

# Developing the Antarctic Protected Area System

Edited by R.I. Lewis Smith,  
D.W.H. Walton and P.R. Dingwall



Proceedings of the SCAR/IUCN Workshop on Antarctic  
Protected Areas, Cambridge, UK  
29 June – 2 July 1992









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**This One**



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## **IUCN - The World Conservation Union**

Founded in 1948, The World Conservation Union brings together States, government agencies and a diverse range of non-governmental organizations in a unique world partnership: over 800 members in all, spread across some 125 countries.

As a Union, IUCN seeks to influence, encourage and assist societies throughout the world to conserve the integrity and diversity of nature and to ensure that any use of natural resources is equitable and ecologically sustainable. A central secretariat coordinates the IUCN Programme and serves the Union membership, representing their views on the world stage and providing them with the strategies, services, scientific knowledge and technical support they need to achieve their goals. Through its six Commissions, IUCN draws together over 6000 expert volunteers in project teams and action groups, focusing in particular on species and biodiversity conservation and the management of habitats and natural resources. The Union has helped many countries to prepare National Conservation Strategies, and demonstrates the application of its knowledge through the field projects it supervises. Operations are increasingly decentralized and are carried forward by an expanding network of regional and country offices, located principally in developing countries.

The World Conservation Union builds on the strengths of its members, networks and partners to enhance their capacity and to support global alliances to safeguard natural resources at local, regional and global levels.

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SCAR is a committee of ICSU, the International Council of Scientific Unions, and is charged with the initiation, promotion and co-ordination of scientific research in Antarctica.

It is the single multinational, multidisciplinary, non-governmental organization which draws on the experience and expertise of an international mix of specialists across the complete scientific spectrum to offer advice on a wide range of scientific questions and problems. Since its establishment in 1957 SCAR has provided such advice to the Antarctic Treaty System and made numerous recommendations on a diversity of matters, most of which have been incorporated into Antarctic Treaty instruments. Foremost among these has been advice for the many instruments concerning protection of the biota and environment of Antarctica.

Membership of SCAR comprises the National Committees of those national scientific academies which are adhering bodies to ICSU and which are, or plan to be, active in Antarctic research, together with the relevant Scientific Unions of ICSU. SCAR meets every two years to conduct its administrative business at the SCAR Delegates Meeting. The scientific business of SCAR is conducted by its Working Groups and Groups of Specialists. These represent the scientific disciplines active in Antarctic research. The Group of Specialists on Environmental Affairs and Conservation (GOSEAC) is the multidisciplinary group most closely associated with providing advice to the Antarctic Treaty and was the SCAR co-sponsor with IUCN of the present Workshop.

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D.W.H. Walton and P.R. Dingwall**

*This volume is dedicated to W.N. Bonner (1928–1994) who died suddenly at his home on 3 September 1994. Nigel played an active role in Antarctic conservation and environmental matters and was responsible for developing much of the Antarctic Treaty's Conservation Policy. He also laid the foundations of environmental and protected area management in Antarctica. He was Convenor of SCAR's Subcommittee on Conservation and, latterly, of the Group of Specialists on Environmental Affairs and Conservation (GOSEAC) from 1974 until 1992. At the time of his death he was still closely involved in conservation, revising the management plans for Antarctic protected areas.*

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**1994**

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The World Conservation Union



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## Foreword

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### Initiatives and Opportunities for Protected Areas in Antarctic Conservation

That Antarctica, the least polluted, most remote and most sparsely populated of all continents, needs special consideration for conservation may seem strange to some people. Yet it is because of its almost pristine state, in a world increasingly damaged by human activities, that special efforts are justified in protecting the Antarctic region.

The focus on Antarctica has increased sharply over the past few years. The development of a commercial fishing regime in the Southern Ocean, the protracted and unsuccessful negotiations for a minerals convention, the increasing area affected annually by ozone depletion, the sustained campaign for a "World Park" by several non-governmental organisations and the agreement on the Protocol for Environmental Protection have all kept Antarctica in the international limelight. The value of Antarctica to the global science community has been clearly established and reaffirmed, and a much wider public interest has been stimulated both by the media and by the rapidly growing tourism industry.

Such critical scrutiny of Antarctica and its management was certain to highlight deficiencies. One of these was the legislation for conservation. This had grown in a piecemeal fashion rather than within an organised theoretical framework, with the Antarctic Treaty responding to suggestions, primarily from SCAR, over a period of twenty years. The work of the Subcommittee on Conservation of the SCAR Working Group on Biology was fundamental in guiding and developing the Protected Area System through these early years and its efforts resulted in the establishment of a considerable number of sites, mainly designated to protect scientific research or provide reserve baseline sites for future use. First there were Specially Protected Areas, followed by Sites of Special Scientific Interest. More recently, recognition that other attributes beside biological ones also needed protection resulted in the definition of two further categories—Specially Reserved Areas and Multiple-use Planning Areas. The result was a considerable complexity in the number of categories of protected areas, especially when Historic Monuments were added in. In addition, it was recognised by the scientific community, and by members of the World Conservation Union (IUCN), that the management plans prescribed by Treaty legislation were increasingly inadequate and did not reflect approaches to conservation developed in the wider world.

In 1991, the negotiation of the Protocol on Environmental Protection to the Antarctic Treaty offered an ideal opportunity for fundamental change. The need for rationalisation was accepted, and the old categories were swept away and replaced by two new ones—Antarctic Specially Protected Areas and Antarctic Specially Managed Areas. New thinking allowed for much more detailed management plans, active management to protect conservation values, recognition of aesthetic as well as scientific criteria for designation, and a provision for inspection and monitoring to ensure that site values are being adequately protected.

The diplomats were clearly satisfied with the new look for protected areas in Antarctic conservation. The grand design was agreed on paper, but what of its actual application by managers and scientists? There still remained a great deal of detail which was unspecified. For example,

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how would the transfer of existing sites to the new system be applied? What format would be acceptable for the new site management plans? How would the increasing amount of data on protected areas be managed and updated? Who would be responsible for management of Specially Protected Areas and Specially Managed Areas? How would protected areas be signposted and their boundaries clearly marked? How would the values of protected areas, their management objectives and the various imposed restrictions on access and use be conveyed to scientists and other visitors to the Antarctic? Without agreement on such questions the new scheme had the potential to become worse than the old one.

The Antarctic community needs to define these operational rules in a practical fashion if the new system is to work. Yet it also needs to take account of the best initiatives in conservation planning and management developed elsewhere in the world. SCAR and IUCN had already worked closely together in developing the IUCN Strategy for Antarctic Conservation and it seemed clear that their complementary interests, experience and skills should again be harnessed to develop an international response to the outstanding questions. It was on this basis that the SCAR/IUCN Workshop on Antarctic Protected Areas, whose results are published in this document, was organised.

The twenty-two recommendations from the workshop were presented as a Working Paper to the XVII Antarctic Treaty Consultative Meeting in Venice, in November 1992. This contribution was very favourably received, and many of the major points were incorporated into the Final Report of the Meeting. Another significant step forward has thus been taken and many new opportunities have been opened up by the new legislation.

