

CONSERVATION MEASURE 18/XIII
Procedure for According Protection to CEMP Sites

The Commission,

Bearing in mind that the Scientific Committee has established a system of sites contributing data to the CCAMLR Ecosystem Monitoring Program (CEMP), and that additions may be made to this system in the future;

Recalling that it is not the purpose of the protection accorded to CEMP sites to restrict fishing activity in adjacent waters;

Recognising that studies being undertaken at CEMP sites may be vulnerable to accidental or wilful interference;

Concerned, therefore, to provide protection for CEMP sites, scientific investigations and the Antarctic marine living resources therein, in cases where a Member or Members of the Commission conducting or planning to conduct CEMP studies believes such protection to be desirable;

hereby adopts the following Conservation Measure in accordance with Article IX of the Convention:

1. In cases where a Member or Members of the Commission conducting, or planning to conduct, CEMP studies at a CEMP site believe it desirable that protection should be accorded to the site, it, or they, shall prepare a draft management plan in accordance with Annex A to this Conservation Measure.
2. Each such draft management plan shall be sent to the Executive Secretary for transmission to all Members of the Commission for their consideration at least three months before its consideration by WG-EMM.
3. The draft management plan shall be considered in turn by WG-EMM, the Scientific Committee and the Commission. In consultation with the Member or Members of the Commission which drew up the draft management plan, it may be amended by any of these bodies. If a draft management plan is amended by either WG-EMM or the Scientific Committee, it shall be passed on in its amended form either to the Scientific Committee or to the Commission as the case may be.
4. If, following completion of the procedures outlined in paragraphs 1 to 3 above, the Commission considers it appropriate to accord the desired protection to the CEMP site, the Commission shall adopt a Resolution calling on Members to comply, on a voluntary basis, with the provisions of the draft management plan, pending the conclusion of action in accordance with paragraphs 5 to 8 below.
5. The Executive Secretary shall communicate such a Resolution to SCAR, the Antarctic Treaty Consultative Parties and, if appropriate, the Contracting Parties to other components of the Antarctic Treaty System which are in force.
6. Unless, before the opening date of the next regular meeting of the Commission, the Executive Secretary has received:
 - (i) an indication from an Antarctic Treaty Consultative Party that it desires the resolution to be considered at a Consultative Meeting; or
 - (ii) an objection from any other quarter referred to in paragraph 5 above;

the Commission may, by means of a conservation measure, confirm its adoption of the management plan for the CEMP site and shall include the management plan in Annex B to Conservation Measure 18/XIII.

7. In the event that an Antarctic Treaty Consultative Party has indicated its desire for the Resolution to be considered at a Consultative Meeting, the Commission shall await the outcome of such consideration, and may then proceed accordingly.
8. If objection is received in accordance with paragraphs 6(ii) or 7 above, the Commission may institute such consultations as it may deem appropriate to achieve the necessary protection and to avoid interference with the achievement of the principles and purposes of, and measures approved under, the Antarctic Treaty and other components of the Antarctic Treaty System which are in force.
9. The management plan of any site may be amended by decision of the Commission. In such cases full account shall be taken of the advice of the Scientific Committee. Any amendment which increases the area of the site or adds to categories or types of activities that would jeopardise the objectives of the site shall be subject to the procedures set out in paragraphs 5 to 8 above.
10. Entry into a CEMP site included in Annex B shall be prohibited except for the purposes authorised in the relevant management plan for the site and in accordance with a permit issued under paragraph 11.
11. Each Contracting Party shall, as appropriate, issue permits authorising its nationals to carry out activities consistent with the provisions of the management plans for CEMP sites and shall take such other measures, within its competence, as may be necessary to ensure that its nationals comply with the management plans for such sites.
12. Copies of such permits shall be sent to the Executive Secretary as soon as practical after they are issued. Each year the Executive Secretary shall provide the Commission and the Scientific Committee with a brief description of the permits that have been issued by the Parties. In cases where permits are issued for purposes not directly related to the conduct of CEMP studies at the site in question, the Executive Secretary shall forward a copy of the permit to the Member or Members of the Commission conducting CEMP studies at that site.
13. Each management plan shall be reviewed every five years by WG-EMM and the Scientific Committee to determine whether it requires revision and whether continued protection is necessary. The Commission may then act accordingly.

**INFORMATION TO BE INCLUDED IN MANAGEMENT
PLANS FOR CEMP SITES**

Management plans shall include:

A. GEOGRAPHICAL INFORMATION

1. A description of the site, and any buffer zone within the site, including:
 - (a) geographical coordinates;
 - (b) natural features;
 - (c) boundary markers;
 - (d) natural features that define the site;
 - (e) access points (pedestrian, vehicular, airborne, sea-borne);
 - (f) pedestrian and vehicular routes in the site;
 - (g) preferred anchorages;
 - (h) location of structures within the site;
 - (i) areas or zones within the site, described in generic or geographical terms, or both, in which activities are prohibited or otherwise constrained;
 - (j) location of nearby scientific stations, research or refuge facilities; and
 - (k) location of areas or sites, in or near the site, which have been accorded protected status in accordance with measures adopted under the Antarctic Treaty or other components of the Antarctic Treaty System which are in force.
2. Maps showing:
 - (a) the location of the site in relation to major surrounding features; and
 - (b) where applicable, the geographical features listed in paragraph 1 above.

B. BIOLOGICAL FEATURES

1. A description of the biological features of the site, in both space and time, which it is the purpose of the management plan to protect.

C. CEMP STUDIES

1. A full description of the CEMP studies being conducted or planned to be conducted, including the species and parameters which are being or are to be studied.

D. PROTECTION MEASURES

1. Statements of prohibited activities:
 - (a) throughout the site at all times of the year;
 - (b) throughout the site at defined parts of the year;

- (c) in parts of the site at all times of the year; and
 - (d) in parts of the site at defined parts of the year.
- 2. Prohibitions regarding access to and movement within or over the site.
- 3. Prohibitions regarding:
 - (a) the installation, modification, and/or removal of structures; and
 - (b) the disposal of waste.
- 4. Prohibitions for the purpose of ensuring that activity in the site does not prejudice the purposes for which protection status has been accorded to areas or sites, in or near the site, under the Antarctic Treaty or other components of the Antarctic Treaty System which are in force.

E. COMMUNICATIONS INFORMATION

- 1. The name, address, telephone, telex and facsimile numbers of:
 - (a) the organization or organizations responsible for appointing national representative(s) to the Commission; and
 - (b) the national organization or organizations conducting CEMP studies at the site.

Notes:

- 1. A code of conduct. If it would help towards achieving the scientific objectives of the site, a code of conduct may be annexed to the management plan. Such a code should be written in hortatory rather than mandatory terms, and must be consistent with the prohibitions contained in Section D above.
- 2. Members of the Commission preparing draft management plans for submission in accordance with this Conservation Measure should bear in mind that the primary purpose of the management plan is to provide for the protection of CEMP studies at the site through the application of the prohibitions contained in Section D. To that end, the management plan is to be drafted in concise and unambiguous terms. Information which is intended to help scientists, or others, appreciate broader considerations regarding the site (e.g., historical and bibliographic information) should not be included in the management plan but may be annexed to it.

