

Management Plan for Antarctic Specially Protected Area No. 167

HAWKER ISLAND, VESTFOLD HILLS, INGRID CHRISTENSEN COAST, PRINCESS ELIZABETH LAND, EAST ANTARCTICA

1. Description of Values to be Protected

Hawker Island, lying some 300 m off the Antarctic mainland, is located 7 km south-west from the Australian Davis station in the Vestfold Hills on the Ingrid Christensen Coast, Princess Elizabeth Land, East Antarctica at 68°35'S, 77°50'E (Map A). The island supports a breeding colony of southern giant petrels (*Macronectes giganteus*) which is the southernmost colony of the species on continental Antarctica. The island also supports a colony of Adélie penguins and a limited number of flying birds.

The southern giant petrel colony was discovered in December 1963; at that time there were 40-50 nests present, "some with eggs". Seventeen population counts were undertaken between 1963 and 1999 (see Figure 1). A maximum of 90 nests with eggs was recorded in 1970/71. The recorded number of nests with eggs had decreased to 10 in 1983, but the two most recent surveys, conducted in 1987 and 1999, recorded 21 and 25 respectively.

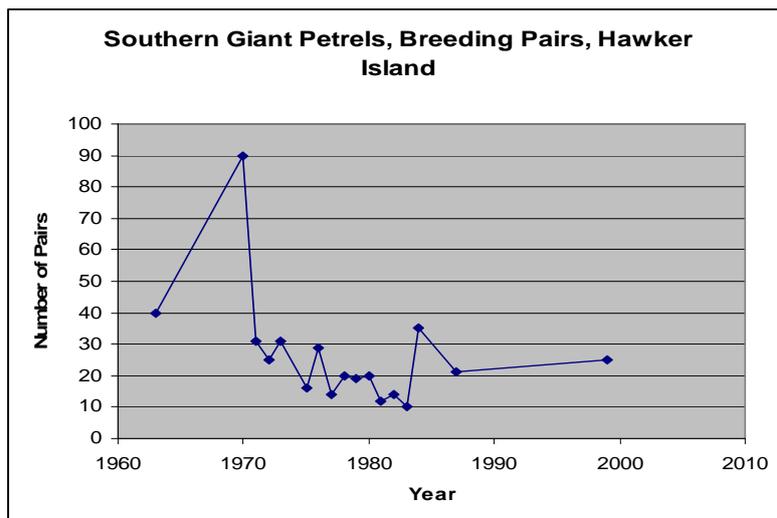


Figure 1: Population records for southern giant petrels (breeding pairs) at Hawker Island

Hawker Island is one of only four known breeding locations for southern giant petrels on the coast of continental Antarctica. The other locations have all been designated as Antarctic Specially Protected Areas (ASPAs): ASPA No. 102, Rookery Islands, Holme Bay, Mac Robertson Land (67°36'S, 62°53'E) – near Mawson Station; ASPA No. 160, Frazier Islands, Wilkes Land (66°13'S 110°11'E) – near Casey station; and ASPA No. 120, Pointe-Géologie, Terre Adélie (66°40'S, 140°01'E) – near Dumont d'Urville. Southern giant petrels on the Antarctic continent comprise less than 1% of the global breeding population. The current population for continental Antarctica is estimated at approximately 290 pairs, comprised of 25 pairs on Hawker Island, 3 pairs on Giganteus Island (part of the Rookery Islands group), 248 pairs on the Frazier Islands and 16 pairs at Pointe-Géologie .

Southern giant petrels also breed on islands in the southern Indian and Atlantic Oceans and in the Antarctic Peninsula.

As indicated above, the breeding population of southern giant petrels at Hawker Island decreased following its discovery in the early 1960s by personnel from nearby Davis Station. Human disturbance has been implicated in the observed decreases at all four southern giant petrel breeding sites on continental Antarctica.

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The disturbance to colonies near the Australian stations arose primarily through early efforts (1950s-1970s) to band adults and chicks at the nest. The population decrease at Pointe-Géologie has been attributed to station construction at Dumont d'Urville Station.

Southern giant petrels breeding in East Antarctica are particularly sensitive to disturbance at the nest. Restrictions in activities permitted at breeding sites, including a prohibition of banding, were introduced in the mid-1980s. While the population at Hawker Island has not recovered to the same extent as that on the Frazier Islands, it is showing signs of long-term recovery.