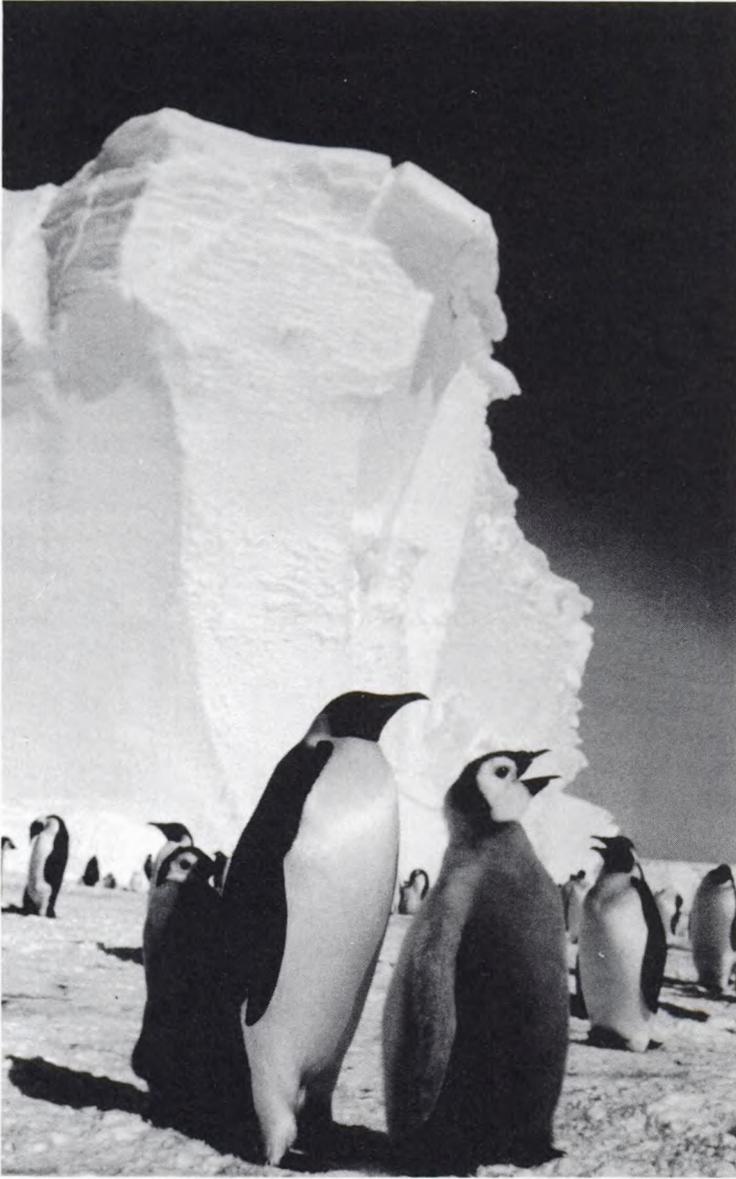
The co-convenors are very grateful for the financial and administrative support from IUCN and SCAR, and in particular the generous funding to the former organisation by The Tinker Foundation Inc. of New York, and the World Wide Fund for Nature (International), without which this meeting could not have been organised. We are also indebted to British Antarctic Survey for hosting the meeting in such congenial surroundings.

As with all workshops the value of the product is determined by the expertise and active involvement of the participants. That the meeting produced such a useful and positive result is an indication of the efforts of the workshop members. We commend the results of the Workshop to the Antarctic Treaty governments, to IUCN members, to operators of national Antarctic Programmes responsible for establishing and managing protected areas, and to all who are concerned about the protection of Antarctica. We hope that this proceedings volume will help in the development of further initiatives in Antarctic conservation.

*D.W.H Walton, SCAR  
P.R. Dingwall, IUCN*

## **CHAPTER I**

# **RECOMMENDATIONS TO THE XVII ANTARCTIC TREATY CONSULTATIVE MEETING, VENICE, NOVEMBER 1992**



*Of the 42 known breeding sites of Emperor penguins (*Aptenodytes forsteri*) around the Antarctic continent, two Specially Protected Areas, Taylor Rookery (SPA No. 1) and Dion Islands (SPA No. 8) were designated specifically to protect their colonies, the only two known to occur on land.*

Photo: D. Allan

# **1. Recommendations of the SCAR/IUCN Workshop on Antarctic Protected Areas to the XVII Antarctic Treaty Consultative Meeting, Venice, November 1992**

The 1991 Protocol on Environmental Protection to the Antarctic Treaty commits the Treaty Parties to the comprehensive protection of the Antarctic environment and dependent and associated ecosystems, and it designates Antarctica as a natural reserve devoted to peace and science. Annex V of the Protocol specifies the objectives and provides the measures for area protection and management and is the legal basis for major reform and development of the existing system of protected and managed areas in the Antarctic. The Protocol thus establishes both a new opportunity and a new need to review the extent, location, rationale and management regime of Antarctic protected areas. It is now important that the Protocol be carried forward to speedy and effective implementation.

SCAR and the World Conservation Union (IUCN), as the world's leading non-governmental bodies experienced in Antarctic science and conservation, joined forces to discuss the new provisions for special area protection and management under the Protocol and to offer advice to the Treaty Parties on their implementation. Accordingly, a Workshop was convened with experts from both organisations, and representatives of some Treaty national authorities. The agenda of the Workshop was not exhaustive and there are plans to continue this work in the future. The principal conclusions of the Workshop, in the form of recommendations and explanatory commentary, are set out below.

These are commended to the Parties for their consideration and adoption, as is deemed appropriate.

## **Recommendation 1**

**That the Antarctic Treaty Consultative Parties are urged to ratify the Protocol on Environmental Protection to the Antarctic Treaty, including its Annexes, as a matter of priority.**

## **Recommendation 2**

**That in the period prior to ratification of the Protocol the Treaty Parties should, as soon as possible, agree the rules of procedure of the Committee for Environmental Protection, and within these terms give due weight to the importance of the work towards development of the Protected Area System.**

Annex V of the Protocol marks a revolutionary change in approach to establishment and management of areas for special protection and management in the Antarctic. Previous designation of protected areas has been sporadic, piecemeal and often uncoordinated, sometimes without any clearly specified underlying rationale. The resulting complicated set of protected area categories has caused some confusion and inconsistency in developing standards of management and incomplete implementation of protected area provisions.

The new Annex overcomes most major deficiencies. It provides, for the first time, rules and guidelines for comprehensive and systematic development of an Antarctic Protected Area System

consistent with principles and practices that have proven successful elsewhere in the world. Among its innovative features are provision for two categories of area, allowing strict protection and multiple-use management; criteria for establishing a geographically extensive and ecologically representative series of areas to protect the widest possible range of natural and human conservation values; mandatory and uniform designation procedures; and requirements for universal application of a management planning process.

The work of the Committee for Environmental Protection together with advice from SCAR will be crucial to successful establishment and management of the Protected Area System. The Committee will be responsible for receiving proposed management plans for areas, taking advice on these plans, and conveying its advice to the Antarctic Treaty Consultative Meetings for approval, or otherwise, of plans. The Committee provides the forum for consideration of protected area requirements among all Parties, together with the best available scientific and technical advice from within and outside the Antarctic Treaty System. This gives opportunity for development of areas in a well-structured, professional and cohesive manner, while promoting integration of protected area objectives with those of other activities in the Antarctic. The functions of the Committee, set out in Article 12 of the Protocol, clearly recognize the responsibilities and tasks involved not only in designation of areas but also in their on-going management.