MANAGEMENT PLANS FOR CEMP SITES

MANAGEMENT PLAN FOR THE PROTECTION OF SEAL ISLANDS,
SOUTH SHETLAND ISLANDS, AS A SITE INCLUDED IN THE
CCAMLR ECOSYSTEM MONITORING PROGRAM

A. GEOGRAPHICAL INFORMATION

1. Description of the site:

- (a) Geographical coordinates. The Seal Islands are composed of small islands and skerries located approximately 7 km north of the northwest corner of Elephant Island, South Shetland Islands. The Seal Islands CEMP Protected Area includes the entire Seal Islands group, which is defined as Seal Island plus any land or rocks exposed at mean low tide within a distance of 5.5 km of the point of highest elevation on Seal Island. Seal Island is the largest island of the group, and is situated at 60°59'14"S, 55°23'04"W (coordinates are given for the point of highest elevation on the island - see Figures 1 and 2).
- (b) Natural features. The Seal Islands cover an area approximately 5.7 km from east to west and 5 km from north to south. Seal Island is approximately 0.7 km long and 0.5 km wide. It has an altitude of about 125 m, with a raised plateau at about 80 m, and precipitous cliffs on most coastlines. There is a raised, sandy beach on the western shore and several coves on the northern and eastern shores. Seal Island is joined to the adjacent island to the west by a narrow sand bar that is approximately 50 m long; the bar is rarely passable on foot, and only when seas are calm and the tide is very low. Other islands in the group are similar to Seal Island, with precipitous cliffs, exposed coasts, and a few sand beaches and protected coves. There is no permanent ice on any of the islands. Seal Island is mainly composed of poorly consolidated sedimentary rocks. Rocks crumble and fracture easily, resulting in prevalent erosion from water runoff and coastal wave action. Geologists have characterised the bedrock as "pebbly mudstone". No fossils have been reported from the site. Because colonies of penguins are present in virtually all sectors of Seal Island (including the summit), the soil in many areas as well as several vertical rock faces are enriched by guano.
- (c) Boundary markers. As of 1991, no man-made boundary markers indicating the limits of the protected area had been established. The boundaries of the site are defined by natural features (i.e., coastlines).
- (d) Natural features that define the site. The Seal Islands CEMP Protected Area includes the entire Seal Islands group (see Section A.1(a) for definition). No buffer zones are defined for the site.
- (e) Access points. The site may be accessed by boat or aircraft at any point where pinnipeds and seabirds will not be adversely affected (see Sections D.1 and D.2). Access by small boat is recommended in most circumstances because the number of beach landing spots for helicopters (which must approach these spots by flying over water rather than over land) is very limited. There are no landing sites for fixed-winged aircraft.

- (f) Pedestrian and vehicular routes. Pedestrians should follow the advice of the local scientists in selecting pathways which will minimise disturbance to wildlife (see Section D.2(d)). Land vehicles are not permitted except in the immediate vicinity of the field camp and the beach (see Section D.2(c)).
- (g) Preferred anchorages. Numerous shoals and pinnacles are known to exist in the vicinity of the Seal Islands, and navigation charts of the area are incomplete. Most ships visiting the area recently have preferred an anchorage spot approximately 1.5 km to the southeast of Seal Island (Figure 2), which has a rather consistent depth of approximately 18 m. A second anchorage utilised by smaller vessels is located approximately 0.5 km to the northeast of Seal Island (Figure 2) at a depth of about 20 m. Organisation(s) conducting CEMP studies at the site can provide further details about sailing instructions pertaining to these anchorages (see Section E.2).
- (h) Location of structures within the site. As of 1991 there were structures at four locations on Seal Island: a research camp and three observation blinds (Figure 2 insert). The temporary field camp, established in December 1986, is located near the sand beach on the western coast of Seal Island. The camp is comprised principally of four structures: the main living quarters, two storage sheds, and an outhouse. In addition, three small blinds are located at various spots on Seal Island (two near penguin and fur seal colonies, and one at the top of the island) to facilitate scientific observations and to house research equipment.
- (i) Areas within the site where activities are constrained. The protection measures specified in Section D apply to all areas within the Seal Islands Protected Area, as defined in Section A.1(d).
- (j) Location of nearby scientific, research or refuge facilities. The nearest research facility to the site is the scientific field camp maintained by the Brazilian government at Stinker Point, Elephant Island (61°04'S, 55°21'W), which is approximately 26 km south of Seal Island. Numerous scientific stations and research facilities are located on King George Island, which is approximately 215 km southwest of Seal Island.
- (k) Areas or sites protected under the Antarctic Treaty System. No areas or sites within or near (i.e., within 100 km) the Seal Island Protected Area have been accorded protected status in accordance with measures adopted under the Antarctic Treaty or other components of the Antarctic Treaty System which are in force.

2. Maps of the site:

- (a) Figure 1 shows the geographical position of the Seal Islands in relation to major surrounding features, including the South Shetland Islands and adjacent bodies of water.
- (b) Figure 2 illustrates the location of the entire Seal Islands archipelago and preferred vessel anchorages. The detailed insert of Seal Island in Figure 2 shows the location of structures associated with CEMP studies and the location of the point of highest elevation (indicated by a cross).

B. BIOLOGICAL FEATURES

1. Terrestrial. There is no information on soil biology at Seal Island but it is likely that similar types of plants and invertebrates are found as at other sites in the South Shetland Islands. Lichens are present on stable rock surfaces. There is no evidence of well-developed moss or grass banks being present on Seal Island.
2. Inland waters. There are no known lakes or ephemeral ponds of significance on Seal Island.
3. Marine. No studies on littoral communities have been carried out.
4. Birds and seals. Seven species of birds are known to breed on the Seal islands: chinstrap penguins (*Pygoscelis antarctica*), macaroni penguins (*Eudyptes chrysolophus*), cape petrels (*Daption capensis*), Wilson's storm petrels (*Oceanites oceanicus*), southern giant petrels (*Macronectes giganteus*), southern black-backed gulls (*Larus dominicanus*), and American sheathbills (*Chionus alba*). The chinstrap penguin population on Seal Island numbers approximately 20 000 breeding pairs, nesting in about 60 colonies throughout the island. About 350 pairs of macaroni penguins nest on Seal Island in five separate colonies. The nesting and chick-rearing period for chinstrap and macaroni penguins at Seal Island extends from November through March. No surveys have been made of cape petrel or storm petrel populations, however, both species are numerous; the cape petrels nest on cliff faces and the storm petrels nest in burrows in the talus slopes. Brown skuas (*Catharacta lönnerbergi*) are common. Blue-eyed shags (*Phalacrocorax atriceps*), Adélie penguins (*Pygoscelis adeliae*), gentoo penguins (*Pygoscelis papua*), king penguins (*Aptenodytes patagonicus*) and rockhopper penguins (*Eudyptes crestatus*) are among the avian visitors to the area.
5. Five species of pinnipeds have been observed at Seal Island: Antarctic fur seals (*Arctocephalus gazella*), southern elephant seals (*Mirounga leonina*), Weddell seals (*Leptonychotes weddellii*), leopard seals (*Hydrurga leptonyx*) and crabeater seals (*Lobodon carcinophagus*). Of these fur seals are the only confirmed breeders on the island, although small numbers of elephant seals probably breed on the island early in the spring. Nearly 600 fur seal pups were born in the Seal Islands group in December 1989, with approximately half of these born on Seal Island and half on Large Leap Island (Figure 2). The fur seal pupping and pup-rearing period at Seal Island extends from late November to early April. During the austral summer, elephant seals are ashore during their moult period; Weddell seals regularly haul out on the beaches; crabeater seals are infrequent visitors; and leopard seals are common both ashore and in coastal waters where they prey on penguins and fur seal pups.

C. CEMP STUDIES

1. The presence at the Seal Islands of both Antarctic fur seal and penguin breeding colonies, as well as significant commercial krill fisheries within the foraging range of these species, make this an excellent site for inclusion in the CEMP network of sites established to help meet CCAMLR objectives.
2. The following species are of particular interest for CEMP routine monitoring and directed research at this site: Antarctic fur seals, chinstrap penguins, macaroni penguins and cape petrels.

