

# Management Plan for Specially Protected Area No. 19

## LAGOTELLERIE ISLAND, MARGUERITE BAY, GRAHAM LAND

### 1. Description of values to be protected

Lagotellerie Island (Latitude 67°53'20" S, Longitude 67°25'30" W, 1.58 km<sup>2</sup>), Marguerite Bay, Graham Land, was originally designated as a Specially Protected Area through Recommendation XIII-II (1985, SPA No. 19) after a proposal by the United Kingdom. It was designated on the grounds that the island "contains a relatively diverse flora and fauna typical of the southern Antarctic Peninsula region; that of particular interest is the abundance of the only two Antarctic flowering plants *Deschampsia antarctica* and *Colobanthus quitensis* which form stands up to 10 m<sup>2</sup>; that these are amongst the largest stands known south of the South Shetland Islands, being only 90 km north of their southern limit; that here both species flower profusely and the seeds have a greater viability than those produced in the South Orkney or South Shetland Islands; that numerous mosses and lichens also form well-developed communities on the island; that a few of the mosses are fertile, a rare phenomenon in most Antarctic localities; that the invertebrate fauna is rich and that the island is one of the southernmost sites for the apterous midge *Belgica antarctica*; that the shallow loamy soil developed beneath these swards and its associated invertebrate fauna and microbiota are probably unique at this latitude; that there is a colony of about 1000 Adélie penguins (*Pygoscelis adeliae*) and one of the farthest south colonies of a few dozen blue-eyed cormorants (*Phalacrocorax atriceps*) at the south-east corner of the island and that numerous pairs of brown and south polar skuas (*Catharacta lonnbergii* and *C. maccormicki*) breed on the island.". (It is probable the original reference to 1000 Adélie penguins was meant to be 1000 pairs).

These values were reiterated in Recommendation XVI-6 (1991) when a management plan for the site was adopted, and are largely reaffirmed again in the present management plan. In addition, Lagotellerie Island is notable for the occurrence of *Deschampsia antarctica* at the highest recorded altitude south of 56° S, with scattered small plants observed at heights of up to 275 m. The island therefore has a particular scientific value for study of the influence of altitudinal gradient on biological viability for plant species represented at this site. The values associated with the penguin and skua colonies are now considered to be their ecological interrelationship with the other biological features of exceptional value noted above. Fossiliferous strata present at the eastern end of the island are of particular geological value, as such formations are not commonly exposed in the Antarctic Peninsula Volcanic Group.

The island is 3.25 km west of the southern end of Horseshoe Island, 29 km NW of General San Martín Station (Arg.), almost 70 km east from Teniente Luis Carvajal (Chile) and 46 km SE from Rothera Research Station (UK). The island has not been subject to frequent visits, scientific research or sampling.

The boundary of the Area is defined in this management plan to include the whole island, and offshore islets within 200 m of the coast, above the low tide water level.

### 2. Aims and objectives

Management at Lagotellerie Island aims to:

- avoid degradation of, or substantial risk to, the values of the Area by preventing unnecessary human disturbance and sampling in the Area;

- preserve the ecosystem of the Area for its potential as a largely undisturbed reference area;
- allow scientific research on the ecosystem in the Area provided it is for compelling reasons which cannot be served elsewhere, in particular research which is expected to improve knowledge of the features and communities identified of special value, and which gathers baseline data on the island's features for which information is poor or not available;
- 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:

- Maps showing the location of the Area (stating the special restrictions that apply) shall be displayed prominently at any operational research station located within 50 km of the Area, where copies of this Management Plan shall also be made available.
- Signs showing the location and boundaries of the Area and listing entry restrictions should be placed at the access beaches on the northern coast and eastern promontory of the island to help avoid inadvertent entry.
- Markers, signs or structures erected within the Area for scientific or management purposes shall be secured and maintained in good condition and removed when no longer necessary.
- 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.

### **4. Period of designation**

Designated for an indefinite period.

