Management Plan

for Antarctic Specially Protected Area No. 150 ARDLEY ISLAND, MAXWELL BAY, KING GEORGE ISLAND (25 DE MAYO)

Introduction

Ardley Island (62°13' S; 58°54' W) is located on the southwest coast of King George Island (25 de Mayo), nearly 500 m east of the coast of Fildes Peninsula, Maxwell Bay (Fildes Bay). The island is about 2 km long and 1.5 km at its widest, and rises to about 65 m altitude. In geomorphological terms, the area comprises mainly tertiary andesitic-basaltic lavas and tuffs, and there are some raised beach terraces.

It is free from snow and ice in summer. A small freshwater pond about 100 m long is formed by melting snow on the southwest part of the island between November and February.

After a proposal by Chile, Ardley Island was designated a Site of Special Scientific Interest, SSSI No. 33, under Recommendation XVI-2 (1991). The aim was to protect the diverse range of bird species that breed on the island. Initially, the Area was under protection until 2001. In that same year, protection was extended until 2005 under Measure 3 (2001). Under Measure 4 (2005), protection of the Area was extended until December 2010.

In 1991, Chile proposed to the Antarctic Treaty System that Ardley Island be protected in view of the site's biological interest due to the diverse range of sea birds that inhabit the area, either to breed (11 species), or to moult. The island also possesses some of the best developed and most extensive plant communities in the South Shetland Islands, notably the peaks, dominated by macrolichens. Such vegetation is extremely sensitive to human disturbance and is very easily damaged.

Studies carried out on Ardley Island since the 1970s on the three populations of Pygoscelid penguins that breed there show major seasonal fluctuations and a decrease in the colonies of giant petrels that nest on the island. Over the last few years, one vascular plant have begun to colonize the island, which has led to an increase in the number of species present in the Area.

The current Management Plan has changed the borders of the Area designated in Recommendation XVI-2 (1991), leaving out one part of what was originally classified as a "tourist area", located on the beach between Faro Point (62°12'34" S; 58°55'34" W) and the beginning of Braillard Point (62°12'40" S; 58°55'4" W). This section has often been visited by tourists and non-scientific staff from stations neighbouring Ardley Island. Visits by tourists are limited exclusively to this area, with groups of no more than 20 people.

It is necessary to maintain protection over the area in order to understand the effects of environmental pressure, both anthropogenic and natural, on the flora and fauna of the site because some of the studies conducted have shown that human activity is contributing to a decrease in flying bird populations on Ardley Island, and to detect the potential effects on the ecosystem and the ecology of the populations locally and regionally due to the increased sea and air temperature recorded in the Antarctic Peninsula region.

1. Description of values to be protected

The island was designated as a protected area on account of the diverse assemblage of bird species that breed on it, and in order to allow a study of their ecology and the factors that affect their populations.

Ardley Island also possesses a developed and outstanding flora, with several species of lichens, mosses and vascular plants. The main species of lichens that inhabit the area belong to the genera *Himantormia* and *Usnea*, which dominate the highlands of Ardley Island, and *Placopsis*, *Xanthoria*, *Haematomma*, *Rinodina*, *Caloplaca* and *Buellia* in the coastal sectors. Both the flora and fauna are thought to be extremely sensitive to human disturbance. The vascular plant *Deschampsia antarctica* has gradually colonized the island from the 90's, mainly in the north part.

Seals have been recorded hauling out and moulting on the beach. The most common type is the Weddell seal (*Leptonychotes weddellii*). During the last few seasons, Chilean researchers have reported the occurrence of leopard seals (*Hydrurga leptonyx*) preying on penguins in the Area.

2. Aims and Objectives

The Management Plan of ASPA No. 150 aims to:

- protect the bird community and the terrestrial ecosystem;
- avoid degradation of, or substantial risk to, the values of the Area by preventing unnecessary human disturbance in the Area;
- allow scientific research, with the least possible interference, on marine Antarctic birds, and the ecosystem and physical environment associated with the values for which the Area is protected;
- allow other scientific research in the Area, provided it does not compromise the values for which the Area is protected;
- minimize the possibility of the introduction of non-native plants, animals and microbes to the Area;
- allow visits for management purposes, and in support of the aims of the Management Plan.

