

Management Plan for Antarctic Specially Protected Area No. 111

SOUTHERN POWELL ISLAND AND ADJACENT ISLANDS, SOUTH ORKNEY ISLANDS

Introduction

The primary reason for the designation of Southern Powell Island and Adjacent Islands, South Orkney Islands (Lat. 62°57'S, Long. 60°38'W) as an Antarctic Specially Protected Area (ASP) is to protect environmental values, predominantly the breeding bird and seal populations, and to a lesser extent, the terrestrial vegetation within the Area.

The Area was originally designated in Recommendation IV-15 (1966, SPA No. 15) after a proposal by the United Kingdom on the grounds that southern Powell Island and the adjacent islands support substantial vegetation and a considerable bird and mammal fauna. The Area was representative of the natural ecology of the South Orkney Islands, and was rendered more important by the nucleus of an expanding colony of Antarctic fur seals (*Arctocephalus gazella*). These grounds are still relevant, though the expansion of the fur seal colony is progressing only slowly.

The Area is also recognised as having scientific value. It is now well established that climate change is affecting the Southern Ocean, and that the region around the Antarctic Peninsula, Scotia Sea and South Orkney Islands is showing some of the most evident impacts of climate change. Air temperatures and ocean temperatures have increased, some ice shelves have collapsed and seasonal sea ice is now much reduced. This has important consequences for biological communities with some of the most obvious consequences of environment change have been reported for pygoscelid penguins. In particular, Adélie penguins, a species of the pack ice, are now thought to be declining at most localities along the Peninsula and at the South Orkney Islands. Chinstrap penguins, a species of the more open ocean, are now also thought to be in decline. Consequently, understanding penguin foraging behaviour in an attempt to relate it to their preferred foraging habitat is particularly important. Understanding how pygoscelid penguins utilise the ocean around them is critical if we are to adequately protect their breeding colonies, including in highly biodiverse protected areas such as southern Powell Island.

Resolution 3 (2008) recommended that the “Environmental Domains Analysis for the Antarctic Continent”, be used as a dynamic model for the identification of Antarctic Specially Protected Areas within the systematic environmental-geographical framework referred to in Article 3(2) of Annex V of the Protocol (see also Morgan et al., 2007). Using this model, ASPA 111 is contained within Environment Domain G (Antarctic Peninsula off-shore islands geologic). The scarcity of Environment Domain G, relative to the other environmental domain areas, means that substantial efforts have been made to conserve the values found within this environment type elsewhere: other protected areas containing Domain G include ASPAs 109, 112, 114, 125, 126, 128, 140, 145, 149, 150, and 152 and ASMA 1 and 4. Environment Domain A is also present (Antarctic Peninsula northern geologic). Other protected areas containing Environment Domain A include ASPAs 128, 151 and ASMA 1.

The three other ASPAs present within the South Orkney Islands (ASPAs 109 Moe Island, ASPA 110 Lynch Island and ASPA 114 Northern Coronation Island) were designated primarily to protect terrestrial vegetation. Therefore, Southern Powell Island and Adjacent Islands complements the local network of ASPAs by protecting primarily breeding bird and seal populations, but also terrestrial vegetation.

1. Description of values to be protected

Following a visit to the ASPA in February 2012, the values specified in the original designation were reaffirmed and expanded. These values are set out as follows:

- The breeding avifauna within the Area is diverse, including up to four species of penguin [chinstrap (*Pygoscelis antarctica*), gentoo (*P. papua*), Adélie (*P. adeliae*) and macaroni penguins (*Eudyptes chrysolophus*)], Wilson's storm petrels (*Oceanites oceanicus*), cape petrels (*Daption capense*), Dominican gulls (*Larus dominicanus*), southern giant petrels (*Macronectes giganteus*), black-bellied storm petrels (*Fregetta tropica*), blue-eyed cormorants (*Phalacrocorax atriceps*), brown skuas (*Catharacta loennbergi*), sheathbills (*Chionis alba*), snow petrels (*Pagodroma nivea*) and possibly Antarctic prions (*Pachyptila desolata*)
- The longest known breeding site of fur seals in the Antarctic, since their near extermination in the nineteenth century, is found within the Area.
- A diverse flora, typical of the region, including moss banks with underlying peat, moss carpet in wet areas, snow algae and the nitrophilous macroalga *Prasiola crispa* associated with the penguin colonies, is found within the Area.
- The Area has scientific value as a location for the collection of telemetry data in order to explore penguin foraging behaviour. This information will contribute to the development of habitat models that will describe the relationship between penguin foraging behaviour and seasonal sea ice extent.