### **5. Maps and photographs**

**Map 1:** Lagotellerie Island Specially Protected Area No. 19, Marguerite Bay, location map, showing the location of General San Martín Station (Arg.), the station Teniente Luis Carvajal (Chile), Adelaide Island, Rothera Research Station (UK) and nearby SSSI No. 9 at Rothera Point, also on Adelaide Island, and the location of the other protected areas in the region (Dion Islands (SPA No. 8) and Avian Island (SPA No. 21)). 'Base Y' (UK) (Historic Monument No. 63) on Horseshoe Island is shown. Inset: the location of Lagotellerie Island along the Antarctic Peninsula.

**Map 2:** Lagotellerie Island (SPA No. 19) topographic map.

Map specifications: Projection: Lambert Conformal Conic;

Standard parallels: 1st 63° 20' 00" S; 2nd 76° 40' 00"S; Central Meridian: 65° 00' 00" W;

Latitude of Origin: 70° 00' 00" S; Spheroid: WGS84; Datum: Mean Sea Level;

Vertical contour interval 20 m. Horizontal and vertical accuracy expected to be better than ±5 m.

**Map 3:** Lagotellerie Island (SPA No. 19) geological sketch map.

### **6. Description of the Area**

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

Lagotellerie Island (Latitude 67°53'20" S, Longitude 67°25'30" W; area 1.58 km<sup>2</sup>), is situated

in Marguerite Bay, Fallières Coast, Graham Land, 46 km SE of Rothera Point on Adelaide Island, 11 km south of Porquois Pas Island and 3.25 km west of the south end of Horseshoe Island. Lagotellerie Island is 2 km by 1.3 km, oriented generally in an E-W direction. Two year-round scientific research stations operate in the vicinity: General San Martín (Argentina; Latitude 68°08' S, Longitude 67°06' W) which is 29.5 km SSE, and Rothera Research Station (UK; Latitude 67°34' S, Longitude 68°07' W) which is 46 km to the NW. A summer-only station, Teniente Luis Carvajal (Latitude 67°46' S, Longitude 68°55' W), has been operated by Chile at the southern end of Adelaide Island since 1985. Lagotellerie Island was first mapped by Jean-Baptiste Charcot during the *Deuxième Expédition Antarctiques Française* in 1908-10. There are no records of further visits until the 1940s, when the island was visited occasionally by American, Argentine and British field parties from nearby scientific stations. The island has not been the subject of any major scientific investigations and is thus largely undisturbed by human activities.

The designated Area comprises the entire main island, and offshore islets within 200 m of the coast, above the low tide water level, which is defined as the boundary of the Area (Map 2). Boundary markers have not been installed because the coast itself is a clearly defined and visually obvious boundary. Signs should be installed on the northern coast and at the penguin colony on the SE promontory of the island, as described in Section 6(iii) below.

Lagotellerie Island is steep-sided and rocky, with about 13% permanent ice cover, most of which is on the southern slopes. The island rises to twin peaks of 268 m and 288 m separated by a broad saddle at around 200 m, with precipitous cliffs up to this height on the south, west and east sides. The upper northern slopes also have steep cliffs, intersected by gullies, screes and traversed by broad rock terraces. The lower northern slopes are more gentle, particularly on the eastern half of the island, with a broad rocky terrace at an elevation of about 15 m which is formed of frost-shattered raised beach debris.

The bulk of Lagotellerie Island is formed of quartz diorite of unknown age, cut by pink, coarse-grained granodiorite and numerous basic and felsic dykes (Map 3). At the eastern end of the island the plutonic rocks are in fault contact with folded, mildly hornfelsed volcanic rocks of Jurassic–Cretaceous age. These consist of agglomerates, andesitic lavas and tuffs of the Antarctic Peninsula Volcanic Group, with plant remains – probably Jurassic – present in shaly beds interbedded with tuff. Such fossiliferous strata are not commonly exposed in the Antarctic Peninsula Volcanic Group, and are therefore of particular geological importance.

Locally extensive areas of coarse sand and gravel derived from weathered quartz-diorite occur on slopes, ledges, gullies and depressions; the most extensive accumulations are on the saddle between the two summits where the soil is sorted into well-developed stone polygons, circles and stripes. On the broad rock terraces closed stands of moss and grass have developed a relatively rich loamy earth up to 25 cm in depth. Glacial erratics are common on the island.

