

Management Plan for Antarctic Specially Protected Area No. 164

SCULLIN AND MURRAY MONOLITHS, MAC ROBERTSON LAND, EAST ANTARCTICA

1. Description of Values to be Protected

Scullin and Murray Monoliths (67° 47'S 66° 42'E and 67° 47'S 66° 53'E) hold the greatest concentration of breeding seabird colonies in East Antarctica, including the second largest colony of Antarctic petrels *Thalassoica antarctica*. The Scullin and Murray Monoliths ASPA is a breeding locality for at least 160,000 pairs of Antarctic petrels from a minimum estimated global total of approximately half a million pairs (van Franeker *et al.* 1999). Scullin Monolith was recently recognised as a candidate Important Bird Area (IBA) using IUCN/BirdLife International criteria on known breeding populations by the SCAR Bird Biology subcommittee in mid-2002 (SCAR unpubl. data).

Adélie penguin colonies occupy the lower slopes of both monoliths, extending almost to the foreshore. Approximately 50,000 pairs nest on Scullin Monolith and a further 20,000 pairs on Murray Monolith. This represents approximately 10% of the Adélie penguin breeding population for East Antarctica and approximately 3% of the global population.

Many of the ocean-facing slopes of both monoliths are used for breeding by petrels. Extensive breeding colonies of four species of petrels occupy many of the steeper, higher-altitude slopes of both monoliths. The Antarctic petrel colony on Scullin Monolith is second in population only to the colony at Svarthameren in the Mühlig Hofmannfjella, in Dronning Maud Land. South Polar skuas nest throughout the ASPA, making use of the high density of breeding seabirds as prey during their breeding season. (See Figure A and Photograph A).

While larger colonies of seabirds are known from elsewhere in East Antarctica (e.g. the Rauer Group), it is the extensive populations (total known breeding population conservatively estimated at 230,000 pairs equivalent to a minimum of 460,000 individual breeding seabirds) and rich species diversity (seven breeding species) within the very small ice-free areas of Scullin and Murray Monoliths (estimated ice free area of 1.9 and 0.9 km², respectively, total of 2.8 km²) that make these the greatest concentration and one of the most diverse seabird breeding localities known from East Antarctica (Appendix 1).

There are no data on population trends available, and the census and survey data collected in 1986/87 serve as baseline data for all future ornithological work in the Area. Some limited census data were collected from Reference Breeding Groups (RBGs) established in the mid 1980s to monitor the Antarctic petrel population; there have been no surveys of these RBGs for more than a decade. Many Adélie penguin breeding populations throughout East Antarctica have increased in the last 20 or so years, and it is likely that the Adélie penguin population within the Scullin and Murray Monoliths ASPA is greater than the 70,000 pairs reported from 1986/87. Further, it is likely that the 1986/87 census under-estimated the breeding population of Antarctic petrels, given the census occurred late in the breeding season.

Aesthetic and wilderness values

In addition to the outstanding ecological and scientific values already identified, the Area possesses outstanding aesthetic values in the geomorphology of the two Monoliths and the spectacular nature of the glaciers descending from the Continental plateau that flow around the Monoliths ending in calving glaciers. The near-vertical aspects of both Monoliths dropping to the sea, used by a high number of seabirds for nesting, represent an unique landscape in the Antarctic.

II. Measures

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

Human history

Recorded visits to Scullin and Murray Monoliths are few. Scullin and Murray Monoliths were first visited during the second BANZARE voyage in 1930-31, on 13th February 1931 (Grenfell Price 1962, Fletcher 1984). A brief landing was made at Scullin Monolith on 26 February 1936 from the R.R.S. *William Scoresby*, when an ascent was made to a height of several hundred metres (Rayner 1940). A landing by the Norwegian, Lars Christensen was made on 30 January 1937, when Scullin Monolith was visited (Christensen 1938, 1939). Australian National Antarctic Research Expeditions (ANARE) personnel have made few visits to the Area from Mawson station, approximately 160 km to the west. The only recorded stay within the Area was a six-day visit (1 - 6 February 1987), when comprehensive ornithological surveys were conducted (Alonso *et al.* 1987). A fibreglass 'Apple' refuge was established within the ASPA for this visit, and as of 13 October 2002, was intact. The first visit by a commercial tourist vessel to the Area was made on 10 December 1992, when passengers were landed at Scullin and Murray Monoliths. Brief tourist visits were made to Scullin Monolith on 7 December 1997, to Scullin and Murray Monoliths on 8 January 1998 and, Scullin and Murray Monoliths on 18 December 2002. Compared to many sites in East Antarctica, Scullin and Murray Monoliths have been visited infrequently, and with the one known exception, all visits have been brief (less than a day). Further, with little activity conducted during those visits, the Area, and in particular the avifauna, is of particular value as a relatively undisturbed area suitable for use in the future as a reference site for other areas that experience a greater level of human visitation and extent of activities.

Nomenclature

Mawson named both Monoliths during the second BANZARE voyage. 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.

