Management Plan

for Antarctic Specially Protected Area (ASPA) No. 129 ROTHERA POINT, ADELAIDE ISLAND

Introduction

The primary reason for the designation of Rothera Point, Adelaide Island (Lat. 68°07'S, Long. 67°34'W), South Shetland Islands, as an Antarctic Specially Protected Area (ASPA) is to protect scientific values, primarily that the Area would serve as a control area, against which the effects of human impact associated with the adjacent Rothera Research Station (UK) could be monitored in an Antarctic fellfield ecosystem. Rothera Point was originally designated in Recommendation XIII-8 (1985, SSSI No. 9) after a proposal by the United. Recent research has shown the ASPA to contain rich and diverse vegetation. Rothera Point along with nearby Léonie Island (part of which is included in ASPA 177 Léonie Islands and southeast Adelaide Island) are the two sites with the largest foristic richness and most complex vegetation within the wider geographical context of Marguerite Bay and Adelaide Island.

The Area is unique in Antarctica as it is the only protected area currently designated predominantly for its value in the monitoring of human impact. The objective is to use the Area as a control area which has been relatively unaffected by direct human impact, in assessing the impact of activities undertaken at Rothera Research Station on the Antarctic environment. Monitoring studies undertaken by the British Antarctic Survey (BAS) began at Rothera Point in 1976, before the establishment of the station later that year. On-going environmental monitoring activities within the Area and Rothera Point include:(i) assessment of heavy metal concentrations in lichens; (ii) measurement of hydrocarbon and heavy metal concentrations in gravel and soils and (iii) survey of the breeding bird populations.

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, Rothera Point is predominantly Environment Domain E (Antarctic Peninsula and Alexander Island main ice fields) which is also found in ASPAs 113, 114, 117, 126, 128, 129, 133, 134, 139, 147, 149, 152 and ASMAs 1 and 4. However, given that Rothera Point is predominantly ice-free this domain may not be full representative of the environment encompassed within the Area. Although not specifically described as such, Rothera Point may also contain Environment Domain B (Antarctic Peninsula mid-northern latitudes geologic). Other protected areas containing Environment Domain B include ASPAs 108, 115, 134, 140 and 153 and ASMA 4. Resolution 3 (2017) recommended that the Antarctic Conservation Biogeographic Regions (ACBRs) be used for the 'identification of areas that could be designated as Antarctic Specially Protected Areas within the systematic environmental-geographic framework referred to in Article 3(2) of Annex V to the Environmental Protocol. ASPA No. 129 sits within Antarctic Conservation Biogeographic Region (ACBR) 3 Northwest Antarctic Peninsula.n B include ASPAs 108, 115, 134, 140 and 153 and ASMA 4.

1. Description of values to be protected

- The Area has scientific value as a control area, against which the effects of human impact associated with the adjacent Rothera Research Station (UK) could be monitored in an Antarctic fellfield ecosystem.
- The Area contains one of the richest and most complex vegetations in the Marguerite Bay area and is representative of the plant life found in the north-western Antarctic Peninsula.
- The Area has value as a biological research site, particularly for scientists working in the Bonner Laboratory (Rothera Research Station).

2. Aims and objectives

Management of the Area aims to:

- avoid degradation of, or substantial risk to, the values of the Area by preventing unnecessary human disturbance to the Area;
- avoid major changes to the structure and composition of the terrestrial ecosystems, in particular to the fellfield ecosystem and breeding birds, by (i) preventing physical development within the site, and (ii) limiting human access to the Area to maintain its value as a control area for environmental monitoring studies;
- allow scientific research and monitoring studies 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;
- minimize to the maximum extent practicable, the introduction of non-native species, which could compromise the scientific values of the Area;
- preserve the natural ecosystem of the Area as a reference area for future comparative studies
- allow regular visits for management purposes in support of the objectives of the management plan.

3. Management activities

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

- Signboards illustrating the location and boundary of the Area and stating entry restrictions shall be erected at the major access points and serviced on a regular basis;
- A map showing the location and boundaries of the Area and stating entry requirements shall be displayed in a prominent position at Rothera Research Station;
- Visits shall be made as necessary to assess whether the Area continues to serve the purposes for which it was designated and to ensure management and maintenance measures are adequate.
- 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.

