, approximately 160 kilometres to the west. The only recorded stay within the Area was a six-day visit in February 1987 when comprehensive ornithological surveys were conducted. The first visit by a commercial tourist vessel to the area occurred on 10 December 1992, and a small number of brief visits have been made in subsequent years.

1. Description of values to be protected

The Area is primarily designated to protect the outstanding ecological and scientific values associated with the important assemblage of seabirds occupying Scullin and Murray monoliths.

With at least 160,000 pairs, the Antarctic petrel colony on Scullin Monolith is smaller in population size to only two colonies elsewhere in Antarctica (Svarthameren in the Mühlig Hofmannfjella in Dronning Maud Land (ASPA 142) and Mount Biscoe).

Adélie penguin colonies occupy the lower slopes of both monoliths, extending almost to the foreshore. The most recent survey in December 2017/18 found approximately 45,000 breeding pairs on Scullin Monolith and a further 10,000 pairs on Murray Monolith. This represents approximately 4% of the breeding population of Adélie penguins in East Antarctica, and approximately 1% of the global population.

The ocean-facing slopes of both monoliths are occupied by several petrel species. Extensive breeding colonies occur on many of the steeper, higher-altitude slopes of both monoliths. South polar skuas nest throughout the Area, preying on the high density of seabirds during their breeding season.

Some large colonies of seabirds also occur in other parts of East Antarctica (e.g. the Rauer Group and Mount Biscoe). However, the two very small ice-free areas of Scullin and Murray monoliths (about 1.9 and 0.9 km^2, respectively) support one of the greatest concentrations of breeding seabirds, with the combined breeding population conservatively estimated at 230,000 pairs, and one of the most diverse seabird breeding localities in East Antarctica (Appendix 1).

In addition to its outstanding ecological and scientific values, the Area possesses outstanding aesthetic values arising from the geomorphology of the two monoliths and the spectacular backdrop of glaciers that descend from the continental plateau and flow around the monoliths to end in calving glaciers.

The very large and diverse breeding assemblage of seabirds in a setting of high aesthetic and wilderness values warrants the highest level of protection.

2. Aims and Objectives

Management of Scullin and Murray Monoliths aims to:

- avoid degradation of, or substantial risk to, the values of the Area by preventing unnecessary human disturbance to the Area;
- maintain the undisturbed nature of the Area to permit its future use as a reference area;
- allow scientific research and monitoring on the ecosystem and values of the Area, providing it is for compelling reasons which cannot be served elsewhere and will not impact on the values of the Area, particularly ornithological values;
- grant high priority to the collection of seabird census data from representative sample areas, reference breeding groups (RBGs) or of whole breeding populations. These census data will be major determinants in, and contributions to, future revisions of management arrangements for the Area;
- accord high priority to the collection of other biological survey data, in particular flora and invertebrate surveys. These survey data will be incorporated into future revisions of the management arrangements for the Area;
- allow visits for management purposes in support of the aims of the management plan; and
- minimise the potential for introduction of non-native plants, animals and micro-organisms, particularly avian pathogens.

3. Management Activities

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

- where practical, the Area shall be visited as necessary, and preferably no less than once every five years, to conduct censuses of seabird breeding populations, including mapping of colonies and nest sites;
- information on the Area, including copies of this management plan, will be made available at both Davis research station and Mawson research station and to all visitors;
- national Antarctic programs operating in the vicinity or intending to visit the Area shall consult with other national programs to ensure that research projects do not overlap or conflict; and
- where practical, management visits will be made to remove unnecessary materials currently located within the Area.

4. Period of Designation

The Area is designated for an indefinite period.

5. Maps and Photographs

Map A: Antarctic Specially Protected Area No 164, Scullin and Murray Monoliths, Mac.Robertson Land, East Antarctica. The inset map indicates the location in relation to the Antarctic continent.

Map B: Antarctic Specially Protected Area No. 164, Scullin Monolith: Topography and Bird Distribution.

Map C: Antarctic Specially Protected Area No. 164, Murray Monolith: Topography and Bird Distribution.

Map D: Antarctic Specially Protected Area No. 164: Scullin Monolith: Helicopter approach and landing site.

Specifications for all maps: Horizontal Datum: WGS84; Vertical Datum: Mean Sea Level.

6. Description of the Area

6(i) Geographical coordinates, boundary markers and natural features

Scullin Monolith (67°47'37"S, 66°43'8"E) and Murray Monolith (67°47'3"S, 66°53'17"E) are situated on the coast of Mac.Robertson Land some 160 km east of Mawson station (Map A). The monoliths are approximately seven kilometres apart, and abut the sea at the edge of the continental ice sheet. The coastline to the west and east, and between the monoliths, consists of ice cliffs 30–40 m high; the Antarctic plateau rises steeply from there to the south. Scullin Monolith is a crescent-shaped massif whose highest point is 443 metres above sea level. It encloses a broad north-facing cove with an approximately one kilometre wide entrance. All upper slopes of the monolith are precipitous, but in the lower 100 metres the slope eases in many parts; these areas are strewn with boulders and large stones. Elsewhere in the lower parts the rock face falls sheer to the sea; there are also some scree slopes.