2. Aims and Objectives

The high concentration and diversity of the ASPA's avifauna requires management strategies that will limit the potential for human activities within the Area to affect the values to be protected. All human activities within the Scullin and Murray Monoliths ASPA will be managed and coordinated to:

- preserve Scullin and Murray Monoliths henceforth as a restricted Area with the goal of ensuring ecosystem integrity and the concomitant minimisation of environmental impacts of human activities;
- avoid degradation to, or substantial risk to, the values of the ASPA by preventing unnecessary human disturbance and activities within the ASPA, and maintain the undisturbed nature of the ASPA to permit its use in future as a reference area;
- permit and facilitate scientific research activities within the ASPA, in particular on the avifauna, while ensuring that the breeding populations are protected through the restriction on the frequency of visits and the types of activities undertaken. Research proposed for the ASPA will be on the basis that it can not be undertaken elsewhere. Non-ornithological research or activities within the Area must not affect the ornithological values of the ASPA and should be limited to areas outside breeding colonies or nesting sites whenever possible;
- prohibit non-research visits to the ASPA during the summer seabird breeding season;

- prohibit the construction or installation of semi-permanent accommodation in the ASPA (i.e. extending beyond the end of one seabird breeding season);
- prohibit flying of any aircraft within the ASPA during the summer breeding season (1 October to 31 March for the purposes of this Management Plan);
- accord high priority to the collection of seabird census data from representative sample areas, reference breeding colonies (RBGs) or of whole breeding populations. These census data will be major determinants in, and contributions to, future revisions of the management strategy for the ASPA;
- accord high priority to the collection of biological survey data, in particular flora and invertebrate surveys. These survey data will be incorporated into future revisions of the management strategy for the Antarctic Specially Protected Area No. 164;
- minimise the potential for introduction of alien plants, animals and micro-organisms to the ASPA. Reducing the potential for the introduction of avian pathogens is a primary concern.

3. Management Activities

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

- allow visits for management purposes that address the conservation and ongoing assessment of values, including the identification of new values or the recognition of values no longer present (i.e. incorporating a dynamic set of values that reflect biological processes within the Area);
- permit research visits to conduct censuses of seabird breeding populations, including mapping of colonies and nest sites. Visits to assess populations or to undertake aerial photography of the colonies shall be undertaken as necessary (preferably no less than one visit every five years);
- markers, signs and other indicators of the Area's extent shall not be erected, maintaining the aesthetic values and undisturbed nature of the Area;
- clothing (and in particular all footwear) and field equipment shall be cleaned before and after entering the Area. Research equipment shall be disinfected where possible and appropriate, to prevent possible introductions to, or contamination of, the Area;
- information on the Scullin and Murray Monoliths ASPA, including restrictions, shall be produced and displayed prominently at Davis and Mawson stations. Copies of this Management Plan will be made available at both stations and via the internet. Copies of the Management Plan will be made available for all visitors;
- visits will be permitted as necessary to facilitate research activities in accordance with the stated aims of the management of the ASPA;
- national Antarctic programs operating in the vicinity or intending to visit the Area shall consult together to ensure that the ASPA is not visited more than once every five (5) years, or that research projects do not overlap or conflict;
- permit visits to remove fuel, grey water, the Apple refuge and associated materials currently stored within the ASPA.

4. Period of Designation

The Area is designated for an indefinite period.

II. Measures

5. Maps and Photographs

- Map A: East Antarctica, Mac. Robertson Land, Location of Antarctic Specially Protected Area Scullin and Murray Monoliths, ASPA No. 165.
Inset Map: indicates the location in relation to the Antarctic continent.
Map Specifications: Projection: Lambert Conical Conformal; Horizontal Datum: WGS84; Vertical Datum: Mean Sea Level.
- Map B: Antarctic Specially Protected Area Scullin and Murray Monoliths, ASPA No. 165. Showing protected area at Scullin Monolith.
Map Specifications: Horizontal Datum: WGS84; Vertical Datum: Mean Sea Level.
- Map C: Antarctic Specially Protected Area, Scullin and Murray Monoliths, ASPA No. 165. Showing protected area at Murray Monolith.
Map Specifications: Horizontal Datum: WGS84; Vertical Datum: Mean Sea Level.
- Map D: Antarctic Specially Protected Area, Scullin and Murray Monoliths, ASPA No. 165, Showing Helicopter Approach for Scullin Monolith.
Map Specifications: Horizontal Datum: WGS84; Vertical Datum: Mean Sea Level.
- Photograph A: Oblique aerial photograph of Scullin Monolith with seabird colonies shown, 2003.

6. Description of the Area

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

Scullin Monolith (67° 47'S, 66° 42'E) and Murray Monolith (67° 47'S, 66° 53'E) are situated on the coast of Mac. Robertson Land approximately 160 km east of Mawson station (Map A). Scullin and Murray Monoliths are approximately 7 km 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 rising steeply from there to the south. Scullin Monolith is a crescent-shaped massif whose highest point is 433 m ASL. It encloses a broad north-facing cove with an entrance approximately 2 km wide. The upper slopes of the Monolith are everywhere precipitous, but in the lower 100 m the slope eases in many parts and these areas are strewn with boulders and large stones. Elsewhere in the lower parts the rock face falls sheer to the sea, and there are some scree slopes.

The walls of Murray Monolith rise at between 70° and 80° from the sea to a dome-shaped summit at 243 m ASL. On the western side of the Monolith, the lower slopes drop to a coastal platform. There are several other rock outcrops inland of the Monolith, and these are included in the ASPA. The protected area extends over all ice-free areas associated with the two Monoliths, including a few small islets and rocks.