3. Management activities

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

- Copies of this Management Plan, including maps of the area, shall be made available at the following locations:
  1) Julio Escudero Station, Fildes Peninsula, King George Island (25 de Mayo)
  2) Eduardo Frei Station, Fildes Peninsula, King George Island (25 de Mayo)
  3) Bellingshausen Station, Fildes Peninsula, King George Island (25 de Mayo)
  4) Great Wall Station, Fildes Peninsula, King George Island (25 de Mayo)
  5) King Seyong Station, King George Island (25 de Mayo)
  6) Artigas Station, King George Island (25 de Mayo)
  7) Jubany Station, King George Island (25 de Mayo)
- The staff to be posted at Ardley Island shall be specifically trained on all matters concerning this Management Plan and the measures established in the Madrid Protocol;
- The pilots of the airplanes that flight to King George Island (25 de Mayo) must know and have a copy of the management plan before travel to Antarctica, to secure the knowledge of the restrictions to protect the values of the Area.
- When even possible, before visit the area the clothing, footwear and equipment, must be clean and disinfected to avoid the introduction of micro organisms.
- Signposts (markers, signs or any other information structures) will be allowed on sites where they do not disturb the protected values or research activities, for scientific, management or information purposes, and shall be maintained in good condition;
- Scientific research shall be allowed in order to study and monitor anthropogenic and natural impacts that could affect the protected values in the Area;
- Visits shall be made as necessary to assess whether the Area continues to serve the purposes for which it was designed and to ensure adequate management and maintenance measures;
- Entry into the Area by vehicles of any kind is strictly forbidden.
- New standards for the management of tourism in the northern section of the island, not included in the boundaries of the ASPA, will be developed as Guidelines for Visitors to the Antarctic Treaty Area. The objective is to ensure that the visits carried out are in strict compliance with the Management Plan and with the protection of its values, given its adjacency to ASPA No 150.

4. Period of designation

Designated for an indefinite period.

5. Maps and figures

Three maps are enclosed to this Management Plan as Annexes:

Map 1. Location of Ardley Island in relation to King George Island (25 de Mayo) and the Fildes Peninsula.

Map 2. Location of Ardley Island in relation to the Fildes Peninsula, King George Island (25 de Mayo), showing the stations present in the region.

Map 3. Ardley Island and Antarctic Specially Protected Area No 150. Permanent structures are shown, as area the demarked route (terrestrial access), exclusive for those whom carry on a permit, and disembarking points (maritime access). The Protected Area is marked out with a dotted line.

Figure 1. Sketch with the distribution of the main nesting birds on Ardley Island, based in Peter *et al*., 2008. Figure 2. Sketch of the distribution and coverage of the plant species present on Ardley Island, based in Peter *et al*., 2008.

6. Description of the area

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

GENERAL DESCRIPTION

Ardley Island (62°13' S; 58°54' W) is about 2 km southeast of the Bellingshausen Station (Russian Federation) and of the Escudero and Frei Stations (Chile), and about 2 km east of the Great Wall Station (China).

The Area comprises most of the island, and is linked to King George Island (25 de Mayo) by an isthmus that remains submerged at high tide. The eastern part of the isthmus, that remain dry during the high tide, is included in the Area due it is part of Ardley island. However, the western part of the isthmus is outside the Area, as the beach below the 1 m contour line in the north-eastern part of the island, from Faro Point (62°12'34" S; 58°55'34" W) until the beginning of Braillard Point (62°12'40" S; 58°55'4" W) (see Map 3). Below this contour line, there is a section that is 5 m wide, on average, and which may be freely visited without the authorization requirements required for entry into ASPA No 150. The geography of the area restricts pedestrian traffic to the protected Area and also permits an appropriate protection of the values if the Management Plan is followed.

A footpath of 2 m of wide, often used by researchers working in the Area, is marked out in the western part of the island, from the isthmus connecting it with King George Island (25 de Mayo). There are no special markings to indicate this path - it is evident from the well-trodden ground.

Geologically, it consists mainly of Tertiary andesitic and basaltic lavas and tuffs together with raised beach terraces. The topography is plain, with the highest elevation at 65 m.

BREEDING BIRDS

The seabird community of Ardley Island is diverse and of exceptional biological interest. Of particular importance are the breeding colonies of Pygoscelid penguins, as it is one of the few places where the three species breed sympatrically. In addition to the penguin species, the area is also the breeding ground for flying birds such as the southern giant petrels (*Macronectes giganteus*), Wilson's storm petrels (*Oceanites oceanicus*), Antarctic terns (*Sterna vittata*) and brown skuas (*Catharacta antarctica lonnbergi*) (Table 1). Figure 1 shows the general distribution of the main groups of birds that nest on Ardley Island.