The walls of Murray Monolith rise from the sea to a dome-shaped summit 340 metres above sea level. On the western side of Murray Monolith, the lower slopes drop to a coastal platform. The Area extends over all ice-free areas associated with the two monoliths, and includes a portion of the adjacent continental ice as well as Torlyn Mountain to the south-west of Murray Monolith (which rises to about 400 metres above sea level).

The Area comprises two sectors (see Map B and Map C):

- Scullin Monolith: the boundary commences at the coastline at 67°46'59"S, 66°40'30"E. It then extends in a southerly direction to 67°48'03"S, 66°40'26"E, east to 67°48'06"S, 66° 44'33"E, and north to the coast at 67°46'41"S, 66°44'37"E. It follows the coastline west at the low tide mark to 67°46'59"S, 66° 40'30"E.
- Murray Monolith: the boundary commences on the coastline at 67°46'36"S, 66°51'01"E, and continues south to 67°48'03"S, 66° 50'55"E. It extends east to 67°48'05"S, 66°53'51"E, and north to 67°46'38"S, 66°54'00"E, then west following the coast line at the low tide mark to 67°46'36"S, 66°51'01"E.

There are no boundary markers delineating the site.

Birds

Seven species occupy territories in the Area: five species of petrel (Antarctic petrels *Thalassoica antarctica*, Cape petrels *Daption capense*, southern fulmars *Fulmarus glacialoides*, snow petrels *Pagodroma nivea*, Wilson's storm petrel *Oceanites oceanicus*), one penguin (Adélie penguin *Pygoscelis adeliae*) and one larid (south polar skua *Catharacta maccormicki*). Scullin Monolith hosts one of the largest colonies of Antarctic petrels in Antarctica and significant Adélie penguin colonies. Less is known about the species diversity and abundance at Murray Monolith.

There has been only one attempt (in 1986/87) to estimate the population of all species in the Area. This survey estimated at least 160,000 pairs of Antarctic petrels at Scullin Monolith, but this is likely an under-estimate because the survey occurred late in the breeding season. Counts of the other petrel species at Scullin Monolith were much smaller (next most abundant species the southern fulmar at 1350 breeding pairs). Subsequent surveys in 2010/11 and 2017/18 focussed on Adélie penguins only. Consequently, the Adélie penguin is the only species for which any data on population change is available. Analysis of population count and guano area data indicate that Adélie penguin populations at both Scullin and Murray monoliths have remained stable or decreased slightly over the past 3-4 decades. The most recent estimate in 2017/18 for Scullin and Murray monoliths combined was 55,000 breeding pairs. There is evidence that the amount of suitable breeding habitat available to individual Adelie penguins at the monoliths is limited and has constrained population growth over the past three decades. This is in contrast to many Adelie penguin breeding sites elsewhere in East Antarctica, where there is more suitable habitat and populations have grown substantially.

Geology

The geology of the two monoliths is poorly understood, as they have been neither the subject of dedicated study nor specific geological mapping. Generally the geology of the monoliths appears to be similar to that of the region around Mawson station. The rocks consist predominantly of high-grade granulite facies gneisses of metasedimentary origin, including some sapphirine bearing rocks. The metamorphism occurred in anhydrous conditions about 1000Ma. An age range of between 1254Ma and 625Ma has been documented for the gneisses from Scullin Monolith. Metamorphism involved sedimentary rocks initially of Proterozoic age. These metamorphic basement rocks were intruded at about 920–985Ma by the Mawson Charnockite, a form of granite characterised by presence of orthopyroxene common in this region. It forms the faces of the monoliths. The recorded age of 433 and 450Ma may reflect a later influence of the '500Ma or Pan-African event' recorded widely throughout Gondwana. The margins of the monoliths contain some sediment carried by the icesheet and deposited by melting ice. The source cannot be specified but it may contain recycled material from farther inland and could perhaps provide evidence of some of the geology beneath the ice.

Environmental Domains, Antarctic Conservation Biogeographic Regions and Important Bird Areas

Based on the Environmental Domains Analysis for Antarctica (Resolution 3(2008)), Scullin and Murray Monoliths are located within Environments D East Antarctic coastal geologic and L Continental coastal-zone ice sheet. Based on the Antarctic Conservation Biogeographic Regions (Resolution 3 (2017)), the Area is assigned to Biogeographic Region 16 Prince Charles Mountains. Scullin and Murray monoliths are identified as Antarctic Important Bird Area 126 Scullin Monolith/Murray Monolith (Resolution 5 (2015)).