4. Period of designation

Designated for an indefinite period.

5. Maps

Map 1. ASPA No. 129 Rothera Point, location map.

Map specifications: Projection: WGS84 Antarctic Polar Stereographic. Standard parallel: 71°S. Central meridian 67°45'W.

Map 2. ASPA No. 129 Rothera Point, topographic map.

Map specifications: Projection: WGS84 Antarctic Polar Stereographic. Standard parallel: 71°S. Central meridian 67°45'W.

6. Description of the Area

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

BOUNDARIES AND CO-ORDINATES

Rothera Point (67°34'S, 68°08'W) is situated in Ryder Bay, at the south-east corner of Wright Peninsula on the east side of Adelaide Island, south-west Antarctic Peninsula (Map 1). The Area is the north-eastern one-third of Rothera Point (Map 2), and is representative of the area as a whole. It is extends about 280 m from west to east and 230 m from north to south, and rises to a maximum altitude of 36 m. At the coast, the Area boundary is the 5 m contour. No upper shore, littoral or sublittoral areas of Rothera Point are therefore included within the ASPA. The southern boundary of the Area, running across Rothera Point, is partially marked by rock filled gabions, in which are placed ASPA boundary signs. The remaining boundary is unmarked. There are two signboards just outside the perimeter of the Area located at the starting points of the pedestrian access route around Rothera Point (see Map 2). The boundary is broadly represented by the following co-ordinates, listed in a clockwise direction, starting with the most northerly point:

Area	Number	Latitude	Longitude
ASPA 129 Rothera Point	1	67°33'59" S	068°06'47" W
	2	67°34'06" S	068°06'48" W
	3	67°34'06" S	068°07'00" W
	4	67°34'02" S	068°07'08" W

Rothera Research Station (UK) lies about 250 m west of the western boundary of the Area (see inset on Map 2).

GENERAL DESCRIPTION

Small areas of permanent ice occur to the north and south of the summit of the ASPA. There are no permanent streams or pools. The rocks are predominantly heterogeneous intrusions of diorite, granodiorite and adamellite of the mid-Cretaceous-Lower Tertiary Andean Intrusive Suite. Veins of copper ore are prominent bright green stains on the rock. Soil is restricted to small pockets of glacial till and sand on the rock bluffs. Local deeper deposits produce scattered small circles and polygons of frost sorted material. There are no extensive areas of patterned ground. Accumulations of recent and decaying limpet (*Nacella concinna*) shells forming patches of calcareous soil around prominent rock outcrops used as bird perches by Dominican gulls (*Larus dominicanus*). There are no accumulations of organic matter. There are no special or rare geological or geomorphological features in the Area.

Areas of terrestrial biological interest are mostly on the rock bluffs where there is a locally abundant growth of lichens. The vegetation is representative of the southern "maritime" Antarctic fellfield ecosystem and is dominated by the fruticose lichens *Usnea antarctica, Usnea sphacelala*, and *Pseudephebe minuscula*, and the foliose lichen *Umbilicaria decussata*. Numerous crustose lichens are found, but bryophytes (mainly *Andreaea* spp.) are sparse. The vegetation of Rothera Point is representative of some of the foristic diversity typical of vegetation communities of the north-western Antarctic Peninsula. Furthermore, Rothera Point along with Leonie Island (part of which is included in

the newly designated ASPA 177 Leonie Islands and southeast Adelaide Island) are the two sites with the largest foristic richness and most complex vegetation within the wider geographical context of Marguerite Bay and Adelaide Island. As such the vegetation on Rothera Point is of exceptional value. Although Rothera Point and Léonie Island both have a high plant biodiversity, the number of shared plant species is not high, indicating the need to protect different vegetated sites within the Ryder Bay area.

The invertebrate fauna is impoverished and consists only of a few species of mites and springtails, of which *Halozetes belgicae* and *Cryptopygus antarcticus* are the most common. There are no special or rare fauna in the Area. During monitoring studies undertaken in January 2015, no non-native springtails were found within the ASPA or elsewhere on Rothera Point.