The Scullin and Murray Monoliths ASPA comprises two sectors:

- Scullin Monolith: the boundary commences at a coordinate on the coastline at, 67°47'01"S, 66°40'31"E (A), then in a southerly direction to a coordinate at 67°48'03"S, 66°40'26"E (B), east to a coordinate at 67°48'06"S, 66°44'33"E (C) then north to a coordinate on the coast at 67°46'41"S, 66°44'37"E (D), then west following the coast line at the low tide mark to the coordinate 67°48'03"S, 66°40'26"E (A). See Map B.
- Murray Monolith: the boundary commences at a coordinate on the coastline at 67°46'29"S, 66°51'01"E (A), then in a southerly direction to a coordinate at 67°48'03"S, 66°50'55"E (B), east to a coordinate at 67°48'05"S, 66°53'51"E (C) then

north to a coordinate on the coast at 67°46'42"S, 66°53'59"E (D), then west following the coast line at the low tide mark to the coordinate 67°46'29"S, 66°51'01"E (A). See Map C.

Geology

The geology of the two Monoliths is poorly known, as they have been neither the subject of dedicated study (but see Tilley 1940) nor specific geological mapping. What is known is summarised briefly in Tingey (1991). The geology of the Monoliths appears to be similar in general terms to that of the region around Mawson. The rocks consist dominantly of high grade-granulite facies gneisses of metasedimentary origin, including some sapphirine bearing rocks. The metamorphism occurred in anhydrous conditions probably at about 1000Ma. Arriens (unpublished data; see Tingey 1991) determined ages of 1075 and 829Ma for the metamorphic age of the gneisses from Scullin Monolith but ages elsewhere as great as 1254Ma and as young as 625Ma have been documented. 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, and common in this region. It forms the faces of the monoliths. Takigami *et al.* (1992) recorded an age of 433 and 450Ma which may reflect a later influence of the '500 Ma 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.

Vegetation

The flora reported from Scullin Monolith is given in Appendix 3, based on visits in 1972 and 1987. All species of lichens and moss found on Scullin Monolith occur elsewhere in Mac. Robertson Land (Filson 1966, Bergstrom and Seppelt 1990). Vegetation on Scullin Monolith is restricted mainly to the western plateau and associated nunataks. The coastal slopes are generally devoid of vegetation due to high levels of seabird guano. The distribution of vegetation on the western plateau is influenced by microtopography that controls the extent of exposure and moisture availability.

Other biota

No invertebrates have been recorded from Scullin and Murray Monoliths. A leopard seal (*Hydrurga leptonyx*) was sighted during the 1936 visit (Rayner 1940) and several Weddell seals (*Leptonychotes weddellii*) were observed during the 1997 and 1998 visits (PG Quilty, pers. comm.); no further observations of biota have been reported. Appendix 2.

6(ii) Restricted and managed zones within the Area

During the summer breeding season (1 October to 31 March), access to all areas occupied by, or adjacent to, colonies or nesting sites of seabirds shall be restricted. Ornithological research as authorised by permit may be conducted within the seabird colonies. Non-ornithological research may be conducted in the Area during the summer breeding season if it does not disturb nesting birds. Non-scientific visits and landings within the Area are prohibited during the summer breeding season.

6(iii) Structures within and near the Area

As of 13 October 2002, a fibreglass 'Apple' refuge is situated on the southwestern summit ridge of Scullin Monolith. There are four (4) 200-litre drums of helicopter fuel and one (1) empty 200-litre drum as well as the (reported) remains of a food cache (1985/86 vintage). It is intended that all of this material be removed from the Area at the first opportunity.

II. Measures

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

There are two ASPAs located to the west of Scullin and Murray Monoliths; Rookery Islands Antarctic Specially Protected Area No. 102 is approximately 180 km to the west (c.20 km west of Mawson), and Taylor Rookery Antarctic Specially Protected Area No. 101 approximately 75 km further west of the ASPA No. 102.

7. Permit conditions

Entry to the Area is prohibited except in accordance with a Permit issued by an appropriate national authority. Any Treaty Party wishing to conduct research within the Area should contact the Australian Antarctic Division to ensure that the frequency of visits does not exceed that permitted in the Management Plan (the current level deemed to be appropriate is no more than one visit every five (5) years). Permits to enter the Area may be issued during the non-breeding period, specifically from 1 April to 30 September, for compelling scientific research that cannot be undertaken elsewhere, or for essential management purposes consistent with the objectives and provisions of the Management Plan. Permits are only to be issued for research that will not jeopardise the ecological or scientific values of the Area, interfere with existing scientific studies, or impact on the ecological integrity of the Area.

Activities permitted within the Area include those addressing management needs such as inspection and the review of the Management Plan.

Restrictions listed within this document must be incorporated into permit conditions.

Conditions that must be included in the Permit are provisions that the issuing authority may include additional conditions, consistent with the objectives and provisions of the Management Plan. The Principal Permit Holder for each Permit issued shall submit to the Permit issuing authority a visit report detailing all activities undertaken within the Area.

Permits issued to enter the Area shall include the following requirements:

- 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;
- the types of activities and specific periods for which they are authorised shall be specified. Activities not detailed on the Permit are prohibited. Permits shall be issued for a single season only, and will not allow entry to the Area for more than 120 days; and
- specification of the minimum number of people required to undertake the permitted activities within the Area. No more than 10 people are to be within the Area at any time during the breeding season, and no more than 15 for the remainder of the year.