### **Recommendation 3**

**That, recalling ATCM Rec. VII-2 and Annex V, Article 3.2 which call for identification of protected areas, and the IUCN *Strategy for Antarctic Conservation* which recognises the importance of protecting distinctive or special landscapes and historic features, Treaty Parties should encourage proposals for new protected and managed areas, together with appropriate historic sites and monuments, in order to achieve an adequate geographical distribution and comprehensive environmental representation of such sites within the Antarctic.**

### **Recommendation 4**

**That, although the Protocol is not yet ratified, SCAR should continue to receive and evaluate proposals in the form of management plans for ASPAs and ASMAs as required under Annex V, and then advise the ATCMs directly or through the Committee for Environmental Protection (once it is established) of the results of its evaluations.**

### **Recommendation 5**

**That proposals for areas for special protection or management should not be rejected because insufficient information is available, provided that adequate detail is included to place the proposed site within the SCAR ecosystem classification matrix and to establish the basis of a management plan.**

### **Recommendation 6**

**That SCAR utilises the revised (at this Workshop) 1977 SCAR ecosystem classification system as the *systematic environmental-geographic framework* (identified in Annex V, Article 3.2 of the Protocol) to evaluate ASPA and ASMA proposals until such time as an improved and internationally agreed Antarctic ecosystem classification system is adopted by the ATCM. This system should be developed in collaboration with IUCN to provide a more comprehensive selection of criteria for assessments, including those**

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**features such as wilderness and aesthetic values, which are recognised to be of international importance.**

Achieving representation of the full range of environmental diversity within protected areas is now a widely recognised goal in developing national systems of protected areas. The Treaty Parties have also accepted this long-term objective in developing the Antarctic protected areas network by providing, in Article 3.2 of Protocol Annex V, a requirement that the Parties seek to identify within a systematic environmental-geographical framework and to include in the series of ASPAs, *inter alia*, representative examples of major terrestrial and marine ecosystems.

The existing network of protected areas in the Antarctic is both uneven in geographical distribution and incompletely representative of major terrestrial, freshwater and marine ecosystems. Overwhelming attention is given to protection of biologically exceptional or scientifically significant sites in coastal areas, especially to seabird and seal breeding localities and vegetated sites. Major gaps occur in according special protection to continental inland sites, particularly aquatic ecosystems; geological features, landforms and glaciological formations; and to marine areas. Also insufficient attention has been given to protecting examples of regional landscapes and ecosystems which have scenic and aesthetic values of importance to tourism and wilderness recreation activities.

Achieving a fully representative protected areas system has been hindered by the absence of a completely adequate biogeographical framework for selecting sites that merit special protection. The 1977 SCAR habitat classification system, though a useful yardstick with which to characterise and compare differing areas, is incomplete in its ecological scope and lacks a geographical framework.

Revision of this classification was begun at the Workshop, particularly to include consideration of invertebrate fauna and to expand or revise reference to physical features such as altitude, oceanicity, geothermal phenomena and ice formations. Consideration was also given to adopting major ice catchments as a first-order geographical reference point. It was agreed that SCAR should further refine the classification in collaboration with IUCN, in order to take advantage of global experience in planning protected area systems and to ensure that, in selecting potential ASPAs, full account is taken of requirements for future management and use.

A comprehensive, scientifically-based approach to selection of further protected areas should be agreed and promoted by the Parties, through the Committee for Environmental Protection, as soon as possible. The appropriate national authorities should be encouraged to prepare and submit proposed management plans for new sites. These plans would then be initially referred to SCAR for advice and comment, including evaluation of their contribution to diversification of the environmental scope and the management objectives of an expanded Antarctic Protected Area System.

## **Recommendation 7**

**That SCAR and IUCN (a) continue to collaborate to provide advice on the scientific and technical requirements for protected area management planning and design, (b) promote further research required to enhance the long-term special protection of biota, habitats, ecosystems, landscapes and other relevant features, and (c) provide wide distribution of a SCAR handbook on the preparation of management plans to assist in ensuring a standard approach, giving particular attention to mapping requirements.**

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### **Recommendation 8**

**That in planning and establishing protected areas, (a) boundaries should be defined by natural features where appropriate, (b) their position should be fixed by Global Positioning System (GPS) techniques where possible, and (c) clearly visible and standardized signs containing basic site information should be erected and maintained, as appropriate, by the ATCPs or their delegated authorities.**

### **Recommendation 9**

**That management plans clearly identify the values to be protected and the management objectives and practices to be observed, recognising that procedures must be practical to apply and are applied consistently among Treaty Parties. The support of COMNAP in achieving these objectives should be sought.**

### **Recommendation 10**

**That when, in accordance with Article 3.3 of Annex V, existing Sites of Special Scientific Interest (SSSI) and Specially Protected Areas (SPA) are reclassified and renumbered, new management plans should also be prepared to conform with Article 5 of Annex V.**

Management planning is essential to successful attainment of protected area goals. Without adequate management plans there is a greater risk that protected areas will be inappropriately designed in terms of their size, shape, coverage and boundary delimitation. Inadequate planning may also lead to incomplete formulation of policies and objectives, inconsistent application of management provisions, unsuccessful resolution of conflicts and ultimately lack of achievement of management objectives. Not only is the management planning process a vital guide for management decision-making, it can also serve a number of consultative and educational purposes.

To date management planning for Antarctic protected areas has been developed only to a rudimentary stage. Where plans exist they are generally very brief documents, which provide insufficient guidance for effective management.

Provisions in Articles 5 and 6 of Annex V of the Protocol, for mandatory and universal application of management planning to ASPAs and ASMAs, lay the foundation for markedly improved protected area planning in the Antarctic. Approved management plans will be required before new protected areas can be designated, and the Annex also contains a detailed checklist of matters to be addressed in proposed plans. Of particular significance are requirements for:

- clearly stated protection values and management objectives;
- comprehensive site descriptions and maps, including identification of any internal zoning allowing diversified management; and
- full specification of conditions relating to the granting of permits for access to and use of Areas.

To comply fully with this demanding set of provisions for management planning Parties will require considerable scientific and technical support and guidance. SCAR and IUCN can provide these, particularly through production of a handbook to guide the preparation and review of management plans. This will ensure that plans are developed uniformly and to the highest professional standards.

### **Recommendation 11**

**That to achieve consistency in management Treaty Parties, when preparing management plans, are urged to establish a standard methodology for site surveillance and monitoring, as well as a co-operative management policy in those areas where more than one Treaty Party is operating and/or where different values requiring protection exist.**

### **Recommendation 12**

**That the issue of a permit for entry to a protected area should require compliance with the management plan for that area, and permits should be subject to review and renewable where appropriate.**

### **Recommendation 13**

**That the Treaty Consultative Parties conduct inspection visits to ASPAs and ASMAs at not more than five-year intervals to ensure that their use is in accordance with their management plans. In planning and conducting inspections, Treaty Parties should co-ordinate their efforts and avoid unnecessary duplication.**

Active supervision and management of protected areas in Antarctica are time-consuming and expensive operations, which present a considerable burden for national authorities. However, site surveillance and monitoring, in particular, are crucial for ensuring that the provisions of management plans are being met.