Gentoo penguins (*Pygoscelis papua*), of which there were closer to 5,000 breeding pairs in the last breeding seasons, make up one of the largest breeding colonies of Gentoo penguins recorded in the South Shetland Islands, and probably in the Antarctic. There are currently around 300 breeding pairs of Adelie penguins (*P. adeliae*) and only a very few Chinstrap penguins (*P. antarctica*) (Table 2).

Table 1: List of bird species breeding on Ardley Island

Common Spanish name	Common English name	Species
Pingüino Adelia	Adelie penguin	Pygoscelis adeliae
Pingüino de barbijo	Chinstrap penguin	Pygoscelis antarctica
Pingüino papúa	Gentoo penguin	Pygoscelis papua
Skúa o salteador pardo	Brown skua	Catharacta antarctica lonnbergi
Skúa o salteador polar	South polar skua	Catharacta maccormicki
Petrel gigante	Southern giant petrel	Macronectes giganteus
Petrel de Wilson	Wilson's storm petrel	Oceanites oceanicus
Golondrina de mar de vientre negro	Blackbellied storm petrel	Fregetta tropica
Petrel damero o del cabo	Cape petrel	Daption capense
Gaviota dominicana	Kelp gull	Larus dominicanus
Gaviotín antártico	Antarctic tern	Sterna vittata

Table 2. Breeding populations of penguins on Ardley Island from 1973/74 to 2005/06

	Breeding pairs				Breeding pairs		
Season	P. antarctica	P. adeliae	P. papua	Season	P. antarctica	P. adeliae	P. papua
1973/74 [1]	18	230	1850	1997/98	33	1173	3146
1980/81 [2]	244	1056	3809	1998/99	43	1192	3349
1981/82 [3]	141	1314	2580	1999/00	34	974	3911
1983/84 [4]	91	1074	1656	2000/01	26	880	4472
1984/85 [5]	110	1331	3105	2001/02	22	780	4444
1985/86 [6]	39	929	3522	2002/03	35	771	5131
1986/87 [7]		1160	3410	2003/04	29	559	4957
1994/95	45	1095	3772	2004/05	13	409	4798
1995/96	49	1226	2985	2005/06	9	334	4635
1996/97	72	923	2974				

Data obtained by the INACH "Ecology of three species of penguins" project led by Dr. J. Valencia, except:

1 and 4: Yañez *et al.* (1984); 2: Trivelpiece *et al.* (1987); 2, 5 and 7: Woehler (1993) (only *P. papua*); 3: Bannasch *et al.* (1983); 5: Peter *et al.* (1998 y 2008) (only *P. antarctica*), and 6: Rauschert *et al.* (1987)

Detailed ornithological and botanical research has been undertaken on Ardley Island for many years, mainly by Chilean and German scientists, with brief studies also made by scientists from Russia, Korea and China. German studies indicate that the giant petrel breeding population has declined by about 80% since research began in 1979. They point to strong evidence that numerical fluctuations of these particular populations are a direct response to disturbances produced by large numbers of visitors, aircraft overflights and station constructions. Disturbed pairs have moved their breeding sites to less affected areas. In the case of the breeding population of skuas, human and natural impacts can be linked to the recorded fluctuations caused by variable food availability and weather conditions. The effects of these impacts will continue to be monitored as an integral part of the long-term ornithological research being undertaken at this site.

MARINE MAMMALS

Seals are usual visitors of Ardley Island. Weddell seals (*Leptonychotes weddellii*) breed near the area between September and November on beaches and on the sea ice in Maxwell Bay (Fildes Bay). Crabeater seal (*Lobodon carcinophagus*) has been recorded in winter months in the sea ice in Maxwell Bay (Fildes Bay), in the vicinities of the Area, sometimes in big numbers. During December and March, some elephant seals *(Mirounga leonina*), Weddell seals and Antarctic fur seals (*Arctocephalus gazella*) visit the area to haul out or to moult.

Over the last few seasons, Chilean researchers have reported the occurrence of leopard seals (*Hydrurga leptonyx*), probably preying on penguins, in the vicinity of Ardley Island and mainly in the eastern part of the Area.

VEGETATION

The island has some of the best developed and most extensive plant communities in the South Shetland Islands, with around 250 species of lichens, 130 mosses and liverworts and 1 species of vascular plants. The climax fell field ecosystem is dominated by macrolichens such as *Himantormia lugubris* and several species of the genus *Usnea.* Such vegetation is extremely sensitive to human disturbance and is very easily damaged. In the coastal regions of Ardley Island it is possible to find many different lichens, mainly of the genera *Placopsis*, *Xanthoria*, *Haematomma*, *Rinodina*, *Caloplaca* and *Buellia*.