3. Longterm studies are underway to assess and monitor the feeding ecology, growth and condition, reproductive success, behaviour, vital rates, demography and abundance of pinnipeds and seabirds that breed in the area. Since an initial survey and pilot field program at Seal Island during the 1986/87 austral summer, United States scientists have conducted monitoring and directed research annually. It is intended that this program will continue for at least another 10 years (through 2000).
4. A program of routine monitoring using CEMP Standard Methods is being carried out by US scientists. Penguin parameters being monitored include trends in population size (A3), demography (A4), duration of foraging trips (A5), breeding success (A6), chick fledging weight (A7), chick diet (A8) and breeding chronology (A9). Fur seal parameters being monitored include duration of foraging/attendance cycles (C1) and pup growth rates (C2). As new CEMP Standard Methods are approved, additional pinniped and seabird parameters may be included in future monitoring efforts.
5. Directed research relevant to CEMP is also being undertaken on fur seals and seabirds. Research topics include foraging behaviour, foraging areas, energy requirements, seasonal movements, penguin chick growth rates and relationships between monitored parameters and the physical environment.

D. PROTECTION MEASURES

1. Prohibited activities and temporal constraints:

- (a) Throughout the site at all times of the year. Any activities which damage, interfere with, or adversely affect the planned CEMP monitoring and directed research at this site are not permitted.
- (b) Throughout the site at all times of the year. Any non-CEMP activities are not permitted which result in:
 - (i) killing, injuring, or disturbing pinnipeds or seabirds;
 - (ii) damaging or destroying pinniped or seabird breeding areas; or
 - (iii) damaging or destroying the access of pinnipeds or seabirds to their breeding areas.
- (c) Throughout the site at defined parts of the year. Human occupation of the site during the period 1 June to 31 August is not permitted except under emergency circumstances.
- (d) In parts of the site at all times of the year. Building structures within the boundaries of any pinniped or seabird colony is not permitted. For this purpose, colonies are defined as the specific locations where pinniped pups are born or where seabird nests are built. This prohibition does not pertain to placing markers (e.g., numbered stakes, posts, etc.) or situating research equipment in colonies as may be required to facilitate scientific research.
- (e) In parts of the site at defined parts of the year. Entry into any pinniped or seabird colonies during the period 1 September to 31 May is not permitted except in association with CEMP activities.

2. Prohibitions regarding access to and movement within or over the site:

- (a) Entry of the site at locations where pinniped or seabird colonies are present in the immediate vicinity is not permitted.
- (b) Aircraft overflight of the site is not permitted at altitudes less than 1 000 m unless the proposed flight plan has been reviewed in advance by the organisation(s) conducting CEMP activities at the site (see Section E.2).
- (c) The use of land vehicles is not permitted except to transport equipment and supplies to and from the field camp.
- (d) Pedestrians are not permitted to walk through areas used regularly by pinnipeds and seabirds (i.e., colonies, resting areas, pathways) or to disturb other fauna or flora, except as necessary to conduct authorised research.

3. Prohibitions regarding structures:

- (a) Building structures other than those directly supporting CEMP directed scientific research and monitoring activities or to house personnel and/or their equipment is not permitted.
- (b) Human occupation of these structures is not permitted during the period 1 June to 31 August (see Section D.1(c)).
- (c) New structures are not permitted to be built within the site unless the proposed plans have been reviewed in advance by the organisation(s) conducting CEMP activities at the site (see Section E.2).

4. Prohibitions regarding waste disposal:

- (a) Landfill disposal of non-biodegradable materials is not permitted; non-biodegradable materials brought to the site are to be removed when no longer in use.
- (b) Disposal of waste fuels, volatile liquids and scientific chemicals within the site is not permitted; these materials are to be removed from the site for proper disposal elsewhere.
- (c) The burning of any non-organic materials or the open burning of any materials is not permitted (except for properly used fuels for heating, lighting, cooking or electricity).

5. Prohibitions regarding the Antarctic Treaty System:

It is not permitted to undertake any activities in the Seal Islands CEMP Protected Area which are not in compliance with the provisions of: (i) the Antarctic Treaty, including the Agreed Measures for the Conservation of Antarctic Fauna and Flora; (ii) the Convention on the Conservation of Antarctic Seals; and (iii) the Convention on the Conservation of Antarctic Marine Living Resources.

E. COMMUNICATIONS INFORMATION

1. Organisation(s) appointing national representatives to the Commission:

Bureau of Oceans and International Environmental and Scientific Affairs
US Department of State
Washington, DC 20520 USA

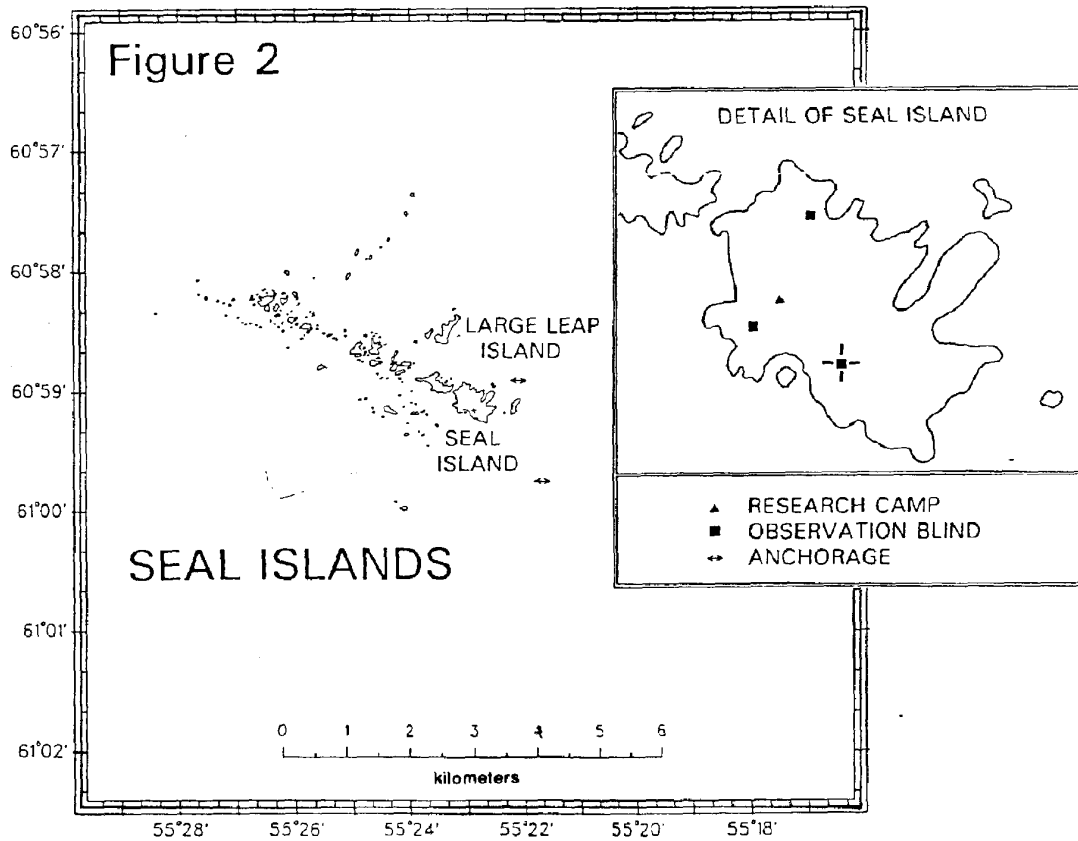
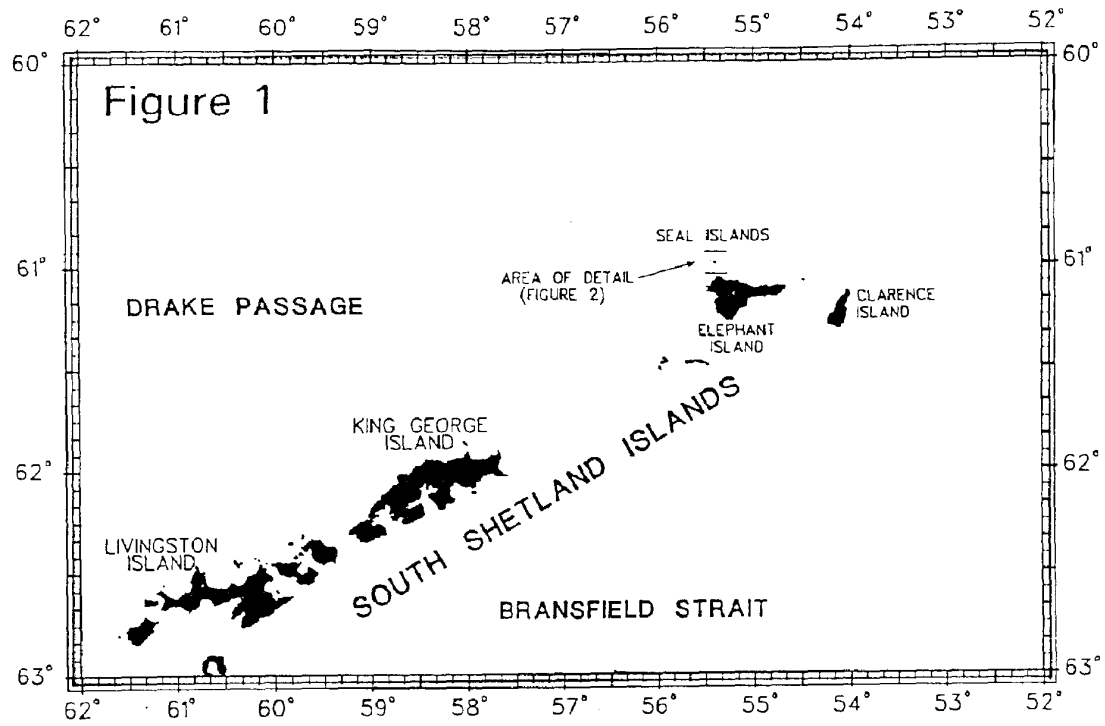
Telephone: (202) 647-3262
Facsimile: (202) 647-1106
Telex: not available