Providing a warden service—a common practice among protected area authorities elsewhere—is at present impractical and, except in a very few instances, unnecessary in Antarctica. This absence of on-site supervision, however, accentuates the need for strict enforcement of permit procedures to control uses of Areas, and adverse impacts on them. At present the national systems for granting permits for entry into and use of protected areas vary, and few allow timely consideration of applications and the issue of permits. All permits should be consistent with management plans, and therefore such plans must give clear guidance on what are acceptable activities and how and when they should be conducted. This will allow appropriate conditions to be specified.

Annex V of the Protocol provides the necessary rules governing the issue of permits, but ensuring full compliance will require monitoring and regular inspection. To date, inspections under the Treaty have been infrequent and sporadic, and have generally not included visits to protected areas. More recent inspections, some of which have included specific reporting on protected areas, have already proved valuable for identifying management problems, such as inaccurate plotting of the location of Areas, inadequate marking of boundaries, littering of sites and other impacts and inappropriate uses, and observations on the adequacy of sites with respect to management objectives.

Provisions in the Protocol for inspection and reporting on site visits will greatly improve this situation. Effort is required, however, to introduce standard approaches to site surveillance, monitoring and reporting, to ensure uniform application of use provisions and to facilitate exchanges of information and experience.

Co-operative and well co-ordinated effort is also required to integrate management where two or more national authorities are undertaking protected area activities in close geographical proximity. Co-ordinated planning and conducting of inspections, for example, would reduce costs

and avoid duplication. Even more important is the need to integrate protected area management with other legitimate but potentially conflicting activities, such as research and associated logistics operations, fishing and tourist activities. The ASMA concept, which is intended to allow integrated land use practices to be applied while avoiding adverse or cumulative impacts, holds the key to solving this problem. Consultative planning and management mechanisms will be needed if the concept is to achieve its full potential.

#### **Recommendation 14**

**That the Treaty Consultative Parties implement appropriate protection measures for Historic Sites and Monuments through provisions under the Protocol, including the use of ASPA and ASMA designations and the listing of Sites and Monuments, as appropriate.**

#### **Recommendation 15**

**That the Treaty Consultative Parties be urged to enjoin their operators to consider the historic and scientific value of each abandoned work site before sanctioning its clean-up.**

Comprehensive protected area systems should give attention, in appropriate balance, to the conservation both of natural and cultural values. The Antarctic Treaty provides adequate measures for protecting historic resources and values, but historic site establishment and management have tended to be *ad hoc* and inadequately integrated within the overall Protected Area System.

Annex V of the Protocol, which allows ASPA and ASMA provisions to be applied in the case of historic resource protection, will promote the required integrated management. Application of the extensive protection mechanisms in Annex V will also provide for much improved management of historic sites and artefacts, and it gives opportunity for overcoming existing deficiencies. For example, it will now be possible to extend protection to areas of historic significance, not simply to structures as at present. Area protection, in turn, will allow for buffering of historic structures, thereby enhancing retention of their physical and aesthetic integrity.

Among the further needs for protecting historic resources and values identified by the Workshop, and which could benefit from appropriate professional advice and support, are improved definitions for historic resources; comprehensive surveys, inventory, documentation and archiving, preferably employing standardised methods; and greater use of voluntary, commercial and charitable support in restoration and management, under specialist guidance, especially to reduce the considerable costs involved, which might otherwise detract from scientific research resources.

#### **Recommendation 16**

**That, in the absence of specific reference to management of tourism in the Protocol, the Treaty Consultative Parties be urged to give consideration to establishing the conservation principles for assessment and management of all tourist operations, and should give due weight to the opportunities and constraints for tourism deriving from protected area management.**

#### **Recommendation 17**

**That the Treaty Consultative Parties be urged to encourage and support research into and monitoring of tourist activities, in particular to assess the nature and degree of impacts and to facilitate improved planning and management of tourism.**

Over recent years tourism in Antarctica has grown into a very substantial commercial enterprise, and it appears likely to continue to expand and diversify in the future. Experience to date, based on information from a very limited number of surveys and impact assessment studies, reveals that environmental impacts from tourism have generally been benign. However, there has been some disruption of the operation of scientific stations and associated research programmes, and there is much potential for an increase in the nature and degree of impacts associated with an expanded tourist industry in the region. On the other hand, there are many benefits to be derived from tourism, such as increased awareness of and support for Antarctic conservation and science.

Tourism requires careful planning and management according to conservation principles. This calls for the preparation of a comprehensive tourism management strategy, backed by appropriate scientific and technical information. Among matters to be considered in the strategy are the ways in which protected area management could support tourist operations, for example by identifying areas or zones within protected areas for the specific use of tourists. At the same time consideration would also be required of the means of avoiding detrimental impacts on protected areas, including those areas which protect elements of human historical heritage.

Tourism management is a complex matter involving, among others, programme planning, licensing of operations and issue of permits, supervision, insurance and liability for damage including environmental damage, safety and search-and-rescue considerations, development and maintenance of facilities, and management costs and revenues. Experience from around the world demonstrates that protected area management and tourism management can be highly complementary in attending to the wide range of issues involved.

The Treaty Parties have accepted that the question of tourism should be addressed within the context of environmental protection. This should include consideration of the ways in which lessons from tourism management in protected areas elsewhere can be adapted to the Antarctic situation, such that tourism and protected area management become mutually supporting in the cause of environmental protection. One useful initiative would be to encourage ATCPs to ensure that reporting procedures relating to tourist and non-governmental expeditions are complied with, and that information on tourist activities is more frequently exchanged among the Treaty Parties.

### **Recommendation 18**

**That the Treaty Consultative Parties give due consideration to the establishment and maintenance of a database on Antarctic Protected Areas, to allow access to the latest available management plans and other data relating to the sites.**

### **Recommendation 19**

**That sufficient information should be made readily available to *all* visitors to the Antarctic to ensure their compliance with the regulations governing wildlife and protected areas. Such information should be clearly written and presented in all four Treaty languages.**

### **Recommendation 20**

**That Treaty Parties ensure that expeditions, under the terms of Article VII of the Antarctic Treaty, which engage in aircraft, ship or other vessel charter shall oblige pilots, captains, officers, crew *and* passengers to comply with Antarctic Treaty conservation measures and protected area regulations through means of charter and carriage**

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**contracts. This obligation is particularly relevant to those modes of transport crewed by nationals of, or chartered from, non-Party States.**

### **Recommendation 21**

**That the Committee for Environmental Protection, when constituted under the Protocol, should develop an information strategy to advise on the collection, storage and evaluation of data associated with the management and monitoring of protected areas.**

Management of Antarctic protected areas currently lacks the support of a dedicated information management system for recording, storing and retrieving management-related information from research and monitoring of areas, or for use in education, training and publicity programmes—all of which are fundamentally important given the steadily increasing pace of activity and interest in the region. Currently, information must be sifted from scientific papers, inspection reports and Treaty documents, many of which are not readily available.

The Protocol imposes very considerable requirements for acquisition and exchange of information on protected areas. Parties are required to prepare and submit proposed management plans as part of the designation process and a record of all approved plans is to be maintained in the Depository and circulated to all Parties. The Parties are also required to make available information (including maps) on the location of protected areas and historic sites and monuments, and management plans, including lists of relevant prohibitions. There is also a requirement that the Parties maintain and exchange information on permits issued; reports of visits, including inspections; significant change or damage to sites; research in sites; and actions taken.