The presence of the Antarctic grass *Deschampsia antarctica* shows a significant increase in the size and number of recorded colonies. It is suggested that this population of vascular plants increases as a response to warmer and longer growing seasons, caused by regional warming. Figure 2 shows the distribution of the vegetation on Ardley Island.

6(ii) Special and managed zones within the Area

There are no special zones within the Area.

6(iii) Structures within and near the Area

There are two Chilean semi-permanent summer-only research shelters. Ripamonti I (62°12' S; 58°53' W) was established in 1982, in the northern coast of Ardley, and Ripamonti II (former Alfred Wegener Institute hut, ceded to Chile by Germany in 1997) lies almost 100 metres southwest from Braillard Point on the south- eastern part, inside the penguin breeding colonies. There are also two Argentinean buildings in the area that make up the Ballvé Refuge, set up in 1953, approximately 50 meters east of Ripamonti I.

An Argentinean radio beacon facilitates navigation, looking towards Maxwell Bay (Fildes Bay). All the structures described remain in the Area year round.

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

There are four protected areas in Nelson and King George (25 de Mayo) Islands, close to Ardley Island. The nearest one is Fildes Peninsula, ASPA No 125, about 1 km west and north-northwest of Ardley Island. ASPA No 128, on the western shore of Admiralty Bay, is located about 25.3 km northeast of Ardley Island. Also in King George Island (25 de Mayo), ASPA No 132, Potter Peninsula, is approximately 14.5 km east of Ardley Island. Finally, Harmony Point, ASPA No 133, is located around 18.6 km southwest of Ardley Island.

7. Permit conditions

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

- it is issued only for scientific or essential management purposes, consistent with plan objectives such as inspection, maintenance or review activities, which cannot be served elsewhere;
- the actions permitted will not jeopardize the scientific and ecological 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;
- during the stated period, scientific staff present within the Area must carry the permit or an authorized copy thereof;
- at the end of the stated period, a report shall be submitted to the appropriate national authority named in the permit, including any activities undertaken that were not explicitly mentioned in the permit.

7(i) Access to and movement within the Area

Access to Ardley Island shall be by small boat or on foot. Movement within the Area shall be only on foot.

Work crews should consist of no more than 10 persons during critical stages of birds' breeding cycles (incubation, hatching and early chick rearing between October and January each year), and of no more than 20 at any other time.

Boat access

The northern coast of Ardley Island is the appropriate area to land. Small zodiac boats may land on the Island. Recommended and preferred landing sites are the beach in front of Ripamonti I, in the Luis Point area, and the beach at Faro Point. Groups of 10-20 visitors are allowed to land at a time, depending on the stage of the birds' breeding cycle.

On foot

Only permit holders with authorized entry into the Area shall be permitted to access the Area on foot.

The island may be reached on foot, crossing the isthmus from the Fildes Peninsula at low tide. Pedestrian activity should be restricted to the marked path (see Map 3) avoiding transit through areas with vegetation, as well as areas close to the seabird breeding sites, unless strictly necessary for scientific research in the Area.

Vehicle access

Entry into the Area by vehicles of any kind is strictly forbidden.

Overflights

Due to the presence of breeding seabirds on the island, aircraft landings are prohibited within the Area and any necessary overflights shall be conducted according to guidelines established in Resolution 2 (2004), Guidelines for Aircraft near concentrations of birds:

- Bird colonies are not to be over flown below 2000ft (~ 610 m) Above Ground Level
- Landings within 1/2 nautical mile (~ 930 m) of bird colonies should be avoided wherever possible.
- Maintain a vertical separation distance of 2000 ft (~ 610 m) AGL and a horizontal separation of 1/4 nautical mile (~ 460 m) from the coastline where possible.
- Cross the coastline at right angles and above 2000ft (~610 m) AGL where possible.
- Never hover or make repeated passes over wildlife concentrations or fly lower than necessary.

Aircraft landing at and taking off from Teniente Marsh airfield or from any other takeoff site or pad should avoid overflying the island.

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

Scientific research that will not jeopardize the ecosystem or scientific values of the Area or in any way diminish the value of the Area as a reference site.

Essential management activities, including monitoring.

7(iii) Installation, modification or removal of structures

No additional structures shall be erected in the Area, except for essential scientific or management activities, and with a proper permit for a specified period. All scientific equipment installed in the Area must be authorized by permit and clearly identified by country, name of the principal investigator or agency and year of installation. All such items shall be made from materials that pose minimal risk of harming fauna or contaminating the Area.

Installation, maintenance, modification or removal of structures shall be undertaken in such a way as to minimize disturbance to flora and fauna. The permit shall also indicate that structures, equipment or signposts be taken down once the period established therein has expired.