South polar skuas ((*Stercorarius maccormicki*) are the most abundant breeding birds found in the Area, with up to five pairs of skuas recorded nesting. A pair of Dominican gulls (*Larus dominicanus*) nest in the Area and one Wilson's storm petrels (*Oceanites oceanicus*) nest has been found. The south polar skuas at Rothera Point have been monitored annually since the 1988/89 season. Nest sites are often reused but may be inactive for a number of consecutive years. Long-term data indicated that the population size at Rothera Point varied considerably between years, increasing overall by 1.9% per annum from 11 breeding pairs in 1975/76 to 24 breeding pairs in 2017/18. ASPA 129 is contained within Antarctic Important Bird Area (IBA) No. 47236 (AQ205), which was designated in 2018; this is the first IBA to be identified in Antarctica since the wider review of candidate sites by Harris et al. (2015) (see Resolution 5 (2015)). The IBA qualifies on the basis of the large breeding populations of south polar skua and Antarctic shag (although no shags breed within the ASPA 129). The IBA includes Rothera Point and the islands in Ryder Bay, which in January 2018 held 978 occupied territories of south polar skuas, 259 south polar skuas at club sites and 405 pairs of Antarctic shags. Based on these counts, the islands in the wider Ryder Bay area contain an estimated c. 3.5% of all breeding Antarctic shags, and c. 10.3% of all breeding south polar skuas.

6(ii) Access to the Area

- Access to the Area shall be by foot.
- Helicopter landings are prohibited within the Area.
- The operation of aircraft should be carried out, to the maximum extent possible, in compliance with the 'Guidelines for the Operation of Aircraft near Concentrations of Birds' contained in Resolution 2 (2004). However, the Area is only c. 250 m from the Rothera Research Station runway and for reasons of safety it is recognized that full compliance may not always be possible.
- The Area boundary extends to the 5 m contour at the coast. There is unrestricted pedestrian access below this contour height around the boundary of the Area. The recommended pedestrian access route follows the Mean High Water Mark (MHWM) and is shown on Map 2. During periods when the ground is snow-covered and sea ice has formed, pedestrians should ensure that they are at a safe distance from the shoreline and are not in danger of straying onto unreliable sea ice or into tide cracks.

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

A rock cairn marks the summit of the Area (36 m; Lat. 68°34'01.5'' S, Long. 068°06'58'' W) and 35 m to the east south east of it there is another cairn marking a survey station (35.4 m; Lat. 68°34'02'' S, Long. 068°06'55'' W).

Rothera Research Station (UK) lies about 250 m west of the western boundary of the Area (see inset on Map 2). A number of masts and aerials exist on the raised beach that is adjacent to the southern boundary of the Area.

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

ASPA No. 177 Léonie Island and southeast Adelaide Island, Antarctic Peninsula is the closest ASPA to ASPA 129 Rothera Point, with the closest sub-site located 4 km away. ASPA No. 107, Emperor Island, Dion Islands, Marguerite Bay, lies about 15 km south of Adelaide Island. ASPA No. 115, Lagotellerie Island, Marguerite Bay, lies about 11 km south of Pourquoi Pas Island. ASPA No. 117, Avian Island, Marguerite Bay, lies about 0.25 km south of the south-west tip of Adelaide Island. The locations of these ASPAs are shown on Map 1.

6 (v) Special 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. Conditions for issuing a Permit to enter the Area are that:

- it is issued only for compelling scientific reasons which cannot be served elsewhere or it is issued for essential management purposes such as inspection, maintenance or review;
- the actions permitted will not jeopardise the environmental or scientific values of the Area;
- any management activities are in support of the objectives of the Management Plan;
- the actions permitted are in accordance with this Management Plan;
- the Permit, or an authorised copy, must be carried within the Area;
- permits shall be issued for a stated period;
- 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

- Access to, and movement within, the Area shall be on foot.
- Land vehicles are prohibited in the Area.
- Landing of helicopters within the Area is prohibited.
- All movement shall be undertaken carefully so as to minimize disturbance to soil and vegetation.
- The Rothera Research Station runway commenced operation in 1991 and is located within 400 m of the Area. Given the proximity of the runway, on occasions overflight of the Area may be necessary for operational or scientific reasons. To the maximum extent possible, the operation of aircraft over the Area should be carried out, in compliance with the Guidelines for the Operation of Aircraft near Concentrations of Birds contained in Resolution 2 (2004) (available at: *http://www.ats.aq/documents/recatt/Att224_e.pdf*).
- Overflight of bird colonies within the Area by Remotely Piloted Aircraft Systems (RPAS) shall not be permitted unless for compelling scientific or operational purposes, and in accordance with a permit issued by an appropriate national authority. Furthermore, operation of RPAS within or over the Area shall be in accordance with the 'Environmental guidelines for operation of Remotely Piloted Aircraft Systems (RPAS) in Antarctica' (Resolution 4 (2018)) (available at: *https://documents.ats.aq/recatt/att645_e.pdf*).