Such information is not required simply to satisfy Protocol requirements. It is also essential for a large number of other users and for a wide range of purposes, including research, environmental monitoring, Environmental Impact Assessment, the preparation of information and education resources for tourists and other visitors, and general information for the public, to increase awareness and encourage support for Antarctic conservation. Attention is required to the format and means by which such information is conveyed to the respective users.

There is an urgent need for development of a comprehensive information management strategy for Antarctic protected areas. This should, in particular, spell out clearly the information management procedures which identify who does what and when. The strategy should also provide advice on the design and use of standard formats for this information, to ensure completeness and facilitate comparison, evaluation and analysis. Development of the strategy could be modelled on the recent SCAR/COMNAP discussion document on environmental monitoring. Input to strategy development should come from SCAR, COMNAP, IUCN, national Antarctic authorities and agencies, and other independent Antarctic institutions with data management roles. The World Conservation Monitoring Centre, in Cambridge, UK, or a similarly experienced institution, could be asked to assist in co-ordinating preparation of the strategy.

### **Recommendation 22**

**That the Treaty Consultative Parties be urged to consider, and to discuss with the relevant international agencies, the opportunities for applying international protected area designations to areas of exceptional and universal conservation value in Antarctica, and in particular to explore the possibility of designating *Antarctic Heritage Landscapes*, analogous to World Heritage Sites under the World Heritage Convention.**

Global experience demonstrates that international designation of protected areas has been a beneficial means of drawing world attention to them, strengthening their protection, and providing them with access to worldwide networks of management support, including information and financial resources.

Important among the international Conventions for designating and listing sites of outstanding international significance, and the one most relevant to Antarctica, is the World Heritage Convention (strictly the Convention concerning the Protection of the World Cultural and Natural Heritage). World Heritage Sites—both natural landscapes and cultural monuments—are nominated by States but are subject to supra-national approval by a Standing Committee of the Parties to the Convention (the World Heritage Committee) which takes appropriate professional advice. Primary responsibility for maintaining and managing Sites remains with the national authorities concerned. Listing under the Convention does not generally exclude scientific research or tourist uses of Sites.

Unquestionably, as the IUCN *Strategy for Antarctic Conservation* points out, there are natural sites in Antarctica which are of outstanding universal value in terms of their scientific, landscape and wilderness qualities, and which would qualify for consideration as World Heritage Sites. Given the unique legal accommodation about national sovereignty under the Antarctic Treaty, however, it must be presumed that the World Heritage Convention in its present form cannot be applied directly to Antarctica.

An alternative option would be to evolve parallel machinery for designation of sites within the Treaty Area, using comparable criteria and procedures, and applying a title such as *Antarctic Heritage Landscape* which made that comparability widely evident. Analogous procedures could also be considered for designation of sites that may qualify under related international protected area instruments, such as the Ramsar Convention, or the Biosphere Reserve concept of the UNESCO Man and the Biosphere Programme.

International protected area designation for appropriate parts of Antarctica, on a basis of and using terms akin to those adopted for other places in the world of outstanding conservation value, would assist the process of harmonising Antarctic protection with the global protected area movement, while strengthening the already substantial protection measures under the Protocol. The opportunities available and the legal questions involved should be discussed between the Treaty Parties and the respective international agencies concerned.



## **CHAPTER 2**

# **THE ANTARCTIC PROTECTED AREA SYSTEM**



*Lynch Island (SPA No. 14) in the South Orkney Islands, designated to protect one of the most extensive and best developed native grass communities (*Deschampsia antarctica*) known in the maritime Antarctic. The island is the smallest Specially Protected Area, measuring only 0,1km<sup>2</sup>.*

Photo: R. I. Lewis Smith

## 2.1 Introduction to the Antarctic Protected Area System

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### 1. Background

For most people the development of the Protected Area System is difficult to follow largely because of the limited distribution of Antarctic Treaty (AT) documents. However, much of this information is to be found in the *Handbook of the Antarctic Treaty System, Part 3, The Antarctic Protected Area System* (7th edition, 1990).

The entire Antarctic Treaty Area has always been considered as a "Special Conservation Area" as stated in the Preamble of the Agreed Measures for the Conservation of Antarctic Fauna and Flora (Third Antarctic Treaty Consultative Meeting (III ATCM), Recommendation 8), and thereby is afforded a modest degree of protection. This is reiterated in the Objective and Designation of Article 2 of The Protocol on Environmental Protection (hereafter called The Protocol) to the Antarctic Treaty, whereby

"The Parties commit themselves to the comprehensive protection of the Antarctic environment and dependent and associated ecosystems and hereby designate Antarctica as a natural reserve, devoted to peace and science."

The concept of individual protected areas was first proposed in an Annex to the third meeting of the Scientific Committee on Antarctic Research (III SCAR) held in Canberra, March 1959. This Annex outlined numerous scientific investigations recommended by SCAR including, under the subheading of Botany,

"Conservation. Protection of representative areas of natural environments is an urgent need. The impact of man and introduced animals on the Antarctic environment should be assessed".

At IV SCAR, in Cambridge, August 1960, the newly formed Working Group on Biology emphasised the need to collect the necessary information for the designation of sanctuaries. Following from that meeting a report on the *Conservation of Nature in Antarctica* provided a number of recommendations (see *SCAR Bulletin*, 8, May 1961) which were subsequently adopted by the newly constituted Antarctic Treaty and which formed the basis of the Agreed Measures.

The first recommendation stated that

"All areas of land and fresh water, including fast ice and ice shelves, and all coastal waters south of 60°S. should be recognized internationally as a nature reserve".

The second recommendation provided the basis for the future Specially Protected Areas:

"Species or habitats which are especially important or vulnerable should be further protected by the designation of selected areas as sanctuaries within which no form of disturbance should be permitted".

The following account outlines the various protected area categories, emphasising their objectives and application.

## **2. SPAs and SSSIs**

Provision for the protection of specific areas within the Antarctic Treaty Area was embodied in an Annex on Agreed Measures for the Conservation of Antarctic Fauna and Flora, (Recommendation 8) and approved at III ATCM, Brussels, 1964. Article VIII of the Agreed Measures provided for the designation of Specially Protected Areas (SPAs). This was expressed simply as:

- "1. The areas of outstanding scientific interest listed in Annex B shall be designated 'Specially Protected Areas' and shall be accorded special protection by the Participating Governments in order to preserve their unique natural ecological system."

Article VIII goes on to outline certain prohibitions and the requirement of a permit to enter a SPA. In fact, no SPAs were included in Annex B, but 15 SPAs were designated in accordance with IV ATCM Recs. 1 to 15 (Santiago, 1966). By 1992 there were 19 extant, although several others had been redesignated as Sites of Special Scientific Interest (SSSIs).

At XII SCAR (Canberra, 1972) the report on a discussion by the SCAR Working Group on Biology (*Purposes and Designation of Special Areas*) gave cause for concern, namely that the then existing SPAs were not fully representative of the major Antarctic land and freshwater ecological systems and that some of these were over-represented in the series so far designated (see note to VII ATCM Rec. 2). It was at XII SCAR that the Working Group on Biology Subcommittee on Conservation was first convened. Among its terms of reference was the following statement:

"to establish a comprehensive classification of Antarctic and sub-Antarctic terrestrial, freshwater, and shallow water benthic [marine] ecosystems; to recommend the preservation of representative examples of the various ecosystems as well as areas with unique assemblages of species and outstandingly interesting breeding colonies of birds and mammals; to develop criteria and procedures for the establishment of shallow water marine reserves; to supervise the compilation and updating of proposed management plans for the Specially Protected Areas; ... to assume responsibility within SCAR for the coordination of biological monitoring in Antarctica; ...".