2. Organisation(s) conducting CEMP studies at the site:

US Antarctic Marine Living Resources Program
Southwest Fisheries Science Centre
National Marine Fisheries Service, NOAA
PO Box 271
La Jolla, CA 92038 USA

BIBLIOGRAPHY

- BENGTSON, J.L., L.M. FERM, T.J. HARKONEN and B.S. STEWART. 1990. Abundance of Antarctic fur seals in the South Shetland Islands, Antarctica, during the 1986/87 austral summer. In: KERRY, K. and G. HEMPEL (Eds). *Antarctic Ecosystems, Proceedings of the Fifth SCAR Symposium on Antarctic Biology*. Springer-Verlag, Berlin: 265-270.
- O'GORMAN, F.A. 1961. Fur seals breeding in the Falkland Island Dependencies. *Nature*, Lond., 192: 914-916.
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- SHUFORD, W.D. and L.B. SPEAR. 1987. Surveys of breeding penguins and other seabirds in the South Shetland Islands, Antarctica, January-February 1987. Report of the US National Marine Fisheries Service.
- STACKPOLE, E.A. 1955. The voyage of the Huron and the Huntress: the American sealers and the discovery of the continent of Antarctic. *The Marine Historical Association, Inc., Mystic, Conn.*, 29: 1-86.



CODE OF CONDUCT FOR THE SEAL ISLANDS, ANTARCTICA

Investigators should take all reasonable steps to ensure that their activities, both in implementing their scientific protocols as well as in maintaining a field camp, do not unduly harm or alter the natural behaviour and ecology of wildlife in the Seal Islands. Wherever possible, actions should be taken to minimise disturbance of the natural environment.

Capturing, handling, killing, photographing and taking eggs, blood or other biological samples from pinnipeds and seabirds should be limited to that necessary to provide essential background information or to characterise and monitor individual and population parameters that may change in detectable ways in response to changes in food availability or other environmental factors. Sampling should be done and reported in accordance with: (i) the Antarctic Treaty, including the Agreed Measures for the Conservation of Antarctic Fauna and Flora; (ii) the Convention for the Conservation of Antarctic Seals; and (iii) the Convention on the Conservation of Antarctic Marine Living Resources.

Geological and other studies which can be done inside of the pinniped and seabird breeding seasons in such a way as they do not damage or destroy pinniped or seabird breeding areas, or access to those areas, would be permitted as long as they would not adversely affect the planned assessment and monitoring studies. Likewise, the planned assessment and monitoring studies would not be affected adversely by periodic biological surveys or studies of other species which do not result in killing, injuring or disturbing pinnipeds or seabirds, or damage or destroy pinnipeds or seabird breeding areas or access to those areas.

**BACKGROUND INFORMATION CONCERNING THE SEAL ISLANDS,
ANTARCTICA**

Prior to the discovery of the South Shetland Islands in 1819, there were substantial colonies of fur seals, and possible elephant seals, throughout the archipelago. Commercial exploitation began shortly after discovery and, by the mid-1820s, fur seal breeding colonies had been completely destroyed throughout the South Shetland Islands (Stackpole, 1955; O’Gorman, 1963). Antarctic fur seals were not observed again in the South Shetland Islands until 1958, when a small colony was discovered at Cape Shirreff, Livingston Island (O’Gorman, 1961). The original colonisers probably came from South Georgia where surviving fur seal colonies had substantially recovered by the early 1950s. At present, the fur seal rookeries in the Seal Islands group are the second largest in the South Shetland Islands, with the largest rookeries being at Cape Shirreff and Telmo Islands, Livingston Island (Bengtson *et al.*, 1990).

During the past three decades, the population of Antarctic fur seals in the South Shetland Islands grew to a level at which tagging or other research could be undertaken at selected locations without threatening the population’s continued existence and growth.

During the 1986/87 austral summer, researchers from the United States surveyed areas on the South Shetland Islands and the Antarctic Peninsula to identify fur seal and penguin breeding colonies that might be suitable for inclusion in the network of CEMP monitoring sites being established. The results of that survey (Shuford and Spear, 1987; Bengtson *et al.*, 1990), suggested that the Seal Island area would be an excellent site for longterm monitoring of fur seal and penguin colonies that might be affected by fisheries in the Antarctic Peninsula Integrated Study Region.

To safely and effectively carry out a longterm monitoring program, a temporary, multi-year field camp for a small group of researchers was established on Seal Island. This camp has been occupied annually by US scientists during the austral summer (approximately December to February) since 1986/87.

To protect the site from damage or disturbance that could adversely affect the longterm CEMP monitoring and directed research currently being conducted and planned for the future, in 1991 the Seal Islands were proposed as a CEMP Protected Area.

**MANAGEMENT PLAN FOR THE PROTECTION OF CAPE SHIRREFF
AND THE SAN TELMO ISLANDS, SOUTH SHETLAND ISLANDS,
AS A SITE INCLUDED IN THE CCAMLR
ECOSYSTEM MONITORING PROGRAM**

A. GEOGRAPHICAL INFORMATION

1. Description of the site:

(a) Geographical coordinates. Cape Shirreff is a low, ice-free peninsula towards the western end of the north coast of Livingston Island, South Shetland Islands, situated at latitude 62°29'S, longitude 60°47'W, between Barclay Bay and Hero Bay. San Telmo Island is the largest of a small group of ice-free rock islets, approximately 2 km west of Cape Shirreff.