Reductions in breeding populations of southern giant petrels at other locations in the Antarctic and subantarctic have been attributed to activities associated with research stations. The bycatch of southern giant petrels in longline fisheries operating in the Southern Ocean is also likely to have contributed to observed population decreases. Decreases in breeding populations of southern giant petrels have also been observed at sites where human disturbance has been minimal, such as Heard Island.

The global breeding population of southern giant petrels is estimated at around 31,300 pairs, and is inferred to be declining at a rate of 20-50% over the past three generations. A total of 30 populations contain 500 or fewer breeding pairs, and at 15 of these sites there are 50 or fewer breeding pairs. It is believed that the global decrease in population is primarily due to fatal interactions with longline fisheries, although the species is also sensitive to other forms of human-induced disturbance such as scientific research and visitor activities, ship movements and overflights. The species is listed as Vulnerable under IUCN criteria and has conservation status under a number of international agreements (see Table 1).

Table 1: The conservation status of southern giant petrels by various authorities using IUCN criteria.

Authority	Conservation Status under IUCN criteria
IUCN Red List 2004	Vulnerable
Garnett, S.T. and Crowley, G. M. (2000) <i>The Action Plan for Australian Birds</i>	Vulnerable (global population) Endangered (Australian population only)
Agreement on the Conservation of Albatrosses and Petrels (ACAP)	Annex I
Convention on the Conservation of Migratory Species of Wild Animals (Bonn Convention)	Unfavourable conservation status listed in Appendix II.

The overall decrease in the Hawker Island population of southern giant petrels since its discovery is consistent with global trends and suggests that continued and formalised protection of the colony is warranted. Long-term protection and monitoring of the colony at Hawker Island will contribute to the development of appropriate regional and global conservation strategies for the species and will provide information for comparisons with populations elsewhere.

The designation of Hawker Island as an Antarctic Specially Protected Area completes a suite of protected areas that safeguard all known southern giant petrel breeding locations in East Antarctica.

2. Aims and Objectives

Management of Hawker Island aims to:

- minimise human disturbance to assist stabilisation and recovery of the breeding colony of southern giant petrels;
- protect the value of Hawker Island as a reference area for future comparative studies with other breeding populations of southern giant petrels; and
- minimise the possibility of the introduction of alien plants, animals and microbes to Hawker Island.

3. Management Activities

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

- one research visit should be conducted to census the southern giant petrels and other seabird populations in each five year period to enable monitoring of breeding populations. The visiting group should be restricted to the lowest number required to safely conduct the activity, and should include an ornithologist who is associated with an approved national program or who has previous field experience with southern giant petrels;
- information on the location of Hawker Island ASPA (stating the restrictions that apply) shall be produced and prominently displayed at Davis station and copies of this Management Plan shall be available at the station. Informative material and the Management Plan shall be provided to ships visiting the vicinity;
- clothing (particularly all footwear) and field equipment shall be appropriately cleaned before entering the Area; and
- the Management Plan shall be reviewed at least every five years and updated/modified as required.

4. Period of Designation

Designation is for an indefinite period.

5. Maps

Map A: Vestfold Hills, showing the location of Hawker Island and protected areas within the region.

Map specifications:

Projection: UTM Zone 49

Horizontal Datum: WGS84

Map B: Hawker Island, Antarctic Specially Protected Area showing distribution of seabird nesting sites.

Map Specifications:

Projection: UTM Zone 49

Horizontal Datum: WGS84

6. Description of the Area

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

Hawker Island is located at 68°35'S, 77°50'E, approximately 300 m offshore from the Vestfold Hills. The Vestfold Hills is a roughly triangular ice-free area of approximately 512 km², of bedrock, glacial debris, lakes and ponds. The Vestfold Hills are bound by the ice plateau to the east, the Sørsdal Glacier to the south, and Prydz Bay to the west. The Vestfold Hills contain low hills (maximum height 158 m at Boulder Hill) and valleys, and are penetrated deeply by fjords and lakes. Numerous islands fringe the coast of the Vestfold Hills, and Hawker Island lies in the south-west, between Mule Island and Mule Peninsula.