Vegetation

The flora reported from Scullin Monolith is listed in Appendix 3, based on visits in 1972 and 1987; all species of lichens and moss occur elsewhere in Mac.Robertson Land (Appendix 2). Vegetation occurs mainly on the western plateau and associated nunataks. The distribution of vegetation on the western plateau is influenced by microtopography that controls the extent of exposure and moisture availability. The coastal slopes are generally void of vegetation due to high levels of seabird guano. Although not recorded, it is likely that vegetation at Murray Monolith is similar to that at Scullin Monolith.

Other biota

There have been no comprehensive invertebrate studies at Scullin or Murray monoliths. A leopard seal *Hydrurga leptonyx* was sighted during a visit in 1936 and several Weddell seals *Leptonychotes weddellii* were observed during visits in 1997 and 1998; no further observations of other biota have been reported.

6(ii) Access to the Area

Travel to the Area is possible by small boat, by over-snow/ice vehicles or by aircraft, in accordance with section 7(ii) of this plan.

6(iii) Structures within and adjacent to the Area

At the time of writing (March 2022), a fibreglass 'Apple' hut is situated on the south western summit ridge of Scullin Monolith (approximately 67°47'24"S, 66°41'38"E) (Map B and Map D). The hut is not suitable for accommodation but may be used for the storage of equipment.

6(iv) Location of other protected areas within close proximity of the Area

ASPA No. 102, Rookery Islands (67°36'36" S, 62°32'01" E),
is located approximately 180 km to the west (less than 20 km west of Mawson). ASPA No. 101, Taylor Rookery (67°27'S; 60°53'E), is located approximately 250 km to the west.

6(v) Special zones within the Area

There are no special zones within the Area.

7. Permit conditions

7(i) General permit conditions

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

- it is issued only for compelling scientific or management purposes 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, maintenance or review;
- the actions permitted are in accordance with this management plan and will not jeopardise the values of the Area;
- it is issued for a specified period;
- it will authorise the entry into the Area of no more than 10 people at any one time during the seabird breeding season (1 October to 31 March), and no more than 15 people at any one time during the remainder of the year;
- the permit or an authorised copy shall be carried at all times when within the Area;
- a visit report shall be supplied to the appropriate national authority at the conclusion of the permitted activity; and
- the appropriate national authority shall be notified of any activities/measures undertaken that were not included in the authorised permit.

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

- Travel to the Area is possible by small boat, by over-snow/ice vehicles or by aircraft.
- Any movement within and around the Area shall observe the minimum specified wildlife approach distances (Appendix 3); closer approach may be allowed only if authorised under a permit.
- Movement by visitors within the Area shall be by foot only.
- Small boats used to approach the Area must be operated at or below five knots within 500 m of the shore.
- It is recommended that visitors not permitted to enter the Area do not approach within 50 m of the shoreline.
- To reduce disturbance to wildlife, noise levels, including verbal communication, are to be kept to a minimum. The use of motor-driven tools and any other activity likely to generate loud noise and thereby cause disturbance to nesting birds shall not be allowed within the Area during the summer seabird breeding season (1 October to 31 March).

Aircraft may operate in the airspace above the Area subject to the following points:

- Disturbance of wildlife colonies by aircraft shall be avoided at all times.
- All aircraft are prohibited from flying directly above or within the Scullin Monolith amphitheatre during the bird breeding season (1 October to 31 March).
- Twin-engine fixed wing aircraft and single-engine helicopters must not operate closer than 750 metres (2500 feet) from known wildlife concentrations during the bird breeding season (1 October - 31 March).
- Twin-engine helicopters must not operate closer than 1500 metres (5000 feet) from known wildlife concentrations during the bird breeding season (1 October to 31 March).
- Fixed-wing aircraft exceeding twin-engine must not operate closer than 2150 metres (7000 feet) from known wildlife concentrations during the bird breeding season(1 October to 31 March).

Aircraft may land in the Area subject to the following points:

- Single-engine helicopters may land at the Scullin Monolith designated landing site (Map D) at any time of the year. Helicopters must approach the landing site according to the approved flight corridor (Map D).
- Twin-engine helicopters may land at the Scullin Monolith designated landing site (Map D) outside of the bird breeding season (1 April to 30 September).
- Twin-engine helicopter may be allowed to land at the Scullin Monolith designated landing site, or an alternate landing site, during the bird breeding season (1 October to 31 March):
  - if it can be demonstrated that disturbance to concentrations of birds can be avoided; and
  - where essential for compelling scientific or management purposes; and
  - in accordance with a permit issued by an appropriate authority.
- Refuelling of aircraft is not to take place within the Area.

