

# Sites of Special Scientific Interest

## Site of Special Scientific Interest No. 1

### Annex to Recommendation XIII-9

#### Site of Special Scientific Interest No 1: Cape Royds, Ross Island

##### *Management Plan*

i. *Description of Site.* Cape Royds is situated at the western extremity of Ross Island, McMurdo Sound (lat 77°33'S, long 166°08'E), about 37 km north-northwest of McMurdo Station. The Site consists of all that area of Cape Royds west of a line drawn from the south coast of the Cape through Flagstaff Hill to the south-eastern tip of Pony Lake, and the west shoreline of this lake; and south of a line drawn from the western extremity of Pony Lake 280° True to the coast; including the littoral and sublittoral zones from Derrick Point on the east side of Arrival Bay about 4 km northwards to Rocky Point to the north of Horseshoe Bay, extending 500m offshore from highwater mark. The boundaries of the Site are shown on the attached map.

ii. *Reason for designation.* The structure and dynamics of the Cape Royds ecosystem, and the relationship with the penguin rookery are the subjects of scientific research. The research area and the main seaward access by Adelie penguins to the rookery should be protected by the creation of a reserve. The coastline of Cape Royds is an important feeding ground for Adelie penguins. The coast between Flagstaff Point and Proposed future research on the Cape Royds coastline incorporates further research on the dynamic of the Cape Royds inshore marine ecosystem. The Cape Royds penguin rookery and historic site provide an attraction for sightseers from the nearby station complexes at Scott Base and McMurdo. Regular visits are made to the area by tourists from vessels which sail into McMurdo Sound. The Site will help control any possible impact from these activities in the future.

iii. *Outline of research.* The coastal area of Cape Royds is the site of continuing New Zealand research studies on Nototheniid fish population structure and dynamics. These studies, which began in 1981, involve the capture, measurement, tagging and release of *Trematomus bernacchii*. The Adelie penguin rookery population at Cape Royds has been continuously monitored since 1965, and these studies will also continue.

iv. *Date of expiry of designation.* 31 December 1995.

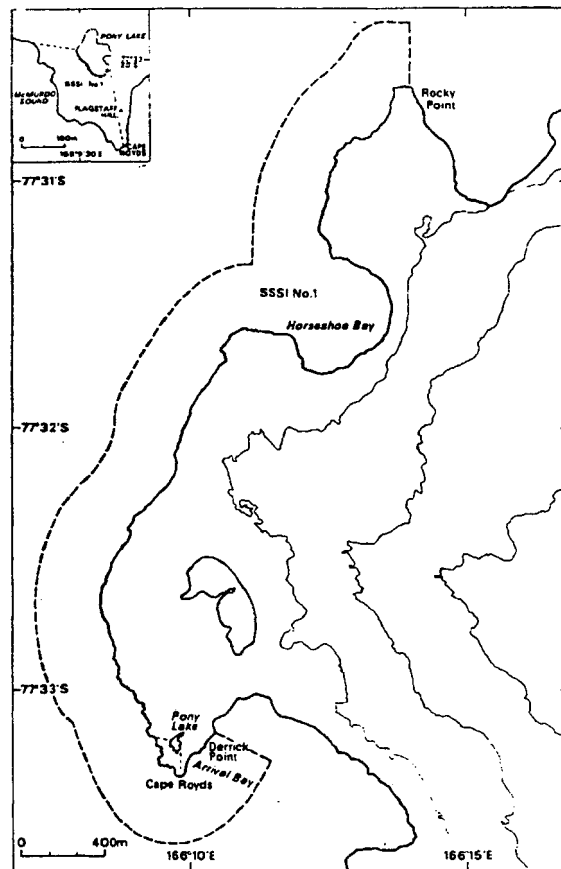
v. *Access points.* The Site should not be entered during the period of penguin occupation (approximately mid-October to mid-March) except by the marked tracks. Only scientists engaged in the scientific studies should approach the penguin colonies at this period. Photographs of the colonies, except for scientific purposes, should be taken from the boundaries of the Site. Access points to the seaward portions of the Site are unrestricted. Boat access from tourist ships or casual visitors should be via the northernmost cove in Backdoor Bay.

vi. *Pedestrian and vehicular routes.* No, vessels, vehicles or helicopters of any description should enter the Site except in event of emergency. Pedestrians should keep to the marked tracks and not move through areas populated by penguins, except as necessary in the course of scientific investigations.

vii. *Other kinds of scientific investigations which would not cause harmful interference.*  
None specified.

viii. *Scientific sampling.* This should be restricted to the minimum required in connection with the research programme.

ix. *Other restraints.* Any activity which would detract from the scientific research for which the area has been designated should be avoided. In particular, the following activities should be avoided: 1. Landscaping and removing surface material; 2. Construction of huts and buildings; and 3. Depositing of any pieces of equipment or material that would in any way hinder re-occupation of nests by penguins.

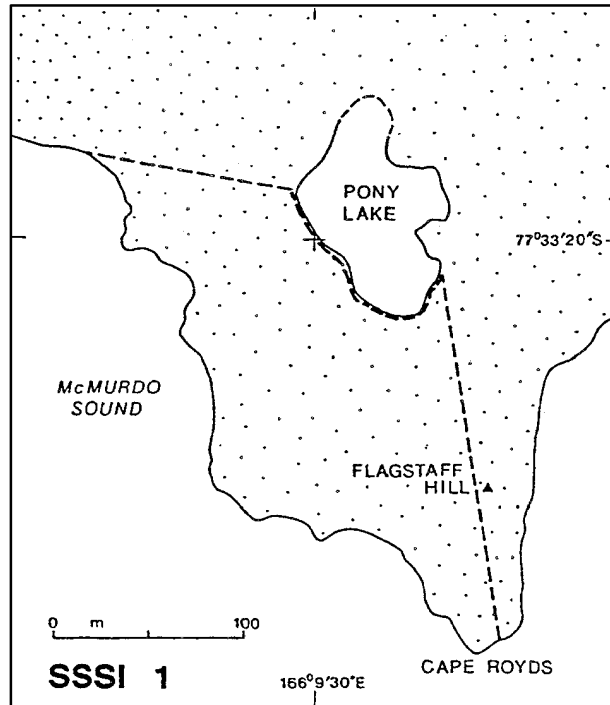


## **Annex to Recommendation VIII-4**

### **Cape Royds, Ross Island**

#### *Management Plan*

- i. *Description of Site.* All that area of Cape Royds west of a line drawn from the south coast of the Cape through Flagstaff Hill to the south eastern tip of Pony Lake, and the west shoreline of this lake; and south of a line drawn from the western extremity of Pony Lake 2803 True to the coast. The boundaries, which are demarcated, are shown on the attached map.
- ii. *Reason for designation.* This area supports the most southerly Adelie Penguin (*Pygoscelis adelia*) colony known, the survival of which is marginal. The population declined rapidly from 1956 following interference by man until 1963 when the United States and New Zealand authorities agreed to restrict activities and develop a management plan for the area. It is considered important to continue study of this colony under controlled conditions, at least until the penguin population has recovered to its estimated normal pre-1956 (pre-man) level.
- iii. *Outline of research.* A long-term study of the population dynamics began in 1969 and is expected to continue.
- iv. *Date of expiry of designation.* 30 June 1981.
- v. *Access points.* The Site should not be entered during the period of penguin occupation (approximately mid-October to March) except by marked tracks. Only scientists engaged in the population studies should enter the Site during his period. Visitors to Cape Royds should not enter the Site. Photographs of the colony, except for scientific purposes, should be taken from the boundaries of the site.
- vi. *Pedestrian and vehicular routes.* Vehicles should not enter the Site. Pedestrians should keep to the marked tracks and not move through the populated areas except as necessary in the course of scientific investigations. Helicopters and low-flying aircraft should avoid the penguin colony in accordance with the Agreed Measures for the Conservation of Antarctic Fauna and Flora.
- vii. *Other kinds of scientific investigations which would not cause harmful interference.* Other kinds of scientific investigations should not be under taken while penguins occupy the Site.
- viii. *Scientific sampling.* Taking samples of the bird population by killing, capture, or taking of eggs should be done only for a compelling scientific purpose and in accordance with the Agreed Measures for the Conservation of Antarctic Fauna and Flora.
- ix. *Other restraints.* The following activities should be avoided:
  1. Landscaping and removing surface material;
  2. Construction of huts and buildings;
  3. The depositing of any pieces of equipment or material that would in any way hinder re-occupation of nests by penguins.



**SSSI 1, Cape Royds**

## **Site of Special Scientific Interest No. 2**

### **Annex to Recommendation VIII-4**

#### **Arrival Heights, Hut Peninsula, Ross Island**

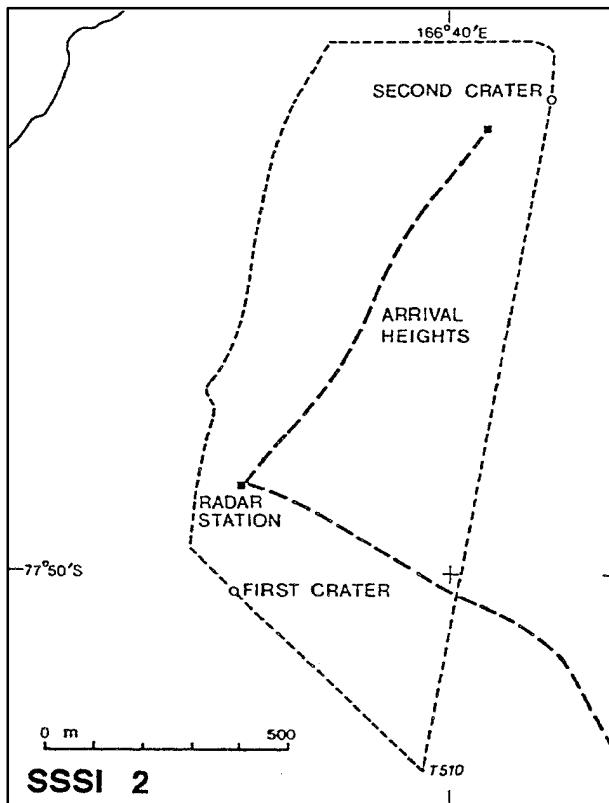
##### *Management plan*

- i. *Description of Site.* All that area of Arrival Heights enclosed with a line drawn from Trig T510 north-west over First crater to the 500 foot contour, then north along this contour to a point immediately west of Second Crater, then around the lip of this crater and south to Trig T510. The boundary, which is demarcated, is shown on the attached map.
- ii. *Reason for designation.* This area is an electromagnetically and natural 'quiet site' offering ideal conditions for the installation of sensitive instruments for recording minute signals associated with upper atmosphere programmes.
- iii. *Outline of research.* Upper atmosphere investigations associated with auroral and geomagnetic studies.
- iv. *Date of expiry of designation.* 30 June 1981.
- v. *Access points.* None are defined but movement within the area by vehicles or personnel other than those directly concerned with the investigations should be kept to the minimum necessary for implementing the programme.
- vi. *Pedestrian and vehicular routes.* Vehicles and pedestrians should keep to the tracks shown on the attached map.

vii. *Other kinds of scientific investigations which would not cause harmful interference.* Scientific investigations other than those associated with the upper atmosphere programme should be kept to a minimum.

viii. *Scientific sampling.* Not applicable.

ix. *Other restraints.* No RF transmitting equipment other than low power transceivers for local essential communication may be installed within this Site. Every precaution should be taken to ensure that electrical equipment is adequately suppressed and correctly installed to keep man-made electrical noise to an absolute minimum.



**SSSI 2, Arrival Heights**

### **Site of Special Scientific Interest No.3**

#### **Annex to Recommendation VIII-4**

#### **Barwick Valley, Victoria Land**

##### *Management Plan*

i. *Description of Site.* The Site includes the greater part of Barwick Valley, Victoria Land, and contains parts of several glaciers, exposed soils, a lake about 3km wide and 16km long and a connecting stream about 5km long leading to Lake Vashka. It is bordered on the south, west and north by Olympus, Willett, and Clare Ranges respectively. The boundary of the Site approximates to an irregular pentagon enclosing about 325 km<sup>2</sup>. The Site is defined by lines joining Skew Peak (77°24'S, 160°43'E), Sponsors Peak (77°18'S, 161°24'E), a point on the Insel Range (77°24'S, 161°26'E), a point in the Apocalypse Peaks (77°24'S, 160°46'E),

Mount Bastion (77°19'S, 60°34'E) and Skew Peak. The boundaries are shown on the attached map.

ii. *Reason for Designation.* Barwick Valley is one of the least disturbed and contaminated of the Dry Valleys of Victoria Land, which are environmentally unique and possess extreme polar desert ecosystems. The Site is important as a reference base against which to measure changes in comparable ecosystems of the other Dry Valleys where a considerable variety of scientific investigations have been conducted regularly over the past decade. It is also expected to be of use in connection with global environmental monitoring.

iii. *Outline of research.* Investigations are proposed of the microbiology, bacteriology, mycology (especially of yeast and moulds), and of the terrestrial and aquatic ecosystems, with special programmes to establish baseline measurements for biological and environmental monitoring.

iv. *Date of expiry of designation.* 30 June 1981.

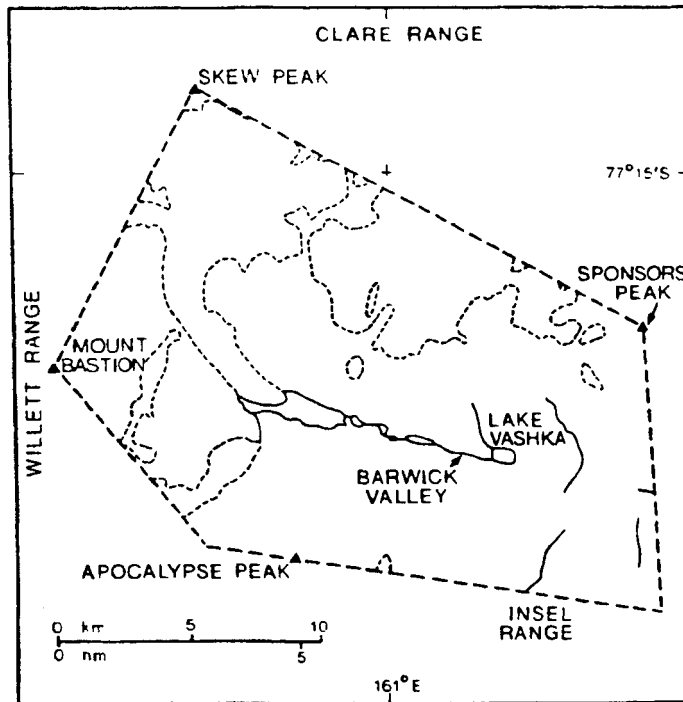
v. *Access points.* Access should be by helicopter to Wright Valley, thence into the Barwick Valley Site on foot past Lake Vashka.

vi. *Pedestrian and vehicular routes.* Vehicles should not be used. Pedestrian routes should keep to well-drained ground avoiding streams and the lake margins as much as possible.

vii. *Other kinds of scientific investigations which would not cause harmful interference.* Geological pedagogical, and glaciological studies except those which would introduce exotic species and those which would disrupt or damage the existing ecosystems.

viii. *Scientific sampling.* Scientific sampling in the Site should be restricted to that which can be accomplished without introducing new organisms, including micro-organisms, and without disturbing the environment.

ix. *Other restraints.* Overflight of the Site should be avoided. Aircraft landing and vehicle parking should be kept well outside the boundaries of the Site. Field activities should be kept to a minimum. Permanent field camps, landfill disposal, and other activities which would introduce new materials or organisms, including micro-organisms, into the Site should be avoided. All material carried into the Site should be removed.



**SSSI 3, Barwick Valley**

#### **Site of Special Scientific Interest No. 4**

*Note:* Cape Crozier was originally designated as SPA No. 6 by Recommendation IV-6. Its Designation as an SPA was terminated by Recommendation VIII-2, and its redesignation as an SSSI was initiated by Recommendation VIII-4. [see under SPA No. 6 for the text of IV-6]

#### **Annex to Recommendation VIII-4**

#### **Cape Crozier, Ross Island**

##### *Management Plan*

i. *Description of Site.* The Site comprises 40 km<sup>2</sup> and includes the land areas where the Adelie Penguins (*Pygoscelis adeliae*) nest and the adjacent fast ice where the Emperor Penguins (*Aptenodytes forsteri*) annually breed. It is bounded by lines joining 77°28'S, 169°20'E, 77°28'S, 169°28'E, 77°31'S, 169°28'E, 77°31'S, 169°20'E, to the summit of Post Office Hill and north-east of a line which bears 315° True from the summit of Post Office Hill to the coast. The boundaries of the Site, the access track and road, the helicopter landing place and refuge hut are indicated on the attached map.

ii. *Reason for designation.* The penguin colonies are the subject of long-term studies of population dynamics and social behavior, and are relatively accessible by air from McMurdo Station and Scott Base. Access to the Site should be restricted to scientists engaged in investigations within the Site.

iii. *Outline of research.* Studies of the Emperor and Adelie Penguin populations and their ethology, life cycles, physiological adaptation and natural population fluctuations. Detection of possible changes in their biological characteristics which may be due to man-induced changes in the environment.

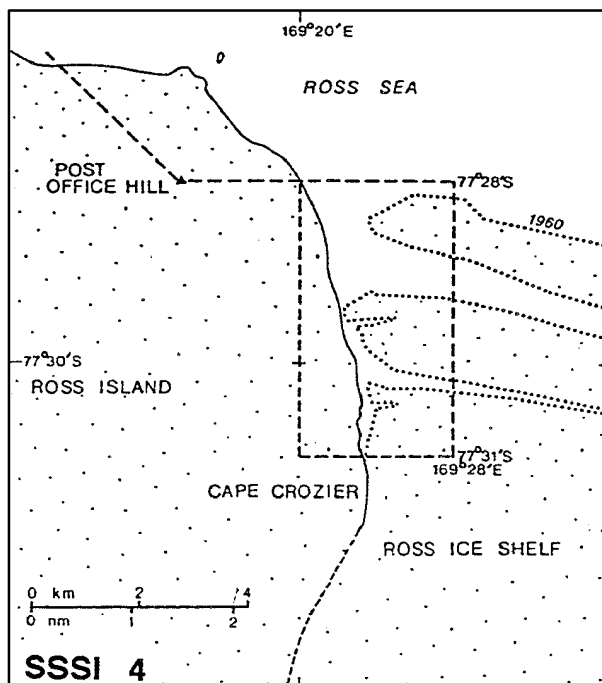
iv. *Date of expiry of designation.* 30 June 1981.

v. *Access points.* Access should be at points on the boundary closest to the refuge hut and the helicopter landing place.

vi. *Pedestrian and vehicular routes.* Helicopters and low-flying aircraft should avoid the Site. Vehicles should not enter the Site and should approach the Site boundary, when serving authorised activities, on courses at right angles to the boundary orientation. Pedestrian movement within the Site should be limited to the shortest routes consistent with the scientific activity.

vii. *Other kinds of scientific investigations which would not cause harmful interference.* Biological, pedological, and geological observations except those which would cause harm to the birds or interfere with the breeding success of the penguin colonies. As far as possible such studies should be made at time when the Adelie Penguin colony is absent or when the Emperor Penguin colony is at least 1 km from the locality under scientific consideration.

viii. *Scientific sampling.* Taking samples of the bird populations by killing, capture, or taking of eggs should be done only for a compelling scientific purpose and in accordance with the Agreed Measures for the Conservation of Antarctic Fauna and Flora. Close inspection of birds, including photography, or taking blood or other biological samples, should be kept to a minimum.



**SSSI 4, Cape Crozier**



## **Site of Special Scientific Interest No. 5**

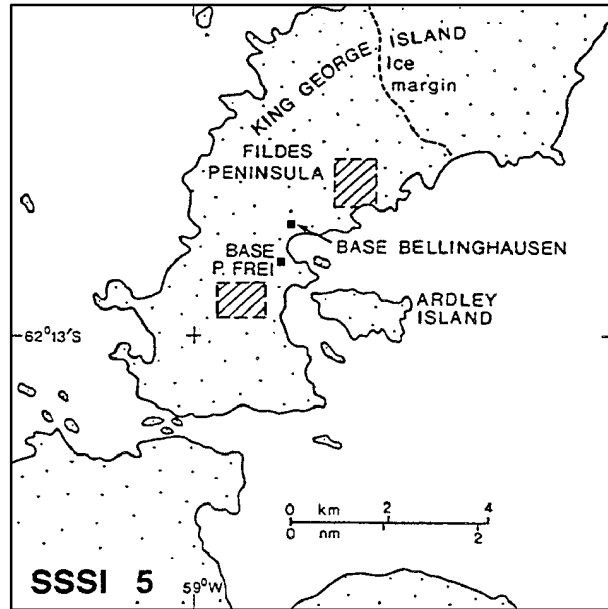
*Note:* Fildes Peninsula was originally designated as an SPA under Recommendation IV-12. The description of the Area was significantly amended by Recommendation V-5. Its designation as a SPA was terminated by Recommendation VIII-2, and its designation as an SSSI was initiated by Recommendation VIII-4. [see under SPA No. 12 for the texts of V-5 and IV-12]

### **Annex to Recommendation VIII-4**

#### **Fildes Peninsula, King George Island, South Shetland Islands**

##### *Management Plan*

- i. *Description of Site.* The two areas on Fildes Peninsula shown on the attached map will be demarcated.
- ii. *Reason for designation.* The unique fossil ichnolites found in these areas are located close to two permanent scientific stations which have been visited frequently by tourist groups. The areas also contain representative sequences of Tertiary strata.
- iii. *Outline of research.* The main object of the research programme is to describe the Tertiary stratigraphic sequences and to understand the geological evolution of this part of the Antarctic Peninsula
- iv. *Date of expiry of designation.* 30 June 1981.
- v. *Access points.* None are defined.
- vi. *Pedestrian and vehicular routes.* Vehicles and helicopters should not enter the Site except in an emergency.
- vii. *Other kinds of scientific investigations which would not cause harmful interference.* Scientific research other than geological should be kept to a minimum.
- viii. *Scientific sampling.* Samples of rocks should only be taken for compelling scientific purposes.
- ix. *Other restraints.* Buildings and other facilities should not be erected in the Site.



**SSSI 5, Fildes Peninsula**

## **Site of Special Scientific Interest No. 6**

*Note:* Byers Peninsula was originally designated as SPA No. 10 by Recommendation IV-6. Its designation as an SPA was terminated by Recommendation VIII-2, and its designation as an SSSI was initiated by Recommendation VIII-4. [see under SPA No. 10 for the text of IV-6]

### **Annex to Recommendation XVI-5**

#### **Amendment to Site of Special Scientific Interest No. 6:**

#### **Byers Peninsula, Livingston Island, South Shetland Islands**

This Site currently comprises three areas of varying shape and size on Byers Peninsula designated solely for their sedimentary and palaeontological interest. However, the peninsula is also of considerable biological and archaeological importance.

1. *Geographical location.* Byers Peninsula is an extensive, largely ice-free area at the western end of Livingston Island, South Shetland Islands, centred on lat 62°38'S, long 61°05'W.

#### 2. *Management Plan*

- i. *Description of site.* The site comprises the entire area of Byers Peninsula extending from the ice margin on the west side of Rotch Dome (to a point directly north of Stackpole Rocks) westwards to the west end of Ray Promontory. The littoral zone of the Peninsula is included within the Site. The nearby offshore islets and islands are not included in the Site. Most of the Site is low and undulating, below 100m altitude, except for Ray Promontory which has a more rugged topography, rising to over 200m at Penca Hill and Start Hill. Numerous volcanic plugs, lakes, pools and

streams occur between Ray Promontory and the Rotch Dome ice field. Coastal areas often have broad beaches several hundred metres wide, with raised beaches behind.

- ii. *Reason for designation.* The fossils found in this area provide evidence of the former link between Antarctica and the other southern continents. A long-term palaeontological research programme has been in progress since the mid-1960s. It is important to protect these Jurassic and Cretaceous rocks from being used as building materials or taken as souvenirs.

The site is of special biological importance. It has a sparse but diverse flora of both calcicolous and calcifuge plants and cyanobacteria associated with the lavas and basalts, respectively. Basaltic plugs are particularly well-vegetated. Several rare cryptogams and the two native vascular plants (*Colobanthus quitensis* and *Deschampsia antarctica*) occur at several sites. There are several coastal and inland lakes, the latter having a particularly important biota, including aquatic mosses, and serve as breeding sites for the midge *Parochlus steineni*, the only native winged insect in the Antarctic and with exceptionally restricted distribution. The only other Antarctic dipteran, the apterous *Belgica antarctica*, occurs in stands of wet moss.

The site is also unique in possessing the greatest concentration of historical sites in Antarctica, namely the remains of refuges, together with contemporary artefacts, and shipwrecks of early nineteenth century sealing expeditions.

It is important that both the biological and archaeological features are also afforded protection.