The island has a relatively diverse flora and luxuriant development of plant communities, representative of the southern maritime Antarctic region. The rich terrestrial biology of Lagotellerie Island was first noted by Herwil Bryant, biologist at East Base (US, on Stonington Island; now Historic Monument No. 55), during a visit in 1940-41 when he observed growths of moss, the Antarctic hair grass *Deschampsia antarctica*, and "a small flowering plant" (almost certainly the Antarctic pearlwort *Colobanthus quitensis*), in a small gully – believed to be that found at the north-eastern end of the island – which he considered of such unusual richness for the region that he unofficially referred to it as "Shangri-la Valley". He did not describe the less luxuriant but more extensive communities of *Deschampsia antarctica* and *Colobanthus quitensis* found on the higher north-facing slopes of the island. These slopes and terraces also provide favourable microclimatic conditions for growth, with a relatively long snow-free growing season, and support an abundance of *Deschampsia antarctica* and *Colobanthus quitensis*, the grass forming closed swards of up to 10 m<sup>2</sup> on some of the terraces. These are among the largest stands of these plants known south of the South Shetland Islands. Both species flower abundantly and the seeds have a greater

viability than those produced in the South Orkney or South Shetland Islands, yet they are close to the southern limit of their range. Lagotellerie Island, however, is notable for the growth of *Deschampsia antarctica* at the highest altitude recorded south of 56° S, with scattered small plants observed at heights of up to 275 m. *Colobanthus quitensis* has been observed growing up to 120 m on the island.

Lagotellerie Island also has a rich cryptogamic flora, with small stands of well-developed communities containing several mosses and lichens which are rare at this latitude (notably the mosses *Platydictya jungermannioides* and *Polytrichastrum alpinum*, and lichens *Caloplaca isidioclada*, *Fuscoparmelia gerlachei* and *Usnea trachycarpa*). The number of bryophyte species thus far identified include 20 mosses and two liverworts (*Barbilophozia hatcheri* and *Cephaloziella varians*), and there are at least 60 lichen species. A comprehensive floristic survey of the island has not yet been undertaken, and numerous species, especially of crustose lichens, remain to be accurately determined.

Vegetation is best developed on a series of rock terraces at around 30-50 m a.s.l. on the northern side of the island. Here, both *Deschampsia* and *Colobanthus* are abundant, and closed grass swards form stands of several square metres. Associated with these, especially on the moister terraces, are usually the mosses *Brachythecium austro-salebrosum*, *Bryum* spp., *Pohlia nutans*, *Polytrichastrum alpinum* and *Sanionia uncinata*, and liverworts *Barbilophozia hatcheri* and *Cephaloziella varians*. Many of these grass swards are used as nest sites by skuas.

In drier habitats, especially on scree and rock faces, there are locally dense stands dominated by the macrolichens *Usnea sphacelata* and *U. subantarctica*, with *Pseudephebe minuscula*, *Umbilicaria decussata*, and a large number of crustose taxa. Several lichens are associated with the grass and moss communities (e.g. *Cladonia* spp., *Leproloma* spp., *Leptogium puberulum*, *Ochrolechia frigida*, *Psoroma* spp.). Near the penguin and cormorant colonies several colourful nitrophilous lichens are abundant (e.g. *Buellia* spp., *Caloplaca* spp., *Fuscoparmelia gerlachei*, *Xanthoria* spp.).

Numerous lichens (notably *Caloplaca isidioclada*, *Pseudephebe minuscula*, *Usnea sphacelata*, *Umbilicaria decussata* and many crustose taxa) and a few mosses (notably *Grimmia reflexidens*) occur close to the summit of the island, as do scattered individual plants of *Deschampsia*. Few bryophytes produce sporophytes at far southern latitudes, but several mosses are fertile on Lagotellerie Island (e.g. *Andreaea regularis*, *Bartramia patens*, *Bryum amblyodon*, *B. pseudotriquetrum*, *Grimmia reflexidens*, *Hennediella heimii*, *Pohlia nutans*, *Schistidium antarctici*, *Syntrichia princeps*).