Hawker Island is an irregularly shaped island of low elevation (maximum elevation of nearly 40 m), with two parallel ranges of hills running in a north south direction terminating in two small southern peninsulas. A third peninsula lies directly west and terminates with a 40 m hill with steep cliffs to the sea on the western and southerly aspects. A number of small fresh-water lakes lie between the ranges of hills on the northern part of the island, with a number of small lakes lying on the flatter terrain on the eastern sector of the island. At its maximum extent the island is 2 km north to south and 1.7 km east to west.

The Hawker Island ASPA comprises the entire terrestrial area of Hawker Island, with the seaward boundary at the low water mark (Map B). The total area of the Hawker Island ASPA is approximately 1.9 km². There are no boundary markers.

Human History

The first recorded sighting of the Vestfold Hills was by Douglas Mawson on the BANZARE voyage of the 'Discovery' on the 9 February, 1931. Four years later, on 20 February 1935, Captain Klarius Mikkelsen of the Lars Christensen Company tanker 'Thorshavn', sighted and landed in the area. He named many features,

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and the area, the Vestfold Hills after his home province in Norway. The Vestfold Hills were again visited by Mikkelsen in early 1937, while undertaking an aerial survey of the coast.

In January 1939 the American explorer, Lincoln Ellsworth, and his Australian adviser, Sir Hubert Wilkins were the next recorded visitors to the area in the motor ship '*Wyatt Earp*', Ellsworth flew some 400 km inland. In early 1947 the '*USS Currituck*' visited the Ingrid Christensen Coast as part of Operation Highjump. Photographic flights were to survey the coastline.

The first Australian National Antarctic Research Expeditions (ANARE) to the area was led by Dr Phillip Law on '*Kista Dan*' and reached the Vestfold Hills on 1 March, 1954. During January, 1956, members of the Soviet Antarctic Expedition landed on the Ingrid Christensen Coast, in preparation for the IGY moving on to establish Mirny Station 595 km to the east. Australia established Davis station in the Vestfold Hills in 1957. Hawker Island was named for A.C. Hawker, radio supervisor at Davis station in 1957.

Climate

Meteorological data for the Area are confined almost entirely to observations at Davis station, 7 km northwest of Hawker Island. The Vestfold Hills area has a polar maritime climate that is cold, dry and windy. Summer days are typically sunny, with a midday temperature from -1°C to $+2.9^{\circ}\text{C}$ and a summer maximum of $+5^{\circ}\text{C}$, but temperatures are below 0°C for most of the year falling to as low as -40.7°C in winter. The maximum temperature recorded at Davis station from 1957 to 2001 was $+13^{\circ}\text{C}$. Long periods of relatively calm, fine conditions occur throughout the year. Winds are generally light. The yearly average is around 20 km/h. Violent winds and blizzards can commence with little warning, and gusts of over 200 km/h have been recorded. Snowfall averages 78 mm/yr, with the greater proportion of annual accumulation resulting from wind blown drift. Apart from several permanent ice banks, the Vestfold Hills are virtually snow free in summer and lightly covered in winter. The record illustrates the seasonal climate expected for high latitudes, but on average Davis station is warmer than other Antarctic stations at similar latitudes. This has been attributed to the "rocky oasis" which results from the lower albedo of rock surfaces compared to ice, hence more solar energy is absorbed and re-radiated.

Geology

The Vestfold Hills consist of Archaean gneiss, upon which thin and often fossiliferous Pliocene and Quaternary sediments occupy depressions. The oldest known Cenozoic strata in the Vestfold Hills are the mid-Pliocene Sørsdal Formation, which contains a diverse marine fossil flora and fauna. Other younger Cenozoic strata attest to repeated glaciation, and several marine transgressions and regressions. The three major lithologies forming the Vestfold Hills are (in order of age) Chelnock Paragneiss, Mossel Gneiss and Crooked Lake Gneiss. This is repeated in units from east-north-east to west-south-west. Intruded into these, are groups of mafic dykes in a rough north-south orientation. The dykes are a major feature of the Vestfold Hills. Hawker Island comprises an extension of the Crooked Lake Gneiss of the northern portion of Mule Peninsula above Laternula Inlet. In common with the Archaean gneisses in the Vestfold Hills, the Hawker Island Crooked Lake Gneiss is cut by very distinctive, middle to early Proterozoic dolerite dykes.