- iii. *Outline of research.* A long-term geological and palaeontological research programme was established in 1964. The main objectives are the description of sediments and fossils found in this area. Botanical, zoological, limnological, ornithological and archaeological investigations have also been undertaken throughout the Site at various times since the late 1950s.
- iv. *Date of expiry of designation.* 31 December 2001.
- v. *Access points.* None defined.
- vi. *Pedestrian and vehicular routes.* Vehicles should not enter the Site, except in an emergency. Helicopters should land only on unvegetated ground at least 500m from any bird or seal concentrations, or freshwater bodies.
- vii. *Other kinds of scientific investigations which would not cause harmful interference.* Scientific research other than archaeological, biological and geological should be kept to a minimum.
- viii. *Scientific sampling.* Samples of rocks or biological specimens should only be taken for compelling scientific purposes.
- ix. *Other restraints.* Buildings and other facilities should not be erected in the Site.

All non-human waste should be removed from the Site. No combustible waste should be incinerated within the Site. There should be no interference of any sealers' refuges (huts, caves, etc) nor removal of any associated artefacts (including implements, timbers, fabrics, etc) from these features or from the

beaches. No skeletal remains of any animal should be moved within or removed from the Site.

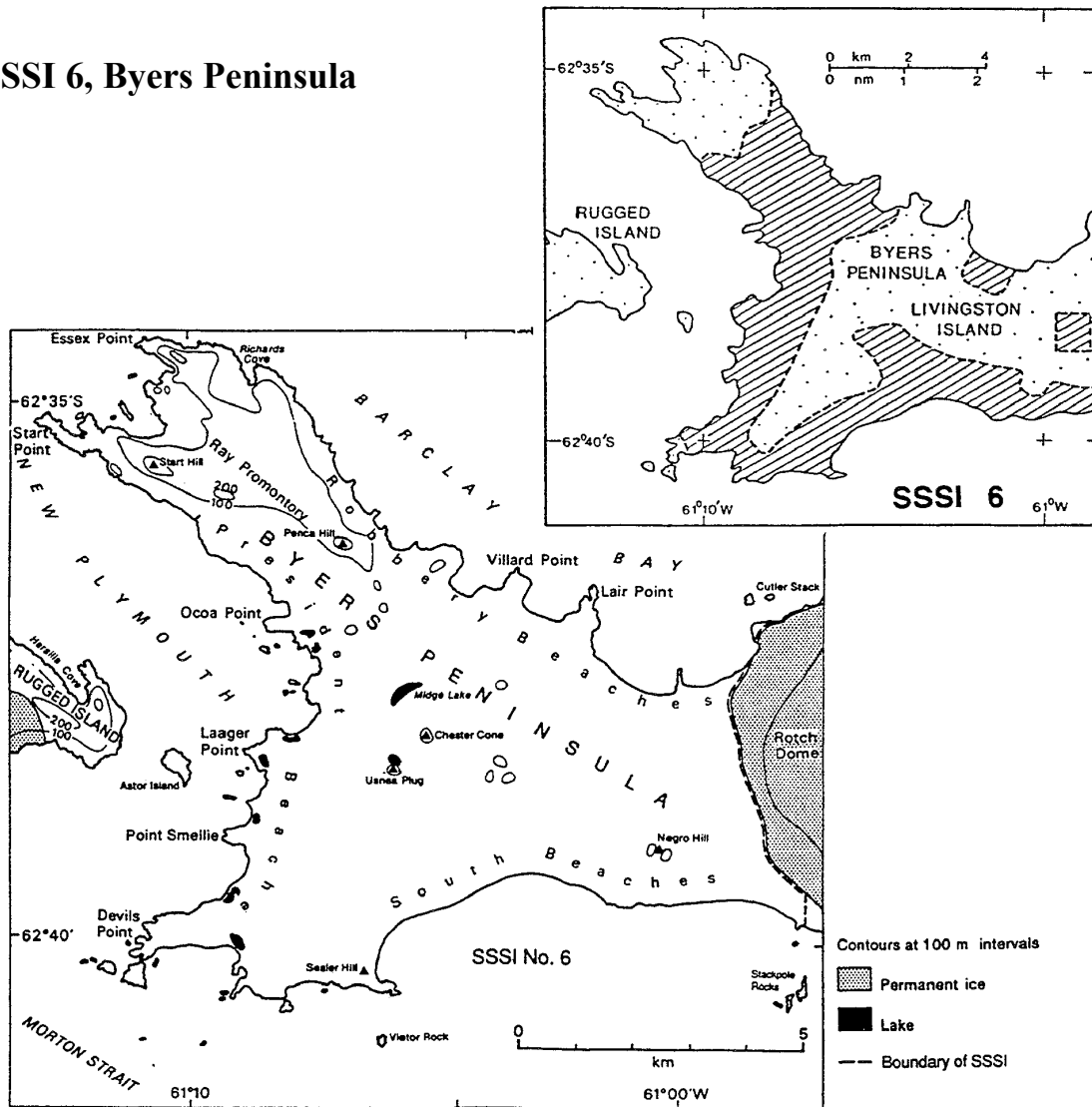
#### **Annex to Recommendation VIII-4**

#### **Byers Peninsula, Livingston Island South Shetland Islands**

##### *Management Plan*

- i. *Description of Site.* The Site comprises three areas of sedimentary and fossiliferous strata on Byers Peninsula. These areas are shown on the attached map.
- ii. *Reason for designation.* The fossils found in this area provide evidence of the former link between Antarctica and the other Southern Continents. A long-term paleontological research programme is in progress. It is important to protect these Jurassic and Cretaceous rocks from being used as building materials or as souvenirs.
- iii. *Outline of research.* A long-term research programme was established in 1964. The main objectives are the description of sediments and fossils found in this area.
- iv. *Date of expiry of designation.* 30 June 1981.
- v. *Access points.* None are defined.
- vi. *Pedestrian and vehicular routes.* Vehicles should not enter the Site except in an emergency.
- vii. *Other kinds of scientific investigations which would not cause harmful interference.* Scientific research other than geological should be kept to a minimum.
- viii. *Scientific sampling.* Samples of rocks or biological specimens should only be taken for compelling scientific purposes.
- ix. *Other restraints.* Buildings and other facilities should not be erected in the Site.

## SSSI 6, Byers Peninsula



## Site of Special Scientific Interest No. 7

### Annex to Recommendation VIII-4

#### Site of Special Scientific Interest No. 7 Haswell Island

##### *Management Plan*

i. *Description of Site.* The Site consists of Haswell Island (66°31'S, 93°00'E), about 1 km<sup>2</sup> in area, the largest of a group of islands lying close to Mirny station, together with its littoral zone and the area of fast ice, when present, lying within the delimitation shown on the attached map. [not reproduced here]

ii. *Reason for designation.* The Site is an exceptionally prolific and representative breeding locality for all the species of birds which occur in this part of the Antarctic (five species of petrel (*Procellariiformes*), one species of skua (*Catharacta skua*), and one species of penguin

(*Pygoscelis adeliae*). The Site provides exceptional opportunities for research and needs protection in view of its close proximity to a large Antarctic station.

iii. *Outline of research.* A long-term biological programme associated with the bird colonies and studies of the inshore marine biology are expected to continue in the Site.

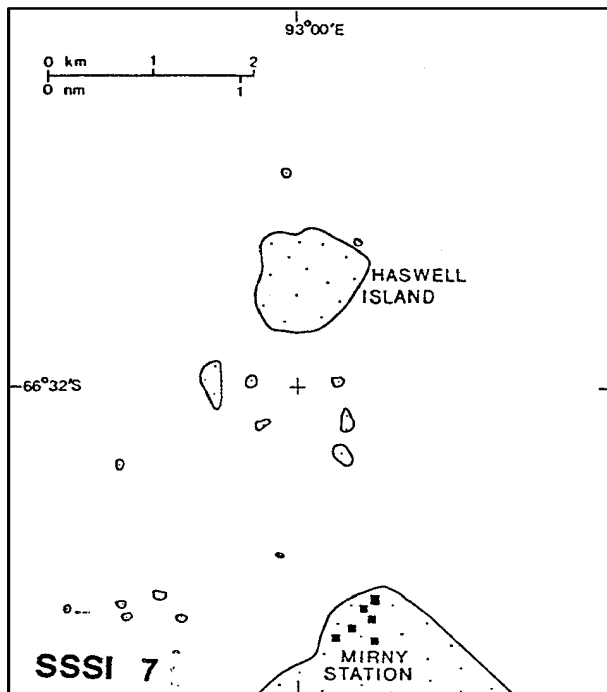
iv. *Date of expiry of designation.* 30 June 1981.

v. *Access points.* The Site may be entered from any direction but access should cause minimum disturbance to the bird colonies.

vi. *Pedestrian and vehicular routes.* Vehicles should not enter the Site. Pedestrians should not move through the populated areas except as necessary in the course of scientific investigations. Helicopters and low-flying aircraft should avoid the bird colonies in accordance with the Agreed Measures for the Conservation of Antarctic Fauna and Flora.

vii. *Other kinds of scientific investigations which would not cause harmful interference.* Any scientific investigation which will not cause significant disturbance to the biological programme for which the Site has been designated.

viii. *Scientific sampling.* Taking samples of the bird population by killing, capture, or taking of eggs should be done only for a compelling scientific purpose and in accordance with the Agreed Measures for the Conservation of Antarctic Fauna and Flora.



**SSSI 7, Haswell Island**

## Site of Special Scientific Interest No. 8

ATSCM XII: Annex to Measure 1(2000)

### Management Plan for Site of Special Scientific Interest No. 8

#### Western Shore of Admiralty Bay, King George Island, South Shetland Islands

##### 1. *Description of Values to be Protected*

The area was originally designated as a Site of Special Scientific Interest in Recommendation X-5 (1979, SSSI No. 8) after a proposal by Poland, because of its diverse avian and mammalian fauna and locally rich vegetation, providing a representative sample of maritime Antarctic ecosystem.

These grounds are still relevant. Research has now shown that the colonies of Ad lie Penguin (*Pygoscelis adeliae*) and Gentoo Penguin (*Pygoscelis papua*) are the largest on the island. There are also breeding areas of other birds - Giant Petrel (*Macronectes giganteus*), Cape Pigeon (*Daption capense*), Wilson's Storm Petrel (*Oceanites oceanicus*), Black-bellied Storm Petrel (*Fregetta tropica*), Sheathbill (*Chionis alba*), McCormick's Skua (*Catharacta maccormicki*), Antarctic Skua (*Catharacta antarctica*), Dominican Gull (*Larus dominicanus*), and Antarctic Tern (*Sterna vittata*). Furthermore, there are numerous sites at

which Elephant Seals (*Mirounga leonina*), Fur Seals (*Arctocephalus gazella*) and Weddell Seals (*Leptonychotes weddelli*) haul out or breed.

The values to be protected are those associated with the exceptional assemblage of animals and the long-term scientific studies on them that have been undertaken since 1976.

##### 2. *Aims and Objectives*

Management of the Area aims to:

- protect all bird colonies and seal breeding areas against unnecessary and potentially damaging human activities, and
- undertake any essential management activities necessary to protect the scientific value of the site.
- protect long-term research

##### 3. *Management Activities*

Ensure that the biologically the Area is adequately monitored and that sign boards and boundary markers are serviced.

##### 4. *Period of Designation*

The Area is designated for an indefinite period.

## 5. Maps

Map A shows the location of King George Island in Antarctica.

Map B shows the Western shore of Admiralty Bay, Site of Special Scientific Interest (SSSI) No. 8, in relation to King George Island.

Map C Shows the Area in greater detail.

## 6. Description of the Area

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

The area consists of land on the western shore of Admiralty Bay (Map C). The westerly boundary extends from Patelnia (Telefon) Point ( $62^{\circ}13'55''\text{S}$ ,  $58^{\circ}28'45''\text{W}$ ), NNW to The Tower (a distinctive peak above Tower Glacier, 366.9 m at  $62^{\circ}12'50''\text{S}$ ,  $58^{\circ}29'00''\text{W}$ ), then continuing in a straight line to encompass the base of Jardine Peak ( $62^{\circ}10'05''\text{S}$ ,  $58^{\circ}29'45''\text{W}$ ). This line then runs NE to the sea (Admiralty Bay) where it bisects the coast immediately north of Rakusa Point ( $62^{\circ}09'45''\text{S}$ ,  $58^{\circ}27'25''\text{W}$ ). Thereafter the Area is all the land which is bounded by the coastline south towards Demay Point ( $62^{\circ}12'50''\text{S}$ ,  $58^{\circ}25'15''\text{W}$ ), then SW along the coast to Patelnia (Telefon) Point.

The western edge of the Area is adjacent to the Warsaw Icefield, with the north-western corner being ice-free in the vicinity of Jardine Peak. Outside of the northern boundary is a small area of ice-free land. Steep cliffs overlook a narrow beach and the waters of Ezcurra Inlet in the north-western section of the ice-free area; and in the north-eastern section there are occasional shallow beaches which extend to the sea, where H. Arctowski station is located, 400 m. outside of the Area. Three small glaciers, Ecology, Baranowski, and Tower, descend from the Warsaw Icefield onto these shores.

There are markers on the northern edge of the Area where the site has a boundary on land, immediately south of H. Arctowski station. The western boundary is not delineated by virtue of fact that it traverses a high (ca. 350 m) mTTobile icefield. The coastline defines the Area's eastern and southern stretches.

Twelve bird species regularly nest in the Area: Adelie Penguin (*Pygoscelis adeliae*) - 18838 nests in 1988/89 and 15151 nests in 1994/95; Chinstrap Penguin (*Pygoscelis antarctica*) - 3353 nests in 1988/89 and 2545 nests in 1994/95; Gentoo Penguin (*Pygoscelis papua*) - 2239 nests in 1988/89 and 2287 nests in 1994/95; Giant Petrel (*Macronectes giganteus*) - 315 nests in 1988/89 and 201 nests in 1994/95; Cape Pigeon (*Daption capense*) - 43 nests in 1988/89 and 290 nests in 1994/95; Wilson's Storm Petrel (*Oceanites oceanicus*); Black-bellied Storm Petrel (*Fregetta tropica*); Sheathbill (*Chionis alba*) - 9 nests in 1988/89 and 2 nests in 1994/95; McCormick's Skua (*Catharacta maccormicki*) - 38 nests (together with *C. antarctica*) in 1988/89 and 64 territories in 1994/95; Dominican Gull (*Larus dominicanus*) - 52 nests in 1988/89 and 46 nests in 1994/95; Antarctic Tern (*Sterna vittata*) - 188 nests in 1988/89 and 132 nests in 1994/95.



Moreover 4 alien bird species from South America have been observed, as stray visitors but which stayed in the Area only temporarily: Black-necked Swan (*Cygnus melanocoryphus*), South Georgia Pintail (*Anas georgica*), White-rumped Sandpiper (*Calidris fuscicollis*), Wilson's Phalarope (*Phalaropus tricolor*).

Continuing long-term ecological studies in this area are aimed principally at penguins and associated species.

Elephant Seals (*Mirounga leonina*), Fur Seals (*Arctocephalus gazella*) and Weddell Seals (*Leptonychotes weddelli*) haul out at numerous sites. Leopard Seals (*Hudrurga leptonyx*) and Crabeater Seals (*Lobodon carcinophagus*) are frequently seen on the ice floes during the winter. Breeding of Elephant Seals and Weddell Seals are observed in the Area.

The ice-free areas within the Area (20% of its surface) are formed by recent and raised pebble-cobble beaches, recent and sub-recent moraines, mountainous peninsula, rocky islets and spurs. The terrain is heavily shaped by glacial, nival and coastal marine processes.

The Area vegetation is typical of the Maritime Antarctic. Ice-free terrain (20% of its surface) is only partly occupied by plants and thus the landscape is of a semi-desert character. Dry areas and rocks are dominated by lichens. Locally, flowering plants such as *Deschampsia* and *Colobanthus* are important, these species occupying fairly large areas particularly in the vicinity of H. Arctowski station and constitute one of the largest areas covered by these species in the Antarctic. In the immediate vicinity of H. Arctowski station, there is an alien grass, *Poa* sp. The vegetation from 0 to 60 m a.s.l. is dominated by *Bryophyta* and flowering plants, and above 60 m a.s.l. by lichens.

#### *6(ii) Restricted zones within the Area*

There are no prohibited zones within the Area, but access to bird breeding areas should be restricted during the breeding season (September to March) and damage to vegetation should be avoided by restricting access to the marked path.

#### *6(iii) Location of structures within the Area*

The following are the structures in the Area (Map C):

- P. J. Lenie field camp (United States of America); consisting of a small hut (for four persons), on the beach between Llano Point and Sphinx Hill which has been in use during the summer since 1977
- a caravan (belonging to Poland) functioning as a summer field laboratory for two persons, south of Demay Point.

#### *6(iv) Location of other Protected Areas within close proximity*

The Western shore of Admiralty Bay, SSSI No. 8, is a part of Antarctic Specially Managed Area (ASMA), Admiralty Bay, King George Island (South Shetland Islands).

SSSI No. 5, Fildes Peninsula and SSSI No. 33, Ardley Island, lie about 27 km west of western shore of Admiralty Bay. SSSI No. 13, Potter Peninsula, lies about 15 km to the west and SSSI No. 34, Lions Rump, lies about 20 km to the east.

## 7. *Permit Conditions*

Permits may be issued only by appropriate national authorities as designated under Annex V Article 7 of the Protocol on Environmental Protection to the Antarctic Treaty.

Conditions for issuing a permit for the Area are that:

- it is issued only for scientific study of the ecosystem, or for compelling scientific reasons that cannot be served elsewhere,
- the actions permitted will not jeopardize the natural ecological system 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 a copy, must be carried within the Area,
- a report is supplied to the authority named in the Permit, and
- the Permit shall be valid for a stated period.

### *7(i) Access to and movement within the Area*

The access to the Area is restricted to the northern end, near H. Arctowski station. Access from the sea is only permitted by inflatable boats. No access to the beach area between Llano Point and Sphinx Hill from the sea is permitted, except to resupply the P. J. Lenie field camp, or in an emergency. Access from the sea to areas further south is permitted but the visitors should at all times avoid disturbance to birds and seals or damage of vegetation.

Landing of helicopters within the Area is permitted only on the glaciers, except in an emergency. Helicopters are allowed to land at H. Arctowski station only, on a special designed helipad. No helicopter or fixed wing aircraft is permitted to fly over the Area below 250 m altitude above the highest point. All helicopters should maintain a distance of at least 500 m from the Area during take-off and landing at H. Arctowski station. To avoid flying over bird colonies, approach from and towards the sea, or over Warsaw Icefield, is recommended.

Pedestrian routes are designated (Map C) and marked within the Area. Persons on foot should at all time avoid disturbance to birds, seals and damage of vegetation.

Vehicles are prohibited in the Area.

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

- Scientific research which cannot be conducted outside the Area, and which will not damage or interfere with any aspect of the Area's biological, geological, or aesthetic values.
- Essential management activities, including monitoring.

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

No further structures are to be erected in the Area, or scientific equipment installed, except for essential scientific or management activities, as specified in the Permit.

*7(iv) Location of the field camps*

Parties should not normally camp in the Area. Both P. J. Lenie field camp and the Polish caravan provide research accommodation, by agreement. The caravan can accommodate up to two persons.

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

No living animals or plant material shall be deliberately introduced into the Area.

Poultry product shall not be taken into the Area. Any chemical which may be introduced for compelling scientific 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.

Fuel, food and other materials are not to be stored in the Area except in support of activities for which the Permit has been granted. All such materials should be kept to a minimum, made secure against the elements and removed when no longer required.

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

Taking or harmful interference is prohibited, except in accordance with a Permit. When animal taking or harmful interference is involved this should be in accordance with the SCAR Code of Conduct for Use of Animal for Scientific Purpose in Antarctica, as a minimum standard.

*7(vii) Collection and removal of anything not brought into the Area by the Permit holder*

Material may be collected or removed from the Area only in accordance with a Permit. This includes rock specimens, whale bones, artefacts of the whaling industry, and any item belonging to or attached to any aspect of the historical uses of Admiralty Bay which are not specifically described herein.

Debris of human origin may be removed from the beaches of the Area. Exceptionally, dead specimens of fauna or flora may be removed for laboratory examination without a Permit.

*7(viii) Disposal of waste*

All waste shall be removed from the Area, with the exception that human waste should be deposited in the sea.

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

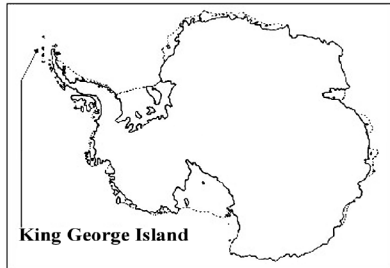
The Permit, or a copy, must be carried within the Area.

Permits may be granted to enter the Area to carry out biological monitoring and site inspection activities, which may involve the collection of small samples for analysis or audit, or to erect or maintain signposts, or other protective measures.

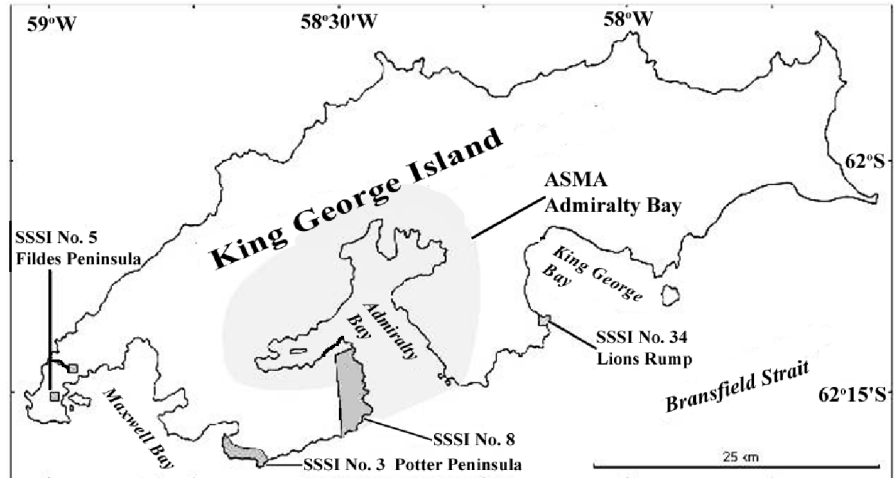
*7(x) Requirements for reports*

The principal Permit Holder for each issued Permit shall submit a report of activities conducted in the Area. The Visit Report form suggested by SCAR provides a suitable model.

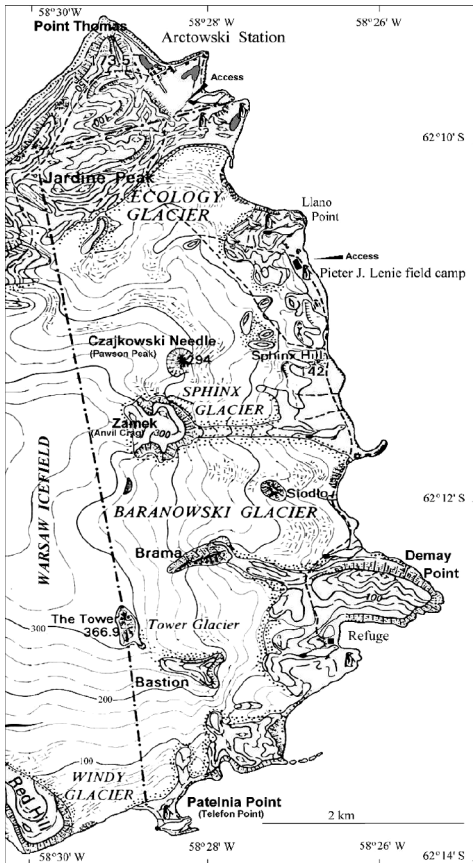
This report shall be submitted to the authority named in the Permit as soon as practicable, but no later than 6 months after the visit has taken place. Such reports should be stored indefinitely and made accessible to interested Parties, SCAR, CCAMLR and COMNAP if requested, to provide the documentation of human activities within the Area, which could be utilized for good management.