Aircraft operations outside of the Area

- It is recommended that flights adjacent to the Area observe the separation distance from wildlife concentrations specified above, and at a minimum adhere to the Guidelines for the operation of aircraft near concentrations of birds in Antarctica (ATCM Resolution 2 (2004)).

Remotely Piloted Aircraft

- Overflights of bird colonies in the Area by remotely piloted aircraft systems (RPAS) are prohibited, except where essential for compelling scientific or management purposes, and in accordance with a permit issued by an appropriate authority. Such flights shall be undertaken in accordance with the *Environmental Guidelines for operation of Remotely Piloted Aircraft Systems (RPAS) in Antarctica.*

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

The following activities may be conducted within the Area as authorised by permit:

- compelling scientific research that cannot be undertaken elsewhere, including the initiation or continuance of ongoing monitoring programmes; and
- other scientific research and essential management activities consistent with this Management Plan that will not affect the values of the Area or its ecosystem integrity.

7(iv) Installation, modification or removal of structures

No new temporary 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.

7(v) Location of field camps

Temporary camps for field parties are permitted within the Area, but must be placed as far from seabird colonies and nesting sites as is practicable without compromising visitor safety. Camps shall be established for the minimum time necessary to undertake approved activities, and shall not be allowed to remain from one seabird breeding season to the next.

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

- A small amount of fuel is permitted within the Area for cooking purposes while field parties are present. Otherwise, fuel is not to be stored within the Area.
- No poultry products, including dried foods containing egg powder, are to be taken into the Area.
- No herbicides or pesticides are to be taken into the Area.
- All chemicals required for research purposes must be approved by permit, and shall be removed at or before the conclusion of the permitted activity to which they relate. The importation and use of radionucleides and stable isotopes within the Area is prohibited.
- Deliberate introduction of animals, plant material, micro-organisms and non-sterile soil into the Area is prohibited. The highest level precautions shall be taken to prevent the accidental introduction of animals, plant material, micro-organisms 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 at station.
- Visitors should also consult and follow as appropriate recommendations contained in the Committee for Environmental Protection Non-native Species Manual, and in the SCAR Environmental Code of Conduct for terrestrial scientific field research in Antarctica.

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. Disturbance to wildlife should be avoided at all times.

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

Material of human origin likely to compromise the values of the Area, which was not brought into the Area by the permit holder or was 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 present within the Area.

Specimens of natural materials may only be collected or removed from the Area as authorised in a permit and should be limited to the minimum necessary to meet scientific or management needs.

7(ix) Disposal of waste

All wastes, including 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 or removed. Wastes are to be removed no later than the departure of the field party.

7(x) Measures that may be necessary to ensure that the aims and objectives of the Management Plan continue to be met

Permits may be granted to enter the Area to carry out biological monitoring and Area management activities, which may involve the collection of samples for analysis or review.

- Ornithological surveys, including aerial photographs for the purposes of population census, shall have a high priority.
- 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 the management of the Area, and the monitoring of bird populations.

8. Supporting documentation

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Appendix 1: Estimates of breeding populations (pairs) of seabirds at Scullin and Murray Monoliths

Species	Scullin Monolith	Murray Monolith
Adélie penguin *Pygoscelis adeliae*	55,000	10,000
Southern fulmar *Fulmarus glacialoides*	1,350	150
Antarctic petrel *Thalassoica antarctica*	157,000	3,500
Cape petrel *Daption capense*	14	ND
Snow petrel *Pagodroma nivea*	1,200	ND
Wilson's storm petrel *Oceanites oceanicus*	ND	ND
South polar skua *Catharacta maccormicki*	30	ND

Note: ND indicates no census data are available

Appendix 2: Flora recorded at Scullin Monolith

The following taxa were collected at Scullin Monolith in 1972 (R Seppelt) and in 1987 (D Bergstrom), and were published in Bergstrom & Seppelt 1990)

LICHENS **Acarosporaceae**	**Teloschistaceae**
Biatorella cerebriformis (Dodge) Filson	*Caloplaca citrina* (Hoffm.) Th. Fr.
Acarosporagwynii Dodge & Rudolph	*Xanthoriaelegans* (Link.)*Th.Fr.*
Lecanoraceae *Lecanora expectans* Darb *Rhizoplaca melanophthalma* (Ram.) Leuck.	*Xanthoria mawsonii* Dodge **Candelariaceae** *Candellariella hallettensis* Murray
Lecideaceae	**Umbilicariaceae**
Lecidea phillipsiana Filson	*Umbilicaria decussata* (Vill.) Zahlbr.
Lecidea woodberryi Filson **Physciaceae** *Physcia caesia* (Hoffm.) Hampe	**Usneaceae** *Usnea antarctica* Du Rietz *Pseudophebe miniscula* (Nyl. Ex Arnold) Brodo et Hawksw.
Buellia frigida Darb	
Buellia grimmiae Filson *Buellia lignoides* Filson	**BRYOPHYTES**
Rinodina olivaceobrunnea Dodge & Baker	**Grimmiaceae** *Grimmia lawiana* Willis **Pottiaceae** *Sarconeurum glaciale* (C.Muell.) Card. Et Bryhn

Appendix 3: Approach distances guide: minimum distances (m) to maintain when approaching wildlife without permit.