(b) Natural features. Cape Shirreff is approximately 3 km from north to south and 0.5 to 1.2 km from east to west. The site is characterised by many inlets, coves and cliffs. Its southern boundary is bordered by a permanent glacial ice barrier, which is located at the narrowest part of the cape. The cape is mainly an extensive rock platform, 46 to 53 m above sea level, the bedrock being largely covered by weathered rock and glacial deposits. The eastern side of the base of the cape has two beaches with a total length of about 600 m. The first is a boulder beach, the second of sand. Above this is a raised beach with mosses and lichens, crossed by melt-streams from the snow above. The extremity of the cape has a rocky barrier about 150 m long. The western side is formed by almost continuous cliffs 10 to 15 m high above an exposed coast with a few protected beaches. Near the southern base of the cape on the western side is a small sandy beach approximately 50 m long.

The San Telmo Islands are located approximately 2 km west of Cape Shirreff, and are a group of ice-free, rocky islets. The east coast of San Telmo Island (the largest of the group) has a sandy and pebble beach (60 m) at the south end, separated from the northern sandy beach (120 m) by two irregular cliffs (45 m) and narrow pebble beaches.

(c) Boundary markers. The boundaries of the Cape Shirreff CEMP Protected Area are identical to the boundaries of the Site of Special Scientific Interest No. 32, as specified by ATCM Recommendation XV-7. As of 1993, no man-made boundary markers indicating the limits of the SSSI or protected area had been established. The boundaries of the site are defined by natural features (i.e., coastlines, glacial margins) described in Section A.1(d).

(d) Natural features that define the site. The Cape Shirreff CEMP Protected Area includes the entire area of the Cape Shirreff peninsula north of the glacier ice tongue margin, and most of the San Telmo Island group. For the purposes of the CEMP protected area, 'the entire area' of Cape Shirreff and the San Telmo Island group is defined as any land or rocks exposed at mean low tide within the area delimited by the map (Figure 3).

(e) Access points. The Cape Shirreff part of the site may be entered at any point where pinniped or seabird rookeries are not present on or near the beach. Access to the island in the San Telmo group is unrestricted but should be at the least densely populated areas and cause minimal disturbance to the fauna. Access for other than CEMP research should avoid disturbing pinnipeds and seabirds (see Sections D.1 and D.2). Access by small boat or helicopter is recommended in most circumstances. Four areas recommended as helicopter landing sites include: (i) the

south plain of Playa Yamana, which is situated on the west coast of the cape; and (ii) on the west coast of the cape, on the top plain of Gaviota Hill (10 x 20 M), near the monument erected to commemorate the officers and crew of the Spanish ship *San Telmo*; (iii) the wide plain situated to the east of Condor Hill; and (iv) the plain located at the foot of Condor Hill, on the east coast of the cape. Recommended sites for landing small boats include: (i) the northern end of Half Moon beach, on the east coast of the cape; (ii) on the east coast, 300 m north of El Mirador, there is a deep channel which permits easy disembarkation, and (iii) the northern end of Playa Yamana on the west coast of the cape (during high tide conditions). There are no landing sites for fixed-wing aircraft.

- (f) Pedestrian and vehicular routes. Boats, helicopters fixed-wing aircraft and land vehicles should avoid the site except for operations directly supporting authorised scientific activities. During these operations, boats and aircraft should travel routes that avoid or minimise disturbance of pinnipeds and seabirds. Land vehicles should not be used except to transport needed equipment and supplies to and from the field camp to be established. Pedestrians should not walk through wildlife population areas, especially during the breeding season, or disturb other fauna or flora except as necessary to conduct authorised research.
- (g) Preferred anchorages. Numerous shoals and pinnacles are known to exist in the vicinity of Cape Shirreff and the San Telmo Islands, and navigation charts of the area are incomplete. Therefore, navigators inexperienced with the local conditions at Cape Shirreff are advised to approach the area with caution. Three anchorages that have been used in the past are: (i) northwest coast - situated between Easter Island Point (Punta Rapa-Nui) on Cape Shirreff and the northern extremity of the San Telmo Islands; (ii) east coast - 2.5 km to the east of El Mirador, being alert for icebergs drifting in the area, and (iii) south coast - located about 4 km off the southern coast of Byers Peninsula to support ship-based helicopter operations. Organisation(s) conducting CEMP studies at the site can provide further details about sailing instructions pertaining to recommended anchorages (see Section E.2).
- (h) Location of structures within the site. During the 1991/92 austral summer, a fibreglass cabin for four people was installed by the Instituto Antártico Chileno (Anonymous, 1992) in the El Mirador area. This area is on the cape's east coast, at the base of Condor Hill (near the site of the previous installation of the former Soviet Union). This site was chosen because of its accessibility by helicopter and boat, shelter from winds, good water supply, and absence of seal or bird colonies. There are some minor remains of a hut used in the past by the former Soviet Union as well as sparse evidence of a 19th century sealers' camp.
- (i) Areas within the site where activities are constrained. The protection measures specified in Section D apply to all areas within the Cape Shirreff CEMP Protected Area, as defined in Section A.1(d).
- (j) Location of nearby scientific, research, or refuge facilities. The nearest research facility to the site is Juan Carlos I Station (summer only) maintained by the Spanish government at South Bay, Livingston Island, (62°40'S, 60°22'W), approximately 30 km southeast of Cape Shirreff. Numerous scientific stations and research facilities (e.g., Argentina, Brazil, Chile, China, Korea, Poland, Russia, Uruguay) are located on King George Island, approximately 100 km northeast of Cape Shirreff. The largest of these facilities is Base Presidente Eduardo Frei Montalva (also formerly referred to as Base Teniente Rodolfo Marsh Martin), maintained by the Chilean government on the western end of King George Island (62°12'S, 58°55'W).

- (k) Areas or sites protected under the Antarctic Treaty System. Cape Shirreff and the San Telmo Islands are protected as a Site of Special Scientific Interest (No. 32) under the Antarctic Treaty System (see Section A.1(c)). Several other sites or areas within 100 km of Cape Shirreff are also protected under the Antarctic Treaty System: SSSI No. 5, Fildes Peninsula (62°12'S, 58°59'W); SSSI No. 6, Byers Peninsula (62°38'S, 61°05'W); SSSI No. 35, Ardley Island, Maxwell Bay, King George Island (62°13'S, 58°56'W); Marine SSSI No. 35, Western Bransfield Strait (63°20'S to 63°35'S, 61°45'W to 62°30'W); and SPA No. 16, Coppermine Peninsula, Robert Island (62°23'S, 59°44'W). The Seal Islands CEMP Protected Area (60°59'14"S, 55°23'04"W) is located approximately 325 km northeast of Cape Shirreff.

2. Maps of the site

- (a) Figures 1 and 2 show the geographical position of Cape Shirreff and the San Telmo Islands in relation to major surrounding features, including the South Shetland Islands and adjacent bodies of water.
- (b) Figure 3 identifies the boundaries of the site and provides details of specific locations within the vicinity of Cape Shirreff and the San Telmo Islands, including preferred vessel anchorages.