Two months later this was reported in VII ATCM, Wellington, 1972, Rec. 2 (*Review of Specially Protected Areas*) as follows:

- "1. In due course they [Antarctic Treaty Consultative Parties (ATCPs)] include in the series of Specially Protected Areas listed in Annex B of the Agreed Measures for the Conservation of Antarctic Fauna and Flora:
  - (a) representative examples of the major Antarctic land and freshwater ecological systems;

- (b) areas with unique complexes of species;
  - (c) areas which are the type locality or only known habitat of any plant or invertebrate species;
  - (d) areas which contain specially interesting breeding colonies of birds or mammals;
  - (e) areas which should be kept inviolate so that in the future they may be used for purposes of comparison with localities that have been disturbed by man;...
3. The number of Specially Protected Areas should be kept to the minimum that will meet the criteria set out in paragraph 1;
  4. The size of each Specially Protected Area should be the minimum required to serve the purpose for which the area has been designated."

Non-biological sites could not be designated as SPAs. While this is not specifically stated in III ATCM Rec. 8 (Agreed Measures) Article VIII (SPAs), it is made clear in the preamble to VII ATCM Rec. 3 (*Sites of Special Scientific Interest*): "sites of non-biological interest cannot be designated Specially Protected Areas". Under the terms of the Agreed Measures it was considered unnecessary for SPAs to have management plans. However, in keeping with comparable intensively protected sites elsewhere in the world, it was agreed that the safeguarding of the functions and values of SPAs would be made easier if each had a management plan. This was proposed in XV ATCM, Paris, 1989, Rec. 9 (*Antarctic Protected Area System: Development of improved descriptions and management plans for Specially Protected Areas*). The report of XV ATCM included a section on *Management plans for Specially Protected Areas* (paragraphs 126–128). Paragraph 127 ended with

"The Report of the SCAR ad hoc Group on Additional Protective Measures...recommended, among other things, that management plans be developed and agreed for each existing and all future SPAs".

One of the criteria for permitting entry into SPAs was in order to fulfill a scientific purpose "which cannot be served elsewhere". However, it soon became apparent that this criterion was being used to protect scientific investigations rather than to protect, exclusively, the fauna, flora and ecosystems in the SPA. Thus, virtually absolute protection came into potential conflict with the need to protect scientific research. Accordingly, the designation of Sites of Special Scientific Interest was adopted in principle for the Antarctic at VII ATCM, under Recommendation 3. VIII ATCM (Oslo, 1975) Rec. 3 introduced the format of SSSI management plans, and the first seven SSSIs together with their respective management plans were proposed in VIII ATCM Rec. 4. It was not until XIV ATCM (Rio de Janeiro, 1987) that marine SSSIs were approved in Rec. 6, although three had been proposed by SCAR at XIII ATCM (Brussels, 1985), but were not approved by the ATCPs. Earlier designations including large areas of shelf ice had, however, been accepted (e.g. SSSI No. 4, Cape Crozier, and SSSI No. 18, White Island). By 1992 there were 35 SSSIs, of which five were wholly marine; one additional site (Avian Island) had been redesignated a SPA.

A listing of all current SPAs and SSSIs is given in Appendix 1, and their location in Antarctica is shown in Figs. 1 and 2. Their combined distribution in each of eight 45° longitudinal sectors is illustrated in Fig. 3. This shows clearly the uneven distribution of these protected areas, with over 80% occurring in two sectors, and three sectors having no SPAs or SSSIs.

### **3. Other pre-Protocol Protected Area categories**

In order to overcome the situation whereby neither the Agreed Measures nor other recommendations adopted by the ATCPs provided a specific mechanism for identifying and protecting areas of outstanding geological, glaciological, geomorphological, aesthetic, scenic or wilderness value, XV ATCM (Paris, 1989) Rec. 10 proposed the designation of Specially Reserved Areas (SRAs). To date only one site has been proposed (North side of Dufek Massif, XVI ATCM Annex F(ii)). The concept of Multiple-use Planning Areas (MPAs) was also proposed at XV ATCM (Rec. 11) where co-operative action in accordance with a rigorous management plan will ensure that on-going or planned multinational activities within an area will not, through their combined or cumulative effects, result in mutual interference or in adverse impacts upon the Antarctic environment. Again, to date, only one site has been proposed (Southwest Anvers Island and vicinity, XVI ATCM Annex F(iii)). While the proposal for both the SRA and MPA, together with their respective management plans, were reviewed and endorsed by XXI SCAR (Sao Paulo, 1990) they have not yet been designated as such by the AT. It was agreed at XVI ATCM

"that Parties should require, voluntarily, that their national programme operators and, to the maximum extent possible, persons subject to their jurisdiction comply with the provisions of the proposed SRA and MPA as amended".

Special protection was accorded to new islands created by geological processes in VI ATCM Rec. 11 (Tokyo, 1970), with particular regard for the sequence and rates of colonization by flora and fauna. Provision for measures to contain tourist impact within Areas of Special Tourist Interest was implemented in VIII ATCM Rec. 9 (Oslo, 1975) and "listed or defined in Annex B to this Recommendation". Unfortunately, Annex B contained no such information, and no sites have yet been designated.

Protection of historic sites and monuments is catered for by I ATCM Rec. 9 (Historic Sites, Canberra, 1961) and V ATCM Rec. 4 (Historic Monuments, Paris, 1968). The first 43 such sites were designated in an Annex to VII ATCM Rec. 9 (Wellington, 1972). To date there are 59 sites, although many appear to be of limited international importance. Although not classified specifically as a protected area category, the site of the air disaster on the northern slopes of Mt. Erebus in 1979 has been declared a Tomb (XI ATCM Rec. 3).

In addition to the above categories of protected areas there are two which concern marine ecosystems and biota. A unique conservation instrument implemented by the Convention for the Conservation of Antarctic Seals (CCAS, London, 1972) affords protection from all sealing operations for all seal species in each of six Sealing Zones covering the entire Southern Ocean and floating ice south of 60° S, between 1 September and 28/29 February. Three seal reserves were established where no commercial sealing may take place. Conservation of all marine living organisms, including birds, and the rational use of all potentially exploitable living resources is the major objective of the Convention for the Conservation of Antarctic Marine Living Resources (CCAMLR, Canberra, 1980). Its area of influence follows approximately the boundary of the Polar Frontal Zone (Antarctic Convergence), including all of the sub-Antarctic islands except Macquarie Island. CCAMLR Ecosystem Monitoring Programme (CEMP) Sites are planned to be designated where populations of marine birds and mammals will be monitored. The first proposal for one of these (Seal Islands, off Elephant Island) was adopted by CCAMLR Conservation Measure 62/XI (Hobart, 1992).

## 4. ASPAs and ASMAs

By the time the Antarctic Treaty came under review in 1991 the proliferation of protected area categories had made the Antarctic Protected Area System unmanageable. In order to regain a degree of simplicity but with more effective control through comprehensive individual site management plans The Protocol introduced two new area categories (Antarctic Specially Protected Areas, ASPAs, and Antarctic Specially Managed Areas, ASMAs) into which all previous AT categories (i.e. excluding CCAS and CCAMLR sites) would be subsumed but differentiated on the basis of their management plans. Article 2 of The Protocol provides the objectives of Annex V (*Area Protection and Management*), stating that

"... any area, including any marine area, may be designated as an Antarctic Specially Protected Area or an Antarctic Specially Managed Area. Activities in those Areas shall be prohibited, restricted or managed in accordance with Management Plans adopted under the provisions of this Annex".