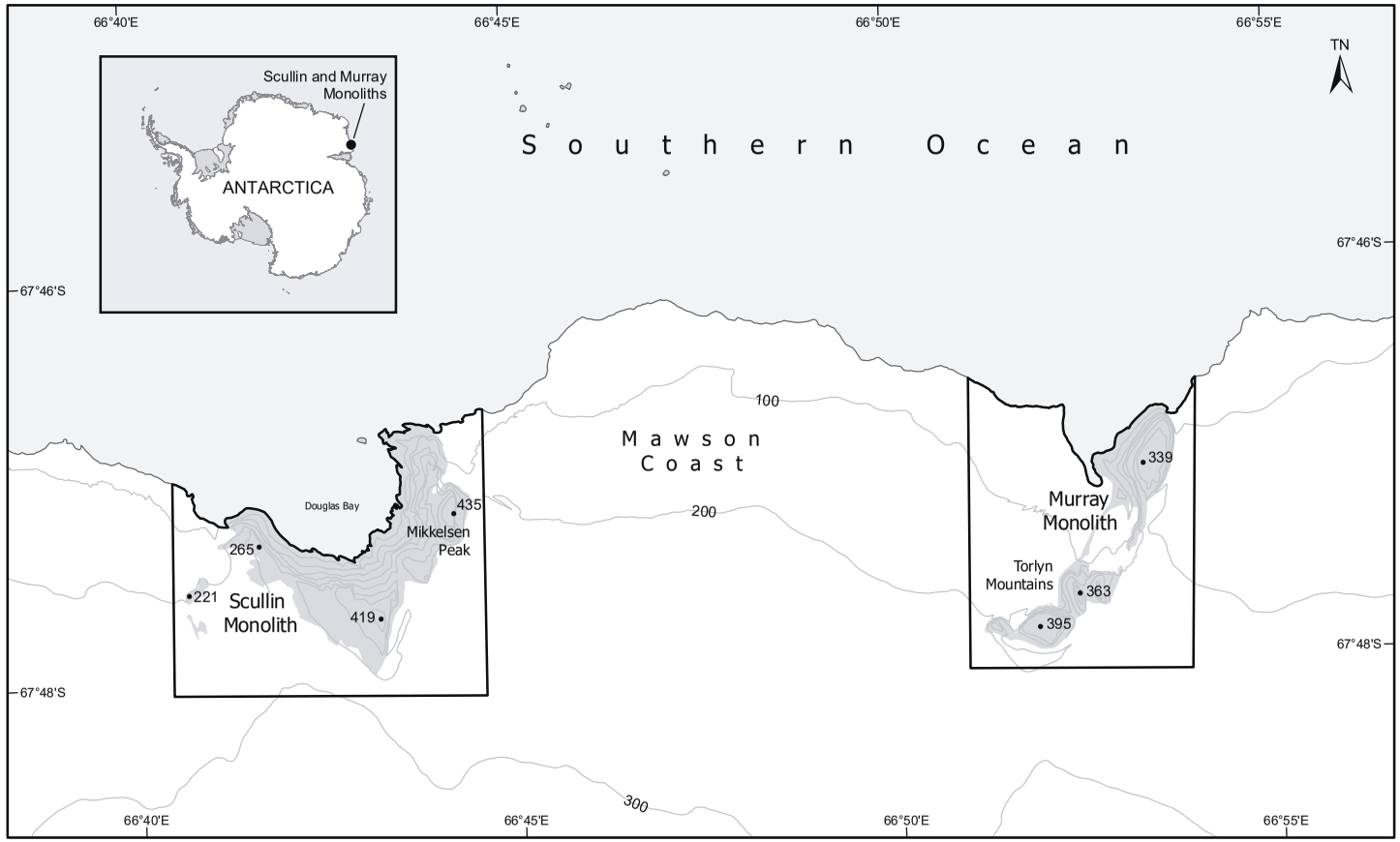
Species	People on foot/ski	Quad/skidoo	Hagglunds
Penguins in colonies Moulting penguins Seals with pups Seal pups on their own Prions and petrels on nest South Polar Skua on nest	15 m	Not permitted inside the Area.	Not permitted inside the Area.
Penguins on sea ice Non-breeding adult seals	5 m		

Notes:

1. These distances are a guide, and should you find that your activity is disturbing wildlife, a greater distance is to be maintained.
2. 'Prions and petrels' comprises Cape petrels, Antarctic petrels, Wilson's storm petrels, snow petrels and southern fulmars.