2. Aims and objectives

Management of southern Powell Island and adjacent islands aims to:

- avoid degradation of, or substantial risk to, the values of the Area by preventing unnecessary human disturbance to the Area;
- allow scientific research in the Area provided it is for compelling reasons which cannot be served elsewhere and which will not jeopardise the natural ecological system in that Area;
- prevent or minimise the introduction to the Area of non-native plants, animals and microorganisms;
- minimise the possibility of introduction of pathogens which may cause disease in bird populations within the Area;
- preserve the natural ecosystem of the Area as a reference area for future comparative studies and for monitoring floristic and ecological change, colonisation processes and community development;
- allow visits for management purposes in support of the aims of the management plan;
- allow for the gathering of data on the population status of the resident penguins and seals on a regular basis and in a sustainable manner

3. Management activities

- Visits shall be made as necessary to assess whether the ASPA continues to serve the purposes for which it was designated and to ensure management and maintenance measures are adequate.
- The Management Plan shall be reviewed at least every five years and updated as required.

- Markers, signs or other structures erected within the Area for scientific or management purposes shall be secured and maintained in good condition and removed when no longer required.
- In accordance with the requirements of Annex III of the Protocol on Environmental Protection to the Antarctic Treaty, abandoned equipment or materials shall be removed to the maximum extent possible provided doing so does not adversely impact on the environment and the values of the Area.
- A copy of this Management Plan shall be made available at Signy Research Station (UK; 60°42'30" S, 045°36'30" W) and Orcadas Station (Argentina; 60°44'15" S, 044°44'20" W).
- Where appropriate, National Antarctic Programmes are encouraged to liaise closely to ensure management activities are implemented. In particular, National Antarctic Programmes are encouraged to consult with one another to prevent excessive sampling of biological material within the Area. Also, National Antarctic Programmes are encouraged to consider joint implementation of guidelines intended to minimize the introduction and dispersal of non-native species within the Area.
- All scientific and management activities undertaken within the Area should be subject to an Environmental Impact Assessment, in accordance with the requirements of Annex I of the Protocol on Environmental Protection to the Antarctic Treaty.

4. Period of designation

ASPA 111 is designated for an indefinite period.

5. Maps

Map 1. The location of southern Powell Island and adjacent island in relation to the South Orkney Islands and the other protected areas in the region. Inset: the location of the South Orkney Islands in Antarctica. Map specifications: Projection: WGS84 Antarctic Polar Stereographic. Standard parallel: 71 °S. Central meridian 45 °W.

Map 2 shows the Area in greater detail.

6. Description of the Area

6(i) Geographical coordinates and natural features

BOUNDARIES AND CO-ORDINATES

The corner co-ordinates of the Area are shown in Table 1.

Corner	Latitude	Longitude
northwest	60°42'35'' S	45°04'00'' W
northeast	60°42'35'' S	44°58'00'' W
southwest	60°45'30'' S	45°04'00'' W
southeast	60°45'30'' S	44°58'00'' W

The Area includes all of Powell Island south of the southern summit of John Peaks (415 m altitude), together with the whole of Fredriksen Island, Michelsen Island (a tidal peninsula at the southern tip of Powell Island), Christoffersen Island, Grey Island and unnamed adjacent islands. The Area encompasses all of the ice-free ground, permanent ice and semi-permanent ice found within the boundaries, but excludes the marine environment extending greater than 10 m

offshore from the low tide water line. All but the Crutchley Ice Piedmont of southern Powell Island are ice-free in summer, though there are patches of semi-permanent or late-lying snow in places.