Article 3 (ASPAs) is quoted here verbatim:

- "1. Any area, including any marine area, may be designated as an Antarctic Specially Protected Area to protect outstanding environmental, scientific, historic, aesthetic or wilderness values, any combination of those values, or on-going or planned scientific research.
2. Parties shall seek to identify, within a systematic environmental-geographical framework, and to include in the series of Antarctic Specially Protected Areas:
  - (a) areas kept inviolate from human interference so that future comparisons may be possible with localities that have been affected by human activities;
  - (b) representative examples of major terrestrial, including glacial and aquatic, ecosystems and marine ecosystems;
  - (c) areas with important or unusual assemblages of species, including major colonies of breeding native birds or mammals;
  - (d) the type locality or only known habitat of any species;
  - (e) areas of particular interest to on-going or planned scientific research;
  - (f) examples of outstanding geological, glaciological or geomorphological features;
  - (g) areas of outstanding aesthetic and wilderness value;
  - (h) sites or monuments of recognized historic value; and
  - (i) such other areas as may be appropriate to protect the values set out in paragraph 1 above.
3. Specially Protected Areas and Sites of Special Scientific Interest designated as such by past Antarctic Treaty Consultative Meetings are hereby designated as Antarctic Specially Protected Areas and shall be renamed and renumbered accordingly.
4. Entry into an Antarctic Specially Protected Area shall be prohibited except in accordance with a permit issued under Article 7."

ASMAs are defined under Article 4 as follows:

- "1. Any area, including any marine area, where activities are being conducted or may in the future be conducted, may be designated as an Antarctic Specially Managed Area to assist in the planning and co-ordination of activities, avoid possible conflicts, improve co-operation between Parties or minimize environmental impacts.
2. Antarctic Specially Managed Areas may include:
  - (a) areas where activities pose risks of mutual interference or cumulative environmental impacts; and
  - (b) sites or monuments of recognized historic value.
3. Entry into an Antarctic Specially Managed Area shall not require a permit.
4. Notwithstanding paragraph 3 above, an Antarctic Specially Managed Area may contain one or more Antarctic Specially Protected Areas, entry into which shall be prohibited except in accordance with a permit issued under Article 7."

The mechanism for proposing new ASPAs and ASMAs is provided in Article 5 (Management Plans) whereby

"Any Party, the Committee [for Environmental Protection], the Scientific Committee for Antarctic Research or the Commission for the Conservation of Antarctic Marine Living Resources may propose an area for designation as an Antarctic Specially Protected Area or an Antarctic Specially Managed Area by submitting a proposed Management Plan to the Antarctic Treaty Consultative Meeting".

The guidelines for preparing proposed site management plans include a code of conduct and the conditions under which permits may be granted (in the case of ASPAs). The procedure for designating new sites by an ATCM, and with prior approval of the CCAMLR, is provided in Article 6.

## **5. Concluding remarks**

The implementation of The Protocol and the redesignation, renaming and renumbering of existing SPAs and SSSIs as ASPAs will offer an ideal opportunity to revise the original management plans and site descriptions (some of which contain factual errors in the original AT accounts). This will also allow reconsideration of site boundaries (some of which are very irregular in outline) and the reasons for designation (some of which were inadequately described).

There is an urgent need for improved public access to information on protected areas. This subject is addressed later in these Proceedings, but it is worth emphasising here the importance of educating all who venture to the Antarctic as to the value of protecting science, the environment and its biota, and providing them with adequate information on protected areas. It is imperative that management plans are clearly written and illustrated, easily understood and readily available. The responsibility for disseminating this information lies with the managers of national Antarctic programmes (through COMNAP and SCAR).

# APPENDIX 1. Antarctic Specially Protected Areas (as at 1 June 1992)

## Specially Protected Areas

SPA No.	Name, location and proposer	Approx. Area (km <sup>2</sup> )
1.	<i>Taylor Rookery</i> , Mawson Coast, Mac.Robertson Land (67°26'S, 60°50'E) [Australia]	0.4
2.	<i>Rookery Islands</i> , Holme Bay, Mawson Coast, Mac.Robertson Land (67°35'S, 62°36'E) [Australia]	30.0
3.	<i>Ardery and Odbert Islands</i> , Budd Coast, Wilkes Land (66°22'S, 110°30'E) [Australia]	1.9
4.	<i>Sabrina Island</i> , Balleny Islands, off Pennell Coast, Oates Land (66°54'S, 163°20'E) [New Zealand]	0.4
5.	<i>Beaufort Island</i> , Ross Sea, off Scott Coast, Victoria Land (76°58'S, 167°00'E) [New Zealand]	18.4
6.	No site (formerly <i>Cape Crozier</i> , now SSSI 4)	
7.	<i>Cape Hallett</i> , Borchgrevink Coast, Victoria Land (including extension to original Site) (72°18'S, 179°19'E) [USA]	0.2
8.	<i>Dion Islands</i> , Marguerite Bay, off Fallières Coast, Graham Land (67°52'S, 68°43'W) [UK]	6.0
9.	<i>Green Island</i> , Berthelot Islands, off Graham Coast, Graham Land (65°19'S, 64°10'W) [UK]	0.1
10.	No site (formerly <i>Byers Peninsula</i> , now SSSI 6)	
11.	No site (formerly <i>Cape Shirreff</i> , now SSSI 32)	
12.	No site (formerly <i>Fildes Peninsula</i> , now SSSI 5)	
13.	<i>Moe Island</i> , South Orkney Islands (60°45'S, 45°41'W) [UK]	1.3
14.	<i>Lynch Island</i> , South Orkney Islands (60°40'S, 45°38'W) [UK]	0.1
15.	<i>Southern Powell Island and adjacent islands</i> , South Orkney Islands (60°45'S, 45°02'W) [UK]	18.0
16.	<i>Coppermine Peninsula</i> , Robert Island, South Shetland Islands (62°23'S, 59°42'W) [Chile]	0.9
17.	<i>Lüchfield Island</i> , Arthur Harbour, Palmer Archipelago, off Danco Coast, Graham Land (64°46'S, 64°06'W) [USA]	0.3
18.	<i>North Coronation Island</i> , South Orkney Islands (60°31'S, 45°41'W) [UK]	88.5
19.	<i>Lagotellerie Island</i> , Marguerite Bay, off Fallières Coast, Graham Land (67°53'S, 67°24'W) [UK]	1.2
20.	<i>New College Valley</i> , Caughtley Beach, Cape Bird, Ross Island, off Scott Coast, Victoria Land (within SSSI 10) [New Zealand] (77°14'S, 166°23'E)	0.1
21.	<i>Avian Island</i> , Marguerite Bay, Fallières Coast, Graham Land (67°46'S, 68°54'W) [UK]	0.8
22.	<i>Cryptogam Ridge</i> , Mt. Melbourne, Victoria Land (within SSSI 24) (74°21'S, 164°42'E) [New Zealand]	0.7
23.	<i>Forlidas Pond and Davis Ponds</i> , Dufek Massif, Pensacola Mountains (unnamed land between Coates Land and Ellsworth Land) (82°27', 51°21'W) [USA]	9.8
<b>Total SPAs : 19</b> <b>Total approximate land area of SPAs : 102.5km<sup>2</sup></b> <b>Total approximate sea (excluding littoral) area of SPAs : 30km<sup>2</sup></b> <b>Total approximate area of SPAs : 132.5km<sup>2</sup></b>		