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

Map A: Antarctic Specially Protected Area No. 164, Scullin and Murray Monoliths, Mac.Robertson Land, East Antarctica



• Spot elevation (metres)

Contour (50 metre interval on rock)

Ice-free area

Antarctic Specially Protected Area

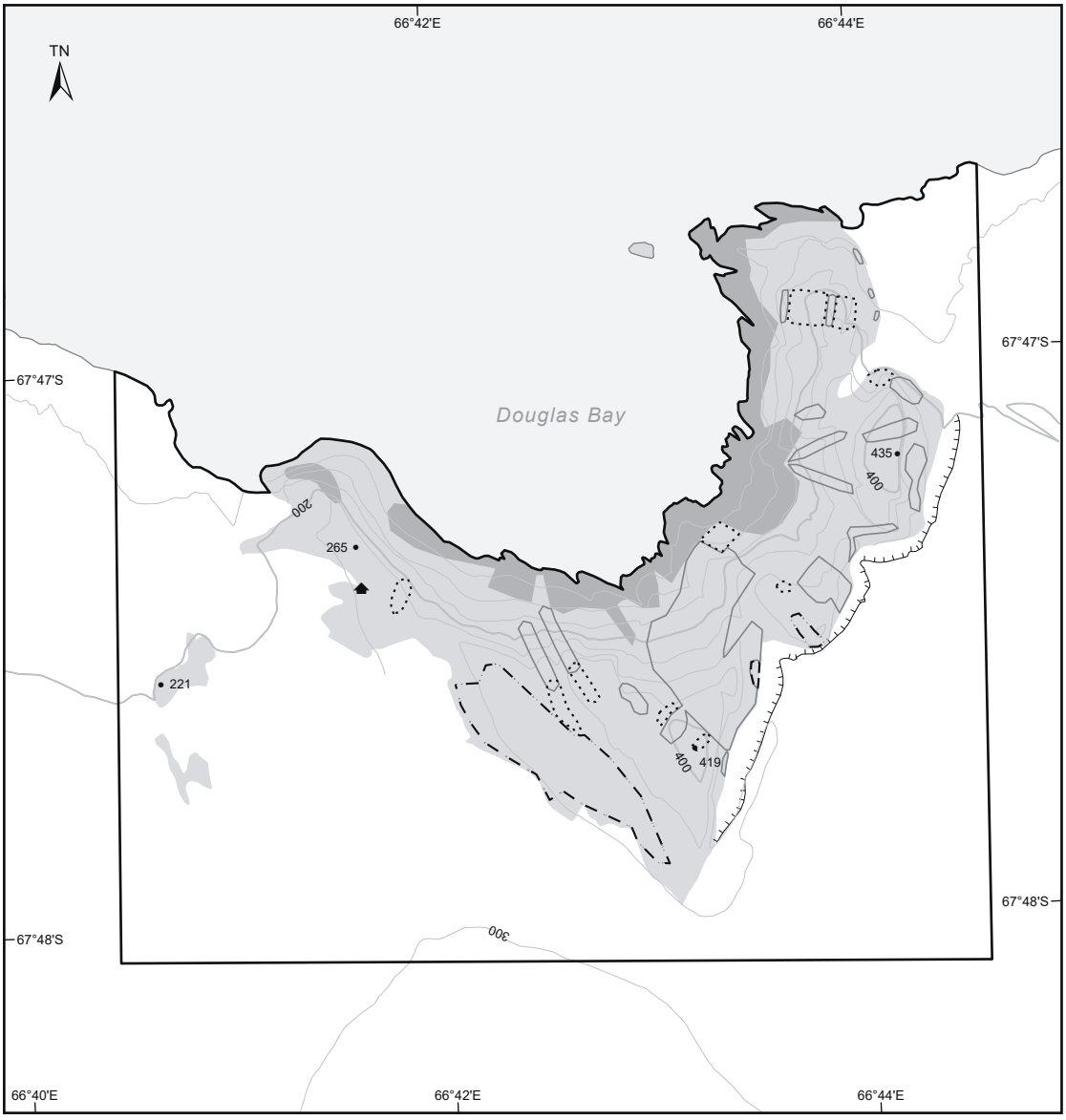
0 1 2 3 Kilometres

Horizontal Datum: WGS84
Projection: UTM Zone 42

Map Available at: *http://data.aad.gov.au/aadc/mapcat/*
Map Catalogue No. 15674
Produced by the Australian Antarctic Data Centre, Australian Antarctic Division, March 2022.