GEOLOGY

The rocks of southern Powell Island, Michelsen Island and Christoffersen Island are conglomerates of Cretaceous-Jurassic age. The two promontories to the west of John Peaks are Carboniferous greywacke-shales. There are boulders containing plant fossils in the glacial deposits around Falkland Harbour. Much of central and southern Fredriksen Island is composed of sandstone and dark phyllitic shales. The north-east and probably most of the north of this island is highly sheared conglomerate with laminated mudstone. The Area has a thick mantle of glacial till, strongly influenced by seabird guano.

BIOLOGICAL COMMUNITIES

Michelsen Island is almost devoid of land vegetation, although on the rocks there are extensive communities of lichens dominated by nitrophilous crustose species. These are also widespread on Fredriksen Island and elsewhere on bird-influenced cliffs and rocks near the shore. The most diverse vegetation on Powell Island occurs on the two promontories and associated scree west of Falkland Harbour. Here, and on Christoffersen Island and the northern part of Fredriksen Island, moss banks with underlying peat occur. Wet areas support stands of moss carpet. There are extensive areas of the nitrophilous macroalga *Prasiola crispa* associated with the penguin colonies in the area. Snow algae are prominent on the ice piedmont and snow patches in late summer.

No information is available on the arthropod fauna, but this is probably very similar to that at Signy Island. The springtails *Cryptopygus antarcticus* and *Parisotoma octoculata* and the mites *Alaskozetes antarcticus*, *Stereotydeus villosus* and *Gamasellus racovitzai* occur in great numbers beneath stones.

There are few observations on marine invertebrates and biota in the Area, but this is likely to be very similar to the well-researched Signy Island area. The relatively enclosed Falkland-Ellefsen Harbour area and the bay on the east side of the peninsula are highly influenced by glacial runoff from the ice piedmont.

Large numbers of penguins and petrels breed throughout the Area. There are many thousand pairs of chinstrap penguins (*Pygoscelis antarctica*), mostly on Fredriksen Island. Similarly large numbers of Adélie penguins (*P. adeliae*) occur principally on the southern Powell-Michelsen Island area. Here there are also several thousand pairs of gentoo penguins (*P. papua*) and a very few scattered pairs of macaroni penguins (*Eudyptes chrysolophus*) breeding among the gentoos.

Other breeding birds include southern giant petrels (*Macronectes giganteus*), cape petrels (*Daption capensis*), snow petrels (*Pagodroma nivea*), Wilson's storm petrels (*Oceanites oceanicus*), blue-eyed shags (*Phalacrocorax atriceps*), Dominican gulls (*Larus dominicanus*), brown skuas (*Catharacia lonnbergi*), sheathbills (*Chionis alba*), and possibly Antarctic prions (*Pachyptila desolata*) and blackbellied storm petrels (*Fregetta tropica*).

Michelsen Island is the longest known breeding site in the Antarctic of fur seals since their near extermination in the nineteenth century. The number of pups born annually has increased slowly but fairly steadily from 11 in 1956 to about 60 in 1989. Thirty-four live pups were recorded in January 1994. Many non-breeding males visit the Area during the summer. Other seals are frequent on the beaches, mainly elephant seals (*Mirounga leonina*) and Weddell seals (*Leptonychotes weddelli*). Leopard seals (*Hydrurga leptonyx*) and crabeater seals (*Lobodon carcinophagus*) are occasionally seen on ice floes.

6(ii) Access to the Area

- Access shall be by small boat.
- There are no special restrictions on boat landings from the sea, or that apply to the sea routes used to move to and from the Area. Due to the large extent of accessible coast around the Area, landing is possible at many locations. Nevertheless, if possible, landing of cargo and scientific equipment should be close to the recommended field camp at 60°43'20''S, 045°01'32''W.
- Under exceptional circumstances necessary for purposes consistent with the objectives of the Management Plan helicopters may be permitted to land at the designated landing site located beside the recommended field camp at 60°43'20''S, 045°01'32''W. Helicopters shall not land elsewhere within the Area.
- To prevent disturbance of breeding avifauna, helicopter landings are prohibited within the Area between the period 1 November to 15 February.
- Within the Area the operation of aircraft should be carried out, as a minimum requirement, in compliance with the 'Guidelines for the Operation of Aircraft near Concentrations of Birds' contained in Resolution 2 (2004). When conditions require aircraft to fly at lower elevations than recommended in the guidelines, aircraft should maintain the maximum elevation possible and minimise the time taken to transit.
- Overflying helicopters should avoid sites where there are concentrations of birds (e.g. southern Powell-Michelsen Island area or Fredriksen Island).
- Use of helicopter smoke grenades is prohibited within the Area unless absolutely necessary for safety. If used all smoke grenades should be retrieved.