Southern Giant Petrels

The Hawker Island southern giant petrel colony is situated on level ground about 20 m above sea-level. Rocks and boulders break the relief but provide little shelter. The same area has been used for nesting since the first records were made in 1963/64. The eastern side of the breeding area forms a slight ridge with the ground dropping away below, providing a good area for take-off into the prevailing north-easterly winds. Nests are built from pebbles and are relatively widely dispersed, about 5-10 m apart. Records of the number of nests with eggs are shown in Figure 1.

The breeding season for southern giant petrels on Hawker Island commences with laying during the second half of October. Following an incubation period of about 60 days, hatching starts in the second half of December. Hatching continues over a period of three to four weeks until mid-January and, with a fledging period of $3\frac{1}{2}$ -4 months. Young birds leave the colony from late March to early May.

Seventeen counts, or on average one visit every two years occurred between 1956 and 1999 (see Figure 1). In the mid 1980s, a management strategy was implemented for all three southern giant petrels breeding localities in the vicinity of the Australian stations, to minimise human disturbance. The strategy involved the Australian Antarctic Division restricting census visits to one in every three to five year period and

implementing tight administrative controls over all other visits. This three to five year interval was considered an appropriate compromise between the risk of disturbing the birds through census work and the need to obtain meaningful population data. The strategy is believed to have contributed to the stabilisation and recovery observed in one of the three populations in Eastern Antarctica during the late 1980s onwards.

Other Birds

Adélie penguins breed along the Vestfold Hills coastline and on at least 17 offshore islands, including Hawker Island. The total number of Adélie penguins in the Vestfold Hills has been estimated at 130000 pairs. The Hawker Island colony is located in the vicinity of a small hill midway on the western side of the island and has been estimated at 2500 to 7500 pairs. There is evidence that the colony or some of the breeding groups within the colony have moved location periodically. The deserted areas are marked by deep deposits of guano, frozen eggs and the dehydrated carcasses of chicks. The first Adélie penguins usually appear in the area by the middle of October with eggs being laid about four weeks later. The interval between laying of the first and second egg is 2½ to 4½ days, and the incubation period is in the range of 32 to 35 days. The last moulted adults depart Hawker Island by the end of March.

A small colony of Cape petrels has been recorded on Hawker Island on the southern tip of the south western peninsula. Cape petrels are absent from the area in winter. Cape petrels return to nesting sites during October with egg laying late in November to early December and fledging in late February and early March.

Snow petrels (*Pagodroma nivea*) breed on most islands and several mainland sites in the Vestfold Hills but there are no records of them breeding on Hawker Island. Antarctic fulmars (*Fulmarus glacialisoides*), Antarctic petrels (*Thalassoica antarctica*) and Emperor penguins (*Aptenodytes forsteri*) are infrequent visitors to the Vestfold Hills in the summer months. South polar skuas (*Catharacta maccormicki*) nest on nearby Marine Plain and occasionally around the waters edge.

Seals

Weddell seals (*Leptonychotes weddellii*) breed in the Vestfold Hills and on the south-east part of Hawker Island. The seals start to appear inshore in late September and early October, and pupping occurs from mid-October until late November. Throughout summer, moulting Weddell seals continue to frequent firm sea-ice and haul out onto land. Most of the local population remains in the Vestfold Hills throughout the summer. Non-breeding groups of southern elephant seals (*Mirounga leonina*) haul out during the summer months in the vicinity of the south-western peninsula on Hawker Island. Crabeater seals (*Lobodon carcinophagus*) and Leopard seals (*Hydrurga leptonyx*) appear occasionally at the Vestfold Hills on sea-ice and beaches.

Vegetation

The flora of the Vestfold Hills comprises at least 82 species of terrestrial algae, six moss species and at least 23 lichen species. The lichens and mosses are distributed chiefly in the eastern or inland sector and their distribution patterns reflect the availability of drift snow, time since exposure of the substrate from the ice plateau and time since the last glaciation, elevation and proximity to saline waters. Very few occurrences of lichens or mosses have been noted towards the salt-affected coastal margin including Hawker Island where the low terrain is densely covered with extensive sand and moraine deposits.