B. BIOLOGICAL FEATURES

1. Terrestrial. There is no information on soil biology of Cape Shirreff but it is likely that similar types of plants and invertebrates are found as at other sites in the South Shetland Islands (e.g., see Lindsey, 1971; Allison and Smith, 1973; Smith, 1984; Somme, 1985). A moderate lichen cover (e.g., *Polytrichum alpestre*, *Usnea fasciata*) is present on rocks located in the higher geological platforms. In some valleys there are patches of moss and grass (e.g., *Deschampsia antarctica*).
2. Inland waters. There are several ephemeral ponds and streams located on Cape Shirreff. These form from melting snow, especially in January and February. Hidden Lake is the only permanent body of water on the cape. The lake's drainage supports the growth of moss banks along its northeast and southwest slopes. From the southwest slope a stream flows to the western coast at Playa Yamana. The lake's depth is estimated at two to three meters and it is approximately 12 m long when fullest; the lake diminishes considerably in size after February (Torres, unpublished). There are no known lakes or ephemeral ponds of significance on the San Telmo Islands.
3. Marine. No studies on littoral communities have been carried out. There is abundant macroalgae present in the intertidal zone. The limpet *Nacella concinna* is common, as elsewhere in the South Shetland Islands.
4. Seabirds and pinnipeds. In January 1958, 2 000 pairs of chinstrap penguins (*Pygoscelis antarctica*) and 200 to 500 pairs of gentoo penguins (*P. papua*) were reported (Croxall and Kirkwood, 1979). In 1981 two unspecified penguin colonies had 4 328 and 1 686 individuals, respectively (Sallaberry and Schlatter, 1983). A census in January, 1987, produced estimates of 20 800 adult chinstrap penguins and 750 adult gentoo penguins (Shuford and Spear, 1987). Dominican gulls (*Larus dominicanus*), brown skuas (*Catharacta lönnerbergi*), Antarctic terns (*Sterna vittata*),

blue-eyed shags (*Phalacrocorax atriceps*), cape petrels (*Daption capense*), and Wilson's storm petrels (*Oceanites oceanicus*) are also reported to nest on the cape. Giant petrels (*Macronectes giganteus*) are regular visitors during the austral summer (Torres, unpublished).

5. Cape Shirreff is presently the site of the largest known breeding colony of the Antarctic fur seal (*Arctocephalus gazella*) in the South Shetland Islands. The first post-exploitation record of fur seals at Cape Shirreff was reported by O'Gorman (1961) in mid-February 1958 when 27 non-breeding adults were seen. In early February 1959 a group of seven adult males, one female and one male pup were observed; there was also a dead male pup. Over the past 30 years, the colony has continued to increase in size (Aguayo and Torres, 1967, 1968, 1993; Aguayo, 1970, 1978; Laws, 1973; Aguayo *et al.*, 1977; Cattan *et al.*, 1982; Oliva *et al.*, 1987; and Bengtson *et al.*, 1990. Data from 1992 confirm that this trend is continuing: 2 973 pups at Cape Shirreff (Aguayo *et al.*, 1992) and 2 340 pups at the San Telmo Islands (Bengtson, unpublished). Groups of non-breeding southern elephant seals (*Mirounga leonina*), Weddell seals (*Leptonychotes weddelli*), leopard seals (*Hydrurga leptonyx*), and crabeater seals (*Lobodon carcinophagus*) have been observed on the cape (O'Gorman, 1961; Aguayo and Torres, 1967; Bengtson *et al.*, 1990; Gajardo *et al.*, 1988; Oliva *et al.*, 1988; Torres unpublished).

C. CEMP STUDIES

1. The presence at Cape Shirreff of both Antarctic fur seal and penguin breeding colonies, and of krill fisheries within the foraging range of these species, make this a critical site for inclusion in the ecosystem monitoring network established to help meet the objectives of the Convention on the Conservation of Antarctic Marine Living Resources. The purpose of the designation is to allow planned research and monitoring to proceed, while avoiding or reducing, to the greatest extent possible, other activities which could interfere with or affect the results of the research and monitoring programme or alter the natural features of the site.
2. The following species are of particular interest for CEMP routine monitoring and directed research at this site: Antarctic fur seals, chinstrap penguins, and gentoo penguins.
3. Long-term studies are being planned and are underway to assess and monitor the feeding ecology, growth and condition, reproductive success, behaviour, vital rates, and abundance of pinnipeds and seabirds that breed in the area. The results of these studies will be compared with environmental data, offshore sampling data, and fishery statistics to identify possible cause-effect relationships.
4. Although Chilean scientists have been active at the site for many years, in recent seasons they have begun developing studies specifically designed to contribute to CEMP. These studies have mainly focused on Antarctic fur seals, but may be expanded to include seabirds in the near future. US scientists have conducted surveys of marine mammals and birds at the site sporadically since 1987, and are interested in conducting CEMP studies if appropriate logistic and funding arrangements can be made.
5. A number of priority CEMP studies are very well suited for implementation at Cape Shirreff and the San Telmo Islands. Penguin parameters for routine monitoring include trends in populations size (A3), demography (A4), duration of foraging trips (A5), breeding success (A6), chick fledging weight (A7), chick diet (A8), and breeding chronology (A9). Fur seal parameters being monitored include duration of

foraging/attendance cycles (C1) and pup growth rates (C2). As new CEMP Standard Methods are approved, additional pinniped and seabird parameters may be included in future monitoring efforts.

6. Directed research relevant to CEMP will also be undertaken on fur seals and seabirds. Research topics include foraging behaviour, foraging areas, energy requirements, seasonal movements, penguin chick growth rates, and relationships between monitored parameters and the physical environment.

D. PROTECTION MEASURES

1. Prohibited activities and temporal constraints.

- (a) **Throughout the site at all times of the year:** Any activities which damage, interfere with, or adversely affect the planned CEMP monitoring and directed research at this site are not permitted.
- (b) **Throughout the site at all times of the year:** Any non-CEMP activities are not permitted which result in:
 - (i) killing, injuring, or disturbing pinnipeds or seabirds;
 - (ii) damaging or destroying pinniped or seabird breeding areas; or
 - (iii) damaging or destroying the access of pinnipeds or seabirds to their breeding areas.
- (c) **Throughout the site at defined parts of the year:** Human occupation of the site during the period 1 June to 31 August is not permitted except under emergency circumstances.
- (d) **In parts of the site at all times of the year:** Building structures within boundaries of any pinniped or seabird colony is not permitted. For this purpose, colonies are defined as the specific locations where pinniped pups are born or where seabird nests are built. This prohibition does not pertain to placing markers (e.g., numbered stakes, posts, etc.) or situating research equipment in colonies as may be required to facilitate scientific research.
- (e) **In parts of the site at defined parts of the year:** Entry into any pinniped or seabird colonies during the period 1 September to 31 May is not permitted except in association with CEMP activities.

2. Prohibitions regarding access to and movement within the site.

- (a) Entry of the site at locations where pinniped or seabird colonies are present in densely populated areas is not permitted.
- (b) Aircraft overflight of the site is not permitted at altitudes less than 1 000 m unless the proposed flight plan has been reviewed in advance by the organisation(s) conducting CEMP activities at the site (see Section E.2). Aircraft overflight at altitudes below 200 m is not permitted.
- (c) The use of land vehicles is not permitted except to transport needed equipment and supplies to and from the field camp.

- (d) Pedestrians are not permitted to walk through wildlife population areas (e.g., colonies, resting areas, pathways), or to disturb other fauna or flora, except as necessary to conduct authorised research.

3. Prohibitions regarding structures.

- (a) Building structures other than those directly supporting authorised scientific research and monitoring programmes or to house research personnel and their equipment is not permitted.
- (b) Human occupation of these structures is not permitted during the period 1 June to 31 August (see Section D.1(c)).
- (c) New structures are not permitted to be built within the site unless the proposed plans have been reviewed in advance by the organisation(s) conducting CEMP activities at the site (see Section E.2).

4. Prohibitions regarding waste disposal.

- (a) Landfill disposal of any materials is not permitted; all materials brought to the site are to be removed when no longer in use.
- (b) Disposal of waste fuels, volatile liquids, and scientific chemicals within the site is not permitted; these materials are to be removed from the site for proper disposal elsewhere.
- (c) The open burning of any materials is not permitted (except for properly used fuels for heating, lighting or cooking).