**Map A Location of King George Island**



**Map B Western Shore of Admiralty Bay, SSSI No. 8, in relation to Antarctic Specially Managed Area (ASMA) and other SSSI's on King George Island.**



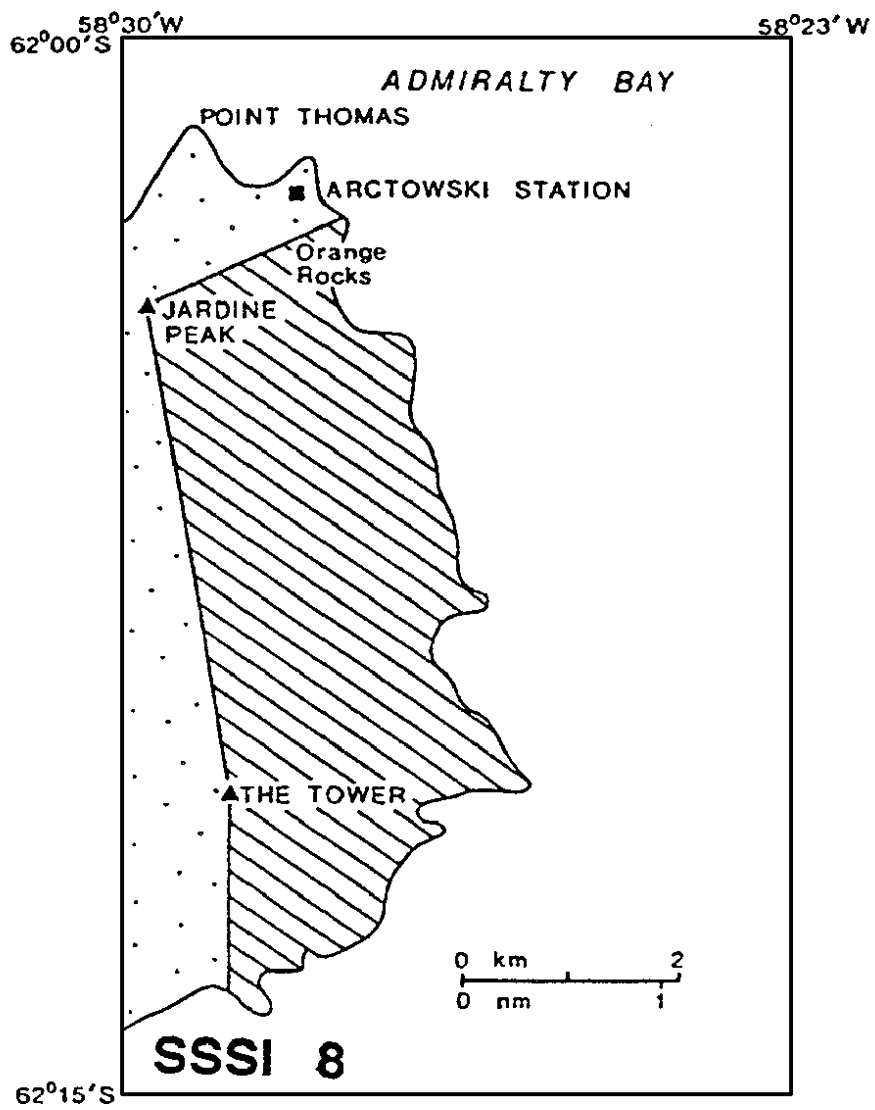
**Map C Western Shore of Admiralty Bay, SSSI No. 8**

## Annex to Recommendation X-5

### Site of Special Scientific Interest No. 8: Western Shore of Admiralty Bay, King George Island

#### *Management Plan*

- i. *Description of Site.* All that area on the western shore of Admiralty Bay, south of Ezcurra Inlet, south of a line connecting Jardine Peak and the shoreline immediately to the north of a prominent group of rocks characterized by a covering of orange lichens bearing approximately 068° from Jardine Peak, and east of a line joining Jardine Peak. The Tower and a point on shore line bearing 180° from the tower.
- ii. *Reason for designation.* This area is one of exceptional scientific interest close to a research station frequently visited by tourist ships. It supports an exceptional assemblage of Antarctic birds and mammals. Long-term research programmes could be jeopardised by accidental interference, especially during the breeding season of these animals.
- iii. *Outline of research.* The area supports a breeding colony of Elephant seals and the three species of pygoscelid penguins in association with eight species of flighted birds. The purpose of the investigations is to gain insight into the dynamics of a typical, but particularly rich, Antarctic coastal ecosystem. Studies of the functioning of the inshore and coastal zone in relation to the ecosystem will include quantitative studies of the circulation of matter and energy between the coastal and marine environments.
- iv. *Date of expiry of designation.* 31 March 1985.
- v. *Access points.* The Site should be entered only from the vicinity of Point Thomas.
- vi. *Pedestrians and vehicular routes.* Vehicles should not enter the Site. Pedestrians should not move through the populated areas, especially during the breeding season, except as necessary in the course of scientific investigations.
- vii. *Other kinds of scientific investigations which would not cause harmful interference.* Scientific investigation which will not cause significant disturbance to the biological programmes mentioned in section (iii) above.
- viii. *Scientific sampling.* Scientific sampling, other than that associated with the research programme described above, should be kept to a minimum and in accordance with the Agreed Measures for the Conservation of Antarctic Fauna and Flora.
- ix. *Other restraints.* Helicopters and low-flying aircraft should avoid the breeding colonies of birds in accordance with the Agreed Measures for the Conservation of Antarctic Fauna and Flora.



SSSI 8, Admiralty Bay

## Site of Special Scientific Interest No. 9

XX: Annex to Measure 1(1996)

### Management Plan for Site of Special Scientific Interest (SSSI)No. 9 Rothera Point, Adelaide Island

#### *1. Description of Values to be Protected*

Rothera Point was originally designated in Recommendation XIII-8 (1985, SSSI No. 9) after a proposal by the United Kingdom that the Site would serve as a biological research site and control area against which the effects of human impact associated with the adjacent Rothera Research Station (UK) could be monitored in an Antarctic fulfilled ecosystem. The Site itself has little intrinsic nature conservation value.

#### *2. Aims and Objectives*

##### *2(i) Aims*

Management of Rothera Point aims to:

- avoid major changes to the structure and composition of the terrestrial ecosystems, in particular to the fellfield ecosystem and breeding birds, by:
  - o preventing physical development within the site, and;
  - o limiting human access to the Site to maintain its value as a control area for environmental monitoring studies;
- allow scientific research and monitoring studies of breeding birds, terrestrial and freshwater biota, and soils, while ensuring as far as possible that the Site is protected from over-sampling;
- allow regular visits for management purposes in support of the objectives of the management plan.

##### *2(ii) Objectives*

The Site is unique in Antarctica as it is the only protected area currently designated (1995) solely for its value in the monitoring of human impact. The objective is to use the Site as an unaffected control area in assessing the impact of activities undertaken at Rothera Research Station on the Antarctic environment.

The hypothesis being tested is that the activities undertaken at Rothera Research Station have not caused environmental impact within the Site.

Monitoring studies undertaken by the British Antarctic Survey (BAS) began at Rothera Point in 1976, before the establishment of the station later that year, and have expanded considerably since 1989. The BAS plans to continue monitoring studies in the future.

The purposes of the monitoring programme (1995) are to:

- survey the distribution of terrestrial flora and invertebrates every decade;
- assess heavy metal concentrations in lichens every five years;
- assess petroleum hydrocarbon concentrations in gravel and soil every other year;

- survey the breeding bird population annually.

### 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 Site 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 Site and stating entry requirements shall be displayed in a prominent position at Rothera Research Station;
- visits shall be made as necessary (no less than once every two years) to assess whether the Site continues to serve the purposes for which it was designated and to ensure management activities are adequate.

### 4. *Period of Designation*

Designation for an indefinite period.

### 5. *Maps*

Map 1 shows the location of Rothera Point in relation to northern Marguerite Bay. Map 2 shows the Site in greater detail, with an inset showing the Site in relation to Rothera Research Station

### 6. *Description of the Area*

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

Rothera Point (lat. 67°34'S, long 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.

The Site is the north-eastern one-third of Rothera Point (Map 2), and is representative of the area as a whole. It is about 300 m from west to east and 250 m from north to south, and rises to a maximum height of 36 m. At the coast, the Site boundary is the 2.5 m contour. No upper shore, littoral or sublittoral areas of Rothera Point are therefore included within the SSSI. The southern boundary of the Site, running across Rothera Point, is marked by a line of pink fuel drums filled with concrete. The remaining boundary is unmarked. There are two signboards just outside the perimeter of the Site located at the starting points of the pedestrian access route around Rothera Point.

The Site boundary extends to the 2.5 m contour at the coast. There is unrestricted pedestrian access below this contour height around Rothera Point. The recommended pedestrian access route follows the Mean High Water Mark (MHW) and is shown on Map 2.

Small areas of permanent ice occur to the north and south of the summit of the SSSI. 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. Around prominent rock outcrops used as bird perches by Dominican gulls (*Larus dominicanus*) there are accumulations of recent and decaying limpet (*Nacella concinna*) shells forming patches of calcareous soil. There are no accumulations of organic matter.

There are no special or rare geological or geomorphological features in the Site.

The limited terrestrial biological interest within the Site is confined to the rock bluffs where there is locally abundant plant growth dominated by lichens. The vegetation is representative of the southern "maritime" Antarctic fellfield ecosystem and is dominated by the fruticose lichens *Usnea antarctica*, *U.sphacelata*, and *Pseudephebe minuscula*, and the foliose lichen *Umbilicaria decussata*. Numerous crustose lichens are associated, but bryophytes (mainly *Andreaea* spp.) are sparse.

A single very small population of antarctic pearlwort (*Colobanthus quitensis*) occurs below the northern cliff of the Site, whilst a few plants of Antarctic hair grass

(*Deschampsia antarctica*) have become established at two locations since 1989.

The invertebrate fauna is impoverished and consists only of a few species of mites and springtails, of which *Halazetes belgicae* and *Cryptopygus antarcticus* are the most common.

There are no special or rare terrestrial flora and fauna in the Site.

Brown and south polar skuas (*Catharacta lonnbergii* and *C. maccormicki*) are the most abundant breeding birds found in the Site, with three pairs of skuas recorded nesting in the 1994/95 season. A pair of Dominican gulls (*Larus dominicanus*) nest in the Site. Wilson's storm petrels (*Oceanites oceanicus*) also breed, but only one nest has been found.

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

#### 6 (ii) Restricted zones within the Site

None.

#### 6 (iii) Location of structures within the Site

A rock cairn marks the summit of the Site (36 m) and 35 m to the east south east of it there is another cairn (35.4) marking a survey station.

#### 6 (iv) Location of other Protected Areas within close proximity

SPA No. 8, Dion Islands, Marguerite Bay, lies about 15 km south of Adelaide Island. SPA No. 19, Lagotellerie Island, Marguerite Bay, lies about 11 km south of Pourquoi Pas Island. SPA No. 21, Avian Island, Marguerite Bay, lies about 0.25 km south of the south-west tip of Adelaide Island. The locations of these SPAs are shown on Map 1.

### 7. Permit Conditions

Entry to the Site is prohibited without a Permit. Permits shall be issued only by appropriate national authorities, and may contain both general and specific conditions.

General conditions for issuing a Permit to enter the Site may include:

- activities limited to scientific research or monitoring purposes;
- the actions permitted will not jeopardize the ecosystem or scientific or monitoring values of the Site.
- any management activities are in support of the objectives of the Management Plan;
- the actions permitted are carried out in accordance with this Management Plan;
- the permit holder must carry the permit, or an authorized copy, within the Site.

National authorities may attach further general and specific conditions to a permit.

*7(i) Access to and movement within the Site*

Access to the Site shall be on foot.

Landing of helicopters within the Site is prohibited. As far as practicable, helicopter overflight of the Site shall be avoided.

Vehicles are prohibited in the Site.

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

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

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

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

No structures are to be erected in the Site, or equipment installed, except for essential scientific or management activities (ea. signboards, monitoring equipment) as specified in the permit.

All scientific and monitoring equipment, including marker stakes, installed in the Site must be approved by Permit and clearly identified to show principal investigator, project and year of installation. The Permit holder must remove any scientific or monitoring equipment installed as soon as it is no longer required or on the expiry of the permit whichever is the sooner.

*7(iv) Location of field camps*

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

*7(v) Restrictions on materials and organisms which may be brought into the site*

No non-indigenous living animals, plant material, microorganisms or soil shall be deliberately introduced into the Site.

Any hazardous substances or chemicals, including radioisotopes, which may be introduced for scientific, monitoring or management purposes specified in the Permit, shall be removed from the Site at or before the conclusion of the activity for which the Permit was granted.

Fuel, food and other materials must not be stored in the Site, unless required for essential purposes connected with the activity for which the Permit has been granted. All such materials introduced shall be removed from the Site at or before the conclusion of the activity for which the Permit was granted. Permanent depots are not permitted.

No poultry products, including food products containing uncooked dried eggs, shall be taken into the Site.

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

Taking of or harmful interference with native flora and fauna is prohibited, except in accordance with a Permit. Where taking of or harmful interference with animals is involved this should be in accordance with the SCAR Code of Conduct for the use of Animals for Scientific Purposes in Antarctica, as a minimum standard.

*7(vii) Collection or removal of anything not brought into the Area by the Permit holder*

Material may be collected and/or removed from the Site only in accordance with a Permit and should be limited to the minimum necessary to meet scientific or management needs. Material of human origin not brought into the site by the Permit holder, or otherwise authorized, which is likely to compromise the values of the Site 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(viii) Disposal of wastes*

All wastes, including all human wastes, must be removed from the Site.

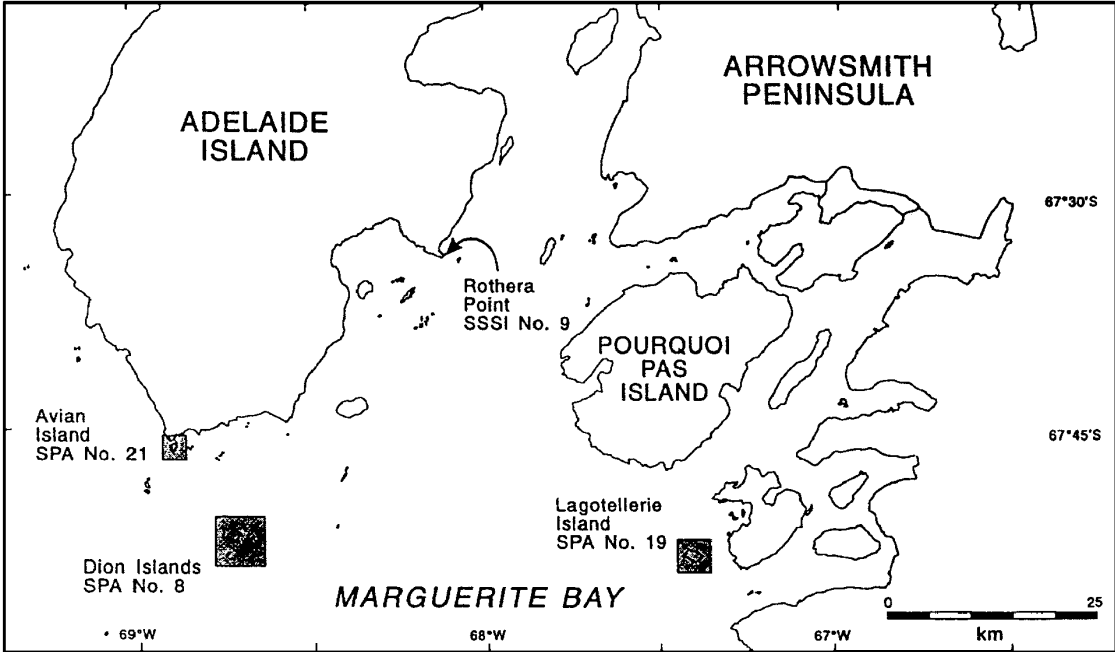
*7(ix) Measures that are necessary to ensure that the aims and objectives of the Management*

Plan can continue to be met

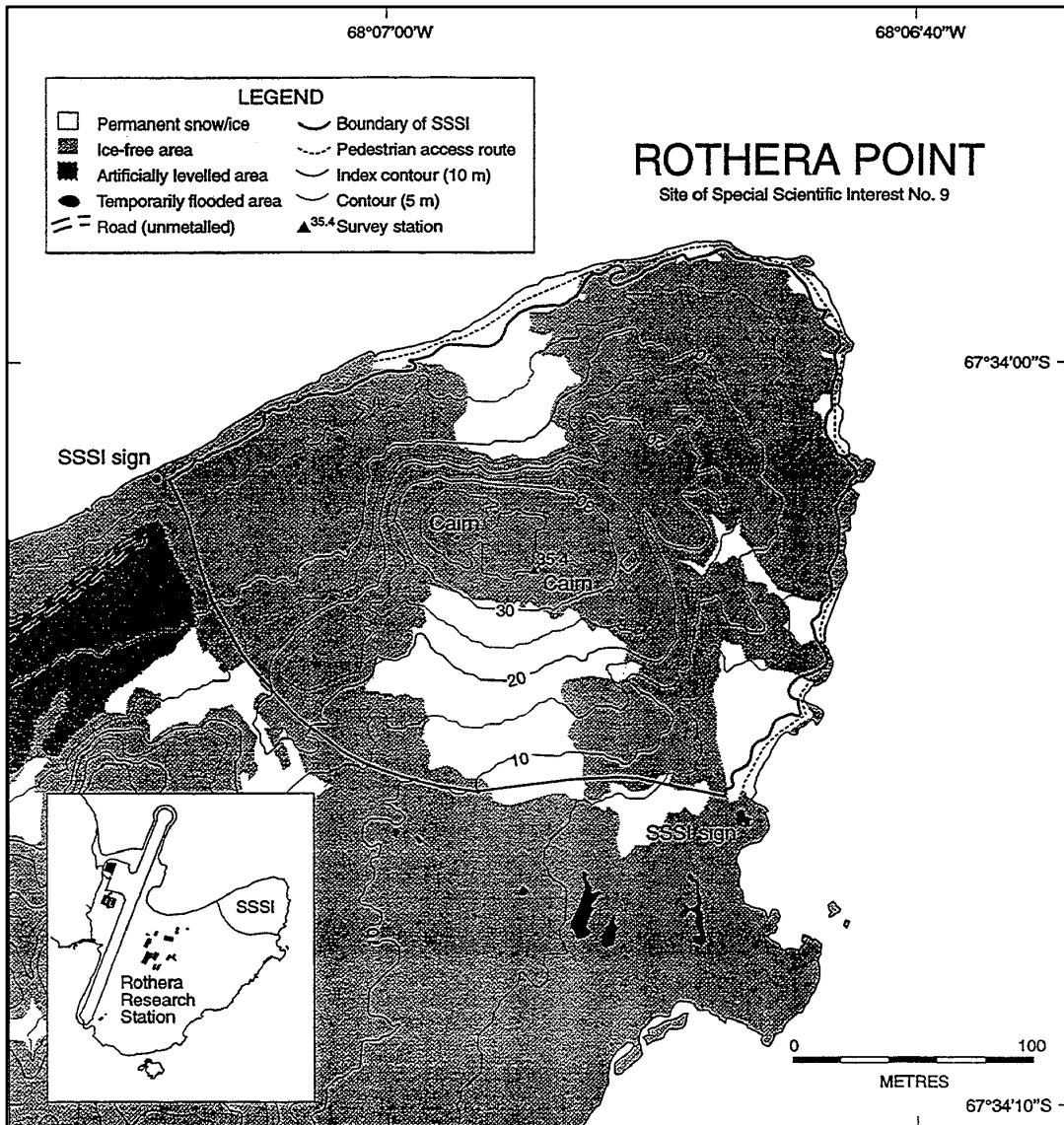
Permits may be granted to enter the Site to carry out scientific research, monitoring and site inspection activities, which may involve the collection of a small number of samples for analysis, to erect or maintain signboards, or to carry out protective measures.

*7(x) Requirements for reports*

Parties should ensure that the principal holder of each Permit issued submits to the appropriate authority a report describing the activities undertaken. Such reports should include, as appropriate, the information identified in the Visit Report Form suggested by SCAR. Parties should maintain a record of such activities and, in the Annual Exchange of Information, should provide summary description of activities conducted by persons subject to their jurisdiction, in sufficient detail to allow evaluation of the effectiveness of the 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 Management Plan and in organising the scientific use of the Site.



**Rothera Point Site of Special Scientific Interest (SSSI) in relation to Marguerite Bay and other nearby protected areas.**

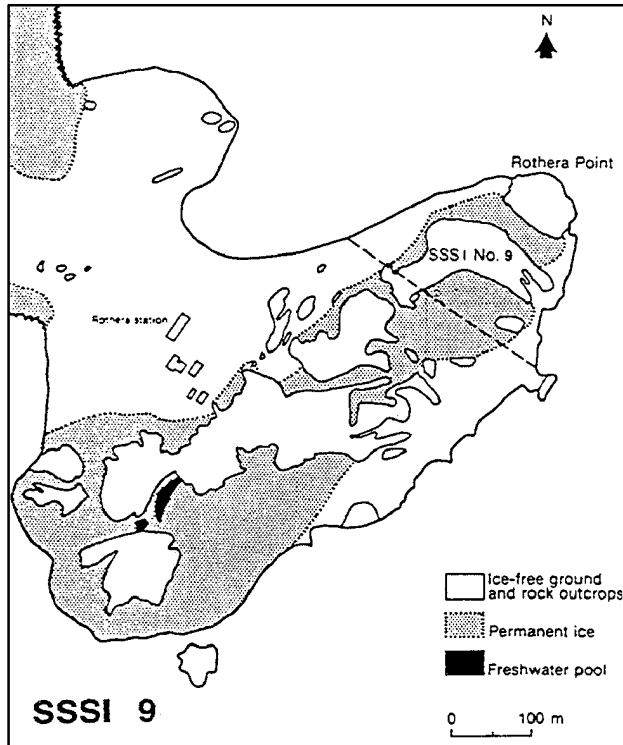


**Rothera Point Site of Special Scientific Interest**

**Annex to Recommendation XIII-8**  
**Site of Special Scientific Interest No. 9: Rothera Point,**  
**Adelaide Island**

*Management Plan*

- i. *Description of Site.* Rothera Point (lat 67°34'S, long 68°08'W) is situated in Ryder Bay, at the south east corner of Square Peninsula on the east side of Adelaide Island, south-west Antarctic Peninsula. The proposed Site is the north-eastern one-third of the point and is representative of the area as a whole. The British station Rothera lies about 350m west of the western boundary of the Site. The boundaries of the Site are shown on the attached map.
- ii. *Reason for designation.* This Site serves to monitor the impact of man on an Antarctic fellfield ecosystem. The vegetation is not rich or well developed, and the soils are shallow and confined to small pockets; there is no significant avifauna. Some monitoring studies have been in progress since before the establishment of the research station in 1975.
- iii. *Outline of research.* Investigations incorporating the monitoring of terrestrial and freshwater macro and micro-biota, soils and heavy metal deposition within the Site (control area) and near the Site (impact area) will continue with a view to assessing the impact of the neighboring research station.
- iv. *Date of expiry of designation.* 31 December 1995.
- v. *Access points.* None designated.
- vi. *Pedestrian and vehicular routes.* Vehicles and helicopters are excluded. Pedestrians should enter the Site only in connection with monitoring activities. Pedestrian access is allowed to the beaches seaward of the Site.
- vii. *Other kinds of scientific investigations which would not cause harmful interference.* Investigation that would not affect the effectiveness of the Site for the purpose for which it has been designated.
- viii. *Scientific sampling.* This should be restricted to the minimum required in connection with the monitoring programme.
- ix. *Other restraints.* Sledge dogs associated with the research programmes at Rothera Station must not be permitted to enter the Site. Human wastes must not be deposited in the Site.



SSSI 9 Rothera Point.

## Site of Special Scientific Interest No. 10

### Annex to Recommendation XIII-8

#### Site of Special Scientific Interest No. 10: Caughley Beach, Cape Bird, Ross Island

##### *Management Plan*

i. *Description of Site.* Caughley Beach and its hinterland lie between the areas known as the Cape Bird Northern and Middle Penguin Rookeries, about 1 km north of Cape Bird, northern Ross Island (lat 77°10'S, long 166°40'E). The proposed Site encompasses the area between the top of the coastal cliffs of Caughley Beach and the Mt. Bird Ice Cap, and between a line 200 m south of the New Zealand Antarctic Research Programme's summer station and a line 500 m north of Cape Bird Middle Adelie Penguin Rookery. The Site surrounds Specially Protected Area No. 20 on three sides and its boundaries are shown on the attached map.

ii. *Reason for designation.* The Cape Bird area is the site of the most extensive stands of moss, algae, and lichens in southern Victoria Land. The terrestrial ecosystem within the Site is the subject of long-term research. Designation of the Site will protect biological experiments and monitoring sites, and provide a buffer zone around the Specially Protected Area's conservation zone.

iii. *Outline of research.* Investigations incorporate monitoring of plant colonization sites, bacteriology, mycology and physiology of terrestrial and aquatic ecosystems, physiology of terrestrial and freshwater fauna, and nitrogen cycling. The research is designed to provide a better understanding of the biogeochemical processes in Antarctic ecosystems.



iv. *Date of expiry of designation.* 31 December 1991.