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

Marker boards denoting the Area's protected status are positioned in the following locations:

- Southern Powell Island: on top of a small rock outcrop at the back of the shingle beach on the east side of the southern promontory of the island (60°43'20''S, 045°01'40''W).
- Michelsen Island: on a low-lying rock about 50 m from the shoreline at the back of a high shingle beach at the southern tip of the island (60°44'06''S, 045°01'25''W).
- Christoffersen Island: on a small promontory on the north-eastern shore of the island at the entrance to Falkland Harbour. The board is located at the back of the beach just below a small Adélie penguin rookery (60°43'36''S, 045°02'08''W).
- Fredriksen Island: at the northern end of the pebble boulder beach on the western side of the island, below a small chinstrap penguin rookery. The board is at the back of the beach on top of a small rock outcrop (60°44'06''S, 044°59'25''W).

There are no other structures within the Area, but various mooring chains and rings associated with the use of Ellefsen and Falkland Harbours by floating whale factories in the 1920s are to be found on the shore.

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

ASPA No. 109, Moe Island, and ASPA No. 110, Lynch Island, are located approximately 35 km west of the Area. ASPA No. 114, North Coronation Island, is located around 35 km west-north-west of the Area on the northern side of Coronation Island (see Map 1).

6(v) Restricted zones within the Area

None.

7. Permit Conditions

7(i) General permit conditions

Entry into the Area is prohibited except in accordance with a Permit issued by an appropriate national authority as designated under Article 7 of Annex V of the Protocol on Environmental Protection to the Antarctic Treaty.

Conditions for issuing a Permit to enter the Area are that:

- it is issued for a compelling scientific purpose which cannot be served elsewhere;
- it is issued for essential management purposes such as inspection, maintenance or review;
- the actions permitted will not jeopardise the natural ecological system in the Area;
- any management activities are in support of the objectives of this Management Plan;
- the actions permitted are in accordance with this Management Plan;
- the Permit must be carried within the Area;
- permits shall be issued for a stated period;
- a report or reports are supplied to the authority or authorities named in the Permit;
- the appropriate authority should 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

- Land vehicles are prohibited in the Area.
- No pedestrian routes are designated within the Area, but persons on foot should avoid walking on vegetated areas or disturbing wildlife wherever possible.
- To reduce disturbance of bird species, anchoring within Falkland Harbour and Ellefsen Harbour is strongly discouraged, except in an emergency.
- Pilots, air and boat crew, or other people on aircraft or boats, are prohibited from moving on foot beyond the immediate vicinity of their landing site unless specifically authorised by Permit.

7(iii) Activities which may be conducted in the Area

Activities include:

- compelling scientific research which cannot be undertaken elsewhere
- essential management activities, including monitoring.

7(iv) Installation, modification or removal of structures

No new structures are to be erected within the Area, or scientific equipment installed, except for compelling scientific or management reasons and for a pre-established period, as specified in a permit. Installation (including site selection), maintenance, modification or removal of structures and equipment shall be undertaken in a manner that minimises disturbance to the values of the Area. All structures or scientific equipment installed in the Area shall be clearly identified by country, name of the principal investigator and year of installation. All such items should be free of organisms, propagules (e.g. seeds, eggs) and non-sterile soil (see Section 7(vi)), and be made of materials that can withstand the environmental conditions and pose minimal risk of contamination of the Area. Removal of specific structures or equipment for which the Permit has expired shall be a condition of the Permit. Permanent structures or installations are prohibited.

7(v) Location of field camps

In order to minimise the area of ground within the ASPA impacted by camping activities, tents should be erected at the designated field campsite, located at 60°43'20''S, 045°01'32''W. When necessary for purposes specified in the Permit, temporary camping beyond the designated field campsite is allowed within the Area. Camps should be located on non-vegetated sites, such as on the drier parts of the raised beaches, or on thick (>0.5 m) snow-cover when practicable, and should avoid concentrations of breeding birds or mammals.