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

- vehicles are prohibited within the Area during the summer breeding season;
- access to the Area for researchers and management-related visits shall be by inflatable rubber boats, over-snow/ice vehicles or by helicopters. Movement by visitors within the Area shall be by foot only;
- access to the Area for all other (non-research, non-management) visits is restricted to shoreline approaches by inflatable rubber boats, with no landings permitted;
- inflatable boats used to approach the Area must be operated at or below five (5) knots within 500 m of the shore. No approach within fifty (50) metres from shore shall be permitted;

- any movement within the Area shall observe the minimum specified approach distances for nesting birds (Appendix 4); closer approach may be allowed specifically under permit;
- 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 be used to enter the Area subject to the following conditions:

- there shall be no overflights of the Area below 1500 m (twin-engine aircraft) and below 750 m (single-engine) during the breeding season (1 October to 31 March);
- refuelling is not to take place within the Area;
- landings within the period 1 October to 31 March shall only occur at the designated landing site and only by single-engine aircraft;
- helicopter overflights for aerial photography are permitted subject to overflight altitude conditions specified above;
- helicopters shall approach the landing site from the south-west (as shown by the approved flight corridor in Appendix 5). Under no circumstances are aircraft to fly within the Scullin Monolith amphitheatre during the breeding season;
- there are no restrictions on the operation of aircraft outside the breeding season (1 October to 31 March).

Exemptions from any or all of the above conditions are only permitted in emergency.

7(ii) 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 between 1 October and 31 March as authorised by permit:

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

The following activities may be conducted within the Area between 1 April and 30 September as authorised by permit:

- scientific research that does not impact or interfere upon the values identified in the Management Plan, either in the short term or the long term;
- management activities consistent with the aims of this Management Plan.

7(iii) Installation, modification or removal of structures

No permanent structures are to be erected within the Area.

7(iv) 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.

II. Measures

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

- A small amount of fuel is permitted within the Area for field parties for cooking purposes. Fuel is not to be stored unattended within the Area. Aircraft and IRB refuelling within the Area is prohibited.
- 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 radio-nucleides and stable isotopes within the Area is prohibited.
- The highest level precautions shall be employed to prevent the introduction to the Area of micro-organisms, including pathogens. No living organisms shall be deliberately introduced to the Area. Clothing (and in particular all footwear) and field equipment shall be cleaned before entering the Area. Research equipment shall be disinfected where possible and appropriate, to prevent possible contamination of the Area.

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

Taking of, or harmful interference with, native flora and fauna are prohibited unless specifically authorised by permit issued in accordance with Article 3 of Annex II to the Protocol on Environmental Protection to the Antarctic Treaty. Disturbance to wildlife should be avoided at all times.

7(vii) 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 ASPA, 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 Australian Antarctic Division and the Permit Issuing Authority (if different) shall be notified if possible while the field party is present within the Area.

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

7(viii) Disposal of waste

No wastes, including human wastes, are to be left within the Area. Wastes from field parties shall be stored in such a manner to prevent wildlife (e.g. skuas) scavenging 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. Human wastes and grey water may be disposed into the sea.

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

- The maximum number of people within the Area at any time during the breeding season (1 October to 31 March) is 10. There will be a maximum of 15 people for all other times of the year.
- Ornithological research shall be limited to activities that are non-invasive and non-disruptive to the breeding seabirds present within the Area. Surveys, including aerial photographs for the purposes of population census, shall have a high priority.
- All GPS, survey and census data collected by field parties visiting the Area shall be made available to the Permit Issuing Authority and the Australian Antarctic Division (if different).

- These data shall be lodged in the Antarctic Master Data Directory through the Australian Antarctic Data Centre.

7(x) Requirements for reports

All visit reports shall provide detailed information on all census data, locations of any new colonies or nests not previously recorded, as texts and maps; a brief summary of research findings, copies of all photographs taken of the Area, and comments indicating measures taken to ensure compliance with permit conditions. Where appropriate, the report may make recommendations relevant to the management of the Area, in particular, as to whether the values for which it was designated are being adequately protected and whether management measures are effective.

The report should be submitted as soon as practicable after the visit to the Area has been completed, but no later than six months after the visit has occurred. A copy of the report should be made available to the Permit Issuing Authority and the Australian Antarctic Division (if different) for the purposes of reviewing the Management Plan in accordance with the Antarctic Treaty system requirements. Reports should include a completed SCAR Visit Report, or such information as required by national laws. The Permit Issuing Authority should maintain a record of the report for an indefinite period and shall make it available to SCAR, CCAMLR, COMNAP and to interested parties if requested.

8. Supporting documentation

Alonso J.C., Johnstone G.W., Hindell M., Osborne P. & Guard R. (1987): Las aves del Monolito Scullin, Antártida oriental (67° 47'S, 66° 42'E). In: *Castellvi J (ed) Actas del Segundo symposium Espanol de estudios antarcticos*, pp. 375-386, Madrid.

Christensen L. (1938): My last expedition to the Antarctic 1936 - 1937. JG Tanum, Oslo. Christensen L 1939. *Charting the Antarctic. Polar Times* 8, 7-10.

Filson R.B. (1966): The lichens and mosses of Mac. Robertson Land. *ANARE Scientific Reports B(II) Botany*.

Takigami Y., Funaki M. & Tokieda K. (1992): ⁴⁰Ar-³⁹Ar geochronological studies on some paleomagnetic samples of East Antarctica. in Y. Yoshida *et al.* (editors) *Recent Progress in Antarctic Earth Science*, pp 61-66, Tokyo, Terra Scientific Publishing Co.

Tilley C.E. (1940): Rocks from Mac. Robertson Land and Kemp Land, Antarctica. *Discovery Reports, XIX, 165-184*.

Tingey R.J. (1991): The regional geology of Archaean and Proterozoic rocks in Antarctica. in Tingey RJ (ed) *The Geology of Antarctic*, pp 1-73, Oxford, Oxford Science Publications.

van Franeker J.A., Gavrilo M., Mehlum F., Veit R.R. & Woehler E.J. (1999): Distribution and abundance of the Antarctic Petrel. *Waterbirds* 22, 14-28.