Terrestrial algae are widespread and are major primary producers in the Vestfold Hills. Sublithic (or hypolithic) algae has been reported from Hawker Island, developing on the undersurfaces of translucent quartz stones that are partially buried in soil. The dominant algae, Cyanobacteria, particularly oscillatoriacean species, *Chroococidiopsis* sp., and *Aphanothece* sp. occur with the greatest frequency together with the Chlorophyta species, cf. *Desmococcus* sp.A and *Prasiococcus calcarius*. The endaphic alga *Prasiola crispa*, occurs as green crumpled sheet-like strands at melt flushes, usually associated with the diatom *Navicula muticopsis* and oscillatoriacean algae. The ornithophilous lichen *Candelariella flava* has been reported from Hawker Island, associated with sea bird nesting sites.

Invertebrates

An extensive survey of terrestrial tardigrades has been undertaken in the Vestfold Hills in 1981 from which four genera and four species of tardigrade were recovered. Although no tardigrades were recovered from the Hawker Island sample site it has been suggested that, as two species of tardigrade, *Hypsibius allisonii* and *Macrobiotus fuciger?* were recovered from Walkabout Rocks, they may be found in other coastal areas of

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similar ecology, associated with *Prasiola crispa*. The mite, *Tydeus erebus* is associated with breeding sites of Adélie penguins on the island.

6(ii) Special zones within the Area

There are no special zones within the Area.

6(iii) Location of structures within the Area

There are no structures within or adjacent to the Area and none are to be erected.

6(iv) Location of other protected Areas within close proximity

The following Protected Areas are located near Hawker Island:

- Marine Plain, Antarctic Specially Protected Area No. 143 (68°36'S, 78°07'E).

7. Permit Conditions

Visits to Hawker Island ASPA are prohibited except in accordance with a Permit issued by an appropriate National Authority. National Antarctic Programs operating in the region shall consult with each other to ensure that the frequency of visits does not exceed that permitted in the Management Plan. Permits to enter the Area may be issued during the non-breeding period for southern giant petrels, specifically from 1 May 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, or interfere with existing scientific studies.

Only one Permit is to be issued for the purpose of conducting a seabird census in each 5 year period. The Permit issuing authority is to refer to the provisions under section 3 of this management plan when issuing Permits. Censuses are to be conducted from beyond the limits of the southern giant petrel colonies, wherever practicable. In most cases there are vantage points from where the nesting birds may be counted. The maximum time to be spent on Hawker Island is 12 hours in total; however, the census may involve several visits to the islands. Only persons named in the Permit may be ashore within the Area at any time. Others, such as boat operators, should remain at the nominated landing sites.

Permits should include a condition that the Permit or a copy shall be carried at all times when within the Area. Additional conditions, consistent with the objectives and provisions of the Management Plan, may be included by the issuing authority. The principal Permit Holder for each Permit issued is required to submit to the Permit issuing authority a visit report detailing all activities undertaken within the Area, and including all census data obtained during the visit.

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

- Vehicles use is prohibited within the Area
- Access to Hawker Island may be by watercraft or vehicle depending upon seasonal conditions. Watercraft landings or parking of vehicles must be made at one of the two small bays at the southern end of the island. Boats used to visit the islands must be left at the shoreline. Movement within the Area is by foot only. Only personnel who are required to carry out scientific/management work in the Area are to leave the landing/parking site;
- The minimum (closest) approach distances set out in Table 2 are to be maintained when approaching any wildlife on, or in the vicinity of Hawker Island, unless a closer approach distance is authorised in a Permit. These distances are a guide and should an activity disturb wildlife, a greater distance is to be maintained.
- Persons permitted to approach southern giant petrels to obtain census data or biological data, should maintain the greatest practical separation distance and should in no case approach closer than 20 m;
- To reduce disturbance to wildlife, noise levels including verbal communication is to be kept to a minimum. The use of motor-driven tools and any other activity likely to generate noise and thereby cause disturbance to nesting birds is prohibited within the Area during the breeding period for southern giant petrels (1 October to 30 April); and

- Landing of aircraft in the Area is prohibited at any time.

Table 2: Minimum distances to maintain when approaching wildlife at Hawker Island

Species	Distances (m)		
	People on foot / ski	Quad/ Skidoo	Hagglunds
Giant petrels	100	150	250
Emperor penguins in colonies	30		
Other penguins in colonies	15		
Moulting penguins			
Seals with pups			
Seal pups on their own			
Prions and petrels on nest			
South polar skua on nest			
Penguins on sea ice	5		
Non breeding adult seals			

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

The following activities may be conducted within the Area from 1 May to 30 September as authorised in a Permit:

- scientific research consistent with this Management Plan that will not jeopardise the values for which the Area has been designated or the ecosystems of the Area;
- compelling management activities, including monitoring; and
- sampling, which should be the minimum required for approved research programs.