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

No living animals, plant material or microorganisms shall be deliberately introduced into the Area. To ensure that the floristic and ecological values of the Area are maintained, special precautions shall be taken against accidentally introducing microbes, invertebrates or plants from other Antarctic sites, including stations, or from regions outside Antarctica. All sampling equipment or markers brought into the Area shall be cleaned or sterilized. To the maximum extent practicable, footwear and other equipment used or brought into the Area (including bags or backpacks) shall be thoroughly cleaned before entering the Area. Further guidance can be found in the CEP Non-native Species Manual (Edition 2011) and COMNAP/SCAR Checklists for supply chain managers of National Antarctic Programmes for the reduction in risk of transfer of non-native species. In view of the presence of breeding bird colonies within the Area, no poultry products, including wastes from such products and products containing uncooked dried eggs, shall be released into the Area or into the adjacent sea.

No herbicides or pesticides shall be brought into the Area. Any other chemicals, including radio-nuclides or stable isotopes, which may be introduced for scientific or management purposes specified in the Permit, shall be removed from the Area at or before the conclusion of the activity for which the Permit was granted. Release of radio-nuclides or stable isotopes directly into the environment in a way that renders them unrecoverable should be avoided. Fuel or other chemicals shall not be stored in the Area unless specifically authorised by Permit condition. They shall be stored and handled in a way that minimises the risk of their accidental introduction into the environment. Materials introduced into the Area shall be for a stated period only and shall be removed by the end of that stated period. If release occurs which is likely to compromise the values of the Area, removal is encouraged only where the impact of removal is not likely to be greater than that of leaving the material in situ. The appropriate authority should be notified of anything released and not removed that was not included in the authorised Permit.

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

Taking of or harmful interference with native flora or fauna is prohibited, except by Permit issued in accordance with Annex II to the Protocol on Environmental Protection to the Antarctic Treaty. Where taking of or harmful interference with animals is involved, the *SCAR Code of Conduct for the Use of Animals for Scientific Purposes in Antarctica* should be used as a minimum standard.

7(viii) Collection and removal of materials not brought into the Area by the Permit holder

Collection or removal of anything not brought into the Area by the permit holder shall only be in accordance with a Permit and should be limited to the minimum necessary to meet scientific or management needs.

Other 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 from the Area unless the environmental impact of the removal is likely to be greater than leaving the material in situ; if this is the case the appropriate Authority must be notified and approval obtained.

7(ix) Disposal of waste

As a minimum standard, all waste shall be disposed of in accordance with Annex III to the Protocol on Environmental Protection to the Antarctic Treaty. In addition, all wastes shall be removed from the Area. Liquid human wastes may be disposed of into the sea. Solid human waste should not be disposed of to the sea, but shall be removed from the Area. No solid or liquid human waste shall be disposed of inland.

7(ix) 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 scientific research, monitoring and site inspection activities, which may involve the collection of a small number of samples for analysis, to erect or maintain signboards, or to carry out protective measures.
- Any long-term monitoring sites shall be appropriately marked and the markers or signs maintained.
- Scientific activities shall be performed in accordance with *SCAR's environmental code of conduct for terrestrial scientific field research in Antarctica*.

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 reports should include, as appropriate, 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. Wherever possible, Parties should deposit the original or copies of the 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.

8. Supporting documentation

Cantrill, D. J. 2000. A new macroflora from the South Orkney Islands, Antarctica: evidence of an Early to Middle Jurassic age for the Powell Island Conglomerate. *Antarctic Science* 12: 185-195.

Harris, C. M., Carr, R., Lorenz, K. and Jones, S. 2011. Important Bird Areas in Antarctica: Antarctic Peninsula, South Shetland Islands, South Orkney Islands – Final Report. Prepared for BirdLife International and the Polar Regions Unit of the UK Foreign & Commonwealth Office. Environmental Research & Assessment Ltd., Cambridge. Available at:
http://www.birdlife.org/datazone/userfiles/file/IBAs/AntPDFs/IBA_Antarctic_Peninsula.pdf

Holmes, K. D. 1965. *Interim geological report on Matthews and Powell islands*. British Antarctic Survey AD6/2H/1965/G2. 2pp

Longton, R.E. 1967. Vegetation in the maritime Antarctic. In Smith, J.E., *Editor*, A discussion of the terrestrial Antarctic ecosystem. *Philosophical Transactions of the Royal Society of London*, B, **252**, 213-235.