Appendix 1. Breeding populations (pairs) of seabirds at Scullin and Murray Monoliths

Species	Scullin Monolith	Murray Monolith
Adélie penguin <i>Pygoscelis adeliae</i>	49,500	20,000
Southern fulmar <i>Fulmarus glacialis</i>	1,350	150
Antarctic petrel <i>Thalassoica antarctica</i>	157,000	3,500
Cape petrel <i>Daption capense</i>	14	ND
Snow petrel <i>Pagodroma nivea</i>	1,200	ND
Wilson's storm petrel <i>Oceanites oceanicus</i>	ND	ND
South polar skua <i>Catharacta maccormicki</i>	30	ND
Note: ND indicates no census data are available		

Appendix 2 seals recorded at Scullin and Murray Monoliths

Leopard seal *Hydrurga leptonyx*
Weddell seal *Leptonychotes weddellii*

Appendix 3 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

Biatorella cerebriformis (Dodge) Filson
Acarospora ewvnii Dodge & Rudolnh

Lecanoraceae

Lecanora expectans Darb
Rhizoplaca melanophthalma (Ram.) Leuck.

Lecideaceae

Lecidea phillipsiana Filson
Lecidea woodberryi Filson

Physciaceae

Physcia caesia (Hoffm.) Hampe

Buellia frigida Darb
Buellia grimmiae Filson
Buellia lignoides Filson

Teloschistaceae

Caloplaca citrina (Hoffm.) Th. Fr.
Xanthoria elegans (Link.) Th. Fr.
Xanthoria mawsonii Dodge

Candelariaceae

Candellariella hallettensis Murray

Umbilicariaceae

Umbilicaria decussata (Vill.) Zahlbr.

Usneaceae

Usnea antarctica Du Rietz
Pseudophebe miniscula (Nyl. Ex Arnold)
Brodo et Hawksw.

BRYOPHYTES

Rinodina olivaceobrunnea Dodge & Baker

Grimmiaceae

Grimmia lawiana Willis

Pottiaceae

Sarconeurum glaciale (C. Muell.) Card. Et Bryhn

Appendix 4 Approach distances guide: minimum distances (m) to maintain when approaching wildlife without permit.

Species	People on foot/ski	Quad/skidoo	Hagglunds
Southern Giant Petrel	100	150	250
Emperor penguins in colonies	30		
Other penguins in colonies Moulting penguins Seals with pups Seal pups on their own Prions and petrels on nest South Polar Skua on nest	15		
Penguins on sea ice Non-breeding adult seals	5		

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. Watercraft and aircraft operations must comply with the minimum approach distances and other requirements outlined in the ANARE Small Boat Operations Manual and Flight Paths for Helicopter Operations in the Australian Antarctic Territory, respectively.

These are available at:

<http://www.aad.gov.au/goingsouth/expeditioner/manuals/default.asp>

<http://www.aad.gov.au/goingsouth/sao/Heli flight paths.asp>

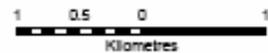
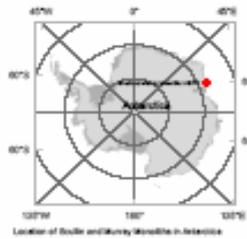
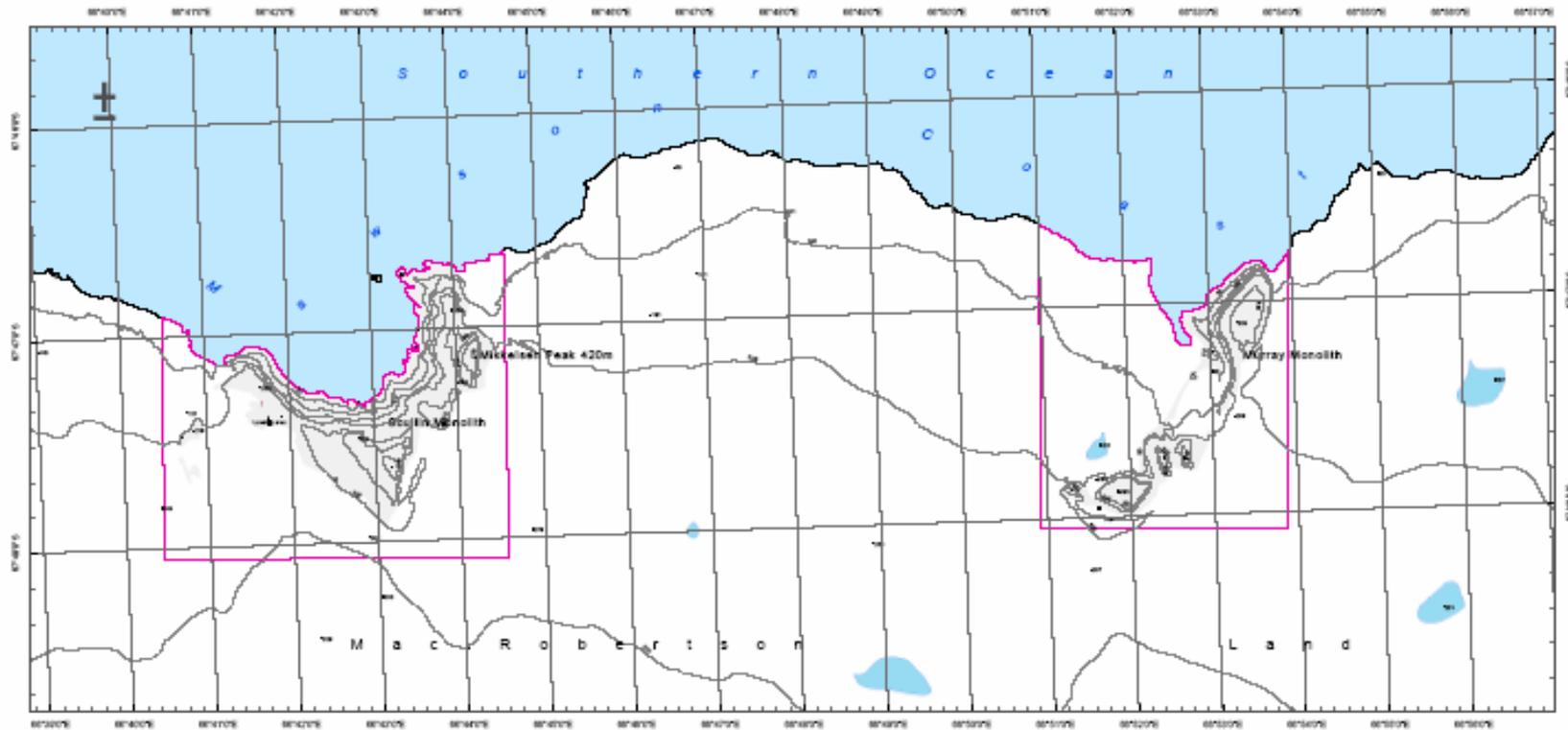
3. 'Prions and petrels' comprises Cape petrels, Antarctic petrels, Wilson's storm petrels, snow petrels and southern fulmars.