7(iv) Location and regulation of field camps

Camping is not permitted in the Area.

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

No living animals or plant material, or parts thereof, shall be deliberately brought into the Area. For that, is required, where ever possible, the inspection and thorough cleaning of all clothing, footwear and equipment before entry to the Area.

No poultry products shall not be brought into the Area as food for researchers in order to protect the bird life on the island.

No herbicides or pesticides shall be brought into the Area. Any other chemicals, which may be introduced for scientific or management purposes specified in the permit, shall be properly stored during the stated period, to minimise risks inherent to their introduction into the environment. If release occurs which is likely to compromise the values of the Area, removal is encouraged only where the impact of removal is likely to be greater than that of leaving the material *in situ*.

Fuel, food and other materials brought into the Area to support the conducting of scientific or management activities for which a permit has been issued shall be stored in the shelters, taking every care not to release them inadvertently into the environment. They should be removed from the Area at or before the end of the stated period. An emergency cache may be kept in the shelters.

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

Taking or harmful interference of native flora and fauna is prohibited, except in accordance with a permit issued under Article 3 of Annex II to the Madrid Protocol. Where the activity involves removing or tampering with native flora or fauna, the SCAR Code of Conduct for the Use of Animals for Scientific Purposes should be used as a minimum standard.

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

Material not brought into the Area by the permit holder 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. Removal of dead biological specimens or geological samples for scientific purposes must not exceed levels that affect the other species or values in the Area, and may only be taken for scientific studies.

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 authorized, 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 shall be removed from the Area. However, human organic waste may be disposed of into the sea, in accordance with Article 5 of Annex III of the Protocol on Environmental Protection to the Antarctic Treaty.

Waste generated as a consequence of the activities developed in the area should be temporarily stored near the shelters in a place where they cannot be accidentally lost. Such waste should be properly labelled as garbage. At the end of the period, it should be removed from the Area and from the Treaty Area.

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 area to carry out biological monitoring and site inspection activities, which may involve the collection of limited samples of plant material and animals for scientific purposes, for analyses or review, or for protection measures, as specified in a permit.
- Any specific sites of long-term monitoring that are vulnerable to inadvertent disturbance should be appropriately marked and informed to other Parties thought appropriate channels.
- To avoid interference with long-term research and monitoring activities or possible overlapping of efforts, anyone planning new projects within the Area should consult established national programmes working at Ardley Island before commencing the work.
- Parties conducting long-term research and monitoring programmes should cooperate closely, facilitate communication among scientists working in the Area, and conduct regular joint assessments of their research lines and products.
- Visitors shall follow the guidelines in this Management Plan strictly to help maintain the scientific values found at Ardley Island.

7(x) Requirements for reports

The principal holder of each permit issued shall submit a report to the appropriate national authority describing the activities undertaken in the area once the stated period has ended. This report must be submitted within two months. Such reports should include the information identified in the visit report form, recommended by SCAR, attaching the permit.

The national authority should keep the reports in order to provide summary descriptions of the activities conducted in the annual exchange of information or to provide the necessary information on human activities within the Area to all the interested Parties in the management of the Area, and further maintain a record of usage which may serve the review processes of the management plan, improve the scientific use of the Area and contribute to its best environmental protection.