7(iii) Installation, modification, or removal of structures

No permanent structures are to be erected in the Area.

7(iv) Location of field camps

Camping is prohibited in the Area except in an emergency.

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

- Fuel is not to be deposited in the Area. Boat refuelling is permitted at shoreline landing sites. A small amount of fuel may be taken into the Area for an emergency stove.
- No poultry products, including dried food containing egg powder, are to be taken into the Area.
- No herbicides or pesticides are to be brought into the Area.
- Any chemical which may be introduced for compelling scientific purposes as authorised in a Permit shall be removed from the Area, at or before the conclusion of the activity for which the Permit was granted. The use of radio-nuclides or stable isotopes is prohibited.
- No animals, plant material or microorganisms shall be deliberately introduced into the Area and precautions shall be taken against accidental introductions; all equipment and clothing should be thoroughly cleaned before entering the Area.

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

Taking of, or harmful interference with, native flora and fauna, is 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 of southern giant petrels should be avoided at all times.

7(vii) Collection or Removal of Anything not Brought into the Area by the Permit Holder

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Material 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.

Material of human origin likely to compromise the values of the Area, 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 appropriate National Authority must be notified.

7(viii) Disposal of Waste

No wastes, including human wastes, are to be deposited or left in the Area.

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

One census of southern giant petrels should be conducted in each 5 year period. Censuses of other species may be undertaken during this visit provided no additional disturbance is caused to the southern giant petrels.

The length of time spent at Hawker Island to conduct a bird census should be minimised. A survey should be able to be completed in less than a 12 hours.

GPS data shall be obtained for specific sites of long-term monitoring for lodgement with the Antarctic Master Directory through the appropriate National Authority.

7(x) Requirement for reports

Parties should ensure that the principal Permit Holder for each Permit submits to the appropriate National Authority a report on activities undertaken. Such reports should include, as appropriate, the information identified in the Visit Report form contained in Appendix 4 of Resolution 2 (1998)(CEP I).

Parties should maintain a record of such activities and, in the Annual Exchange of Information, should provide summary descriptions of activities conducted by persons subject to their jurisdiction, which should be in sufficient detail to allow evaluation of the effectiveness of this Management plan. Parties should, wherever possible, deposit originals or copies of such original reports in a publicly accessible archive to maintain a record of usage, to be used both in any review of the Plan of Management and in organising the scientific use of the Area.

A copy of the report should be forwarded to the National Party responsible for development of the Management Plan to assist in management of the Area, and monitoring of bird populations. Additionally visit reports should provide detailed information on census data, locations of any new colonies or nests not previously recorded, a brief summary of research findings and copies of photographs taken of the Area.

8. Supporting documentation

Some or all of the data used within this paper was obtained from the Australian Antarctic Data Centre (IDN Node AMD/AU), a part of the Australian Antarctic Division (Commonwealth of Australia).