Appendix 5 Vehicular activities permitted in the vicinity of Scullin and Murray Monoliths ASPA during the breeding and non breeding season

Activity	Breeding season 1 October - 30 March	Non-breeding 1 April - 30
Helicopter operations (single engine)	750 m horizontal and vertical buffer zone. Landing permitted only at designated site (see map).	Landing permitted only at designated site (see map).
Helicopter operations (twin engine)	1500 m horizontal and vertical buffer zone. No landings permitted.	Landing permitted only at designated site (see map).
Boating operations	No approach closer than 100m from shore, no landings. Boats to be operated at less than 5kn between 500m and 100m from shore.	Landings permitted.



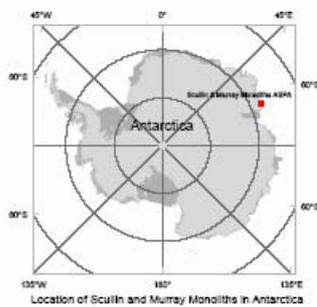
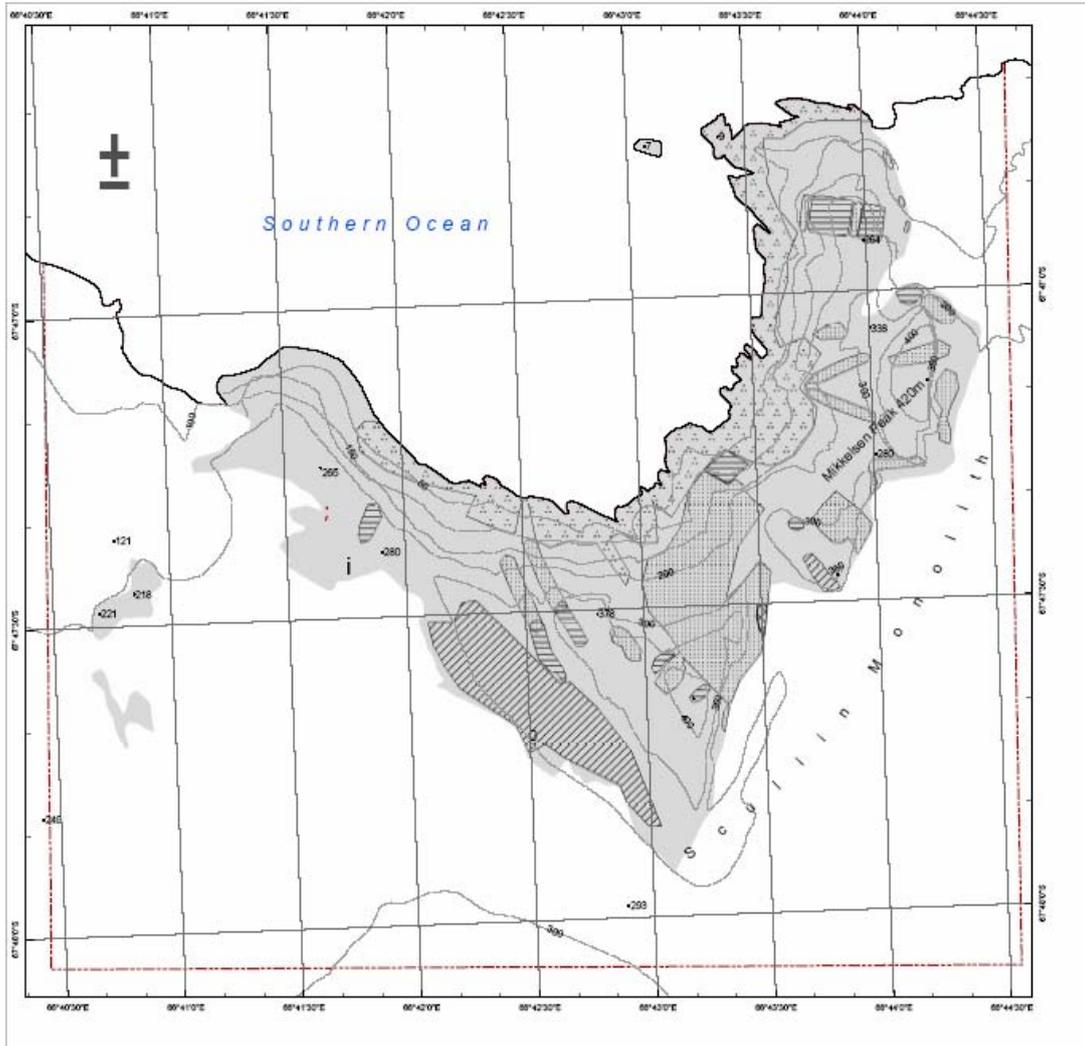
**Map A: Antarctic Specially Protected Area No 164
Scullin and Murray Monoliths, Mawson Coast,
Mac.Robertson Land, East Antarctica**