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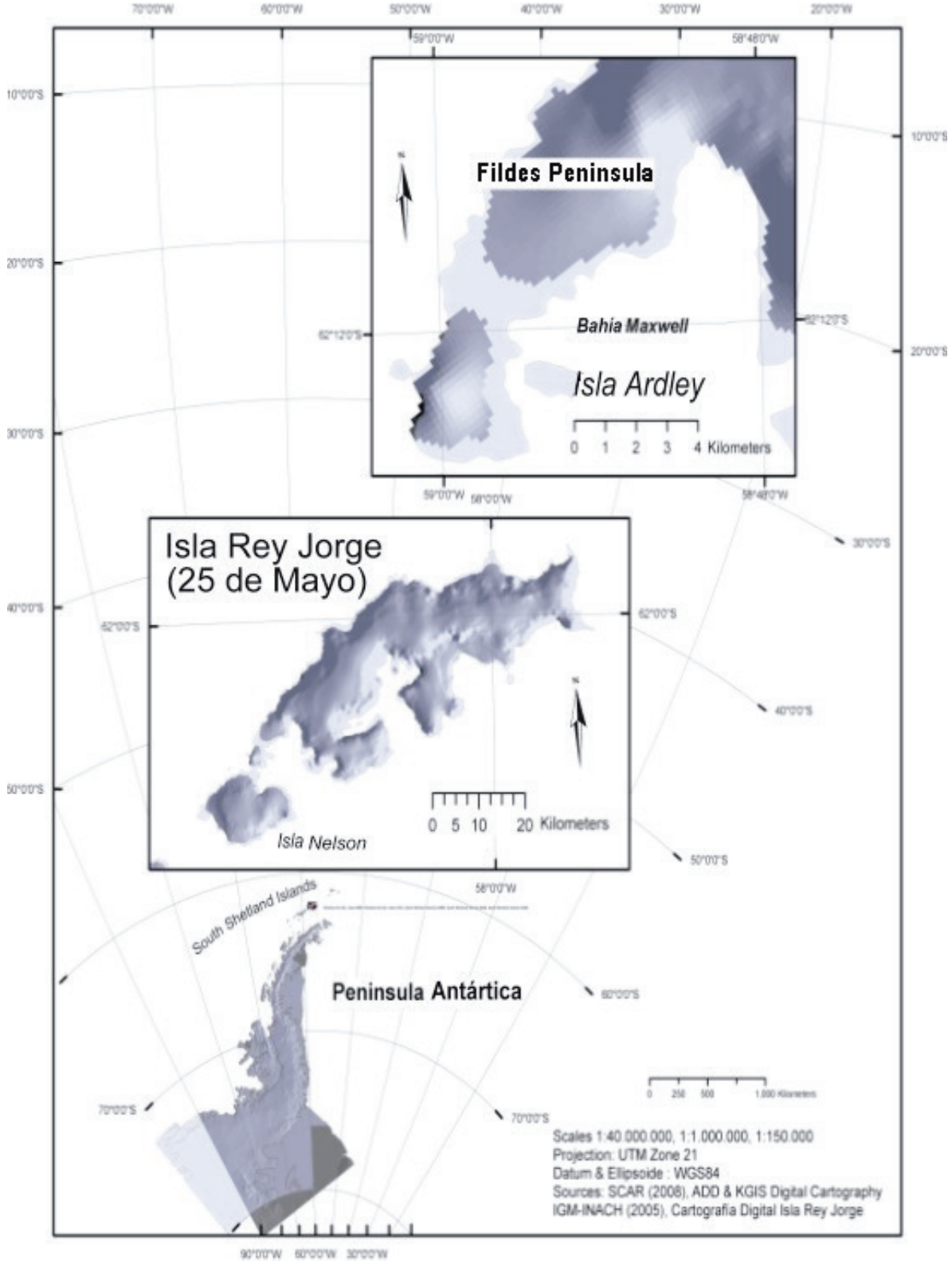