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

Activities which are or may be conducted within the Area are:

- scientific research or monitoring which will not jeopardise the ecosystems of the Area;
- essential management activities.

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, 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

Camping in the Area is prohibited. Accommodation may be available at Rothera Research Station.

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

No living animals, plant material or microorganisms shall be deliberately introduced into the Area. To ensure that the 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. No poultry or egg products shall be taken into the Area. Further guidance can be found in the CEP Non-native Species Manual (Resolution 4 (2016)) and COMNAP/SCAR Checklists for supply chain managers of National Antarctic Programmes for the reduction in risk of transfer of non-native species. 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 shall not be permitted. Fuel, food and other materials are not to be deposited within the Area, unless authorized by Permit for specific scientific or management purposes. Permanent depots are not permitted. All materials introduced shall be for a stated period only, shall be removed at or before the conclusion of the stated period, and shall be stored and handled so that risk of their introduction into the environment is minimised. 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 shall be notified of any materials released and not removed that were not included in the authorised Permit.

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

Taking of or harmful interference with native flora and fauna is prohibited, except in accordance with a Permit 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 this should in accordance with the SCAR Code of Conduct for the use of Animals for Scientific Purposes in Antarctica (Resolution 4 (2019)), as a minimum standard.

7 (viii) The collection or removal of materials not brought into the Area by the Permit holder

Material of a biological or geological nature may be collected and/or removed from the Area only in accordance with a Permit and should be limited to the minimum necessary to meet scientific or management needs. Permits shall not be granted if there is reasonable concern that the sampling proposed would take, remove or damage such quantities of soil, sediment, flora or fauna that their distribution or abundance within the Area would be significantly affected. Material of human origin not brought into the site by the Permit holder, or otherwise authorised, which is likely to compromise the values of the Area shall be removed unless the impact of removal is likely to be greater than leaving the material in situ. In the latter case the appropriate authority shall be notified.

7 (ix) Disposal of wastes

All wastes shall be removed from the Area in accordance with Annex III (Waste disposal and waste management) of the Protocol on Environmental Protection to the Antarctic Treaty (1998). All solid and/or liquid human waste shall be removed from the Area.

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

- Permits may be granted to enter the Area to carry out 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 (Resolution 5 (2018)).*r 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 visit reports should include, as applicable, the information identified in the recommended visit report form (contained as an Appendix in the Guide to the Preparation of Management Plans for Antarctic Specially Protected Areas (available from the website of the Secretariat of the Antarctic Treaty; www.ats.aq)). 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.

8. Supporting documentation

Block, W., and Star, J. 1996. Oribatid mites (Acari: Oribatida) of the maritime Antarctic and Antarctic Peninsula. Journal of Natural History 30: 1059-67.

Bonner, W. N. 1989. Proposed construction of a crushed rock airstrip at Rothera Point, Adelaide Island - final Comprehensive Environmental Evaluation. NERC, Swindon. 56 pp.

Cannone, N., Convey, P., and Malfasi, F. 2018. Antarctic Specially Protected Areas (ASPA): a case study at Rothera Point providing tools and perspectives for the implementation of the ASPA network. Biodiversity and Conservation 27: 2641–2660.

Convey, P., and Smith, R.I.L. 1997. The terrestrial arthropod fauna and its habitats in northern Marguerite Bay and Alexander Island, maritime Antarctic. Antarctic Science 9:12-26.

Downie, R., Ingham, D., Hughes, K. A., and Fretwell, P. 2005. Initial Environmental Evaluation: proposed redevelopment of Rothera Research Station, Rothera Point, Adelaide Island, Antarctica. British Antarctic Survey, Cambridge, 29 pp.