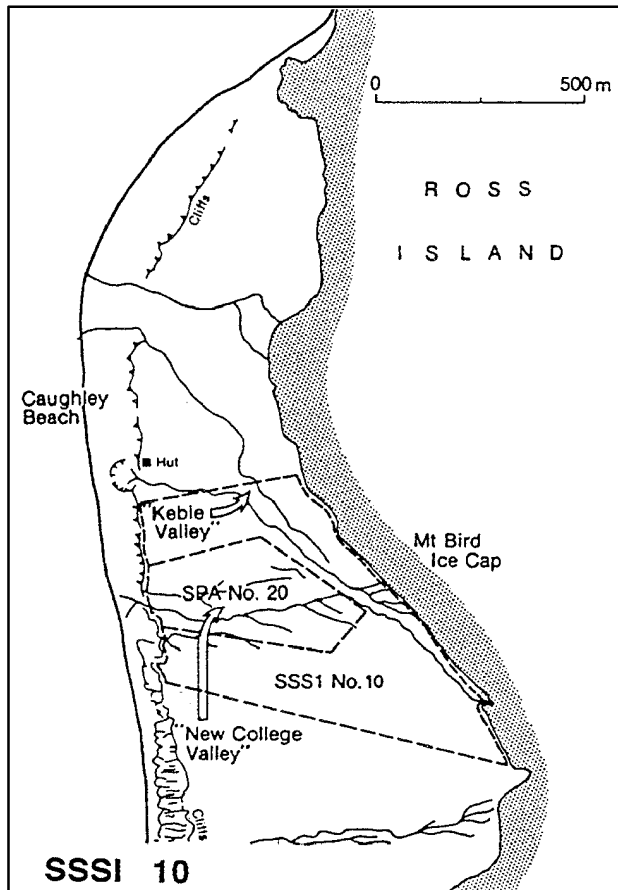
v. *Access points.* There are no restrictions on access points other than that section of the Caughley Beach cliff top which is a designated boundary shared with the Specially Protected Area.

vi. *Pedestrian and vehicular routes.* Vehicles and helicopters are excluded. Pedestrians should keep to ridge lines and well drained ground.

vii. *Other kinds of scientific investigations which would not cause harmful interference.* Research studies and access to the USN Astrofix with the provision that exotic biota are not introduced and ecosystems are not damaged or disrupted.

viii. *Scientific sampling.* Sampling should be restricted to the minimum required and should not be undertaken to the detriment of the functioning of existing ecosystems, or of the purposes for which the Site has been designated.

ix. *Other restraints.* None specified.



**SSSI 10, Caughley Beach**

## **Site of Special Scientific Interest No 11**

### **Extract from XXI: Measure 3(1997)**

#### **Antarctic Protected Areas System: Revised Descriptions and Management Plans for Sites of Special Scientific Interest (SSSI)**

...For SSSI No. 11 Tramway Ridge, that the term 'restricted zone' be changed to 'prohibited zone'.

### **XXI: Annex to Measure 3(1997)**

#### **Antarctic Protected Areas System: Revised Descriptions and Management Plans for Sites of Special Scientific Interest (SSSI)**

##### **Tramway Ridge Site of Special Scientific Interest (SSSI) No. 11: Proposed Change to Restricted Zone**

###### *1. Introduction*

A new management plan for Tramway Ridge (SSSI No. 11) was adopted by the XIX ATCM in Seoul in 1995 (Measure 2). This site contains a "Restricted Zone", where access is prohibited until agreed otherwise by a review of the management plan.

When preparing a new management plan for Botany Bay, Cape Geology, Victoria Land, New Zealand faced a question over terminology in attempting to describe a "Restricted Zone" proposed for the area. The science community supported controls on access to the proposed "Restricted Zone" at Botany Bay but favoured access to proposed zone to be "restricted" and not "prohibited", as at Tramway Ridge. The justification for allowing access was the presence of a liverwort within the zone that scientists did not want to place completely off-limits until a management plan review.

The access policy for the "Restricted Zone" proposed for Cape Geology would therefore be inconsistent with the "Restricted Zone" policy now adopted for Tramway Ridge. New Zealand is concerned that as far as possible Consultative Parties should attempt to achieve consistency in policy for zones of the same name within Antarctic protected areas.

###### *2. A Prohibited Zone at Tramway Ridge SSSI No. 11*

One possible way to achieve consistency is to change the name of the "Restricted Zone" on Tramway Ridge to a "Prohibited Zone" and to proceed with the proposal to call the zone for Botany Bay a "Restricted Zone". This proposed change in terminology would more

accurately reflect the actual level of restriction/prohibition that applies, given that access to the "Restricted Zone" at Tramway Ridge is already strictly prohibited in order to preserve the northern half of the area as a reference site for future comparative studies.

New Zealand noted that the Protocol on Environmental Protection to the Antarctic Treaty provides for "prohibiting" in Antarctica, and within protected areas specifically. Annex V,

Article 5.3(f) provides for the "identification of zones within the area, in which activities are to be prohibited, restricted, or managed for the purpose of achieving the aims and objectives" of the management plan. In this, the Protocol makes a specific distinction between "restricted" and "prohibited".

In June 1996, the SCAR Group of Specialists on Environmental Affairs and Conservation (GOSEAC) considered the question of zoning terminology. GOSEAC concluded that the use of the terms "Prohibited Zone" and "Restricted Zone" under Annex V would be appropriate from a scientific, technical and environmental standpoint.

### *3. Conclusion*

In view of these points, New Zealand considers that it would be appropriate to change the management plan for SSSI No. 11 at Tramway Ridge, Mt Erebus, so that the current designation of the "Restricted Zone" be changed to "Prohibited Zone".

## **XIX: Annex to Measure 2(1995)**

### **Management Plan for Site of Special Scientific Interest (SSSI) No. 11: Tramway Ridge, Mt. Erebus, Ross Island**

#### *1. Description of Values to be Protected*

The lower end of Tramway Ridge was originally designated in Recommendation XIII-8 (1985, SSSI No. 11) after a proposal by New Zealand on the grounds that the Area supports an unusual ecosystem of exceptional scientific value to botanists, physiologist and microbiologist. Mt. Erebus (3794 m) is one of only three known high altitude localities of fumarolic activity and associated vegetation in the Antarctic. Tramway Ridge is an ice free area of gently sloping warm ground 1.5 km to the Northwest of the main crater of Mt. Erebus, located at an elevation of between 3350 m and 3400 m. The single, as yet unidentified, moss species found in the Area is unusual in that it persists in the protonematal stage. An unusual variety of a common thermophilic cyanobacterium is especially noteworthy. The plant communities which have developed on the fumarolic soils within the Area differ significantly from those found elsewhere in Antarctica. The regional uniqueness of the communities is of substantial scientific interest and value. The very limited geographical extent of the ecosystem, its unusual biological features, its exceptional scientific values and the ease with which it could be disturbed through trampling or alien introductions, are such that the Area requires long-term special protection.

#### *2. Aims and Objectives*

*Management at Tramway Ridge aims to:*

- avoid degradation of, or substantial risk to, the values of the Area;
- prevent unnecessary human disturbance to the Area;
- permit research on the unique vegetation and microbial communities while ensuring they are protected from over-sampling;
- minimise the possibility of introduction of alien plants, animals and microbes to the Area;
- preserve a part of the Area, which is declared a Restricted Zone, as a reference site for future studies;

- permit 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:

- Durable wind direction indicators should be erected close to the designated helicopter landing site whenever it is anticipated there will be a number of landings near the Area in a given season. These should be replaced as needed and removed when no longer required.
- Markers, which should be clearly visible from the air and pose no significant threat to the environment, should be placed to mark the helicopter landing pad.
- A line of flags should be placed to mark the preferred snowmobile route (Map A) between the USAP Upper and Lower Erebus Huts, which should pass no closer than 200 m to the Area.
- Signs illustrating the location, boundaries and clearly stating entry restrictions shall be placed on posts marking the boundaries of the Area.
- Signs showing the location of the Area (stating the special restrictions that apply) shall be displayed prominently, and a copy of this Management Plan should be kept available, in all of the research hut facilities located close to the summit of Mt Erebus.
- Markers, signs or structures erected within the Area for scientific or management purposes shall be maintained in good condition.
- Visits shall be made as necessary (no less than once every five years) to assess whether the Area continues to serve the purposes for which it was designated and to ensure management and maintenance measures are adequate.
- National Antarctic Programmes operating in the region shall consult together with a view to ensuring these steps are carried out.

### *4. Period of Designation*

Designated for an indefinite period.

### *5. Maps and Photographs*

Map A: Tramway Ridge, Mt. Erebus, location image-map. Image is rectified by a fine transformation and scale is approximate. Photography USGS/DOSLI (SN7842) 11 November 1993. [not reproduced]

Map B: Tramway Ridge, protected area orthophotograph. Orthophoto and protected area boundary coordinates are tied to the Camp Area Plane Datum 1981, a local framework, using the WGS72 spheroid. Precise GPS coordinates for the site will differ: these were unavailable at the time of mapping. Photography US Navy (SN6480) 9 February 1980. [not reproduced]

Map C: Tramway Ridge, protected area map. Contours are derived from a digital elevation model generated using a 10 m grid for the orthophotograph in Map B.: accuracy  $\pm 2$  m. Precise area of warm ground is subject to variation seasonally and inter-annually.

Figure 1: Perspective view of the Tramway Ridge area from an elevation of 6200 m, 5000 m out from the Area at a bearing of 215° SW, showing the protected area boundary, the location of the USAP Erebus huts, and the preferred helicopter landing site and snowmobile route. Image source: Map A. [not reproduced]

## *6. Description of the Area*

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

The boundary of the designated Area is defined as a square of 200 m by 200.8m which encompasses most of the warm ground area of lower Tramway Ridge (167°06'35"E,

77°31'05"S: Map B). The Area is divided into two parts of almost equal size, the northern half being a Restricted Zone. The boundaries of the Area and the Restricted Zone (marked by signposts at each corner) and prominent features are shown on Map B. Several boundary signposts have been offset owing to dangerous ground at the actual corner point.

The Area is in general on a gentle slope of about 5°, with much of the ice-free ground in the form of terraces which have a typical vertical height of about 0.5 m and steeper sides of up to 30° in slope. The steep sides of the terraces have the maximum development of crusts of vegetation, and it is from these sides that visible steam emissions occur. Visible vegetation covers about 16% of the Area. Low ice hummocks of up to about 1 m high are distributed over the Area where steam has frozen. Surface ground temperatures are up to about 75°C.

The steam-warmed lithosols in the Area provide an unusual habitat of limited extent. The acid reaction of the soils, the constant supply of moisture by condensation of steam and the regular supply of geothermal heat produce conditions which contrast markedly with most Antarctic soils. There is no evidence of the presence of microinvertebrate animals in the soils. The vegetation comprises protonematal moss and diverse microalgae, which has developed on the fumarolic soils and differs significantly from other Antarctic plant communities. The single moss species, which has not yet been identified, is unusual in that it has never been seen to produce leaves but persists in the protonematal stage. The vegetation occurs in zones related to surface temperature. Warmest ground, from about 35-60°C, is colonised by dark blue-green and reddish-brown mats of cyanobacteria, whereas cooler surfaces of about 10-30°C are dominated by green crusts of coccoid chlorophytes and moss protonema. Bare ground lacking a macroscopically visible vegetation occurs between 0-20°C.

The algal flora comprises four cyanobacteria and 11 coccoid chlorophytes. The presence of a thermophilic cyanobacterium is especially noteworthy as it is an unusual variety of the hot spring cyanobacterium *Mastigocladus laminosus*, which is common elsewhere in the world. Thermophilic bacteria have been isolated at 60°C. These include heterotrophic and a thiosulfate-utilising autotrophic species.

### *6(ii) Restricted zones within the Area*

The northern half of the Area is designated a Restricted Zone in order to preserve part of the Area as a reference site for future comparative studies, while the southern half of the Area (which is essentially similar in biology, features and character) is available for research programmes and sample collection. The south boundary of the Restricted Zone is defined by a line that bisects the Area into two halves (Map B), and is marked at both ends by signposts.

This boundary may be identified on the ground approximately as an extension westwards of the south ridge line of lower Tramway Ridge. The other three boundaries of the Restricted Zone are defined by the boundaries of the Area. Access to the Restricted Zone is strictly prohibited until such time as it is agreed by management plan review that access should be allowed.

*6(iii) Structures within and near the Area*

Signposts mark the corner points of the boundaries. The USAP Lower and Upper Erebus Huts are located approximately 1 km to the Northeast (3400 m) and Southeast (3612.5 m) respectively.

*6(iv) Location of other SPAs within close proximity of the Area*

None.

*7. Permit Conditions*

Permits may be issued only by appropriate national authorities. Conditions for issuing a Permit to enter the Area are that:

- it is issued only for scientific study of the ecosystem, or for a compelling scientific or management purpose that cannot be served elsewhere;
- access to the Restricted Zone shall be prohibited;
- the actions permitted are not likely to jeopardise the natural ecological system 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 the Management Plan;
- any Permit issued shall be valid for a stated period.

*7(i) Access to and movement within the Area*

Landing of helicopters within the Area is strictly prohibited. Helicopter overflight of the Area should be avoided, except for essential scientific or management purposes when helicopters shall in no instance fly lower than 30 m above the ground surface of the Area. Use of helicopter smoke bombs is strictly prohibited within 200 m of the Area and is discouraged nearby. For short-duration visits which do not require camp establishment, access by helicopter should be to a designated landing site, located outside of the Area and 300 m to the Northwest (Map A and Figure 1). For visits which require camp establishment, helicopter access should be to the USAP Upper or Lower Erebus Huts, and thence on foot or by land vehicle to the edge of the Area at Tramway Ridge. Landing of helicopters at other sites close to the Area is strongly discouraged. Only those persons specifically authorised by Permit are allowed to enter the Area. No special restrictions apply to the air or land routes used to move to and from the Area, although those traveling between the Upper and Lower Erebus Huts should keep to the preferred snowmobile route and stay at least 200 m from the protected area boundary.

Access into the Area shall be on foot and land vehicles are prohibited. Visitors should avoid walking on visible vegetation and, as far as practicable, areas of warm ground. Visitors should be aware that walking in the Area can compact soil, alter temperature gradients (which

may change rates of steam release), and break thin ice crusts which may form over warm ground, with resulting damage to soil and biota below. The presence of snow or ice surfaces is not a guaranteed indication of a suitable pathway: therefore every reasonable effort should be made to minimise the effects of walking activity. Pedestrian

traffic should be kept to the minimum necessary consistent with the objectives of any permitted activities.

*7(ii) Activities that are or may be conducted in the Area, including restrictions on time or place*

- Scientific research which will not jeopardise the ecosystem of the Area;
- Essential management activities, including monitoring.
- Entry to the Restricted Zone is prohibited.

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

No structures, except for boundary markers and signs, are to be erected within the Area except as specified in a Permit. All scientific equipment installed in the Area must be approved by Permit and clearly identified by country, name of the principal investigator and year of installation. All such items should be made of materials that pose minimal risk of contamination of the Area. Removal of specific equipment for which the Permit has expired shall be the responsibility of the authority which granted the original Permit.

*7(iv) Location of field camps*

Camping required for work in the Area should be near the existing USAP Upper or Lower Erebus Hut sites, and is discouraged anywhere within 500 m of the boundaries of the Area (Map A).

*7(v) Restrictions on materials and organisms which can be brought into the Area*

To avoid compromising the microbial ecosystem for which this site is protected no living animals, plant material or microorganisms shall be deliberately introduced into the Area and precautions shall be taken against accidental introductions. 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.

Fuels are not to be brought into the Area. Food shall not be consumed within the Area. Equipment and other materials are not to be stored in the Area, unless required for essential purposes connected with the activity for which the Permit has been granted. All such materials introduced shall be for a stated period only, shall be removed at or before the conclusion of that stated period, and shall be stored and handled so that risk of their introduction into the environment is minimised.

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

Taking of or harmful interference with native flora or fauna is prohibited, except in accordance with a Permit. Where taking of animals or harmful interference is involved this

should be in accordance with the SCAR Code of Conduct for the Use of Animals for Scientific Purposes in Antarctica, as a minimum standard.

*7(vii) Collection or removal of anything not brought into the Area by the Permit holder*

Material may be collected or removed from the Area only in accordance with a Permit. Material of human origin, not brought into the Area by the Permit Holder, but which is likely to compromise the values of the Area may be removed from any part of the Area, including the Restricted Zone.

*7(viii) Disposal of waste*

All wastes, including all human wastes, must be removed from the Area. Excretion of human wastes is prohibited within the Area.

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

1. The Permit, or an authorised copy, must be carried within the Area.
2. Permits may be granted to enter the Area to carry out biological monitoring and site inspection activities, which may involve the collection of small samples for analysis or audit, to erect or maintain signposts, or protective measures.
3. To help maintain the scientific value derived from the unique communities found at Tramway Ridge visitors shall take special precautions against introductions, especially when visiting several thermal regions in a season. Of particular concern are microbial or vegetation introductions sourced from:
  - o thermal areas, both Antarctic non-Antarctic;
  - o soils at any other Antarctic sites, including those near stations;
  - o soils from regions outside Antarctica.

To this end, visitors shall take the following measures to minimise the risk of introductions:

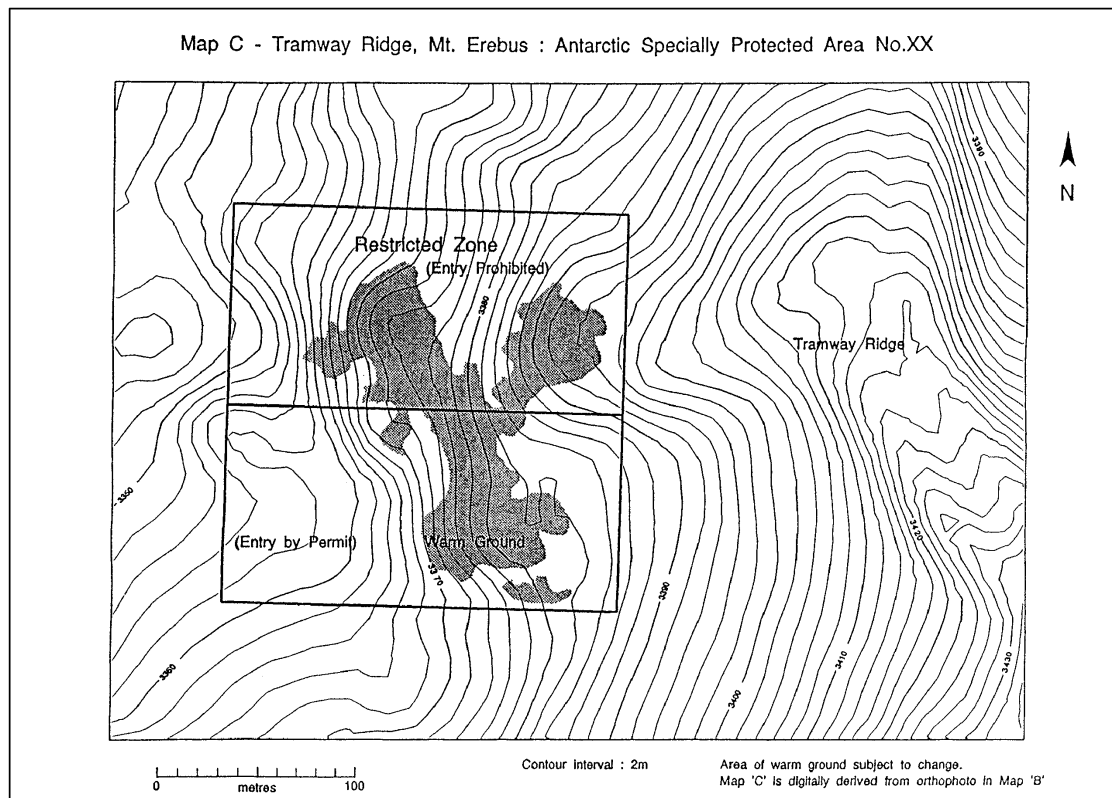
- (a) Any sampling equipment or markers brought into the Area shall be sterilised and maintained in a sterile condition before being used within the Area. To the maximum extent practicable, footwear and other equipment used or brought into the Area (including backpacks or carry-bags) shall be thoroughly cleaned or sterilised and maintained in this condition before entering the Area;
- (b) Sterilisation should be by an acceptable method, such as by UV light, autoclave or by washing exposed surfaces in 70% ethanol solution in water.
- (c) Sterile protective overclothing shall be worn. The overclothing shall be suitable for working at temperatures of -20°C or below and comprise at a minimum sterile overalls to cover arms, legs and body and sterile gloves suitable for placing over the top of cold-weather gloves.

*7(x) Requirements for reports*

Parties should ensure that the principal holder of each permit issued submit to the appropriate authority a report describing the activities undertaken. Such reports should include, as appropriate, the information identified in the Visit Report form suggested by SCAR. 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, in sufficient detail to allow evaluation of the effectiveness of the management plan. Parties should, wherever possible, deposit originals or copies of such original reports in a publicly accessible archive to maintain a record all usage, to be used both in any review of the management plan and in organising the scientific use of the Area.



**Annex to Recommendation XIII-8**  
**Site of Special Scientific Interest No. 11: Tramway Ridge,**  
**Mt. Erebus, Ross Island**

*Management Plan*

i. *Description of Site.* Mt. Erebus (3,795 m) Ross Island, South Victoria Land is one of two active volcanoes on continental Antarctica. Tramway Ridge is situated between altitudes 3350 and 3400 m 1km north-west of the Mt. Erebus crater (lat 77°32'S, long 167°8'E). The Site comprises an extensive area of gently sloping warm ground located 1 km north-west of

the main crater of Mt Erebus at the lower end of Tramway Ridge. The boundary of the Site is a square with sides of 100 m and encompasses the entire warm ground area of lower Tramway Ridge. The 1 ha Site is divided into two areas of permitted use. The northern area 'A' is designated as a reference site with all access prohibited except for pressing research reasons. The southern area 'B' is designated as a research site to accommodate on-going research programmes and sample collection. The boundaries of the Site are shown on the attached map.

ii. *Reason for designation.* Mt Erebus provides one of only two known high altitude areas of fumarolic activity and associated vegetation in the Antarctic. The warm ground of the Site and its associated vegetation are of interest to botanists, phycologists and microbiologist. The Site serves as a study area for descriptive purposes and provides a reference site for future studies. In order to preserve the research status of the Site and protect it against trampling damage and alien introductions which may find conditions here favourable for survival, the area has been designated as a Site of Special Scientific Interest.

iii. *Outline of research.* Botanical, phycological and microbiological studies of the Site and its associated vegetation, with particular reference to the presence of warm ground in an extremely rigorous environment.

iv. *Date of expiry of designation.* 31 December 1991.

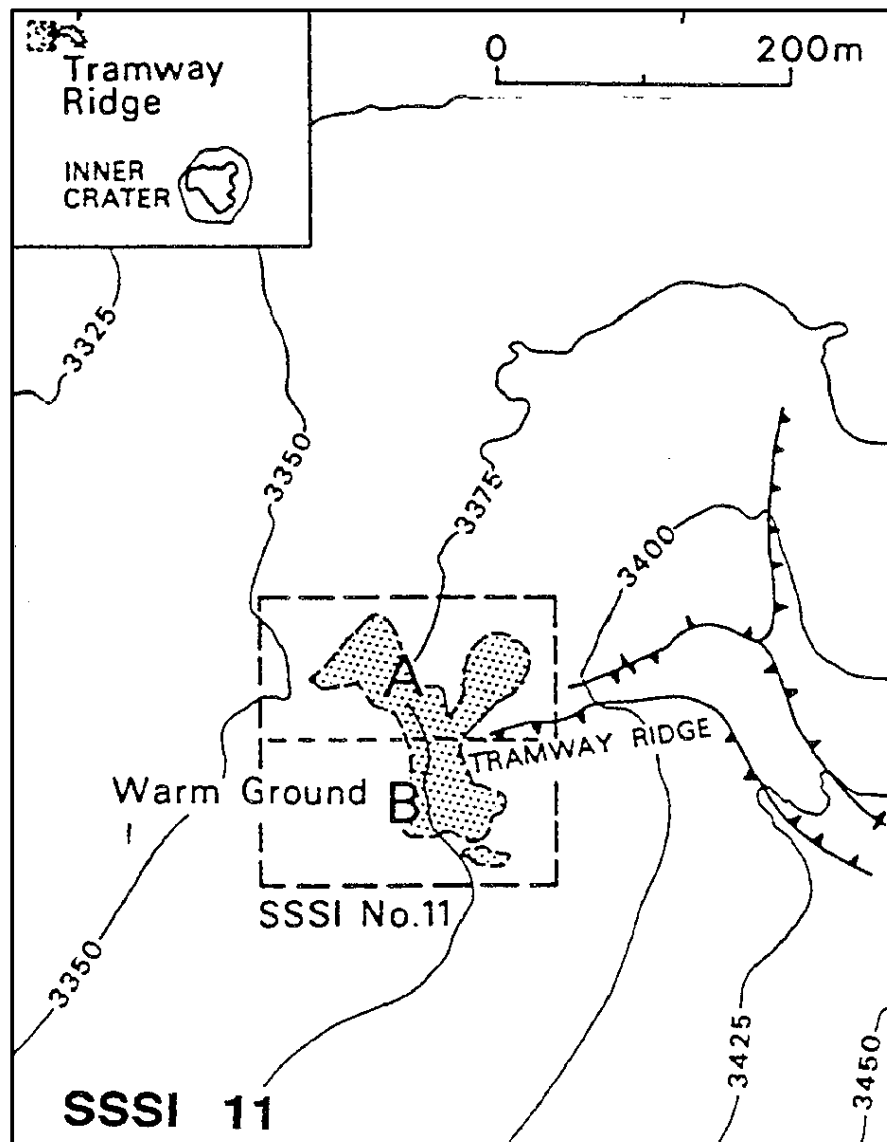
v. *Access points.* There are no restrictions on access points.

vi. *Pedestrian and vehicular routes.* Vehicles and helicopters are excluded. Pedestrians should ensure great care is taken to avoid, wherever possible, walking on any visible vegetation and areas of heated ground.

vii. *Other kinds of scientific investigations which would not cause harmful interference.* Scientific investigations which will not cause disturbance to the environment and its biota or to the biological programmes.

viii. *Scientific sampling.* Samples are not to be taken from area 'A'. Sampling from area 'B' should be restrained and not be undertaken to the detriment of the sustainability of the biological communities or the interests of future investigations.

ix. *Other restraints.* Sterile protective overclothing should be worn and footwear should be sterilized before entering the Site to minimize the risk of introducing alien biota to the geothermal areas. Human wastes must not be deposited within the Site.