Horizontal Datum: WGS 84
Projection: UTM Zone 42
Produced by:
Environmental Management and Protection Section, Australian Antarctic Division,
Department of the Environment and Heritage,
December 2004, AAD Map Catalogue No. 15161



Map B: Antarctic Specially Protected Area: No 164
Scullin and Murray Monoliths, Mawson Coast,
Mac.Robertson Land, East Antarctica
Detail Scullin Monolith: Topography and Bird Distribution

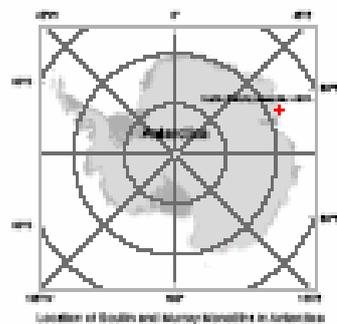
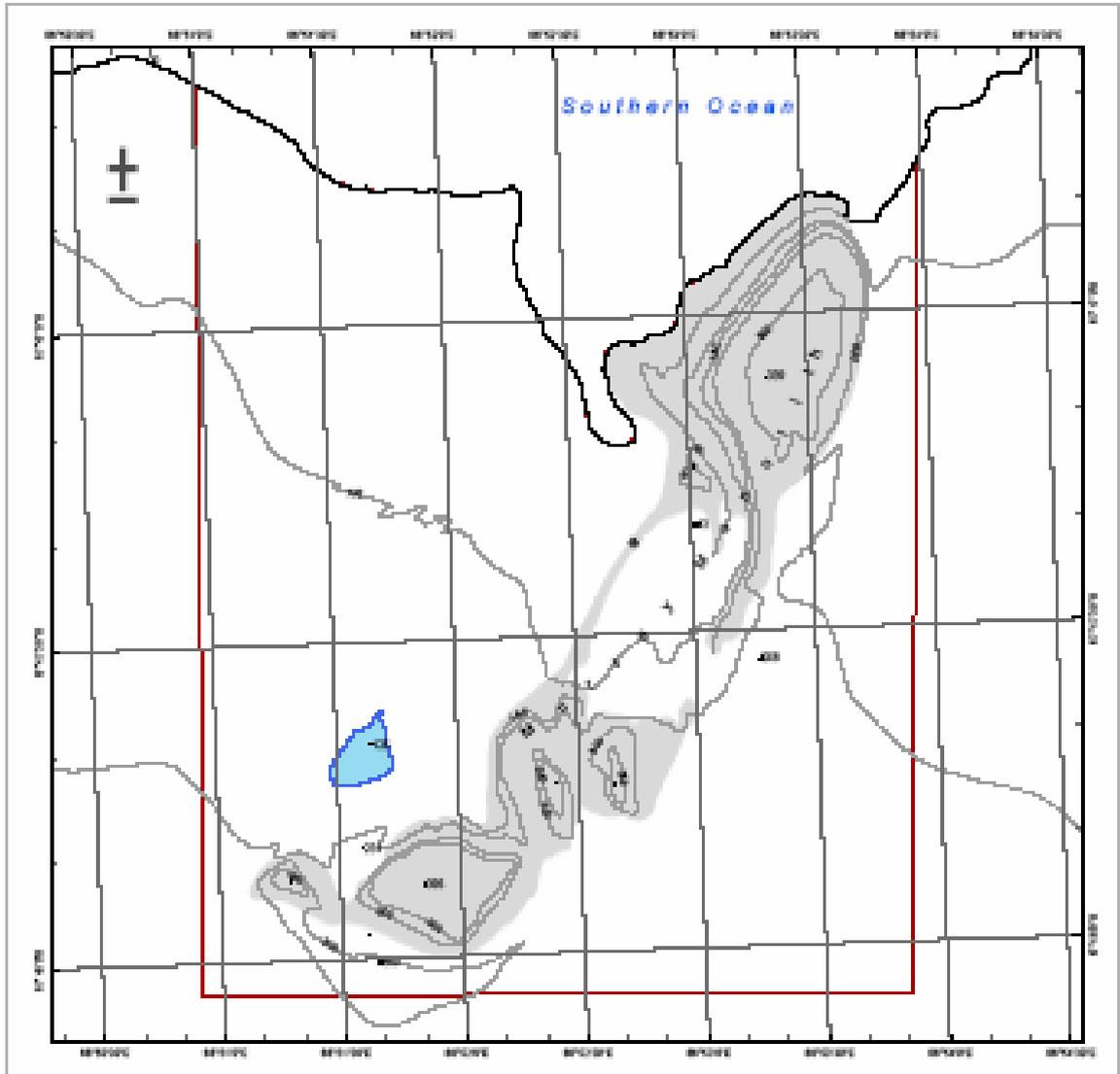