5. Prohibitions regarding the Antarctic Treaty System.

It is not permitted to undertake any activities in the Cape Shirreff CEMP Protected Area which are not in compliance with the provisions of: (i) the Antarctic Treaty, including the Agreed Measures for the Conservation of Antarctic Fauna and Flora, and, when it comes into force, the Protocol on Environmental Protection, (ii) the Convention for the Conservation of Antarctic Seals, and (iii) the Convention for the Conservation of Antarctic Marine Living Resources.

E. COMMUNICATIONS INFORMATION

1. Organisation(s) appointing national representatives to the Commission.

- (a) Ministerio de Relaciones Exteriores
Dirección de Política Especial
Morandé 441, 2° Piso
Santiago
Chile

Telephone: +56 (2) 698 0301
Facsimile: +56 (2) 699 1202
Telex: not available

- (b) Bureau of Oceans and International Environmental
and Scientific Affairs
US Department of State
Washington D.C. 20520
USA

Telephone: +1 (202) 647 3262
Facsimile: +1 (202) 647 1106
Telex: not available

2. Organisation(s) conducting CEMP studies at the site.

- (a) Ministerio de Relaciones Exteriores
Instituto Antártico Chileno
Luis Thayer Ojeda 814
Casilla 16521, Correo 9
Santiago
Chile

Telephone: +56 (2) 232 2617
Facsimile: +56 (2) 232 0440
Telex: 346261 INACH CK

- (b) US Antarctic Marine Living Resources Program
National Marine Fisheries Service, NOAA
Southwest Fisheries Science Center
PO Box 271
La Jolla CA 92038
USA

Telephone: +1 (619) 546 7600
Facsimile: +1 (619) 546 7003
Telex: 910 337 1271

**CODE OF CONDUCT FOR THE CAPE SHIRREFF
CEMP PROTECTED AREA**

Investigators should take all reasonable steps to ensure that their activities, both in implementing their scientific protocols as well as in maintaining a field camp, do not unduly harm or alter the natural behaviour and ecology of wildlife. Wherever possible, actions should be taken to minimise disturbance of the natural environment.

Geological, glaciological, and other studies which can be done outside of the pinniped and seabird breeding season, and which will not damage or destroy pinniped or seabird breeding areas, or access to those areas, would not adversely affect the planned assessment and monitoring studies. Likewise, the planned assessment and monitoring studies would not be affected adversely by periodic biological surveys or studies of other species which do not result in killing, injuring, or disturbing pinnipeds or seabirds, or damage or destroy pinnipeds or seabird breeding areas or access to those areas.

Killing, capturing, handling, photographing, and taking eggs, blood, or other biological samples from pinniped and seabirds should be limited to that necessary to characterise and monitor individual and population parameters that may change in detectable ways in response to changes in food availability or other environmental factors. Sampling should be done and reported in accordance with: (i) the Agreed Measures for the Conservation of Antarctic Fauna and Flora, and, when it comes into force, the Protocol on Environmental Protection, (ii) the Convention for the Conservation of Antarctic Seals, and (iii) the Convention for the Conservation of Antarctic Marine Living Resources.

BACKGROUND INFORMATION CONCERNING CAPE SHIRREFF

Prior to the discovery of the South Shetland Islands in 1819, there were substantial colonies of fur seals, and possibly elephant seals, throughout the archipelago. Within a few months of discovery, Cape Shirreff was the scene of intensive sealing activities until about 1825. Sealers' refuges were erected all around the western shores of Livingston Island, with those on the south coast being occupied mainly by American sealers and those on the north coast by British sealers. There were about 60 to 75 men living ashore at Cape Shirreff in January 1821 (Stackpole, 1955) and 95 000 skins were taken during the 1821/22 season (O'Gorman, 1963). There are ruins of at least one sealers' hut on the cape and the shoreline in several bays is littered with timbers and sections of wrecked sealers' vessels. The outcome of the sealing of the early 1820s was the extermination of fur seals from the entire region.

Antarctic fur seals were not observed again on the South Shetland Islands until 1958, when a small colony was discovered at Cape Shirreff, Livingston Island (O'Gorman, 1961). The original colonisers probably came from South Georgia, where surviving fur seal colonies had substantially recovered by the early 1950s. At present, the fur seal rookeries at Cape Shirreff and the San Telmo Islands are the largest in the South Shetland Islands (Bengtson *et al.*, 1990).

During the past three decades, the population of Antarctic fur seals in the South Shetland Islands grew to a level at which tagging and other research could be undertaken at selected locations without threatening the population's continued existence and growth. Chilean studies on Cape Shirreff began in 1965 (e.g., Aguayo and Torres, 1967; Aguayo, 1978), and have been continuous from 1981 to the present. In 1982 Chilean investigators initiated field studies of fur seals, including an ongoing tagging program (Cattan *et al.*, 1982; Torres, 1984; Oliva *et al.*, 1987). United States investigators have conducted occasional pinniped and seabird surveys at Cape Shirreff and the San Telmo Islands since 1986/87 (Shuford and Spear, 1987; Bengtson *et al.*, 1990).

HISTORY OF PROTECTION AT CAPE SHIRREFF

Cape Shirreff was designated in 1966 as Specially Protected Area (SPA) No. 11 by ATCM Recommendation IV-11 'on the grounds that the cape supports a considerable diversity of plant and animal life, including many invertebrates, that a substantial population of elephant seals (*Mirounga leonina*) and small colonies of Antarctic fur seals are found on the beaches and that the area is of outstanding interest'. The protection conferred on this site was successful in ensuring that Antarctic fur seals were not disturbed during the important early phases of their recolonisation. Subsequent to the site's designation as a SPA, the locally breeding population of Antarctic fur seals increased to a level at which biological research activities could be undertaken without threatening the continued recolonisation and population increase of this species.

Surveys during the mid 1980s to locate study sites for long-term monitoring of fur seal and penguin populations as part of the CCAMLR Ecosystem Monitoring Program (CEMP) indicated that Cape Shirreff would be an excellent site within the Antarctic Peninsula Integrated Study Region. To carry out such a monitoring program safely and effectively, a multi-year field camp for four to six researchers was needed within the area previously designated as SPA No. 11. This might have been considered inappropriate within a SPA and hence a proposal was made in 1988 to redesignate Cape Shirreff as a Site of Special Scientific Interest (SSSI). Additionally, it was proposed substantially to enlarge the site by the inclusion of the San Telmo Islands group, presently the location of the largest fur seal colony in the Antarctic Peninsula region.