**SSSI 11, Tramway Ridge, Mount Erebus**

**Site of Special Scientific Interest No. 12**

**XXI: Annex to Measure 3(1997)**

**Antarctic Protected Areas System: Revised Descriptions and Management Plans for Sites of Special Scientific Interest (SSSI)**

**Management Plan For Site Of Special Scientific Interest (SSSI) No. 12: Canada Glacier, Taylor Valley, Victoria Land**

*1. Description of values to be protected*

An area of 1 km: to the east side of Canada Glacier was originally designated in Recommendation XIII-8 (1985, SSSI No. 12) after a proposal by New Zealand on the

grounds that it contains some of the richest plant growth (bryophytes and algae) in the southern Victoria Land Dry Valleys. As such, the Area is of exceptional intrinsic ecological value, and is also of scientific value to botanists, zoologists and microbiologists. The Area is designated primarily to protect the site's ecological values. It is also valuable as a reference site for other dry valley ecosystems. The boundaries of this site have been changed such that the Area now includes biologically rich communities that were previously excluded. The Area, located at an elevation of between 20 and 220 m, comprises gently to moderately sloping ice-free ground with summer ponds and small meltwater streams draining from the Canada Glacier to Lake Fryxell. Most of the plant growth occurs in a flush area close to the glacier in the central part of the Area. The composition and distribution of the plant communities in the Area are correlated closely with the water regime. Thus, water courses and water quality are important to the values of the site. The Area is unusual in that it receives higher levels of moisture compared with other parts of the south Victoria Land Dry Valleys, and is sheltered from strong winds by the nearby 20 m glacier face.

The Area has been well-studied and documented, which adds to its scientific value. However, the plant communities are fragile and vulnerable to disturbance and destruction by trampling and sampling. Damaged areas will be slow to recolonize. Sites damaged at known times in the past have been identified, which are valuable in that they provide one of the few areas in the Dry Valleys where the long-term effects of disturbance, and recovery rates, can be measured.

The Area requires long-term special protection because of its exceptional moss communities for the south Victoria Land Dry Valleys and thus ecological importance; its

scientific values; the limited geographical extent of the ecosystem; the vulnerability of the Area to disturbance through trampling, sampling, pollution or alien introductions; and in view of the existing and increasing pressure from scientific, logistic and tourist activities in the region.

## *2. Aims and objectives*

Management at Canada Glacier 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 on the ecosystem and elements of the ecosystem in particular moss communities while ensuring protection from over-sampling;
- allow other scientific research provided it is for compelling reasons;
- which cannot be served elsewhere;
- minimise the possibility of introduction of alien plants, animals and microbes to the Area;
- allow visits for management purposes in support of the aims of the management plan.

## *3. Management Activities*

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

- Signs illustrating the location and boundaries with clear statements of entry

restrictions shall be placed at appropriate locations at the boundaries of the Area to help avoid inadvertent entry.

- Signs showing the location of the Area (stating the special restrictions that apply) shall be displayed prominently, and a copy of this Management Plan shall be kept available, in all of the research hut facilities located in the Taylor Valley that are within 20 km of the Area.
- Brightly coloured markers, clearly visible from the air and posing no significant threat to the environment, shall be placed to mark the helicopter landing pad.
- Durable wind direction indicators should be erected close to the designated helicopter landing site. These should be replaced as needed and removed when no longer required.
- Markers, signs or structures erected within the Area for scientific or management purposes shall be secured and maintained in good condition.
- Visits shall be made as necessary (no less than once every five years) to assess whether the Area continues to serve the purposes for which it was designated and to ensure management and maintenance measures are adequate.
- National Antarctic Programmes operating in the region shall consult together with a view to ensuring these steps are carried out.

#### *4. Period of Designation*

Designated for an indefinite period.

#### *5. Maps and Photographs*

Map A: Canada Glacier, Taylor Valley, location map.

Map specifications:

Projection: Lambert conformal conic;

Standard parallels: 1st 79°18'00" S; 2nd 76° 42' 00"S

Central Meridian: 162°30'00" E Latitude of Origin: 78°01'16.2106" S;

Spheroid: WGS84.

Inset: McMurdo Dry Valleys and Ross Island region, showing the location of McMurdo Station (US) and Scott Base (NZ), and the location of the other specially protected areas in the Dry Valleys (Barwick Valley SSSI-3, and Linnaeus Terrace SSSI-19).

Map B: Canada Glacier, protected area location image map. Specifications are the same as those for Map A; the underlying image is Landsat Thematic Mapper Band 4, 6 January 1993, Row 115 Path 57, with an original pixel resolution of 30 m. [not reproduced]

Map C: Canada Glacier, topographic map. Map specifications are the same as those for Map A. Contours are derived from the digital elevation model used to generate the orthophotograph in Map D. Precise area of moist ground associated with the flush is subject to variation seasonally and inter-annually.

Map D: Canada Glacier, site orthophotograph. Specifications are the same as those for Map A; the original orthophotograph was prepared at 1:2500 in colour with a pixel resolution of

0.25 m and a positional accuracy of <1 m. Photography USGS/DoSLI (SN7856) 22 November 1993. [not reproduced]

Figure 1: Perspective view of the Canada Glacier protected area, combining orthophoto and Landsat images. The perspective is from an elevation of 485 m (1600 ft), 1.1 km out from the Area at a bearing of 95°SE. [not reproduced]

## 6. Description of the Area

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

The designated Area encompasses most of the glacier forefield area on the east side of the lower Canada Glacier, on the north shore of Lake Fryxell (77°37'S, 163°03'E: Maps A and B). The south boundary of the Area is defined as the shoreline of Lake Fryxell, to the water's edge, extending about 1 km east from where the Canada Glacier toe meets Lake Fryxell. The west boundary of the Area follows the edge of the Canada Glacier. The SE corner is near the neck of a small peninsula extending into L. Fryxell. The peninsula, outside of the Area, is marked by a large rock (split) surrounded by a circle of rocks which was a benchmark for the 1985 NZ survey of the original SSSI. A wooden post marking Dry Valley Drilling Project Site 7 (1973) is about 10 m to the NW of this point. A moraine ridge extends from the SE corner upward and in a northerly direction: this ridge defines the eastern boundary of the Area. The ridge dips sharply before joining the featureless slope of

the main Taylor Valley wall: the NE corner of the Area is in this dip and will be marked by a cairn. A cairn will also be placed on a knoll on the ridge 450 m from the SE corner point.

Above the central flush a slope of lateral moraine of fairly even gradient extends upward and parallel to the glacier for about 1 km. At the top of this slope is a small knoll (220 m) about 300 m from where the glacier emerges into the Taylor Valley: a cairn and signpost will mark the boundary of the Area at this point. The upper, northern, boundary of the Area extends from the Canada Glacier to the boundary markers on the knoll and thence declines in elevation in an easterly direction for 1.7 km to the NE boundary cairn. The broad area above this upper boundary - outside of the Area - serves as an access 'corridor' between L. Fryxell and L. Hoare.

The central flush area (Maps C and D) containing the richest stands of vegetation is close to the glacier edge, near a small, shallow pond. The flush area is gently sloping and very moist with numerous small ponds and rivulets in the summer. The slopes above this area are better drained, but vegetation colonises several small stream channels which extend parallel to the glacier from the upper boundary of the Area down to the flush. Undulating moraines assist accumulation of persistent snow patches on this slope, which may also provide moisture for plant growth. Stream channels, and associated vegetation, become less obvious with distance from the glacier. These slopes and the central flush are drained to the SE by Canada Stream, one of three streams which dominate the water input to Lake Fryxell. In the 1990-91 season Canada Stream had a maximum streamflow of 0.65 m<sup>3</sup>s<sup>-1</sup> with a peak daily mean flow of 0.34 m<sup>3</sup>s<sup>-1</sup>, both occurring in December.

Three moss species have been identified from the flush area: *Bryum argenteum*, *Bryum pseudotriquetrum* and *Pottia heimii*. Lichen growth in the Area is inconspicuous, but two

epilithic lichens, *Carbonea capsulata* and an unknown species of *Sarcogyne*, and *Lecanora expectans* and *Caloplaca citrina* may be found in a small area near the outflow of the pond near Canada Glacier. Chasmoendolithic lichens occur in many boulders. Over 37 species of freshwater algae have been described at the site, predominantly from the Cyanophyta. The upper part of Canada Stream superficially appears sparse in algal growth. However, abundant encrusting epilithophytes grow on the undersides of stones and boulders. Two algae, *Prasiola calophylla* and *Chamaesiphon subglobosus*, have been observed only in this upper part of the stream. Cyanobacterial mats are extensive in the middle and lower reaches of the stream. Mucilaginous colonies of *Nostoc commune* dominate wetter parts of the central flush, while oscillatoriacean felts cover much of the mineral fines. Epiphytic algae, dominated by *Nostoc*, are common over the surface of *Bryam argenteum* and *Pottia heimii*. The lower stream is similar in floral composition, although it is notable in that the alga *Tribonema elegans* is abundant while absent further upstream: this is the first record of this alga from Antarctica. *Phormidium* and *Gloeocapsa* species are common throughout the stream-course.

Invertebrates from six phyla have been described in the Area: the three main groups are Rotifera, Nematoda and Tardigrada, with Protozoa, Platyhelminthes, and Arthropoda also present.

Evidence of human activities is commonplace within the Area. The main forms of damage evident at sites of vegetation are paths and footprints, removal of core samples from bryophyte turfs, and removal of larger clumps of bryophyte turfs. A number of old markers exist in the flush area and there has been some site modification closeby in the form of small rock dams, soil pits and several old campsites - much of this was remediated in the 1995-96 season. A plastic greenhouse was erected within the Area close to the flush in 1979 for experimental growth of garden vegetables, but this was destroyed in 1983 by a winter storm. Remains of the greenhouse found in the Area have been removed.

#### *6(ii) Restricted zones within the Area*

None.

#### *6(iii) Structures within and near the Area*

The first New Zealand hut at Canada Glacier was relocated to a second site in 1989, and removed completely in 1995-96. The second site is now designated for essential camping associated with research, marked on Maps C and D. Paths marked by lines of rocks, areas cleared for use as campsites, an old helicopter pad, and several low rock structures associated with the first hut site have nosier been remediated. A series of at least four shallow pits (~1 m in depth) were dug close to the old hut site. The second hut site comprised two small buildings, several new campsites, and a new helicopter pad. A path exists between the site and the glacier edge, crossing a moist area of plant growth. The helicopter pad remains as the current designated landing site.

A rock weir had been constructed in the constricted part of Canada Stream prior to 1981; in 1990 a more substantial weir and 9-inch Parshall flume were installed nearby (Maps C and D). The flume is made of black fibreglass. The weir consists of polyester sandbags filled with alluvium from near the stream channel: areas disturbed during construction were restored and after one season were not evident. The upstream side of the weir is lined with vinyl-coated

nylon. A notch has been built into the weir for relief in case of high flow. Clearance of seasonal snow from the channel has been necessary to prevent water from backing up at the weir. Data logging instrumentation and batteries are stored in a plywood crate located nearby on the north side of the stream.

Signposts and cairns mark the Area boundaries.

The U.S. Fryxell Hut (20 m ASL) is located 1.5 km to the east, and Hoare Hut (65 m ASL) is located 3 km to the west of the Area (Maps A and B).

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

The nearest protected areas to Canada Glacier are Linnaeus Terrace (SSSI-19) 47 km west in the Wright Valley, and Barwick Valley (SSSI-3) 50 km to the NW (Inset, Map A).

### *7. Permit Conditions*

Entry into the Area is prohibited except in accordance with a Permit issued by appropriate national authorities. Conditions for issuing a Permit to enter the Area are that:

- it is issued only for scientific study of the ecosystem, or for compelling scientific reasons that cannot be served elsewhere, or for essential management purposes consistent with plan objectives such as inspection or review;
- the actions permitted will not jeopardise the ecological or scientific values of the Area;
- any management activities are in support of the aims of the Management Plan;
- the actions permitted are in accordance with the Management Plan;
- the Permit, or an authorized copy, shall be carried within the Area;
- a visit report shall be supplied to the authority named in the Permit;
- permits shall be issued for a stated period.

#### *7(i) Access to and movement within the Area*

Vehicles are prohibited within the Area and access shall be by foot or by helicopter. Helicopter access should be from south of the line marked on the accompanying site maps, and overflight within the Area less than 100 m Above Ground Level (AGL) north of this line is prohibited. Helicopters shall land only at the designated site (163°02' 53" E, 77°36' 58" S: Map B) and overflight of the Area should generally be avoided. Exceptions to these flight restrictions, which will only be granted for an exceptional scientific or management purpose, must be specifically authorized by Permit. Use of helicopter smoke grenades within the Area is prohibited unless absolutely necessary for safety, and then these should be retrieved. Visitors, pilots, air crew, or passengers en route elsewhere on helicopters, are prohibited from moving on foot beyond the immediate vicinity of the designated landing and camping site unless specifically authorised by a Permit.

Pedestrians travelling up- or down-valley shall not enter the Area without a Permit. Permitted visitors entering the Area are encouraged to keep to established routes where possible. Visitors should avoid walking on visible vegetation or through stream beds. Care should be exercised walking in areas of moist ground, where foot traffic can easily damage sensitive soils, plant and algal communities, and degrade water quality: walk around such areas, on ice



or rocky ground, and step on larger stones when stream crossing is necessary. Care should also be taken of salt-encrusted vegetation in drier areas, which can be inconspicuous. Pedestrian traffic should be kept to the minimum necessary consistent with the objectives of any permitted activities and every reasonable effort should be made to minimise effects.

*7(ii) Activities that are or may be conducted in the Area, including restrictions on time or place*

- Scientific research that will not jeopardise the ecosystem of the Area;
- Essential management activities, including monitoring.

In view of the importance of the water regime to the ecosystem, activities should be conducted so that disturbance to water courses and water quality is minimised. Activities occurring outside of the Area (e.g. on the Canada Glacier) which may have the potential to affect water quality should be planned and conducted taking possible downstream effects into account. Those conducting activities within the Area should also be mindful of any downstream effects within the Area and on Lake Fryxell.

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

Any structures erected or scientific equipment installed within the Area are to be specified in a Permit. Scientific equipment shall be clearly identified by country, name of the principal investigator and year of installation. All such items should be made of materials that pose minimal risk of contamination of the Area. Removal of specific equipment for which the Permit has expired shall be a condition of the Permit.

*7(iv) Location of field camps*

Nearby permanent camps outside of the Area should be used as a base for work in the Area. Camping at the designated campsite (Maps B and C) may be permitted to meet specific essential scientific or management needs.

*7(v) Restrictions on materials and organisms which can be brought into the Area*

No living animals, plant material or microorganisms shall be deliberately introduced into the Area and precautions shall be taken against accidental introductions. 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. Fuel is not to be stored in the Area, unless required for essential purposes connected with the activity for which the Permit has been granted. All materials introduced shall be for a stated period only, shall be removed at or before the conclusion of that stated period, and shall be stored and handled so that risk of their introduction into the environment is minimised.

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

This is prohibited, except in accordance with a Permit. Where animal taking or harmful interference is involved this should, as a minimum standard, be in accordance with the SCAR Code of Conduct for the Use of Animals for Scientific Purposes in Antarctica.

*7(vii) Collection or removal of anything not brought into the Area by the Permit holder*

Material may be collected 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. 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 removal is likely to be greater than leaving the material in situ: if this is the case the appropriate authority should be notified.

*7(viii) Disposal of waste*

All wastes, including all human wastes, shall be removed from the Area.

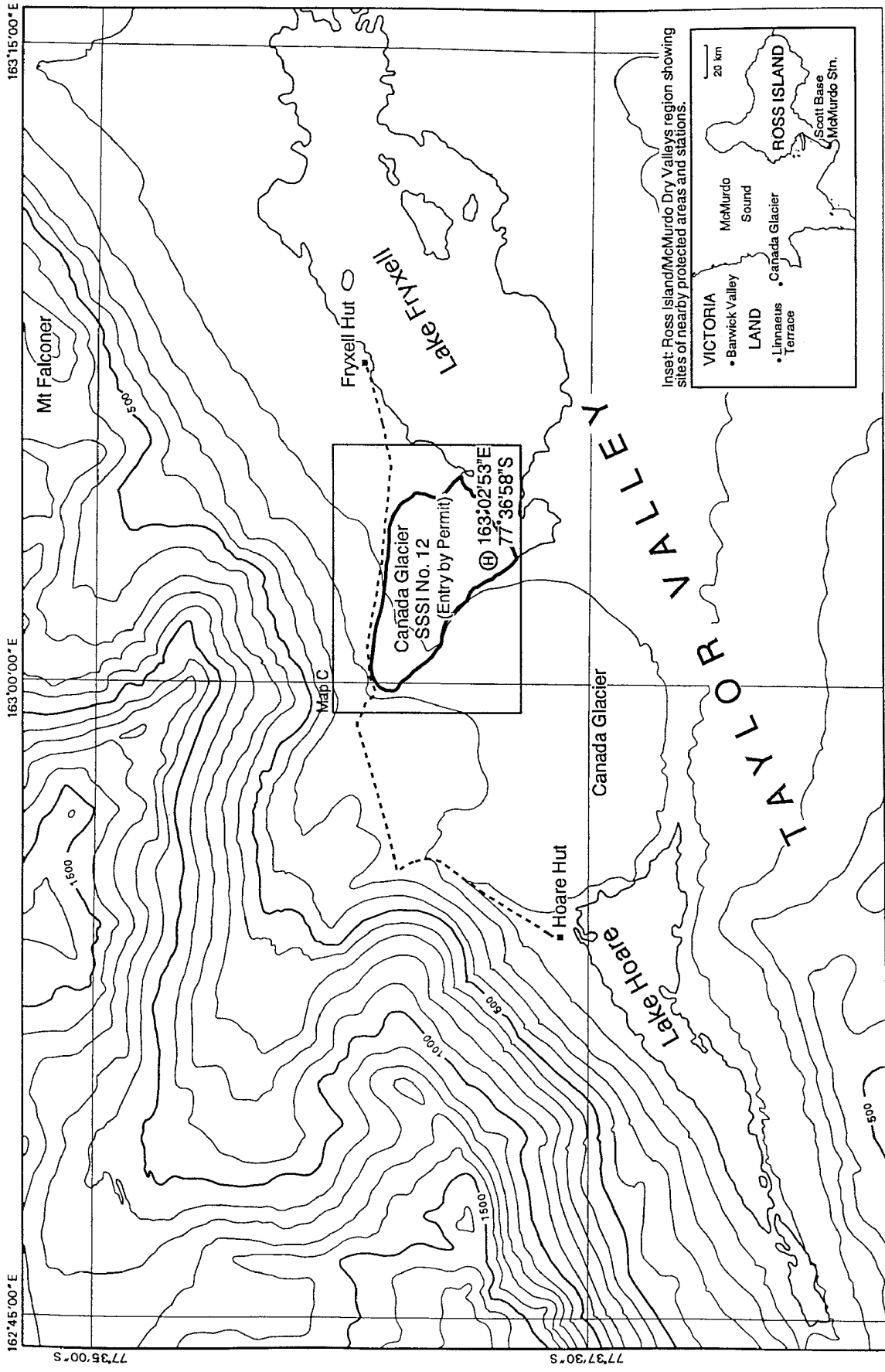
*7(ix) Measures that are necessary to ensure that the aims and objectives of the Management Plan can continue to be met*

1. Permits may be granted to enter the Area to carry out biological monitoring and site inspection activities, which may involve the collection of small samples for analysis or review, to erect or maintain signposts, or for protective measures.
2. Any specific sites of long-term monitoring shall be appropriately marked.
3. To help maintain the ecological and scientific values of the plant communities found at the Area visitors shall take special precautions against introductions. Of particular concern are microbial or vegetation introductions sourced from soils at other Antarctic sites, including stations, or from regions outside Antarctica. To minimise the risk of introductions, visitors shall thoroughly clean footwear and any equipment to be used in the area — particularly camping and sampling equipment and markers — before entering the Area.

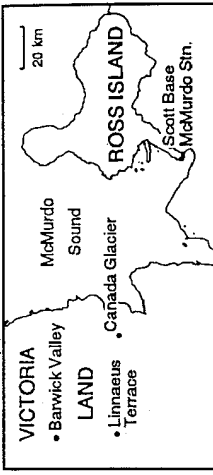
*7(x) Requirements for reports*

Parties should ensure that the principal holder for each permit issued submit to the appropriate authority a report describing the activities undertaken. Such reports should include, as appropriate, the information identified in the Visit Report form suggested by SCAR. 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 the 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 management plan and in organising the scientific use of the Area.

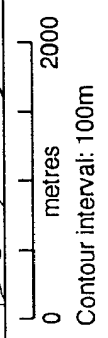
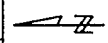
Map A - Canada Glacier, Taylor Valley, location map



Inset: Ross Island/McMurdo Dry Valleys region showing sites of nearby protected areas and stations.

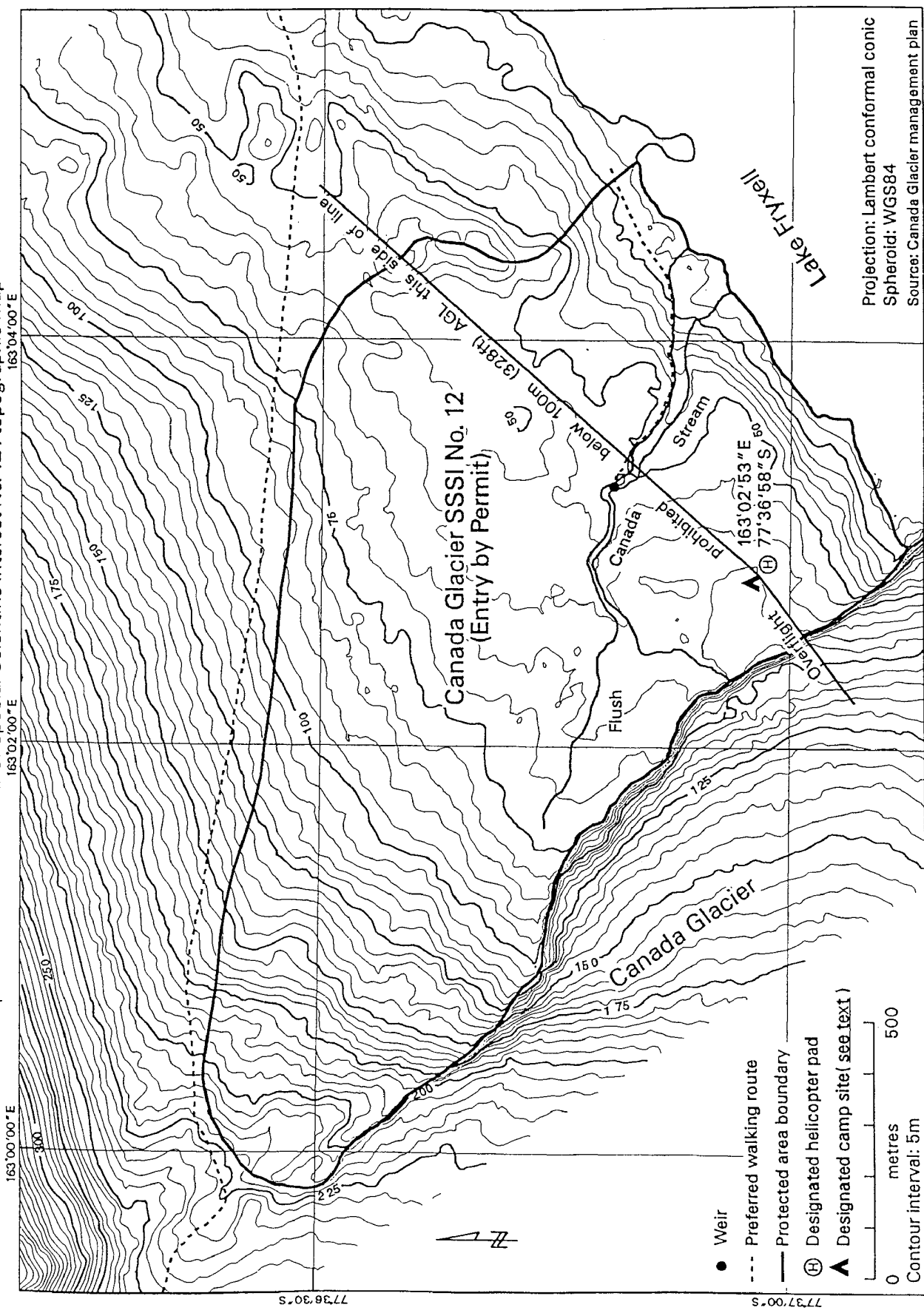


- Protected area boundary
- ⊕ Designated helicopter pad
- - - Preferred Hoare-Fryxell walking route over glacier



Projection: Lambert conformal conic  
Spheroid: WGS84  
Source: Canada Glacier management plan

Map C - Canada Glacier Site of Special Scientific Interest No. 12: topographic map



- Weir
  - Preferred walking route
  - Protected area boundary
  - ⊕ Designated helicopter pad
  - ▲ Designated camp site ( see text )
- 0 500 metres  
Contour interval: 5m

Projection: Lambert conformal conic  
Spheroid: WGS84  
Source: Canada Glacier management plan

**Annex to Recommendation XIII-8**  
**Site of Special Scientific Interest No 12: Canada Glacier,**  
**Lake Fryxell, Taylor Valley, Victoria Land**

*Management Plan*

i. *Description of Site.* The Site lies between Canada Glacier and Lake Fryxell in lower Taylor Valley, south Victoria Land (lat 77°37'S, long 163°05'E). The Site encompasses an area of 1 km located between the tongue of Canada Glacier and the shoreline of Lake Fryxell. Surface features included old moraine deposits and ancient lake level. During summer months small meltwater streams drain from the glacier to the lake creating an extensive area of flushes. The central flush area is about 100 m west of the New Zealand Antarctic Research Programme field hut. The boundaries of the Site are shown on the attached map.

ii. *Reason for designation.* The Site contains some of the richest plant growth (algae and mosses) in the southern Victoria Land Dry Valleys. With the concentration of research activity within this area there is a need to regulate human impact with regard to trampling, water quality and sampling.

iii. *Outline of research.* The Site is the centre of scientific research for freshwater and terrestrial biological research and a reference site for other dry valley biological ecosystems.

iv. *Date of expiry of designation.* 31 December 1991.