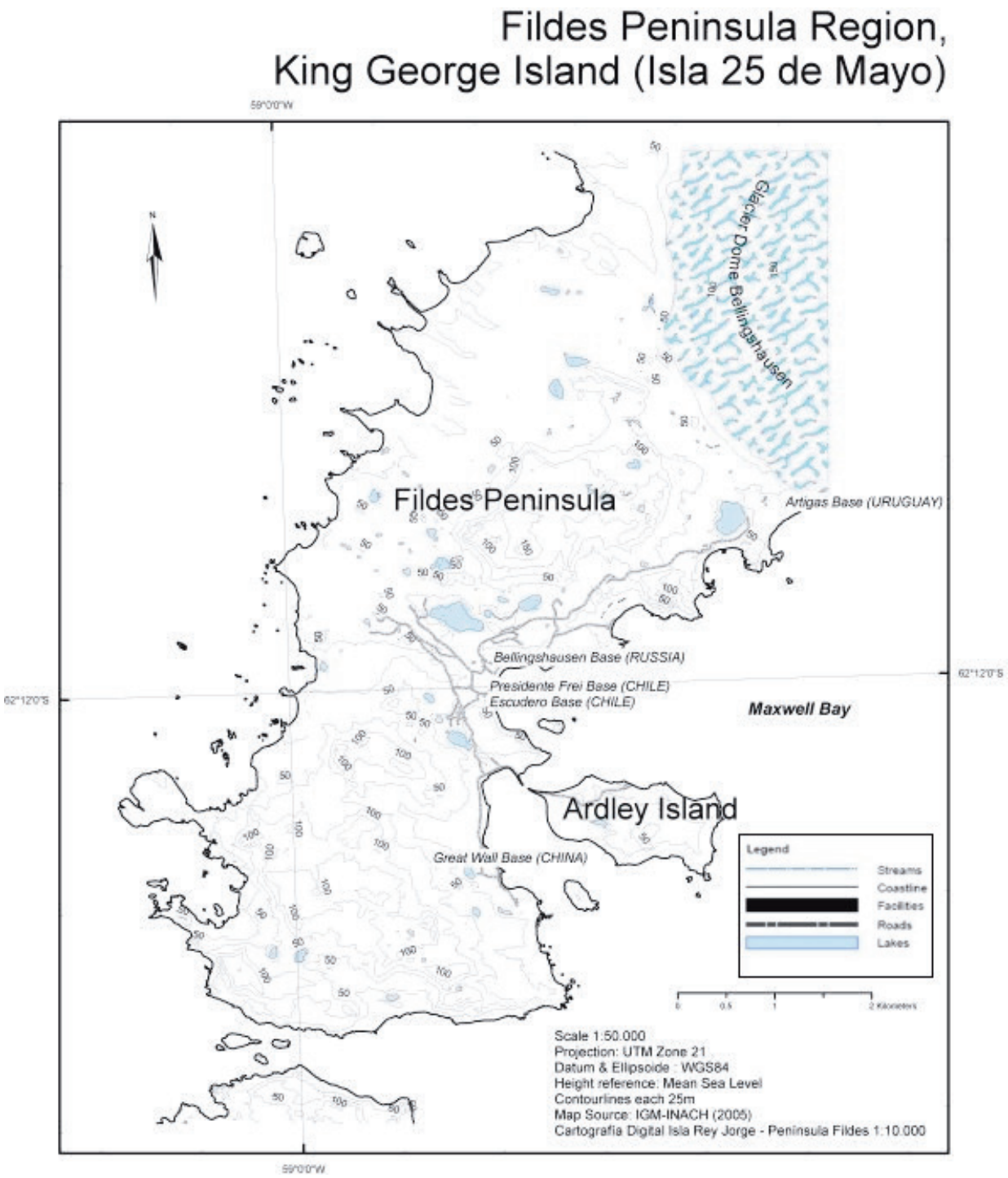
ANNEXES: Maps and Figures