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

Map B: Antarctic Specially Protected Area No. 164
Scullin Monolith
Topography and Bird Distribution



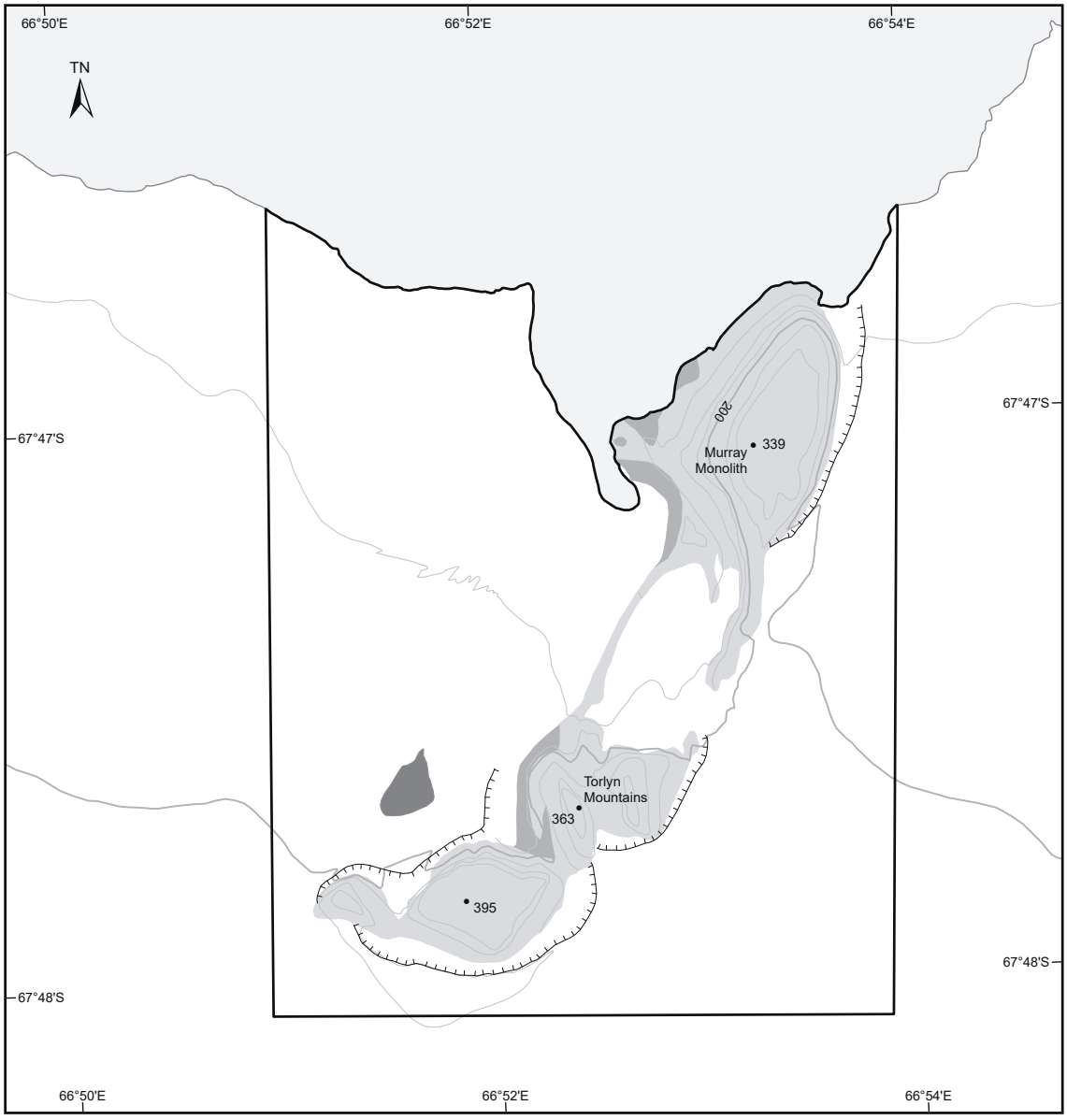
Horizontal Datum: WGS84
Projection: UTM Zone 42

- Spot elevation (metres)
- Antarctic petrel colony
- Southern fulmar colony
- South polar skua colony
- Adélie penguin colony
- Refuge
- Cliff
- Ice-free area
- Antarctic Specially Protected Area
- Contour (50m interval on rock)
- Index contour (200m interval)

Map Available at: *http://data.aad.gov.au/aadc/mapcat/*
Map Catalogue No. 15675
Produced by the Australian Antarctic Data Centre, Australian Antarctic Division, March 2022.