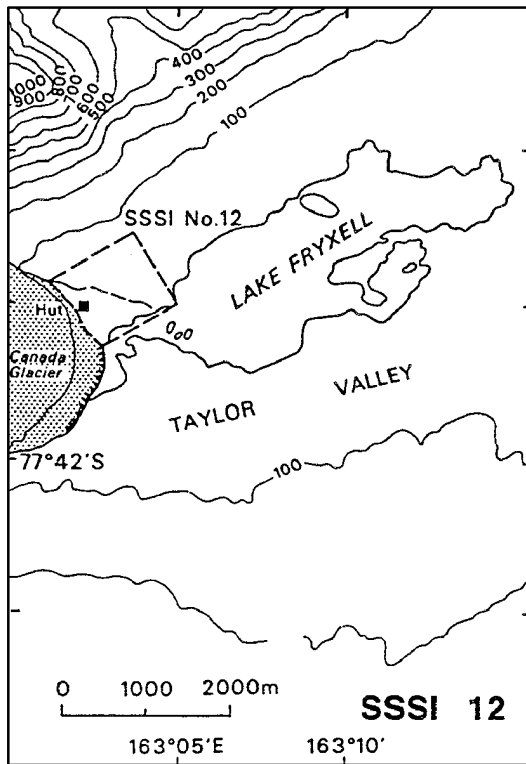
v. *Access points.* Access should be from the north-east side of the Site.

vi. *Pedestrian and vehicular routes.* Vehicles are excluded, although access to the Site by helicopter is allowed but landings should be restricted to the helicopter landing pad 50m north-east of the New Zealand Antarctic Research Programme hut. Pedestrian movement within the site should be restricted to designated paths and shortest routes consistent with scientific activity.

vii. *Other kinds of scientific investigations which would not cause harmful interference.* None specified.

viii. *Scientific sampling.* Sampling should be restricted to the minimum required and should not be undertaken to the detriment of the environment and its biota. It should be accomplished without causing introduction to new biota, including microorganisms.

ix. *Other restraints.* (a) Collection of ice for water supply should be taken from the edge of the glacier immediately south of the area of rich algal growth. (b) All human wastes must be containerized and returned to Scott or McMurdo Stations. (c) Tent sites are to be restricted to within a 50m radius of the hut. (d) Entry into the area of rich moss growth west of the hut is prohibited except for compelling scientific purposes.



**SSSI 12, Canada Glacier Lake Fryxell,  
Taylor Valley**

## **Site of Special Scientific Interest No 13**

**XXI: Annex to Measure 3(1997)**

### **Antarctic Protected Areas System: Revised Descriptions and Management Plans for Sites of Special Scientific Interest (SSSI)**

#### **Management Plan For Site Of Special Scientific Interest (SSSI) No. 13: Potter Peninsula, 25 de Mayo (King George) Island, South Shetland Islands**

##### *1. Description of Values to be Protected*

This area was originally designated as SSSI No. 13 in ATCM Recommendation XIII-8 after a proposal by Argentina because of its diverse avian and mammal fauna and locally rich vegetation, providing a representative sample of maritime Antarctic ecosystem. Coastal areas support large breeding colonies of ten seabird species, including three penguin species and three species of marine mammals.

The reasons for the original designation of the Area are still relevant. Scientific research on the breeding ecology of elephant seals and seabirds has been undertaken since 1982. This includes both the CCAMLR Ecosystem Monitoring Programme and basic biological and ecological research that must be developed without interferences by other human activities. Long-term research programmes could be endangered by accidental interference, especially during breeding periods.

##### *2. Aims and Objectives*

*Management of Potter Peninsula aims to:*

- Avoid major changes in the structure and composition of communities of flora and fauna;
- Prevent unnecessary human disturbance to the area;
- Permit scientific research which cannot be served elsewhere, and allow the continuity of the ongoing long-term biological and ecological research programmes established in the Area.

### *3. Management Activities*

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

- Because the area is close to a station permanently occupied, a marker board will be placed at the principal access point illustrating the location boundaries and stating entry restrictions;
- Within the Area those locations used for research will be clearly marked.
- Priority pedestrian routes within the Area will be established for transit to sample sites.
- Collection of samples will be limited to the minimum required for approved scientific research.
- Visits shall be made as necessary to ensure management and maintenance measures are adequate.

### *4. Period of Designation*

Designated for an indefinite period.

### *5. Maps*

Map 1 shows the location of Potter Peninsula in relation with the Antarctic Peninsula.

Map 2 shows the location of Potter Peninsula in relation with 25 de Mayo (King George) Island.

Map 3 shows the Protected Area in greater detail.

### *6. Description of the Area*

#### *6(i) Geographical co-ordinates and natural features of the Area*

The site is located on the east side of Maxwell Bay, south-west of 25 de Mayo (King George) Island between Mirounga Point (the north-west most extreme point of Potter Peninsula) and the east side of Stranger Point (lat. 62°15' S - long 58° 37' W). The site occupies the coastal zone of variable width up to 500 m from the shore line (low water mark) and rising to above 70m altitude at Stranger Point. It is mainly an area of raised beaches, mostly pebble-covered, backed by basalt cliffs, terminal or lateral moraines and small glaciers. The coastline is very irregular and alternates between small base and rocky headlands.

This area offers a great scientific value by the presence of many bird colonies (Adelie penguin, gentoo penguin, chinstrap penguin, Dominican gull, brown skua, Antarctic tern, sheathbill, giant petrel and cape petrel) and breeding groups of marine mammals (Crabeater seal, Weddell seal, Southern elephant seal). There is a relatively abundant development of lichen-dominated plant communities, especially on the succession of prominent rocks along

the beach. Long-term research and research programmes could be endangered by accidental interference, destruction of vegetation and soil, and perturbation of breeding birds and mammals.

*6(ii) Restricted zones within the Area*

None

*6(iii) Location of structures within the Area*

Within the Area there is a small Argentine refuge used by research teams. The refuge measuring 3 by 2.5m, is built of metal sheets and glass-fibre roof. It can accommodate up to two persons. Approximately 500 metres outside the site is placed Jubany Station.

*6(iv) Location of other Protected Areas within close proximity*

SSSI No. 5, Fildes Peninsula lies about 20 km to the east direction. SSSI No. 8 Western Shore of Admiralty Bay lies 10 km to the north-east direction. SSSI No. 14 Harmony Point, lies about 30 km to the WSW direction.

*7. Permit conditions*

Entry into the Area is prohibited except in accordance with a permit issued by appropriate national authorities.

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

- It is used to continue study for the natural history, biology and ecology of the flora and fauna of the area or for a compelling scientific purpose that cannot be met elsewhere;
- The actions permitted will not jeopardise the natural ecological system in 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 authorised copy, must be carried within the Site of Special Scientific Interest.
- A report or reports are supplied to the authority that issued the Permit.

*7(i) Access to and movements within the Area*

The access to the Area is restricted to the Northern end, near the helipad. Marine access will be restricted to a landing site in front of the refuge. No vehicles or aircraft are permitted in the Area except under emergency.

Limitation on access to particular localities used by breeding birds and mammals for specific periods may be necessary.

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



Scientific study and monitoring of the populations of flora and fauna in the area and compelling scientific research which cannot be conducted elsewhere and which will not interfere with ongoing long-term research programmes or jeopardise the structure or dynamics of the ecosystem of the Area.

Essential management activities, including monitoring.

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

No additional structures are to be erected in the Area, or scientific equipment installed, except for essential scientific or management activities, as specified in a Permit.

*7(iv) Location of field camps*

Parties using the Area will normally be able to use Jubany Station. In the event that this is not possible, a camp site should be used near the existing station and outside the Area.

*7(v) Restriction on material and organisms which may be brought into the Area*

No living animals or plant material shall be deliberately introduced into the Area.

No poultry products, including food products containing uncooked dried eggs, shall be taken into the Area. No herbicides or pesticides shall be brought into the Area. Any other chemicals, which may be introduced for compelling scientific purpose specified in the permit, shall be removed from the Area at or before the conclusion of the activity for which the Permit was granted.

As far as possible the use of chemicals should be clearly documented for the benefit of later researchers.

Fuel, food and other material are not to be stored in the Area, unless required for essential purposes connected with the activity for which the Permit has been granted. All such material introduced are to be removed when no longer required. Permanent depots are not permitted.

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

This is prohibited, except in accordance with a Permit. Where animal taking or harmful interference is involved this should be in accordance with the SCAR Code of Conduct for Use of Animals for Scientific Purposes in Antarctica, as a minimum standard.

*7(vii) Collection or removal of anything not brought into the area by the permit holder*

Biological specimens and samples may be collected and/or removed from the Area only according to a permit. Debris of human origin should be removed and reported to the authority that issued the permit. Dead biological specimens may be removed for pathological analysis.

*7(viii) Disposal of waste*

All non-human wastes shall be removed from the Area to the nearby research station. Human waste may be deposited in the sea.

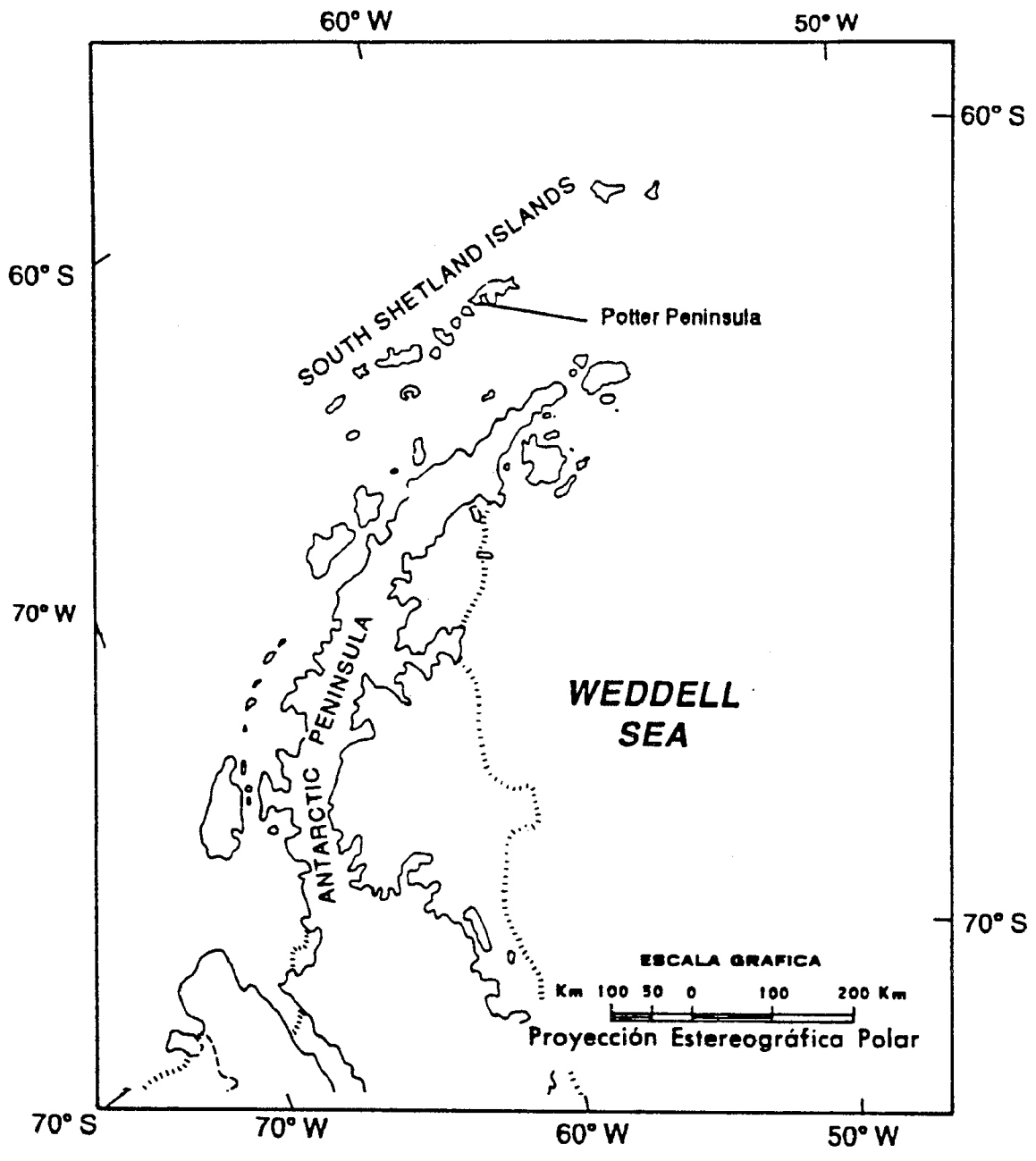
*7(ix) Measures that may be necessary to ensure that the aims and objectives of the management plan continue to be met*

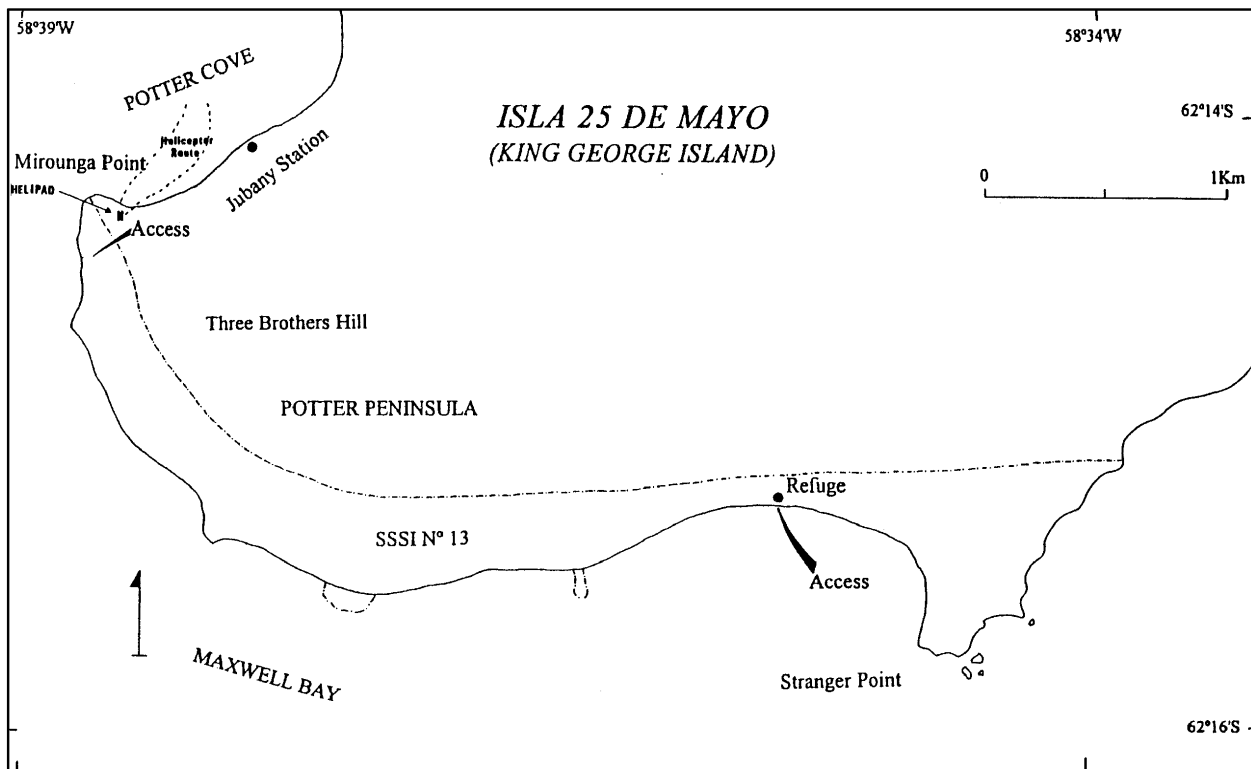
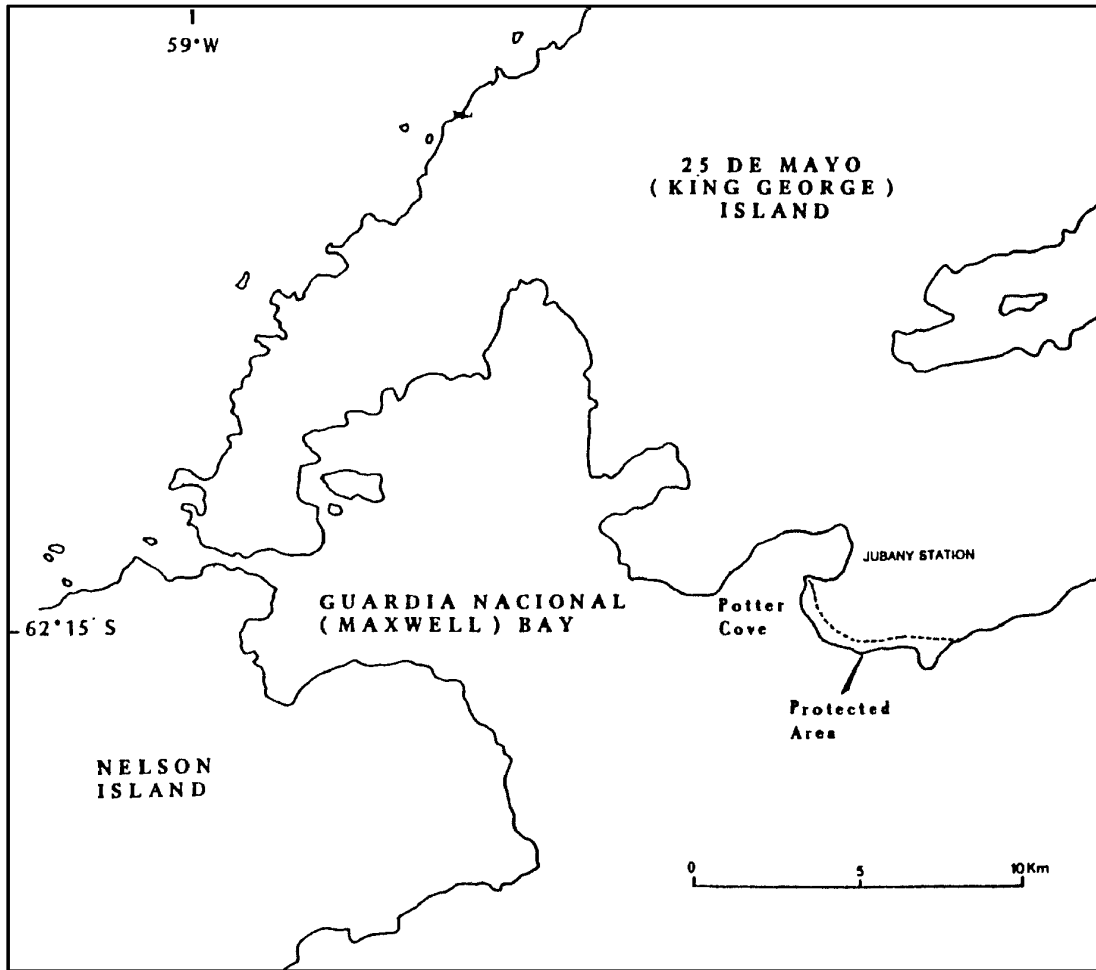
Permits may be granted to enter the area to carry out biological and ecological studies and monitoring, and site inspection activities, including the collection of small amounts of plant material and small numbers of animals for scientific purposes, to erect or maintain notice boards and protective measures.

All scientific structures and instrumentation, including research markers, installed in the Area must be authorised in a permit and clearly identified by country, name of investigator and year of installation. Research markers and structures must be removed at or before the expiry of the Permit. If specific scientific projects cannot be concluded within the permitted time, applications must be made for an extension to leave the items in situ.

*7(x) Requirements for reports*

The principal permit holder for each issued permit shall submit a report of activities conducted in the Area. This report shall be submitted to the authority named in the Permit as soon as practicable. Such report should be stored indefinitely and made accessible to interested Parties, SCAR, CCAMLR, and COMNAP if requested, to provide the documentation of human activities within the Area necessary for good management.





**Annex to Recommendation XIII-8**  
**Site of Special Scientific Interest No 13: Potter Peninsula, King**  
**George Island, South Shetland Islands**

*Management Plan*

i. *Description of Site.* The Site is located on the east side of Maxwell Bay, south-west King George Island between 'Mirounga Point' and the east side of Stranger Point (lat 62°15'S, long 58°37'W). The Site occupies the coastal zone of variable width up to 500m from the shoreline (low water mark) and rising to about 70m altitude at Stranger Point. It is mainly an area of raised beaches, mostly pebble-covered, backed by basalt cliffs, terminal or lateral moraines and small glaciers. The coastline is very irregular and alternates with small bays and rocky headlands. The boundaries of The Site are shown on the attached map.

ii. *Reason for designation.* This area has a diverse avian and mammal fauna and locally rich vegetation, and is located close to an Argentine research station (Jubany) frequently visited by tourist cruises. Long-term research programmes could be endangered by accidental interference, especially during breeding periods.

iii. *Outline of research.* The Site contains a fairly large breeding population of elephant seals (*Mirounga leonina*). Various research projects are being carried out, including population censuses, tagging, studies of population structure, birth and mortality rates, growth rates and analysis of blood samples for the study of protein polymorphism. The status of fur seals (*Arctocephalus gazella*) and other seals is also being monitored. Studies of breeding seabirds are also being made on Adelie penguins (*Pygoscelis adeliae*), gentoo penguins (*P. papua*), giant petrels (*Macronectes giganteus*), Dominican gulls (*Larus dominicanus*), sheathbills (*Chionis alba*), brown skuas (*Catharacta lonnbergii*) and Antarctic terns (*Sterna vittata*). This work includes nest censuses, fledgling development, predation and analysis of egg albumen to determine protein polymorphism. All the investigations have the objective of assessing the population dynamics of the different species, and the biotic and abiotic factors that regulate them.

iv. *Date of expiry of designation.* 31 December 1995.