Specific studies of the invertebrate fauna have not been conducted on Lagotellerie Island. However, at least six species of arthropod have been recorded: *Alaskozetes antarcticus*, *Gamasellus racovitzai*, *Globoppia loxolineata* (Acari), *Cryptopygus antarcticus*, *Friezea grisea* (Collembola), and *Belgica antarctica* (Diptera, Chironomidae). Several species of nematophagous fungi have been isolated from the soils associated with mosses and *Deschampsia* on Lagotellerie Island (*Cephalosporium balanoides*, *Dactylaria gracilis*, *Dactylella ellipsospora*), species widely distributed in similar habitats throughout the Antarctic and also commonly found in temperate soils.

Bryant reported several small pools present on the island in the early 1940s, which presumably are the same as, or close to, those observed more recently on the extensive flat low-lying ground on the northern side of the island. He recorded the pools contained many phyllopod crustaceans identified as *Branchinecta granulosa*. Rocks in one of the pools were coated in a bright green filamentous alga, on which the mites *Alaskozetes antarcticus* were observed. *A. antarcticus* was also common under pebbles on the pool floor. Other microorganisms of the trochelminth type were observed living in the algae, with a pink rotifer identified as *Philodina gregaria* being especially numerous. Small tufts of a grey-green alga were observed on large pebbles close to the pool bottom. The algae have not been described in more detail, although the presence of *Prasiola crispa* has been noted. More recent

observations in the early 1980s suggested there were no permanent freshwater bodies on the island, but temporary runnels in summer were found, with some brackish pools in rock depressions near the northern coast. An inspection visit on 12 January 1989 again noted the presence of several small melt pools of around 5-10 m<sup>2</sup>, some with fringing wet moss carpets, and suggested these were probably the habitat of *Belgica antarctica*. No record has been found of any more comprehensive freshwater surveys on the island.

A small Adélie penguin (*Pygoscelis adeliae*) colony occupies the eastern promontory of the island (Map 2). Numbers have varied from a low of perhaps 350-400 pairs based on an estimate made in December 1936 to a high of 2402 pairs recorded in an accurate nest count in November 1955. The colony was regularly used as a source of eggs for personnel stationed at the nearby British Base Y on Horseshoe Island between 1955-60. It was reported that some 800 eggs were taken during 1955. The number of breeding pairs dropped to around 1000 in 1959 and 1960. Adélie penguin colonies are known to exhibit high interannual change in numbers as a result of a variety of natural factors, and in March 1981 it was observed that all of the approximately 1000 chicks in the colony had died. A chick count made in February 1983 suggested the colony consisted of approximately 1700 pairs, which is considered accurate to within 15-25%.

A small colony of blue-eyed cormorants (*Phalacrocorax atriceps*) has been observed on the eastern promontory of the island, which is one of the most southerly breeding sites reported for the species. Some 200 immature birds were observed close to the island, within view of the colony, on 16 January 1956. The colony was reported to consist of 10 nests on 17 February 1983. However, the colony was not seen in the January 1989 inspection on Lagotellerie Island. Brown and south polar skuas (*Catharacta loenbergi* and *C. maccormicki*) are also present, with 12 nests reported in 1956, when it was noted that many of the chicks were definitely south polar skua (*C. maccormicki*). It was estimated in 1958 that five pairs nested around the penguin colony and that both species occurred. A group of 59 non-breeding birds of both species was recorded on 12 January 1989 mid-way along the northern side of the island. Two Wilson's storm petrel (*Oceanites oceanicus*) nests were recorded on 14 January 1956. A kelp gull (*Larus dominicanus*) nest, with eggs, was recorded in the 'Shangri-La Valley' by Bryant in December 1940.

The inspection visit in January 1989 reported 12 Weddell seals (*Leptonychotes weddellii*) hauled out on a small shingle beach at the base of a rocky spit on the north coast, but no other seals were seen. However, southern elephant (*Mirounga leonina*) and Antarctic fur (*Arctocephalus gazella*) seals are commonly observed in Marguerite Bay and it is possible that they also haul out at accessible parts of the island.

The most significant environmental impact at Lagotellerie Island appears to have been from the practice of egg harvesting to feed personnel at bases operating nearby in the period 1955-60. The only evidence of human activity currently thought to exist on the island are the remains of a survey mast on the summit. The inspection visit of January 1989 reported there was no evidence of any recent physical or biological change on the island and it was concluded that the Area was continuing to serve the purpose for which it was designated.