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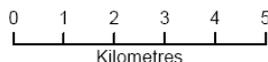
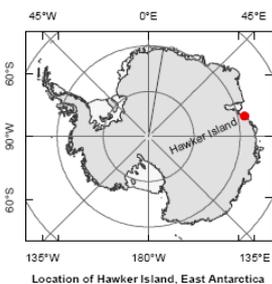
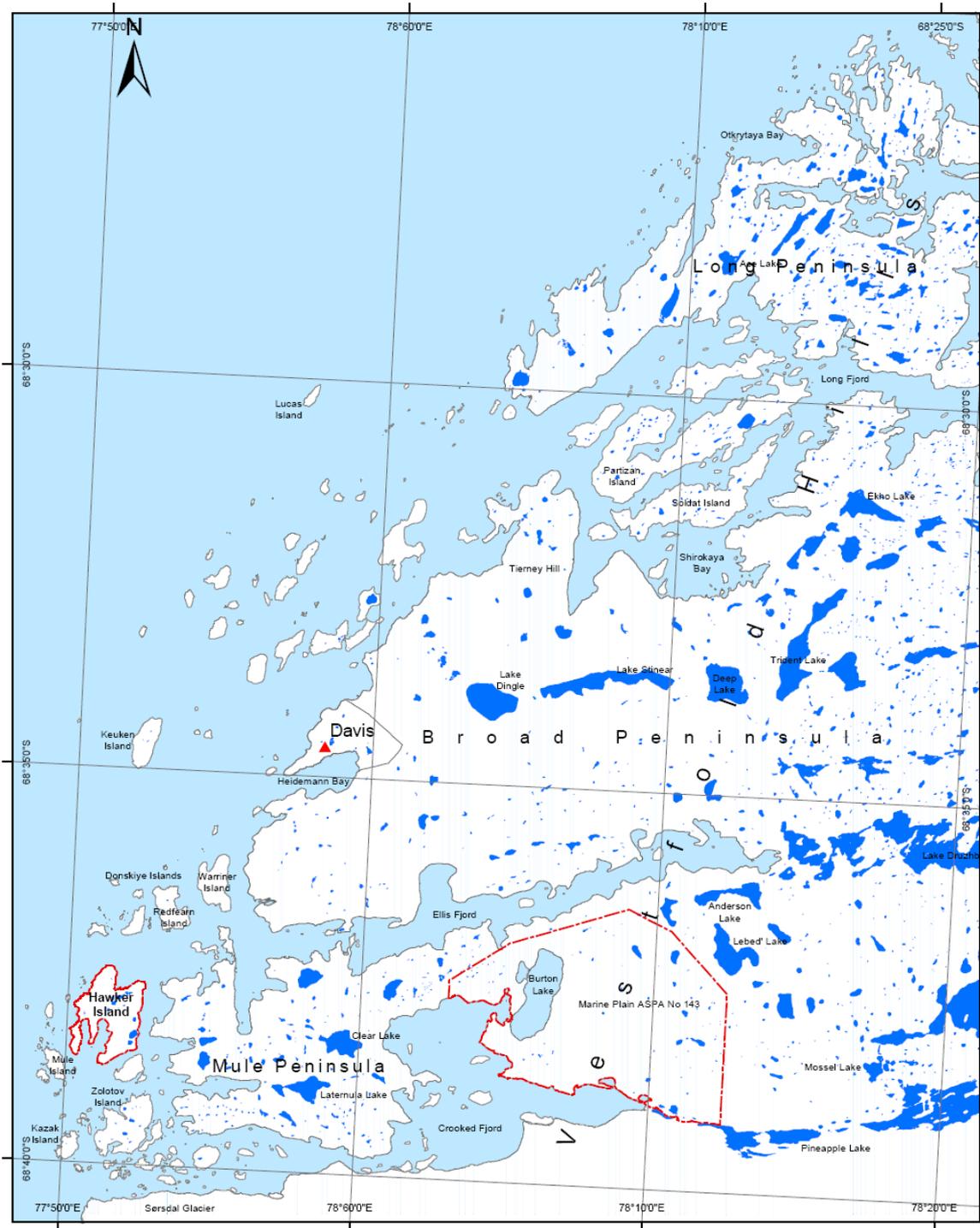
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Map A: Hawker Island Antarctic Specially Protected Area No. 167, Vestfold Hills, Ingrid Christensen Coast, Princess Elizabeth Land, East Antarctica