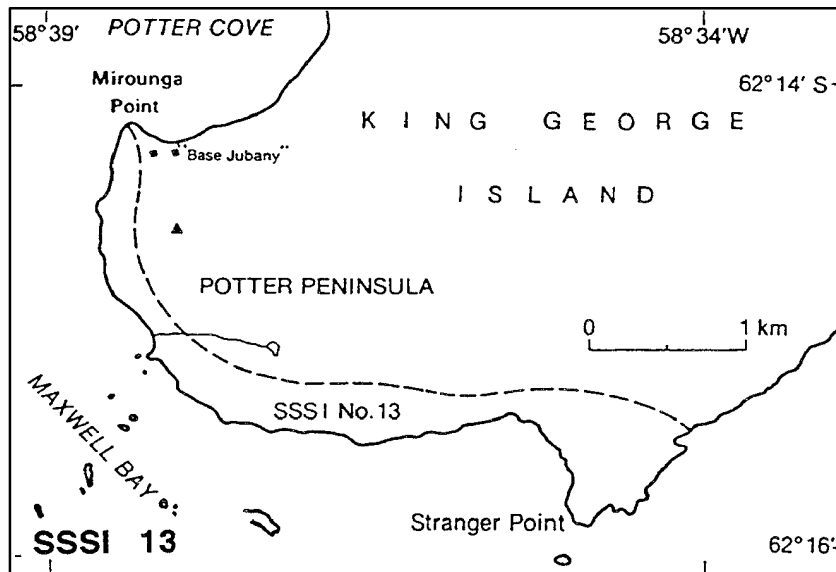
v. *Access points.* Access to the Site is restricted to the northern end in the vicinity of 'Mirounga point'.

vi. *Pedestrian and vehicular routes.* Pedestrians and vehicles must use established routes particularly during the breeding season. No vehicles or helicopters should be used near any of the breeding sites.

vii. *Other kinds of scientific investigation which would not cause harmful interference.* None specified.

viii. *Scientific sampling.* Scientific sampling, both by killing or capturing, must be the minimum required for the research programme described above, and must conform with the Agreed Measures for the Conservation of Antarctic Fauna and Flora.

ix. *Other restraints.* None specified.



**SSSI 13, Potter Peninsula**

## **Site of Special Scientific Interest No 14**

**XXI: Annex to Measure 3(1997)**

### **Antarctic Protected Areas System: Revised Descriptions and Management Plans for Sites of Special Scientific Interest (SSSI)**

#### **Management Plan For Site Of Special Scientific Interest (SSSI) No. 14: Harmony Point, Nelson Island, South Shetland Islands**

##### *1. Description of Values to be Protected*

This area was originally designated as SSSSI No. 14 in ATCM Recommendation XIII-8, after a proposal by Argentina and Chile, because of its diverse seabird community and extensive terrestrial vegetation cover and rich flora including mosses, lichens and two vascular plant species.

Ice free land supports large breeding colonies of 11 seabird species, and one of the largest single colonies of chinstrap penguin. The seabird colonies, and particularly the chinstrap penguin colony, are still important for scientific purposes, and have shown significant increases in the last decade. The Area supports a large giant petrel colony (500 breeding pairs), a species which is highly sensitive to any kind of human disturbance and is decreasing in many sites in Antarctica.

The Area is an excellent example of the South Shetland Islands maritime Antarctic seabird community and terrestrial ecosystem, allowing long term research without damage or

## *2. Aims and Objectives*

Management of Harmony Point aims to:

- Avoid major changes in the structure and composition of communities of flora and fauna;
- Prevent unnecessary human disturbance to the area;
- Permit scientific research which cannot be served elsewhere, and allow the continuity of the ongoing long-term biological and ecological research programmes established in the Area.

## *3. Management Activities*

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

- A marker board will be placed at the principal access point illustrating the location, boundaries and stating entry restrictions;
- Access to the Area and paths will be marked;
- Preferred walking routes within the area will be established for transit to sample sites;
- Collection of samples will be limited to the minimum required for authorised scientific research;
- Visits shall be made as necessary to ensure management and maintenance measures are adequate.

## *4. Period of Designation*

Designated for an indefinite period.

## *5. Maps*

Map 1: shows the location of Nelson Island in relation with the Antarctic Peninsula

Map 2: shows the location of Harmony point on Nelson Island.

Map 3: shows the Protected Area in greater detail.

## *6. Description of the Area*

*6(i) Geographical coordinates and natural features of the Area*

This Area is located in the west coast of Nelson Island, between 25 de Mayo (King George) Island to the Northeast and Robert Island to the Southwest (lat. 62°18'S; 59°14'W).

The Area includes Harmony Point and the Toe, the adjacent ice and surrounding marine zone within the rectangle showed on maps 2 and 3.

Geomorphologically Harmony Point presents three well defined units: an andesitic plateau, coastal andesitic outcrops and ancient sea levels (raised beaches). The plateau reaches 40 metres above sea level and its area is covered by detritus resulting from the destruction of andesitic rock by freeze/thaw action, with a well-developed vegetation of mosses and lichens.

Lakes and streams with a limited flow appear on the undulations. Some isolated andesitic rocks stand out from the glacier ice, and some of them are formed on the deglaciated plateau (ancient nunataks), evidencing that the past extension of the glacier covered Harmony Point.

There are three successive raised beaches, between the coast and the westward extremity and the glacier. These beaches are defined by pebble accumulations of variable height.

The Area holds breeding colonies of eleven seabird species: gentoo penguin 4,000 pairs, chinstrap penguin 12,000 pairs, giant petrel 500 pairs, cape petrel 300 pairs, blue eyed shag 110 pairs, sheathbill 110 pairs, brown skua 40 pairs, Dominican gull 120 pairs, Antarctic tern 30 pairs. Other seabirds nesting in the Area are Wilson storm petrel and black-bellied storm petrel.

There are some extensive areas covered by a very rich and diverse development of bryophytes and lichen-dominated plant communities, including two vascular plant species, especially in the areas less affected by recent perturbation or breeding activities. Moss turf subformations are located in wind protected and moist places, whilst lichen-dominated subformations occur in places with a high wind exposure.

#### *6(ii) Restricted zones within the Area*

There are no prohibited zones within the Area, but access to bird breeding areas should be restricted during the breeding season (September to March) and damage to vegetation should be avoided by limited access to the marked paths.

#### *6(iii) Location of structures within the Area*

There is a refuge measuring 4.5 by 3.5m, that can house three scientists, and a storage building. The installations are used only during spring and summer. There is an Argentine navigation light on the westmost point of Harmony Point.

#### *6(iv) Location of other Protected Areas within close proximity*

SPA No. 16, Coppermine Peninsula, Robert Island lies about 30 km south-west. SSSI No. 13 Potter Peninsula, 25 de Mayo (King George) Island lies about 30 km east-north-east. SSSI No. 5, Fildes Peninsula, 25 de Mayo (King George) Island lies about 23km north-

north-east. SSSI No. 8, Western Shore of Lasserre/Admiralty Bay, 25 de Mayo (King George) Island lies about 45km east-north-east.

### *7. Permit Conditions*



Entry into the Area is prohibited except in accordance with a permit issued by appropriate national authorities.

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

- It is issued to continue study of the natural history, biology and ecology of the flora and fauna of the area or for a compelling scientific purpose that cannot be met elsewhere;
- The actions permitted will not jeopardise the natural ecological system in 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 authorised copy, must be carried within the Site of Special Scientific Interest;
- A report or reports are supplied to the authority that issued the Permit.

*7(i) Access to and movements within the Area*

Access to Harmony Point area from the sea, which is the preferred method, is restricted to the pebble beach 400m south-west to the refuge. There is a navigation light located in the westmost point of Harmony Point. Access to the navigation light is by boat from the coast at the south of the light. Special access points are not specified for the Toe, but access is limited to inflatable boats.

Aircraft landing should be avoided where practicable. Small planes could land on the glacier but flights over the Area are not allowed. Helicopters must not overfly any of the major bird breeding areas, and should land only in the vicinity of the refuge or landing beach. Map 3 shows proposed helicopter flight route. It is forbidden to overfly the Area below 250m above the highest point except for access to the landing point specified above.

Pedestrians must use established routes, particularly during the bird breeding season.

Vehicles are prohibited in the area.

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

Scientific study and monitoring of the populations of flora and fauna in the area and compelling scientific research which cannot be conducted elsewhere and which will not interfere with ongoing long-term research programmes or jeopardise the structure or dynamics of the ecosystem of the Area.

Essential management activities, including monitoring.

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

No additional structures are to be erected in the Area, or scientific equipment installed, except for essential scientific or management activities, as specified in a Permit.

*7(iv) Location of field camps*

No additional structures are to be erected in the Area, or scientific equipment installed, except for essential scientific or management activities, as specified in a Permit.

*7(v) Restriction on material and organisms which may be brought into the Area*

No living animals or plant material shall be deliberately introduced into the Area.

No poultry products, including food products containing uncooked dried eggs, shall be taken into the Area.

No herbicides or pesticides shall be brought into the Area. Any other chemicals, which may be introduced for compelling scientific purpose specified in the permit, shall be removed from the Area at or before the conclusion of the activity for which the Permit was granted.

As far as possible the use of chemicals should be clearly documented for the benefit of later researchers.

Fuel, food and other material are not to be stored in the Area, unless required for essential purposes connected with the activity for which the Permit has been granted. All such material introduced are to be removed when no longer required. Permanent depots are not permitted.

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

This is prohibited, except in accordance with a Permit. Where animal taking or harmful interference is involved this should be in accordance with the SCAR Code of Conduct for Use of Animals for Scientific Purposes in Antarctica, as a minimum standard.

*7(vii) Collection or removal of anything not brought into the area by the Permit holder*

Biological specimens and samples may be collected and/or removed from the Area only according to a permit. Debris of human origin should be removed and reported to the authority that issued the permit. Dead biological specimens may be removed for pathological analysis.

*7(viii) Disposal of waste*

All non-human waste shall be removed from the Area. Human waste may be deposited in the sea.

Waste resulting from research activities in the Area may be stored temporarily beside the refuge to await its removal from the Area at the first opportunity. Any such stored waste must be adequately contained, marked as waste and secured against accidental loss.

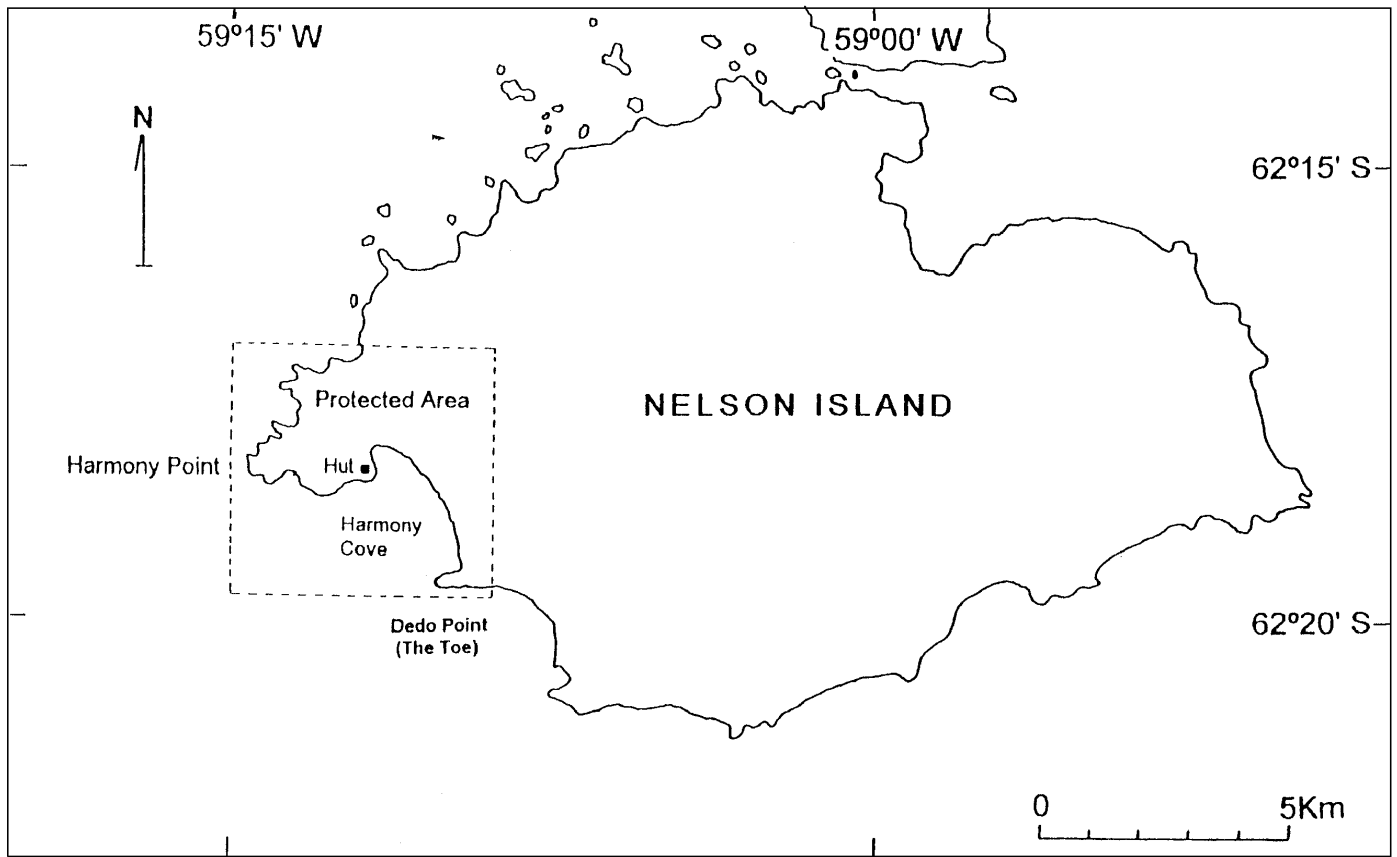
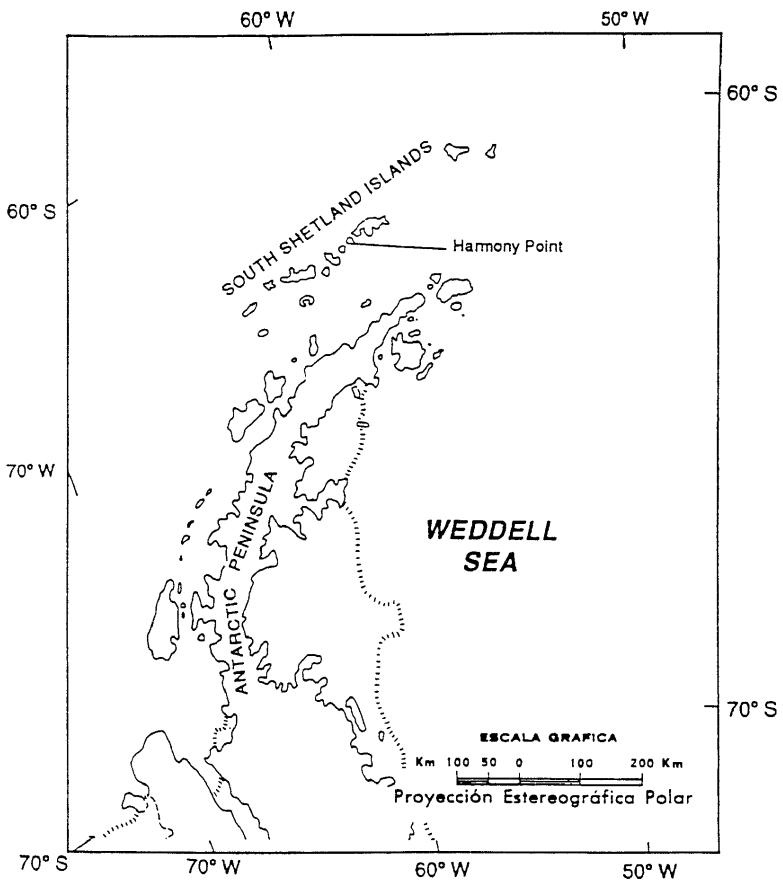
*7(ix) Measures that may be necessary to ensure that the aims and objectives of the management plan continue to be met*

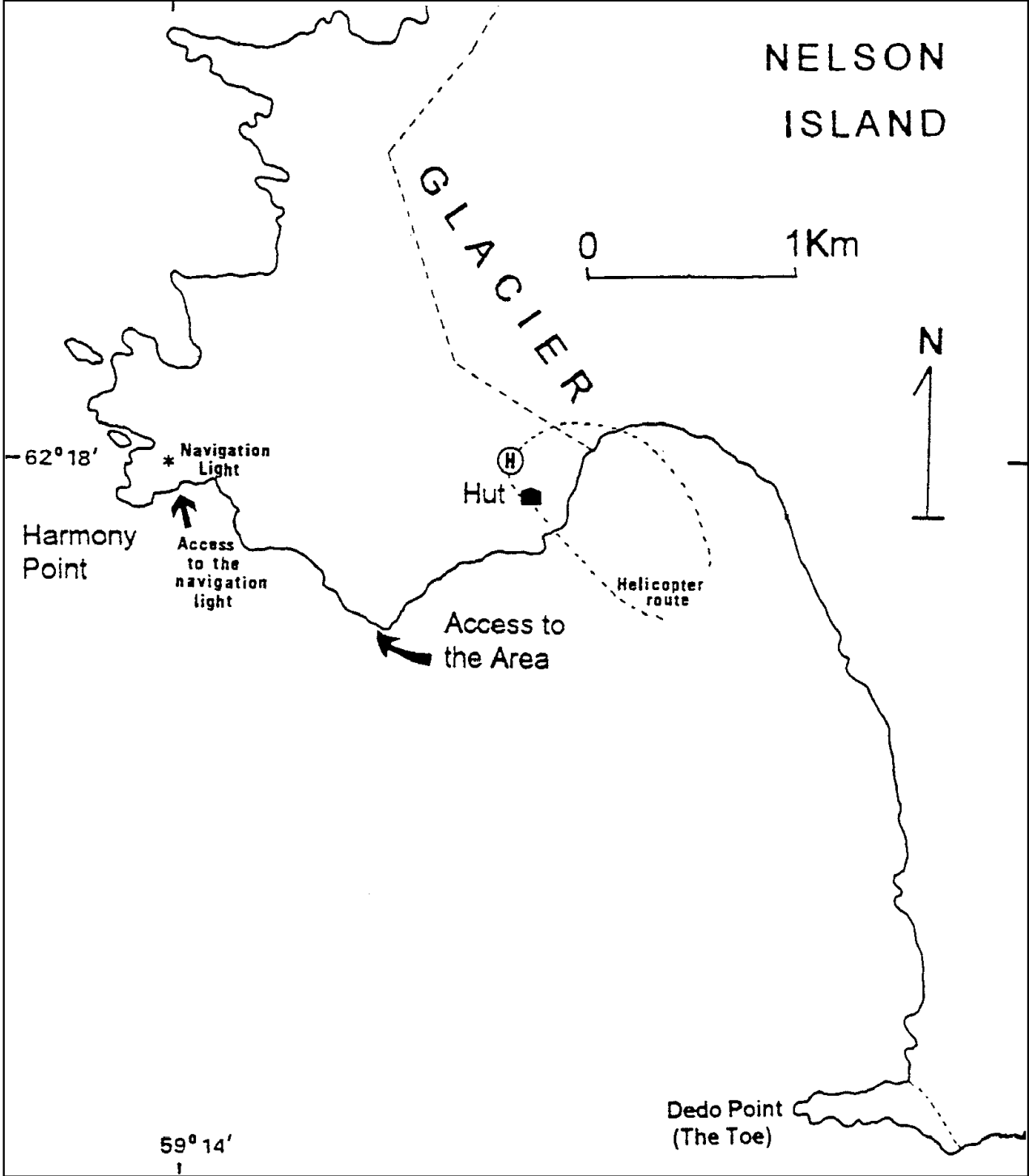
Permits may be granted to enter the area to carry out biological and ecological studies and monitoring, and site inspection activities, including the collection of small amounts of plant material and small numbers of animals for scientific purposes, to erect or maintain notice boards and protective measures.

All scientific structures and instrumentation, including research markers, installed in the Area must be authorised in a permit and clearly identified by country, name of investigator and year of installation. Research markers and structures must be removed at or before the expiry of the Permit. If specific scientific projects cannot be concluded within the permitted time, applications must be made for an extension to leave the items in situ.

*7(x) Requirements for reports*

The principal permit holder for each issued permit shall submit a report of activities conducted in the Area. This report shall be submitted to the authority named in the Permit as soon as practicable. Such reports should be stored indefinitely and made accessible to interested Parties, SCAR, CCAMLR, and COMNAP if requested, to provide the documentation of human activities within the Area necessary for good management.



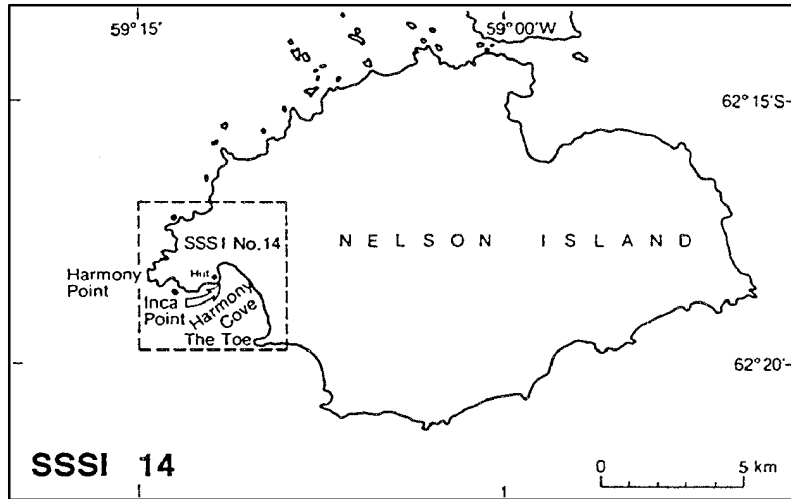


**Annex to Recommendation XIII-8**  
**Site of Special Scientific Interest No 14: Harmony Point,**  
**west coast of Nelson Island, South Shetland Islands**

*Management Plan*

- i. *Description of Site.* The Site is on the north-west coast of Nelson Island, between King George Island to the north-east and Robert Island to the south-west (lat 62°18'S, long 59°14'W). The Site includes Harmony Point and The Toe, the adjacent ice-free land and intertidal zone within the rectangle shown on the attached map.
- ii. *Reason for designation.* This area is of special scientific interest, being situated in an area rich in avian species. Vegetation cover is extensive, often dense and comprises a relatively rich flora including both species of vascular plants. Its rocky coasts are inhabited by large numbers of marine invertebrates. Long-term research programmes could be disrupted by accidental interference, the destruction of the vegetation and substratum, and the perturbation of nesting areas.
- iii. *Outline of research.* Argentine and Chilean research in the area includes the following ornithological activities: nest censuses, juvenile mortality studies, growth studies, banding, and studies on predators, ie leopard seal (*Hydrurga leptonyx*), giant petrel (*Macronectes giganteus*) and skuas (*Catharacta spp*). The relationships between the flora and nesting areas of the various bird species are being studied. In the tide pools ecological studies are continuing. The results are compared with those from other research sites in order to understand the relationships among different littoral systems.
- iv. *Date of expiry of designation.* 31 December 1995.
- v. *Access points.* Access to the Harmony Point area is restricted to access from the sea, across the pebble beach situated to the south-west of Inca Point, 400 m south-south-west of the refuge. Special access points are not specified for the Toe.
- vi. *Pedestrian and vehicular routes.* Pedestrians must use established routes, particularly during the bird breeding season. Helicopters must not overfly any of the bird breeding areas below the height stated in the Agreed Measures, and should land only in the vicinity of the refuge or landing beach, and should not land anywhere on The Toe. There is no vehicular access.
- vii. *Other kinds of scientific investigations which would not cause harmful interference.* None specified.
- viii. *Scientific sampling.* All sampling, including killing or capturing of fauna, must be the minimum required for the approved scientific programmes and must conform to the Agreed Measures for the Conservation of the Antarctic Fauna and Flora.

ix. *Other restraints.* No refuse should be deposited within the Site, or at sea beyond the Site in a manner which may allow it to be washed ashore within the Site. The refuge should be maintained in a habitable state and all refuse and unwanted materials associated with it should be removed from the Site.



**SSSI 14, Harmony Cove**

## **Site of Special Scientific Interest No 15**

**XXI: Annex to Measure 3(1997)**

### **Antarctic Protected Areas System: Revised Descriptions and Management Plans for Sites of Special Scientific Interest (SSSI)**

#### **Management Plan For Site Of Special Scientific Interest (SSSI) No. 15: Cierva Point, Danco Coast, Antarctic Peninsula**

##### *1. Description of Values to be Protected*

This area was originally designated as SSSI No. 15 in ATCM Recommendation XIII-8, after a proposal by Argentina, as an important example of well developed maritime vegetation and having breeding colonies of at least five bird species.

This area has a great scientific value due to the presence of important bird colonies (gentoo penguin, brown skua, blue-eyed shag, snow petrel, Dominican gull), an abundant development of plant cover, and a diverse flora that includes the two Antarctic flowering plant species and some liverworts and an associated invertebrate fauna. Its littoral area possesses abundant tidal pools inhabited by a large number of marine invertebrates. Long-term research programmer on terrestrial ecology and natural variability could be endangered by accidental interference, destruction of vegetation and soil, pollution of rock pools and perturbation of breeding birds.

##### *2. Aims and Objectives*

Management of Cierva Point aims to:

- Avoid major changes in the structure and composition of communities of flora and fauna;
- Protect long-term research programmes on terrestrial ecology and natural variability established in the Area;
- Prevent unnecessary human disturbance to the area;
- Utilize the Area as a monitoring site to assess direct and indirect effects of the neighbouring station.