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

None.

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

The remains of a mast erected for survey purposes in the 1960s are present on the summit of the island. No other structures are known to exist on the island. Signs marking the Area have yet to be installed. It is proposed to install two signs: one on the SE promontory close to the penguin colony, another on a prominent access point on the northern coast.

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

The nearest protected areas to Lagotellerie Island are the Dion Islands (SPA No. 8) about 55 km west, Avian Island (SPA No. 21) 65 km west, and Rothera Point (SSSI No. 9) 46 km to the NW (Map 1). Several Historic Sites and Monuments are located in the vicinity: 'Base Y' (UK) on Horseshoe Island (HSM No. 63); 'Base E' (UK) (HSM No. 64) and buildings and artefacts at and near East Base (US) (HSM No. 55), both on Stonington Island; and installations of San Martín Station (Argentina) at Barry Island (HSM No. 26).

**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 compelling scientific reasons that cannot be served elsewhere, or for essential management purposes consistent with plan objectives such as inspection, maintenance 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 and objectives of the Management Plan;
- the actions permitted are in accordance with the Management Plan;
- the Permit, or an authorised 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.
- The appropriate authority should be notified of any activities/measures undertaken that were not included in the authorised Permit.

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

Vehicles are prohibited within the Area and access shall be by small boat or by helicopter. Access from the sea should be to the northern coast of the island (Map 2), unless specifically authorised by Permit to land elsewhere or when landing along this coast is impractical because of adverse conditions. Access into the Area at the 200 m section of NE coast immediately below the "Shangri-la Valley", which contains the richest vegetation growth on the island, is strongly discouraged at all times (Map 2). No special restrictions apply to the sea or air routes used to move to and from the Area. These restrictions apply equally to persons wishing to access the Area via sea ice in the winter.

Overflight of the eastern end of the island over the penguin/cormorant colony is prohibited below 750 m (2500 feet) (Map 2). Landing of helicopters within the Area shall be at the designated location on the broad rock/permanent snow platform about half-way along the NW coast at about 15 m altitude, and 200 m inland from the sea (Map 2). Use of helicopter smoke grenades is prohibited within the Area unless absolutely necessary for safety, and all grenades should be retrieved.

Movement within the Area shall be on foot. Pilots, helicopter or boat crew, or other people on helicopters or boats, are prohibited from moving on foot beyond the immediate vicinity of their landing site unless specifically authorised by Permit. All movement should be undertaken carefully so as to minimise disturbance to the soil and vegetated surfaces, walking on rocky terrain if practical. Pedestrian traffic should be kept to the minimum consistent with the objectives of any permitted activities and every reasonable effort should be made to minimise trampling 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 or scientific values of the Area and which cannot be served elsewhere;
- Essential management activities, including monitoring.

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

Structures shall not 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 a condition of the Permit.

**7(iv) Location of field camps**

When necessary for purposes specified in the Permit, temporary camping is allowed at the designated site on the broad rock/permanent snow platform about half-way along the NW coast at about 15 m altitude, and 200 m inland from the sea (Map 2).

**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 the precautions listed in 7(ix) below shall be taken to prevent accidental introductions. In view of the presence of breeding bird colonies on the island, no poultry products, including products containing uncooked dried eggs, shall be taken into the Area. 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 specifically authorised by Permit for specific scientific or management purposes. Anything 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 any introduction into the environment is minimised. If release occurs which is likely to compromise the values of the Area, removal is encouraged only where the impact of removal is not likely to be greater than that of leaving the material *in situ*. The appropriate authority should be notified of anything released and not removed that was not included in the authorised Permit.

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

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

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

Collection or removal of anything not brought into the Area by the Permit holder shall only be in accordance with a Permit and should be limited to the minimum necessary to meet scientific or management needs. Permits shall not be granted in instances where it is proposed to take, remove or damage such quantities of soil, native flora or fauna that their distribution or abundance on Lagotellerie Island would be significantly affected. Anything 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. Human wastes may be disposed of into the sea.