Map 1. Location of Ardley Island in relation to King George Island (25 de Mayo) and the Fildes Peninsula, (Map Database, Project 153, IGM-INACH, Mapping and GIS of South Shetland Islands)



Map 2. Location of Ardley Island in relation to the Fildes Peninsula, King George Island (25 de Mayo), showing the stations present in the region. (Map Database, Project 153, IGM-INACH, Mapping and GIS of South Shetland Islands)



Map 3. Ardley Island and Antarctic Specially Protected Area No 150. Permanent structures are shown, as the demarked route (terrestrial access) , exclusive for those whom carry on a permit, and disembarking points (maritime access). The Protected Area is marked out with a dotted line.
(Map Database 1:2000, Project IGM-INACH No. 153, Mapping and GIS of South Shetland Islands 2005)

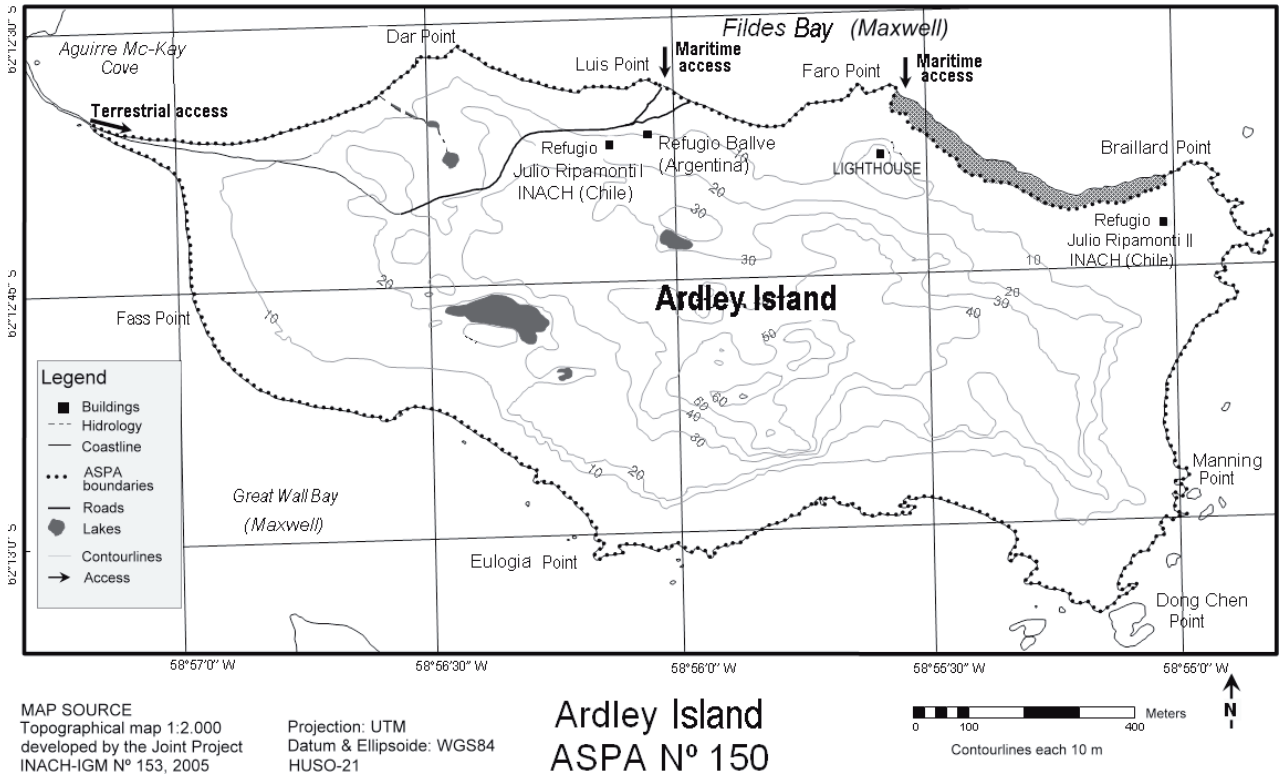


Figure 1. Sketch with the distribution of the main nesting birds on Ardley Island, based in Peter et al., 2008.

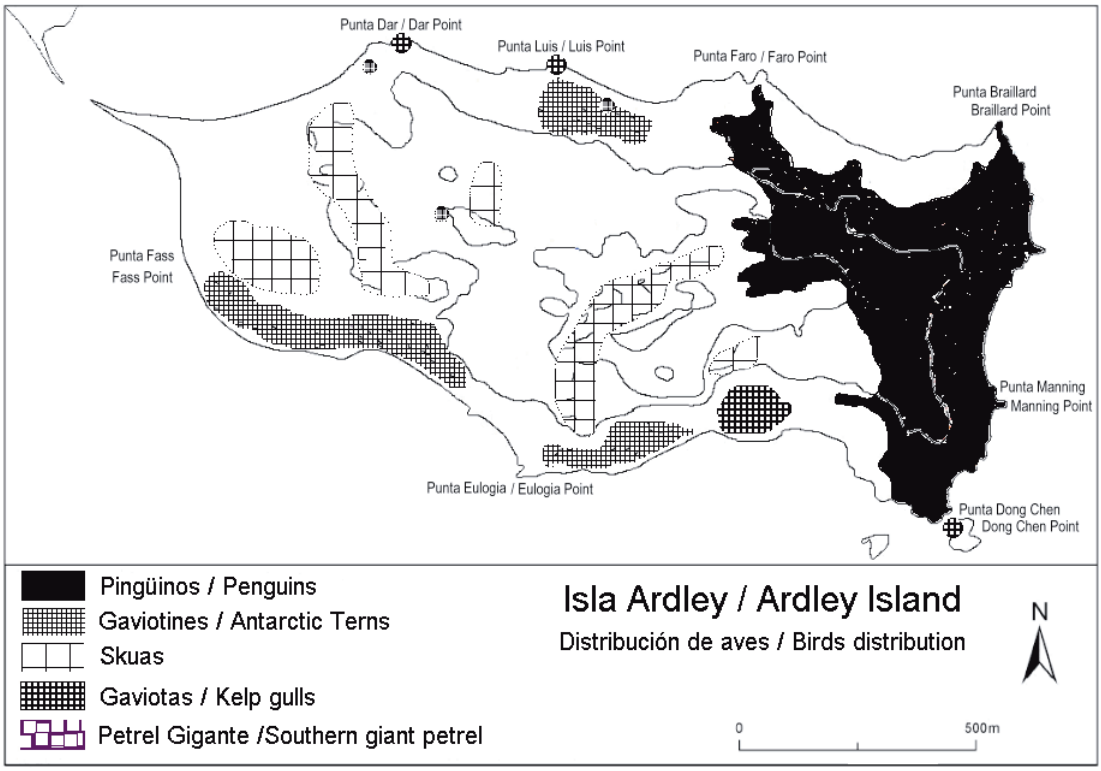


Figure 2. Sketch of the distribution and coverage of the plant species present on Ardley Island, based in Peter et al., 2008.