### *3. Management Activities*

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

- A marker board will be placed at the principal access point illustrating the location boundaries and stating entry restrictions;
- Access to the Area and paths will be marked;
- Priority pedestrian routes within the Area will be established for transit to sample sites;
- Collection of samples will be limited to the minimum required for approved scientific research;
- Visits shall be made as necessary to ensure management and maintenance measures are adequate.

### *4. Period of Designation*

Designated for an indefinite period.

### *5. Maps*

Map 1 shows the location of Cierva Point in relation with the Antarctic Peninsula. Map 2 shows the location of Cierva Point and adjacent islands in relation to Danco Coast. Map 3 shows the area surrounding Primavera Station in detail to indicate access to the Protected Area.

### *6. Description of the Area*

#### *6(i) Geographical co-ordinates and natural features of the Area*

Cierva Point (lat. 64°10' S. lon. 60°57' W) is in the north-west of the Antarctic Peninsula, on the south coast of Cierva Cove, at the north end of Hughes Bay. The site comprises Cierva Point, encompassing the land west on an imaginary line drawn from the southeast of the north side of the Point, through the summit of a flat hill of 540m high, to the southeast of the south side of the Point. Also included are Apendice/Rivera/Sterneck Island, and Jose Hernandez/Bofill/Midas Island and Lopez/Moss Island, which lie mainly between Jose Hernandez/Bofill/Midas Island and Cierva Point. Although the intertidal zone of each of these areas is included in the Area, the subtidal marine environment is not included.

Base Primavera (Argentina) and all its associated installations and areas of disturbance are excluded from the area.



The plant cover of lichen, moss and grass-dominated communities is very extensive. The dominant plant communities are lichen-dominated fellfield, *Polytrichum-Chorisodontian* moss turf and *Descampsia-Colobantus* subformation. Areas of more than a hundred square metres off the ground are covered by moss turves, with a peat depth of about 80 cm. This type of habitat allows the establishment of many bird colonies, including gentoo penguins, chinstrap penguins, blue-eyed shags, brown skuas, Wilson's storm petrels, sheathbills and kelp gulls.

*6(ii) Restricted zones within the Area*

None

*6(iii) Location of structures within the Area*

There are no vehicular routes, structures or refuges within the Area. Primavera Station (Argentina) located at the north west of the cape, is open in summers. It is composed of eight huts, and a place delimited for helicopter landings.

*6(iv) Location of other Protected Areas within close proximity*

None

*7. Permit Conditions*

Entry into the Area is prohibited except in accordance with a permit issued by appropriate national authorities.

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

- It is issued to continue study of terrestrial ecology and natural variability of the area or for a compelling scientific purpose that cannot be met elsewhere;
- The actions permitted will not jeopardise the natural ecological systems in 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 authorised copy, must be carried within the Site of Special Scientific Interest;
- A report or reports are supplied to the authority that issued the Permit.

*7(i) Access to and movements within the Area*

There is only one access to the Area for helicopters. Helicopters may only land in the specified area ESE of the station. The aircraft route to be used is limited to a north approach and departure. Marine access is allowed to any point for any of the islands. Access will be by permit issued by a component authority and will only be allowed for activities which are in accordance with this management plan. Tourism or any kind of recreational activities are not permitted. Movement within the site should be by designated pedestrian routes. No vehicle access is permitted.

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

Scientific study and monitoring of the terrestrial ecosystem and natural variability in the area and compelling scientific research which cannot be conducted elsewhere and which will not interfere with ongoing long-term research programmes or jeopardise the structure or dynamics of the ecosystem of the Area.

Essential management activities, including monitoring.

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

No structures are to be erected in the Area, or scientific equipment installed, except for essential scientific or management activities, as specified in a Permit.

*7(iv) Location of field camps*

Parties should not normally camp in the Area. If it is essential for safety reasons, tents should be erected having regard to causing the least damage to vegetation and disturbance to fauna.

*7(v) Restriction on material and organisms which may be brought into the Area*

No living animals or plant material shall be deliberately introduced into the Area.

No poultry products, including food products containing uncooked dried eggs, shall be taken into the Area. No herbicides or pesticides shall be brought into the Area. Any other chemicals, which may be introduced for compelling scientific purpose specified in the permit, shall be removed from the Area at or before the conclusion of the activity for which the Permit was granted.

As far as possible the use of chemicals should be clearly documented for the benefit of later researchers.

Fuel, food and other material are not to be stored in the area, unless required for essential purposes connected with the activity for which the permit has been granted. All such material introduced are to be removed when no longer required. Permanent depots are not permitted.

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

This is prohibited, except in accordance with a Permit. Where animal taking or harmful interference is involved this should be in accordance with the SCAR Code of Conduct for Use of Animals for Scientific Purposes in Antarctica, as a minimum standard.

*7(vii) Collection or removal of anything not brought into the area by the permit holder*

Biological specimens and samples may be collected and/or removed from the Area only according to a permit. Debris of human origin should be removed and reported to the authority that issued the permit. Dead biological specimens may be removed for pathological analysis.

*7(viii) Disposal of waste*

All non-human wastes shall be removed from the Area to Primavera station. Human waste may be deposited in the sea.

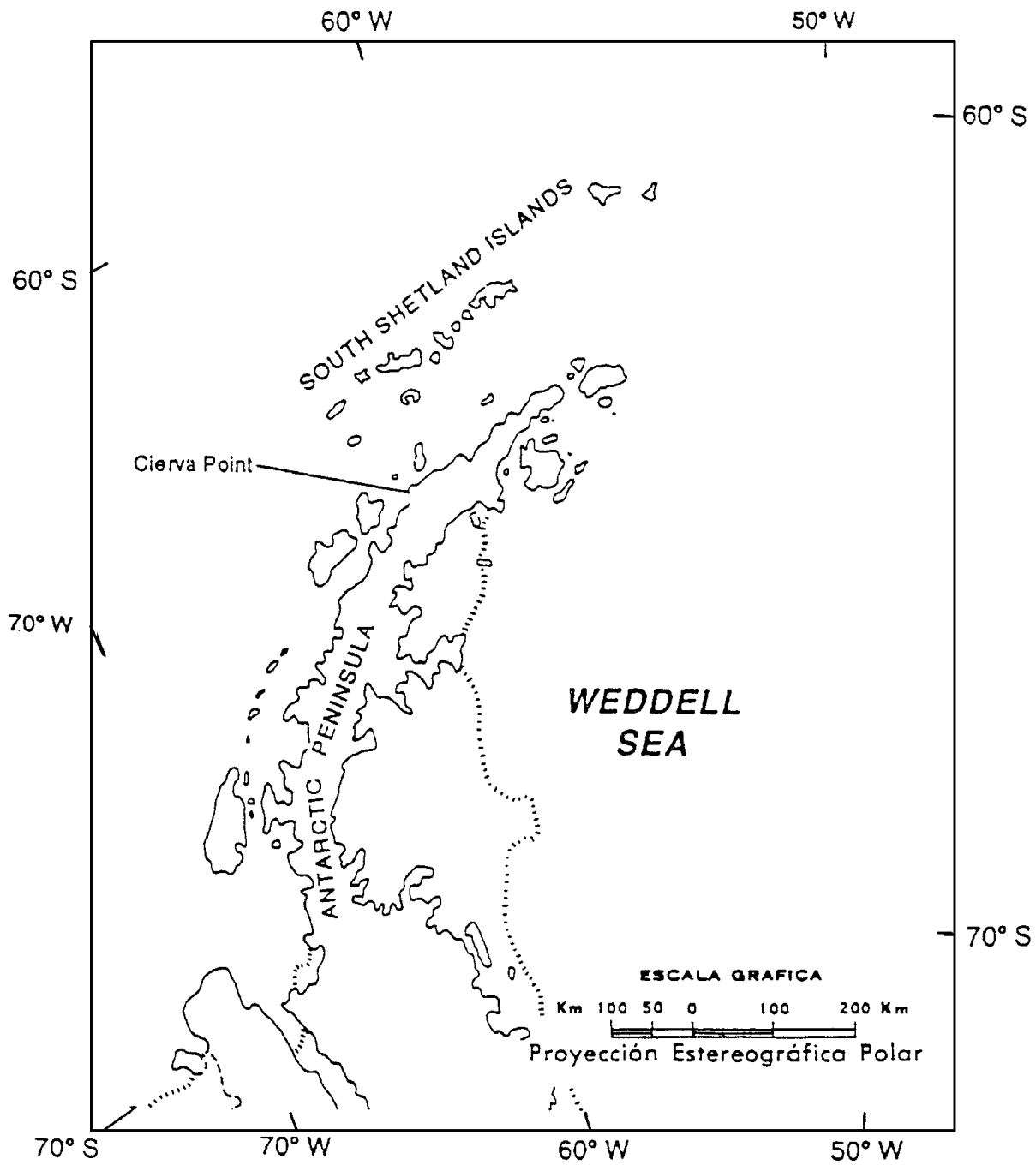
*7(ix) Measures that may be necessary to ensure that the aims and objectives of the management plan continue to be met*

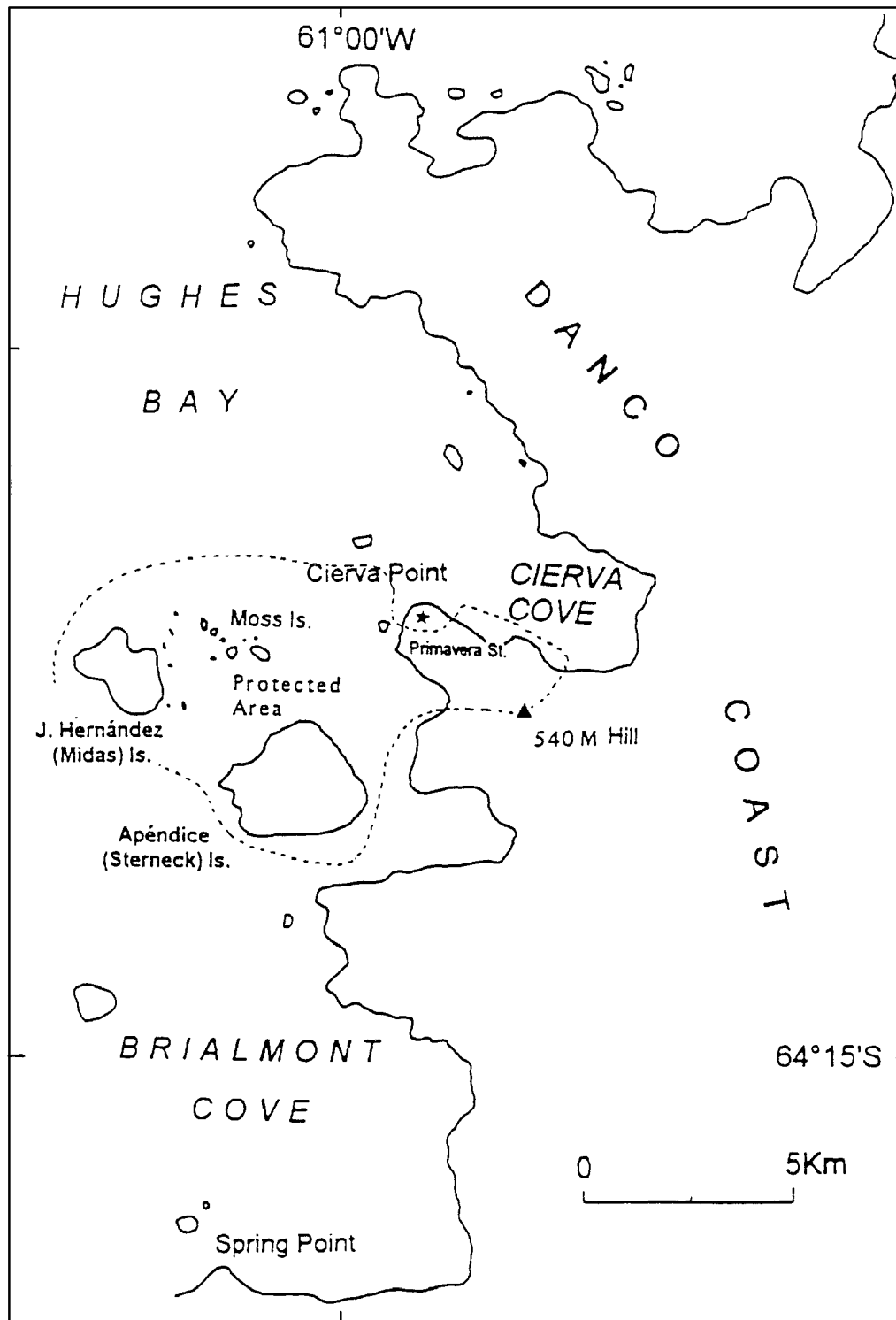
Permits may be granted to enter the area to carry out biological and ecological studies and monitoring, and site inspection activities, including the collection of small amounts of plant material and small numbers of animals for scientific purposes, to erect or maintain notice boards and protective measures.

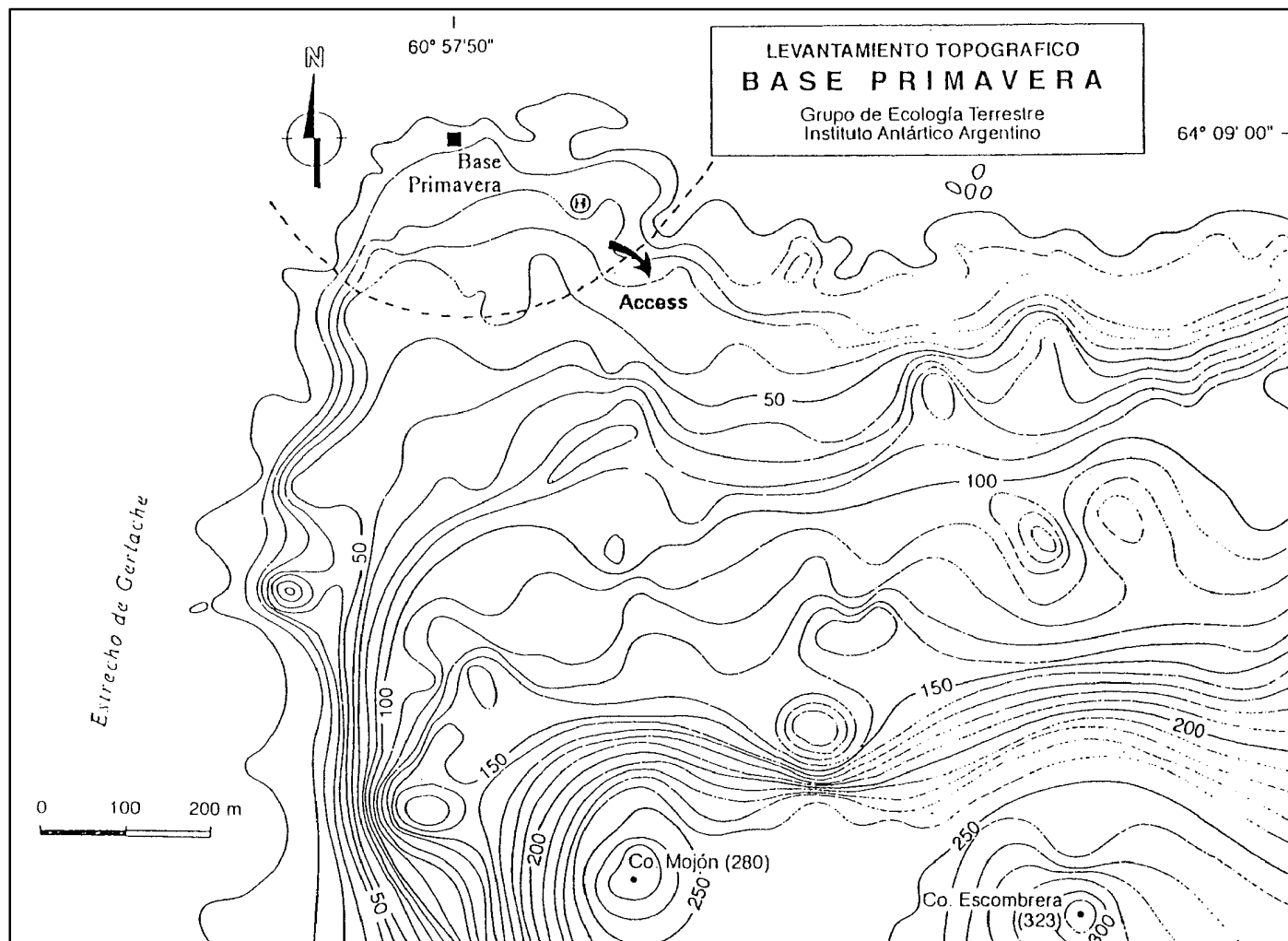
All scientific structures and instrumentation, including research markers, installed in the Area must be authorised in a permit and clearly identified by country, name of investigator and year of installation. Research markers and structures must be removed at or before the expiry of the Permit. If specific scientific projects cannot be concluded within the permitted time, applications must be made for an extension to leave the items on site.

*7(x) Requirements for reports*

The principal permit holder for each issued permit shall submit a report of activities conducted in the Area. This report shall be submitted to the authority named in the Permit as soon as practicable. Such reports should be stored indefinitely and made accessible to interested Parties, SCAR, CCAMLR, and COMNAP if requested, to provide the documentation of human activities within the Area necessary for good management.







### Annex to Recommendation XIII-8

#### Site of Special Scientific Interest No 15: Cierva Point and Offshore islands, Danco Coast, Antarctic Peninsula

##### *Management Plan*

i. *Description of site.* Cierva Point (lat 64°10'S, long 60°57'W) is at the north-west of the peninsula on the south side of Cierva Cove at the north end of Hughes Bay. (It should not be confused with Spring Point on the south side of Brialmont Cove in Hughes Bay.) The Site comprises the Cierva Point peninsula encompassing the land west of an imaginary line from the south east of the north side of the Point through the summit of Mojon Hill to the south-east of the south side of the Point. Also included are Sterneck Island and Midas Island and Moss Islands, which lie mainly between Midas Island and Cierva Point. Although the intertidal zone of each of these areas is included in the Site, the sub-tidal marine environment

is not included. Base Primavera and all its associated installation and areas of disturbance are excluded from the Site.

ii. *Reason for designation.* The area has a special scientific value in that it sustains important avian populations, extensive vegetation and a diverse flora including the two Antarctic flowering plants and several liverworts, and invertebrate fauna; its littoral possesses abundant tidal pools inhabited by large numbers of marine invertebrates. Long-term research programmes could be endangered by accidental interference, destruction of the vegetation and soil, pollution of rock pools, and perturbation of breeding birds.

iii. *Outline of research.* Eight species of bird are being studied. The studies include: nesting censuses, growth of fledglings, banding, mortality of young by predation and study of predators, especially leopard seals (*Hydrurga leonyx*) and giant petrels (*Macronectes giganteus*). The relationship between the vegetation and bird colonies is being studied. Studies of Antarctic hair grass (*Deschampsia antarctica*) and Antarctic pearlwort (*Colobanthus quitensis*) are being undertaken. The ecology of the relatively diverse fauna of the intertidal pools is being studied in detail.

iv. *Date of expiry of designation.* 31 December 1995.

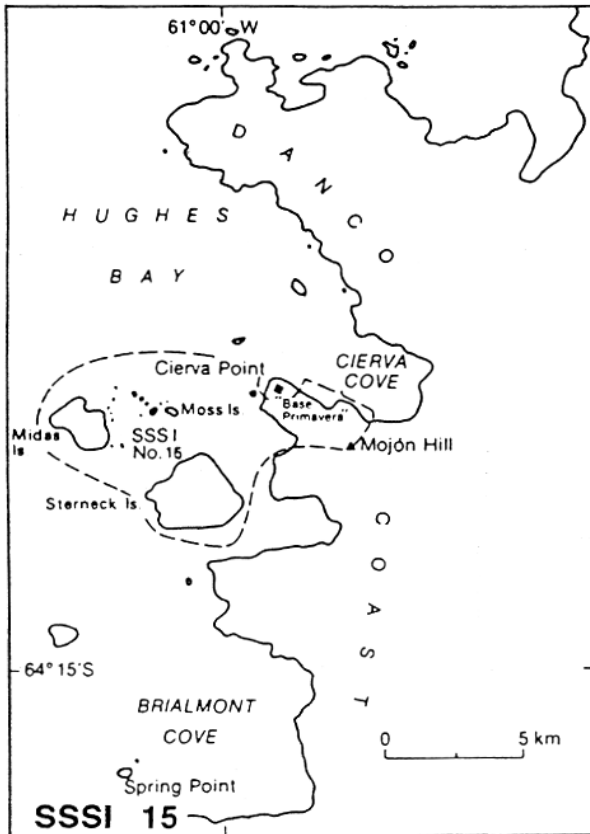
v. *Access points.* Access to Cierva Point should be at one point only, a landing area to the west of the research station. No access points are specified for any of the islands.

vi. *Pedestrian and vehicular routes.* Pedestrians must keep to established routes, particularly in densely vegetated areas and in bird breeding areas.

vii. *Other kinds of scientific investigations which would not cause harmful interference.* Any research which will not have detrimental impact on the environment

viii. *Scientific sampling.* All sampling must be the minimum required for approved scientific projects, and must conform to the Agreed Measures for the Conservation of the Antarctic Fauna and Flora. No sampling of any kind (eg. for souvenirs) is permitted for any other reason, especially by tourists.

ix. *Other restraints.* No waste of any description should be disposed of within the Site, or at sea in a manner which will allow it to be washed ashore within any part of the Site.



**SSSI 15, Cierva Point**

## **Site of Special Scientific Interest No 16**

### **Annex to Recommendations XIII-8**

#### **Site of Special Scientific Interest No 16: North-East Bailey Peninsula, Budd Coast, Wilkes Land**

##### *Management Plan*

i. *Description of Site.* Bailey Peninsula is situated between Newcomb and O'Brien Bays at the west end of Vincennes Bay, opposite the Windmill Islands, on Budd Coast at lat 66°17'S, long 110°32'E. The Site consists of an irregular area of rock exposed during summer, surrounding the Casey Station transmitter building. The boundary, which is

demarcated, is shown on the map attached to the Management Plan for Site of Special Scientific Interest No 17 (below).

ii. *Reason for designation.* The Site is not unique in the Windmill Islands region context but is representative of a diverse assemblage of vegetation; it contains contrasting habitats and water bodies; has extremely rich (by continental Antarctic standards) lichen and moss communities and an important stand of liverwort. Proximity to Casey Station minimizes logistic problems with respect to field research and, at the same time, maximizes the potential for disturbance of study areas. It is primarily for this latter reason that this Site, where research is concentrated, requires protection.



iii. *Outline of research.* The Site contains three extensive and contrasting moss fields which are the subject of taxonomic, ecological and physiological studies which commenced during the summer of 1982-83. Additional studies include population ecology of invertebrates associated with the vegetation, and soil/water chemistry. Permanent lichen growth monitoring sites have also been established as have sites monitoring annual growth increments in mosses.

iv. *Date of expiry of designation.* 31 December 1995.

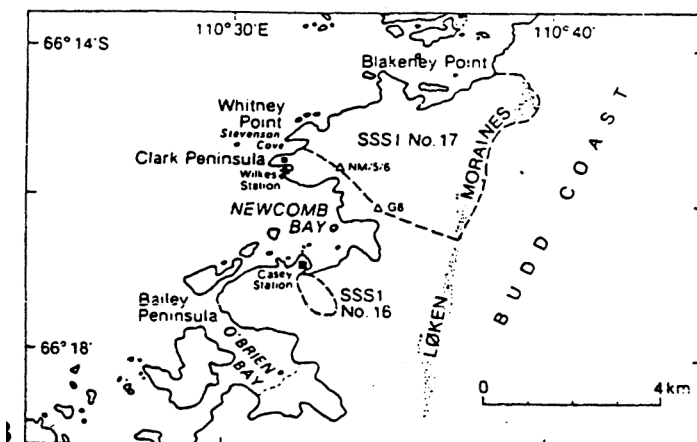
v. *Access points.* None Specified, although access to the transmitter building near the south-east end of the Site should be via the ice/snow of the oversnow access route to Law Dome, several kilometres to the south.

vi. *Pedestrian and vehicular routes.* Access to the area should be restricted as far as possible to that necessary to conduct scientific work and operate the transmitter building. Vehicles should be restricted to existing access routes. These are clearly demarcated. No helicopter landing is permitted within the Site. Particular care should be taken to avoid damage to bryophytes and lichens, disrupting of soils and periglacial features, and to avoid causing changes to water quality or drainage. Selected study reference areas (eg three contrasting moss communities) have been delimited by marked stakes without causing disturbance to the environment. Access to these areas should be restricted to scientists participating in the study programme.

vii. *Other kinds of scientific investigations which would not cause harmful interference.* Scientific research other than the programmes for which the Site has been designated should be kept to a minimum.

viii. *Scientific Sampling.* Sampling should be kept to a minimum and should not affect the existing research programmes.

ix. *Other restraints.* No storage or disposal of any products relating to human occupancy of the Station should occur in the Site.



SSSI 16, Bailey Peninsula