**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 monitoring and site inspection activities, which may involve the small-scale collection of samples for analysis or review, or for protective measures.
- Any specific long-term monitoring sites shall be appropriately marked.
- To help maintain the ecological and scientific values of Lagotellerie Island special precautions shall be taken against introductions. Of concern are microbial, invertebrate or plant introductions from other Antarctic sites, including stations, or from regions outside Antarctica. All sampling equipment or markers brought into the Area shall be cleaned or sterilised. To the maximum extent practicable, footwear and other equipment used or brought into the Area (including backpacks, carry-bags and tents) shall be thoroughly cleaned before entering the Area.

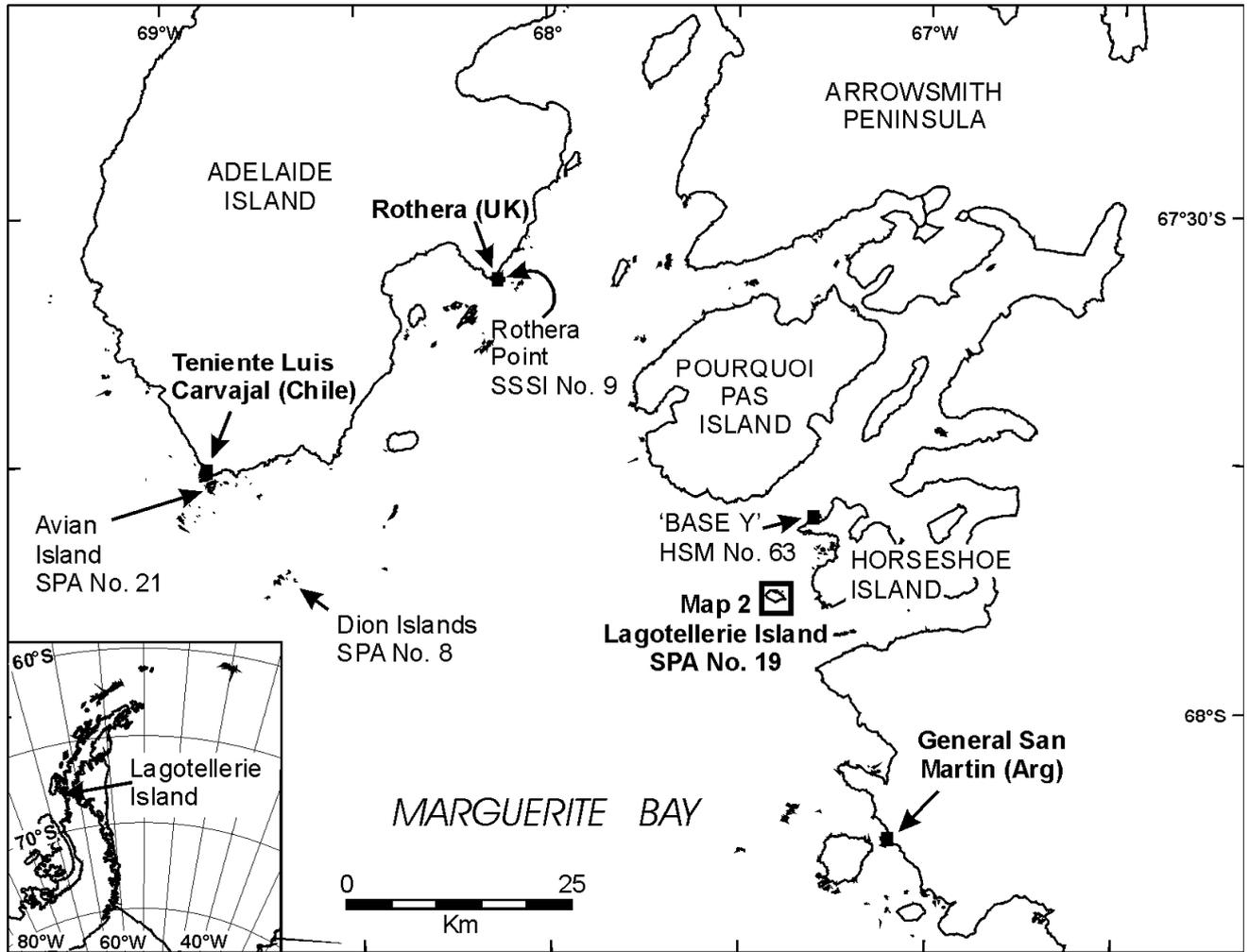
**7(x) Requirements for reports**

Parties should ensure that the principal holder for 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 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.