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

Map C: Antarctic Specially Protected Area No. 164
Murray Monolith
Topography and Bird Distribution



0 500 1000 Metres

Horizontal Datum: WGS84
Projection: UTM Zone 42

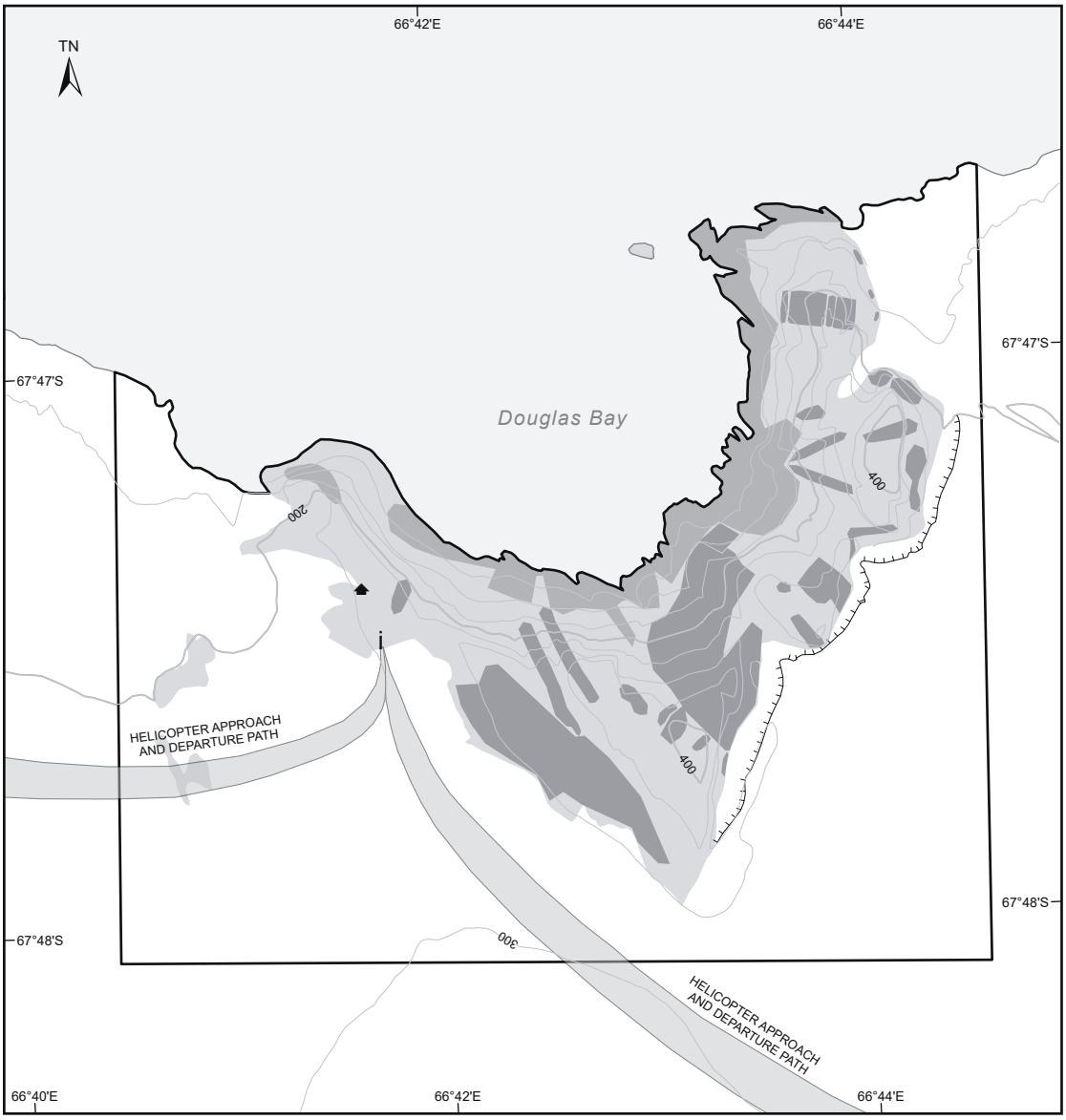
- Cliff
- Adélie penguin colony
- Ice-free area
- Lake
- Antarctic Specially Protected Area
- Spot elevation (metres)
- Contour (50m interval on rock)
- Index contour (200m interval)

Flying birds are known to be in this area, but there is insufficient data to map locations.

Map Available at: *http://data.aad.gov.au/aadc/mapcat/*
Map Catalogue No. 15676
Produced by the Australian Antarctic Data Centre, Australian Antarctic Division, March 2022.

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

Map D: Antarctic Specially Protected Area No. 164
Scullin Monolith
Helicopter approach and landing site



i Helicopter landing area
Refuge
Cliff
Flying bird colony
Adélie penguin colony
Ice-free area

0 500 1000 Metres

Horizontal Datum: WGS84
Projection: UTM Zone 42

Antarctic Specially Protected Area
Contour (50m interval on rock)
Index contour (200m interval)

Map Available at: *http://data.aad.gov.au/aadc/mapcat/*
Map Catalogue No. 15677
Produced by the Australian Antarctic Data Centre, Australian Antarctic Division, March 2022.