Morgan, F., Barker, G., Briggs, C., Price, R. and Keys, H. 2007. *Environmental Domains of Antarctica Version 2.0 Final Report*. Manaaki Whenua Landcare Research New Zealand Ltd, 89 pp.

Ochyra, R., Bednarek-Ochyra, H. and Smith, R.I.L. *The Moss Flora of Antarctica*. 2008. Cambridge University Press, Cambridge. 704 pp.

Øvstedal, D.O. and Smith, R.I.L. 2001. *Lichens of Antarctica and South Georgia. A Guide to their Identification and Ecology*. Cambridge University Press, Cambridge, 411 pp.

Peat, H., Clarke, A., and Convey, P. 2007. Diversity and biogeography of the Antarctic flora. *Journal of Biogeography*, 34, 132-146.

Poncet, S., and Poncet, J. 1985. A survey of penguin breeding populations at the South Orkney Islands. *British Antarctic Survey Bulletin*, No. 68, 71-81.

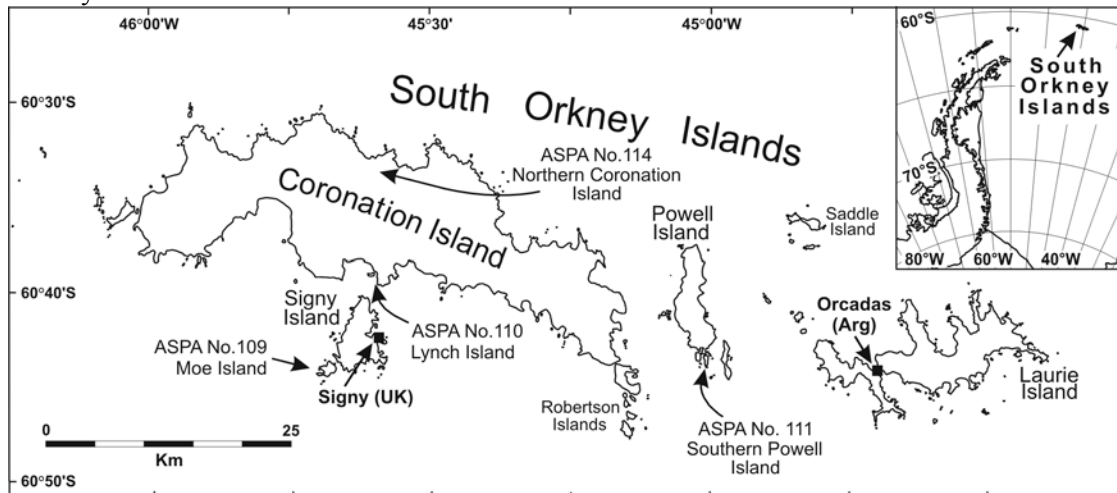
Smith, R. I. L. 1972. *British Antarctic Survey science report 68*. British Antarctic Survey, Cambridge, 124 pp.

Smith, R. I. L. 1984. Terrestrial plant biology of the sub-Antarctic and Antarctic. In: *Antarctic Ecology*, Vol. 1. Editor: R. M. Laws. London, Academic Press.

Thomson, J. W. 1973. The geology of Powell, Christoffersen and Michelsen islands, South Orkney Islands. *British Antarctic Survey Bulletin*, Nos. 33 & 34, 137-167.

Thomson, M. R. A. 1981. Late Mesozoic stratigraphy and invertebrate palaeontology of the South Orkney Islands. *British Antarctic Survey Bulletin*, No. 54, 65-83.

Map 1. The location of Southern Powell Island and adjacent island in relation to the South Orkney Islands and the other protected areas in the region. Inset: the location of the South Orkney Islands in Antarctica.



Map 2. Southern Powell Island and adjacent islands Antarctic Specially Protected Area No. 111.