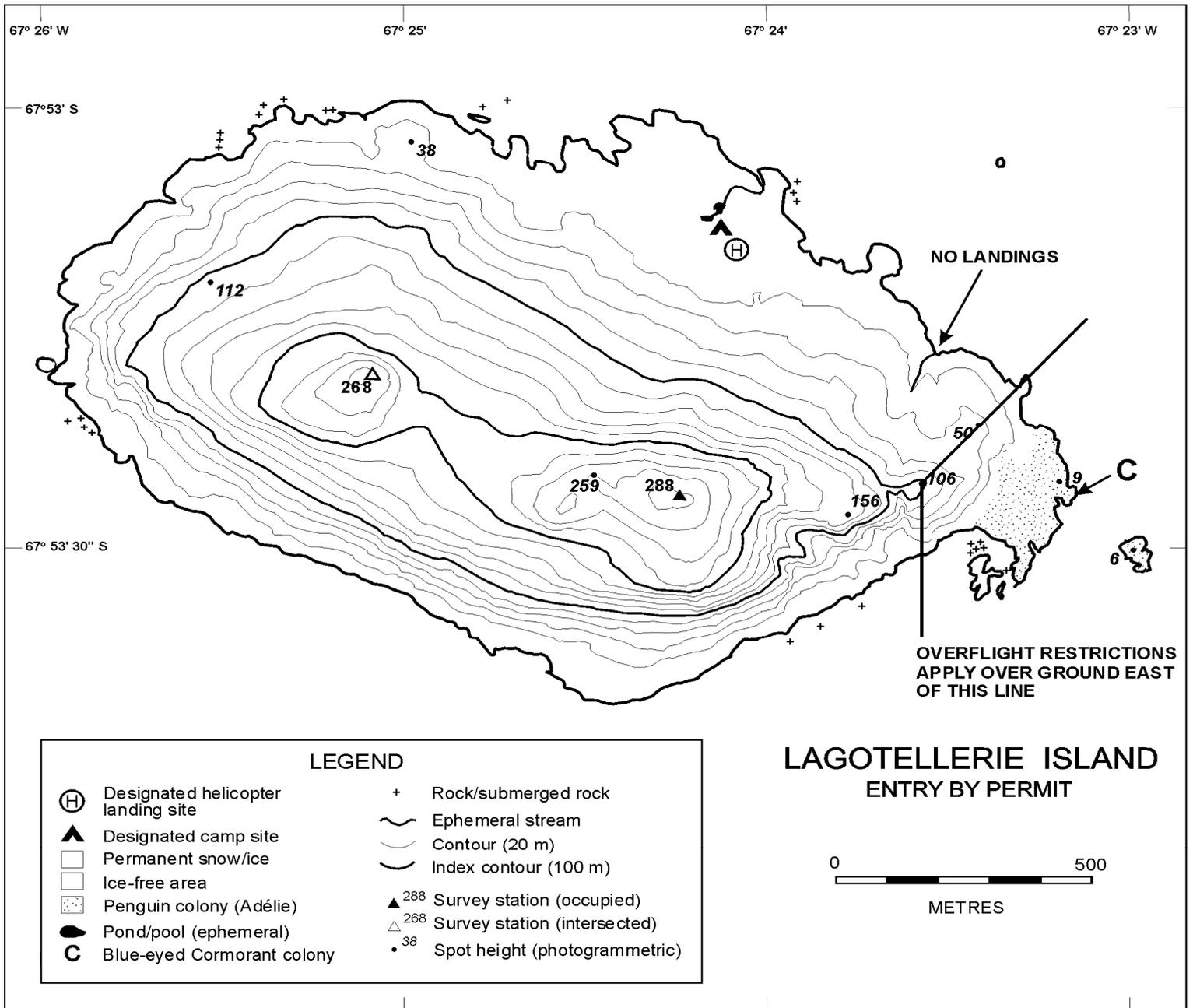
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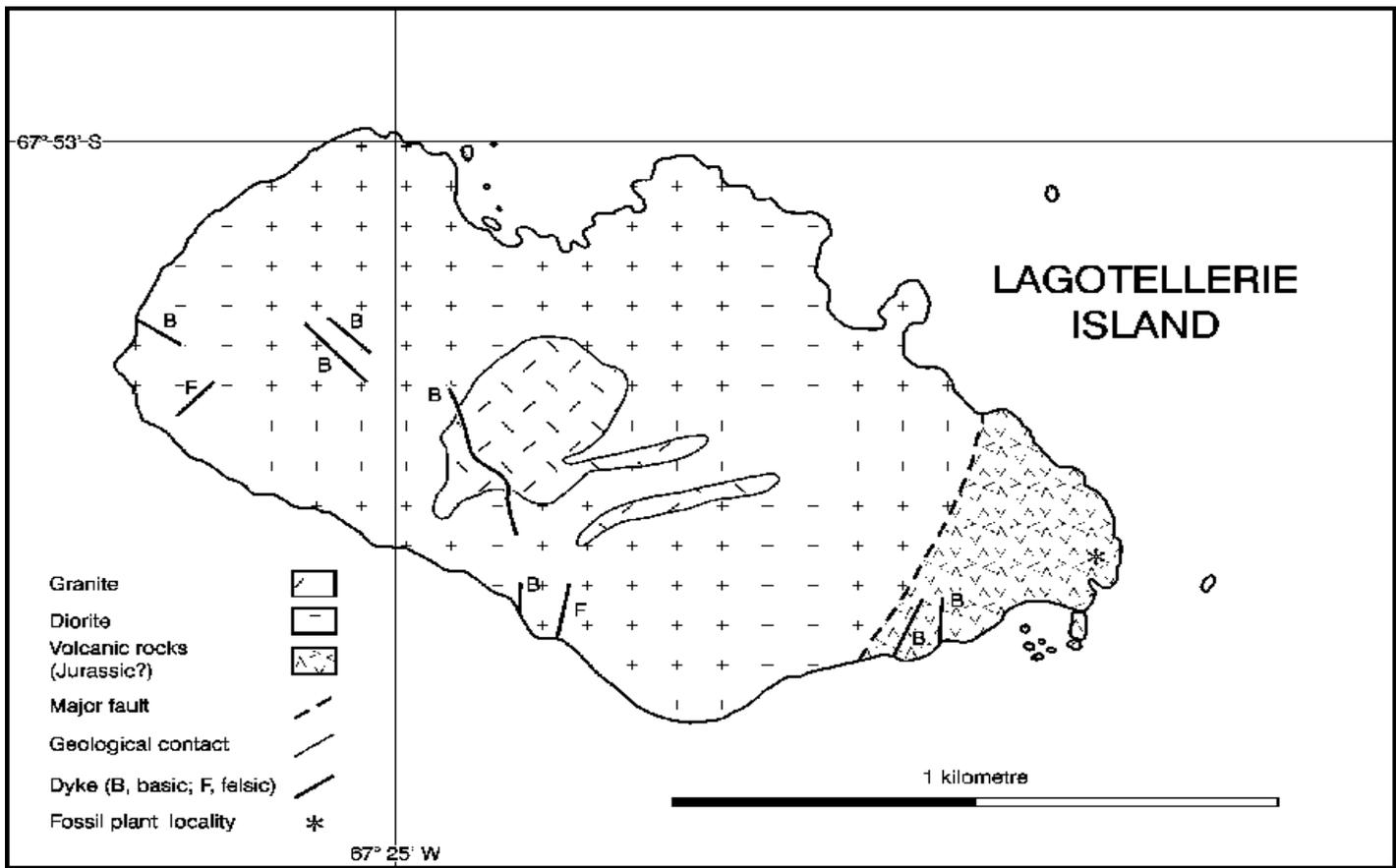
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**Map 1.** Lagotellerie Island (SPA No. 19), Marguerite Bay, location map. Inset: location of Lagotellerie Island on the Antarctic Peninsula.



Map 2. Lagotellerie Island (SPA No. 19) topographic map.



Map 3. Lagotellerie Island (SPA No. 19) geological sketch map (note: sketch based on earlier data than Map 2).