Horizontal Datum: WGS 84
 Projection: UTM Zone 42

Produced by:
 Environmental Management and Protection Section, Australian Antarctic Division,
 Department of the Environment and Heritage,
 December 2004. AAD Map Catalogue No. 13162



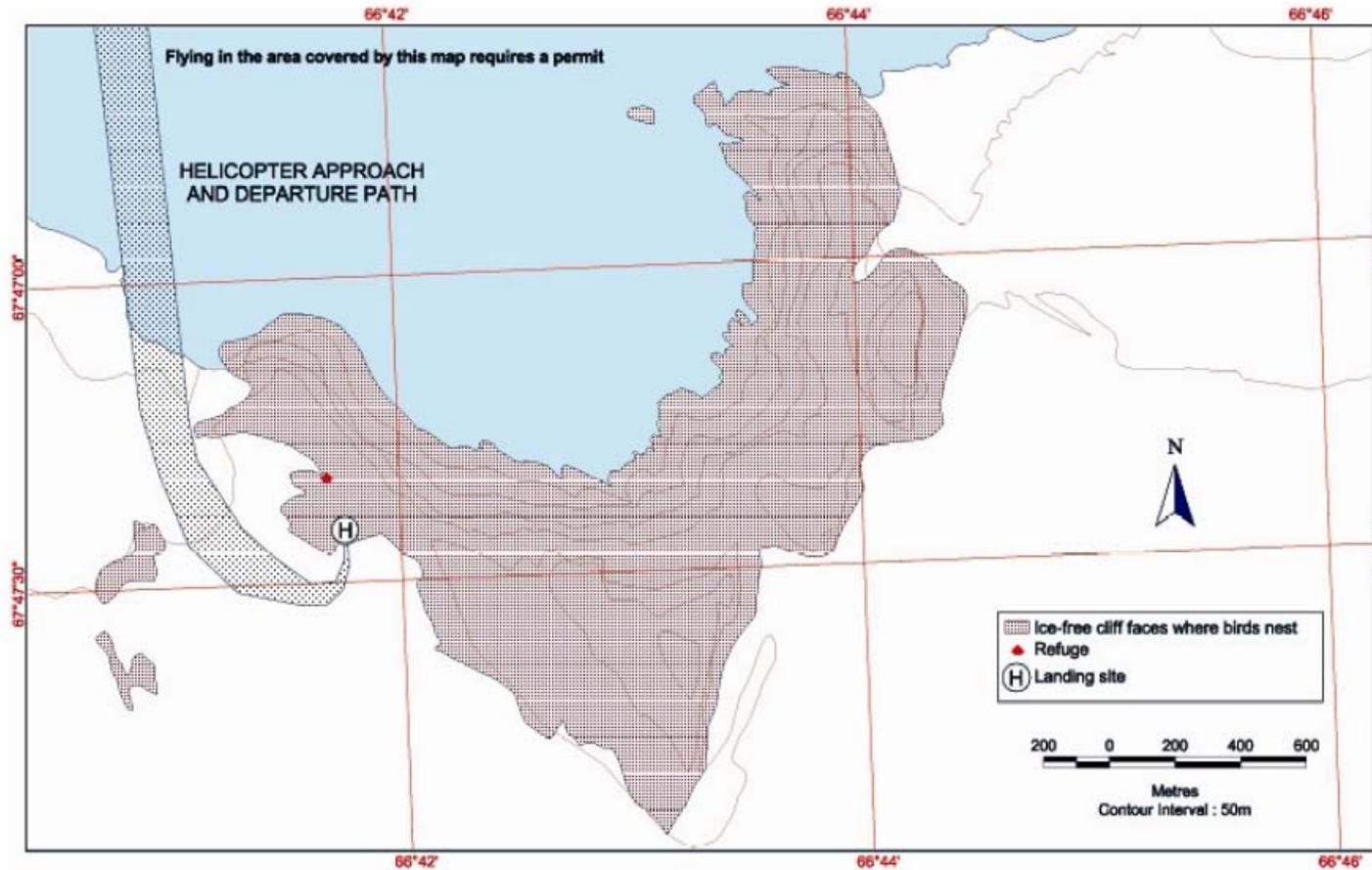
Map C: Antarctic Specially Protected Area: No 164
Scullin and Murray Monoliths, Mawson Coast,
Mac.Robertson Land, East Antarctica
 Detail Murray Monolith: Topography



National Datum: MGRS 48
 Projection: UTM Zone 48
 Produced by:
 Environmental Management and Protection Section, Australian Antarctic Division,
 Department of the Environment and Heritage,
 December 2000. AAD Map Change No. 12 000



Map D: Antarctic Specially Protected Area No 164, Scullin and Murray Monoliths, Mawson Coast, East Antarctica. Helicopter Approach to Scullin Monolith



**Photograph A: Antarctic Specially Protected Area No 164,
Scullin and Murray Monoliths, Mawson Coast, East Antarctica.
Oblique Aerial Photograph of Scullin Monolith.**
(Unrectified and unscaled) Australian Antarctic Division Map Catalogue No. 13160.