Hughes, K.A., Greenslade, P., and Convey, P. 2017. The fate of the non-native Collembolon, *Hypogastrura viatica*, at the southern extent of its introduction range in Antarctica. Polar Biology 40: 2127–2131.

Milius, N. 2000. The birds of Rothera, Adelaide Island, Antarctic Peninsula. Marine Ornithology 28: 63-67.

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.

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.

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

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

Phillips, R.A., Silk, J.R.D., Massey, A., and Hughes, K.A. 2019. Surveys reveal increasing and globally important populations of south polar skuas and Antarctic shags in Ryder Bay. Polar Biology 42: 423–432.

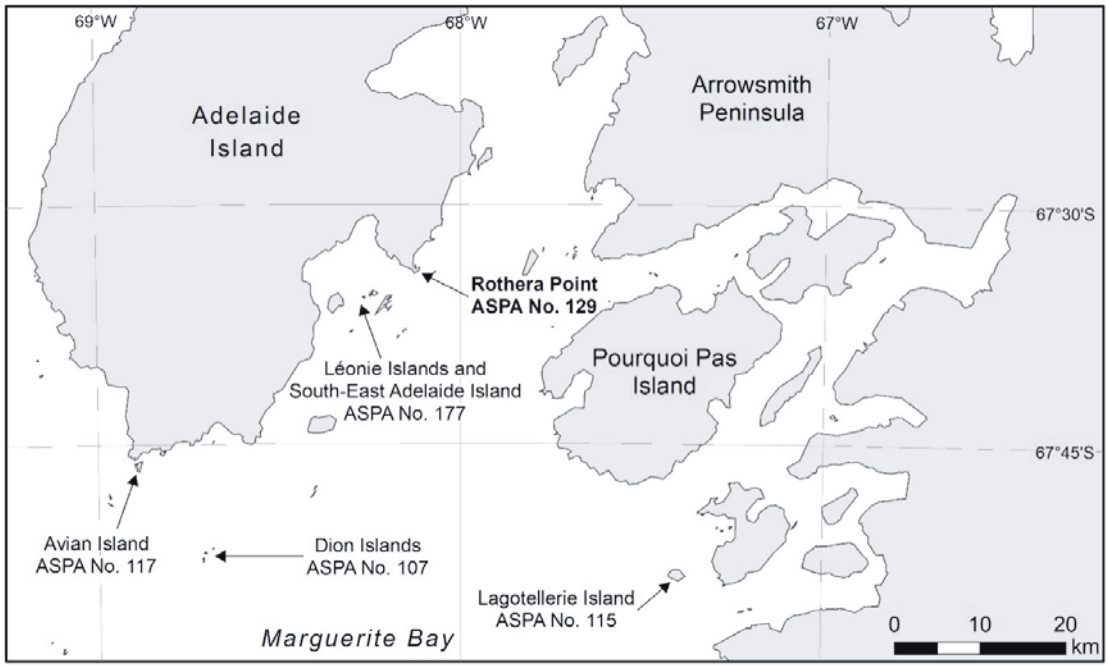
Riley. T. R., Flowerdew, M. J. and Whitehouse, M. J. 2012. Chrono- and lithostratigraphy of a Mesozoic–Tertiary fore- to intra-arc basin: Adelaide Island, Antarctic Peninsula. Geological Magazine 149: 768-782.

Shears, J. R. 1995. Initial Environmental Evaluation – expansion of Rothera Research Station, Rothera Point, Adelaide Island, Antarctica. British Antarctic Survey, Cambridge, 80 pp.

Shears, J. R., and Downie, R. 1999. Initial Environmental Evaluation for the proposed construction of an accommodation building and operations tower at Rothera Research Station, Rothera Point, Adelaide Island, Antarctica. British Antarctic Survey, Cambridge, 22 pp.

Map 1. ASPA No. 129 Rothera Point, location map.

Map specifications: Projection: WGS84 Antarctic Polar Stereographic. Standard parallel: 71°S. Central meridian 67°45'W.



Map 2. ASPA No. 129 Rothera Point, topographic map.

Map specifications: Projection: WGS84 Antarctic Polar Stereographic. Standard parallel: 71°S. Central meridian 67°45'W.