Horizontal Datum: WGS84
Projection: UTM Zone 43

Legend

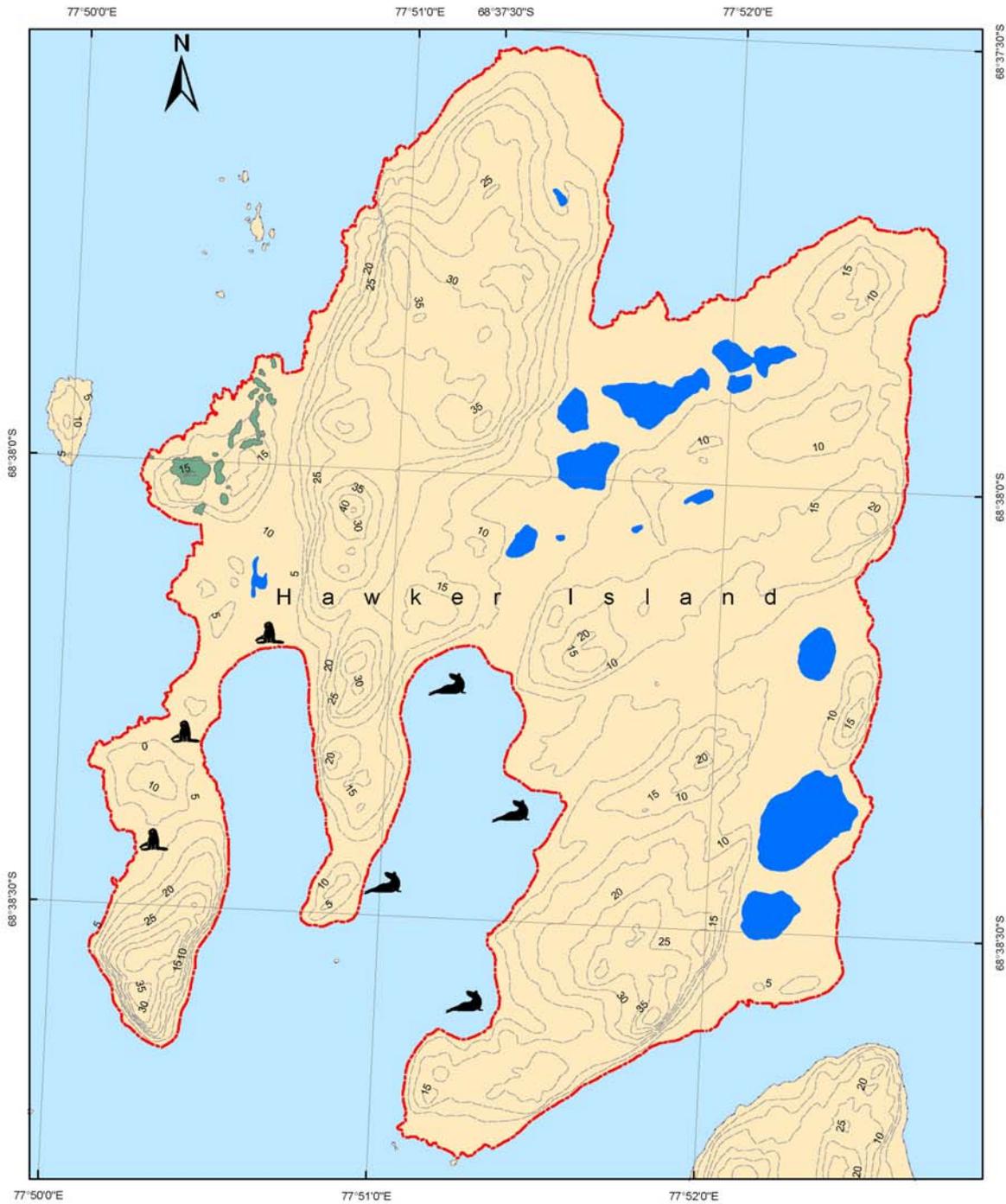
- ▲ Station
- ▭ ASPA Boundary
- Lake

Produced by the Environmental Policy and Protection Section and the Antarctic Data Centre, Australian Antarctic Division, Department of the Environment & Heritage, March 2006. Map Catalogue No:

Some or all of the data used within this map was obtained from the Australian Antarctic Data Centre (IDN Node AMD/AU), a part of the Australian Antarctic Division (Commonwealth of Australia). Vector data extracted from the Antarctic Digital Database version 4.

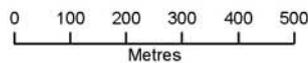
II. Measures

**Map B: Hawker Island Antarctic Specially Protected Area No. 167, Vestfold Hills, Ingrid Christensen Coast, Princess Elizabeth Land, East Antarctica
Biota, Topography and Physical Features**



Legend

- Contour (5 m interval)
- Lake
- Ice free area
- ▨ Southern giant petrel area
- Adelle Penguin
- Weddell seal
- Southern elephant seal haulout area
- ASPA Boundary



Horizontal Datum: WGS84
Projection: UTM Zone 43

Produced by the Environmental Policy and Protection Section and the Antarctic Data Centre, Australian Antarctic Division, Department of the Environment & Heritage, March 2006. Map Catalogue No:

Some or all of the data used within this map was obtained from the Australian Antarctic Data Centre (IDN Node AMD/AU), a part of the Australian Antarctic Division (Commonwealth of Australia). Vector data extracted from the Antarctic Digital Database version 4. Landsat 7 satellite image captured 30 January 2000. © Landsat