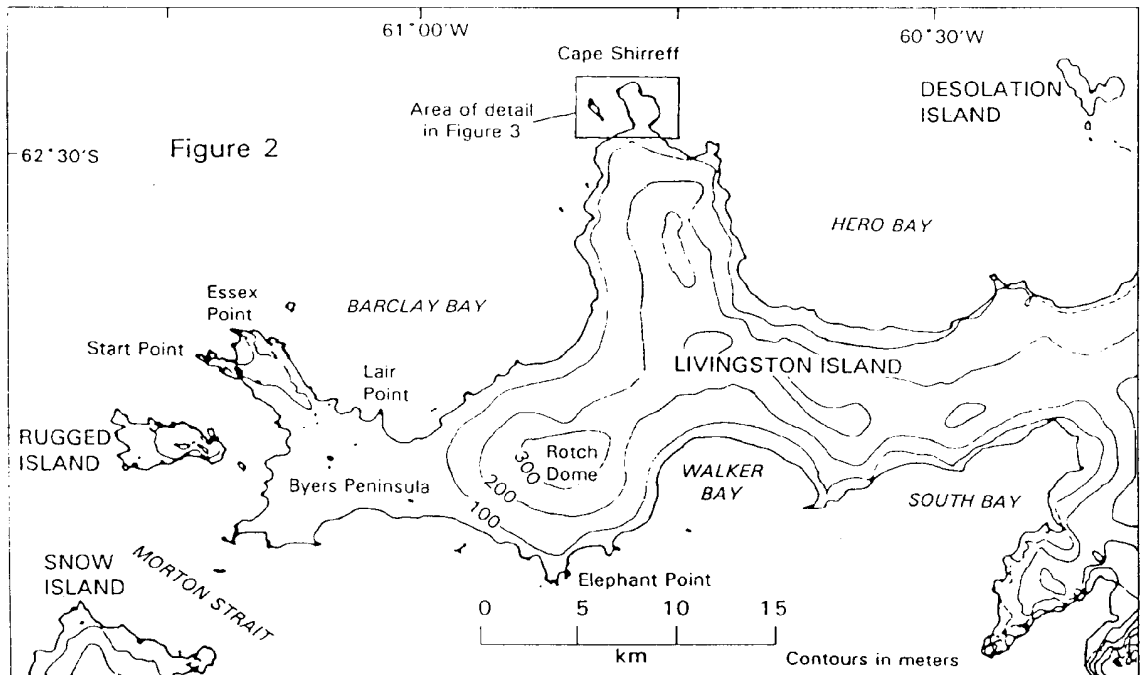
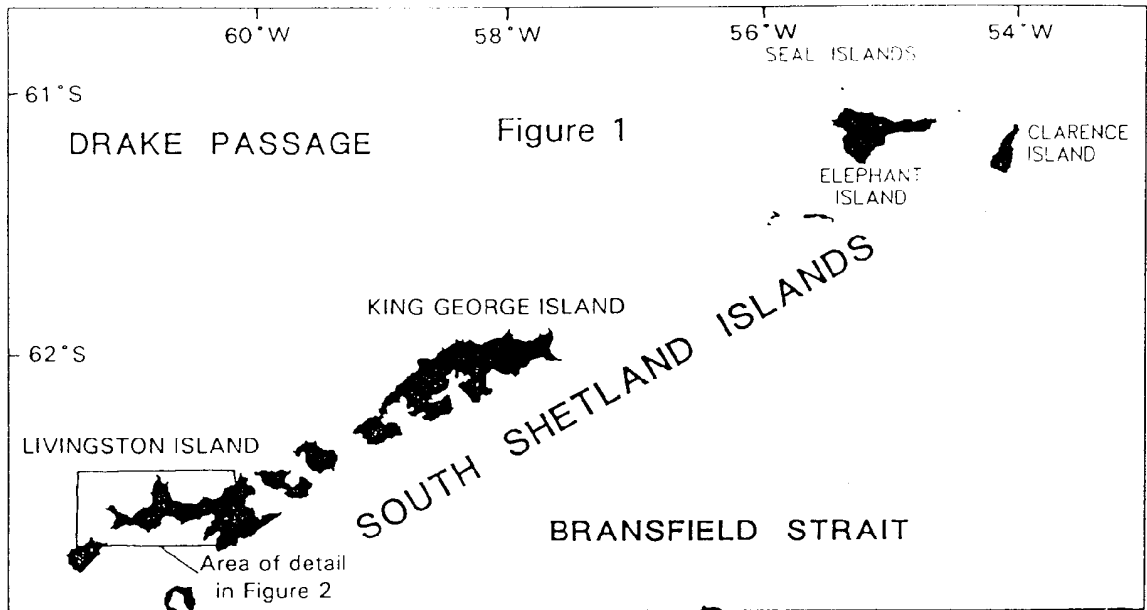
Cape Shirreff was redesignated in 1990 as SSSI No. 32 by Recommendation XV-7, which was adopted by the XVth Consultative Meeting of the Antarctic Treaty. It was understood that SSSI No. 32, Cape Shirreff, should be redesignated an SPA (in its enlarged form) if and when the longterm monitoring of fur seals and seabirds at the site should be ended.

Chilean and US scientists initiated CEMP studies at Cape Shirreff during the late 1980s, and there are plans to continue these studies in the future. To further protect the site from damage or disturbance that could adversely affect the longterm CEMP monitoring and directed research, in 1991 Cape Shirreff was proposed as a CEMP Protected Area.

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Figures 1 and 2: These maps show the general position of Cape Shirreff and the San Telmo Islands CEMP Protected Area (Figure 1) and the location of the CEMP Protected Area in relation to the northwestern portion of Livingston Island.

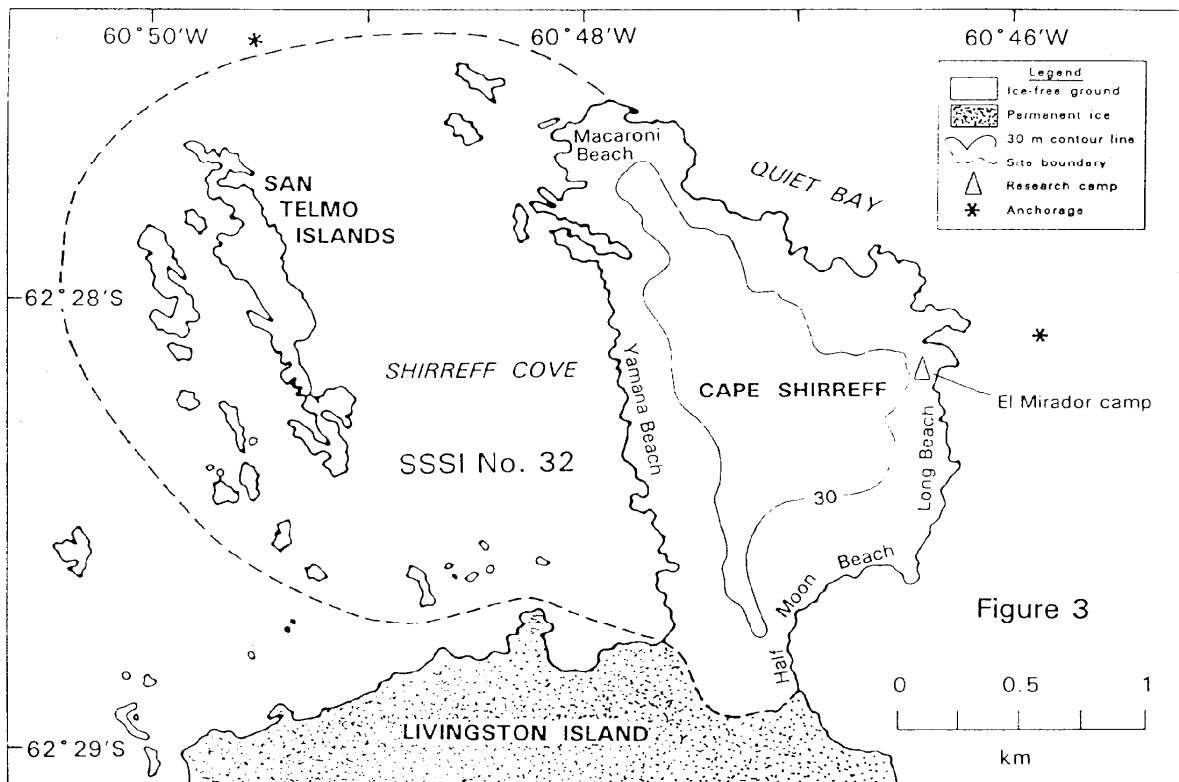


Figure 3: This map shows a detailed view of the Cape Shirreff and the San Telmo Islands CEMP Protected Area. Note that the boundaries of the CEMP Protected Area are identical to the boundaries of Site of Special Scientific Interest No. 32, which is protected under the Antarctic Treaty.