**Sites of Special Scientific Interest**

SSSI No.	Name, location and proposer	Approx. Area(km <sup>2</sup> )
1.	<i>Cape Royds</i> , Ross Island, off Scott Coast, Victoria Land (including additional offshore area) (77°33'S, 166°08'E) [USA]	4.6
2.	<i>Arrival Heights</i> , Hut Peninsula, Ross Island, off Scott Coast, Victoria Land (77°49'S, 166°39'E) [USA]	1.1
3.	<i>Barwick Valley</i> , Scott Coast, Victoria Land (77°18'S, 161°00'E) [USA]	279.0
4.	<i>Cape Crozier</i> , Ross Island, off Scott Coast, Victoria Land (77°30'S, 169°24'E) [USA]	19.0
5.	<i>Fildes Peninsula</i> , King George Island, South Shetland Islands (2 areas) (approx. 62°12'S, 58°57'W) [Chile]	1.8
6.	<i>Byers Peninsula</i> , Livingston Island, South Shetland Islands (revised and extended) (62°38'S, 61°05'W) [Chile & UK]	65.7
7.	<i>Haswell Island</i> , off Queen Mary Coast, Queen Mary Land (66°31'S, 93°00'E) [Russia]	1.0
8.	<i>Western shore of Admiralty Bay</i> , King George Island, South Shetland Islands (62°08'S, 53°29'W) [Poland]	17.5
9.	<i>Rothera Point</i> , Adelaide Island, off Fallières Coast, Graham Land (67°34'S, 68°08'W) [UK]	0.1
10.	<i>Caughley Beach</i> , Cape Bird, Ross Island, off Scott Coast, Victoria Land(77°10'S, 166°40'E) [New Zealand]	0.3
11.	<i>Tramway Ridge</i> , Mt. Erebus, Ross Island, off Scott Coast, Victoria Land (77°32'S, 167°08'E) [New Zealand]	0.04
12.	<i>Canada Glacier</i> , Lake Fryxell, Taylor Valley, Scott Coast, Victoria Land (77°37'S, 163°05'E) [New Zealand]	1.2
13.	<i>Potter Peninsula</i> , King George Island, South Shetland Islands (62°15'S, 58°37'W) [Argentina]	1.9
14.	<i>Harmony Point</i> , Nelson Island, South Shetland Islands (62°18'S, 59°14'W) [Argentina & Chile]	4.0
15.	<i>Cierva Point and offshore islands</i> , Danco Coast, Graham Land (64°10'S, 60°57'W) [Argentina]	51.8
16.	<i>North-east Bailey Peninsula</i> , Windmill Islands, Budd Coast, Wilkes Land (66°17'S, 110°32'E) [Australia]	0.5
17.	<i>Clark Peninsula</i> , Windmill Islands, Budd Coast, Wilkes Land (66°15'S, 110°36'E) [Australia]	12.1
18.	<i>North-west White Island</i> , McMurdo Sound, off Scott Coast, Victoria Land (marine/shelf ice site) (78°10'S, 167°25'E) [USA]	170.0
19.	<i>Linnaeus Terrace</i> , Asgard Range, Scott Coast, Victoria Land (77°36'S, 161°07'E) [USA]	3.2
20.	<i>Biscoe Point</i> , Anvers Island, Palmer Archipelago, off Danco Coast, Graham Land (64°49'S, 63°49'W) [USA]	2.7
21.	<i>Parts of Deception Island</i> , South Shetland Islands (5 small areas) (approx. 62°55'S, 60°37'W) [UK]	1.7
22.	<i>Yukidori Valley</i> , Langhovde, Lutzow-Holm Bay, Crown Prince Olav Coast, Enderby Land (69°14'S, 39°46'E) [Japan]	3.6
23.	<i>Svarthamaren</i> , Muhlig-Hofmannfjella, Crown Princess Martha Coast, Dronning Maud Land (71°53'S, 5°10'E) [Norway]	3.8
24.	<i>Summit of Mt. Melbourne</i> , Scott Coast, Victoria Land (74°21'S, 164°42'E) [New Zealand & Italy]	8.4
25.	<i>Marine Plain</i> , Mule Peninsula, Vestfold Hills, Ingrid Christensen Coast, Princess Elizabeth Land (68°03'S, 78°08'E) [Australia]	19.9

**Sites of Special Scientific Interest (continued)**

SSSI No.	Name, location and proposer	Approx. Area(km <sup>2</sup> )
26.	<i>Chile Bay (Discovery Bay)</i> , Greenwich Island, South Shetland Islands (marine site, two areas) (approx. 62°29'S, 59°41'W) [Chile]	0.8
27.	<i>Port Foster</i> , Deception Island, South Shetland Islands (marine site, two areas) (approx. 62°56'S, 60°37'W) [Chile]	1.9
28.	<i>South Bay</i> , Doumer Island, Palmer Archipelago, off Danco Coast, Graham Land (marine site) (64°51'S, 63°35'W) [Chile]	1.0
29.	<i>Ablation Point-Ganymede Heights</i> , Alexander Island, Palmer Land (70°50'S, 68°39'W) [UK]	186.0
30.	No Site (formerly Avian Island, now SPA 21)	
31.	<i>Mt. Flora</i> , Hope Bay, Trinity Peninsula, Graham Land (63°25'S, 57°01'W) [UK]	0.6
32.	<i>Cape Shirreff</i> , Livingston Island, South Shetland Islands (includes Telmo Island and neighbouring islets) (62°27'S, 60°47'W) [USA]	6.3
33.	<i>Ardley Island</i> , Maxwell Bay, King George Island, South Shetland Islands (62°13'S, 58°54'W) [Chile]	1.5
34.	<i>Lions Rump</i> , King George Island, South Shetland Islands (62°08'S, 58°08'W) [Poland]	1.3
35.	<i>Western Bransfield Strait</i> , south of Low Island, South Shetland Islands (marine site) (approx. 63°28'S, 62°08'W) [USA]	1100.0
36.	<i>East Dallmann Bay</i> , west of Brabant Island, Palmer Archipelago off Danco Coast, Graham Land (marine site) approx. 64°10'S, 62°48'W) [USA]	710.0
<p><b>Total SSSIs : 35</b>  <b>Total approximate land area of SSSIs : 675km<sup>2</sup></b>  <b>Total approximate sea area of SSSIs : 2010km<sup>2</sup></b>  <b>Total approximate area of SSSIs : 2685km<sup>2</sup></b></p>		

**Specially Reserved Area**

*Dufek Massif* (part of), Pensacola Mountains, between Coats Land and Ellsworth Land (approx. 82°31'S, 51°02'W); approx. area 390km<sup>2</sup>. [USA]

**Multiple-use Planning Area**

South-west of *Anvers Island*, southern Palmer Archipelago, off Danco Coast, Graham Land (approx. 64°50'S, 64°08'W); approx. area 1535km<sup>2</sup>. [USA]

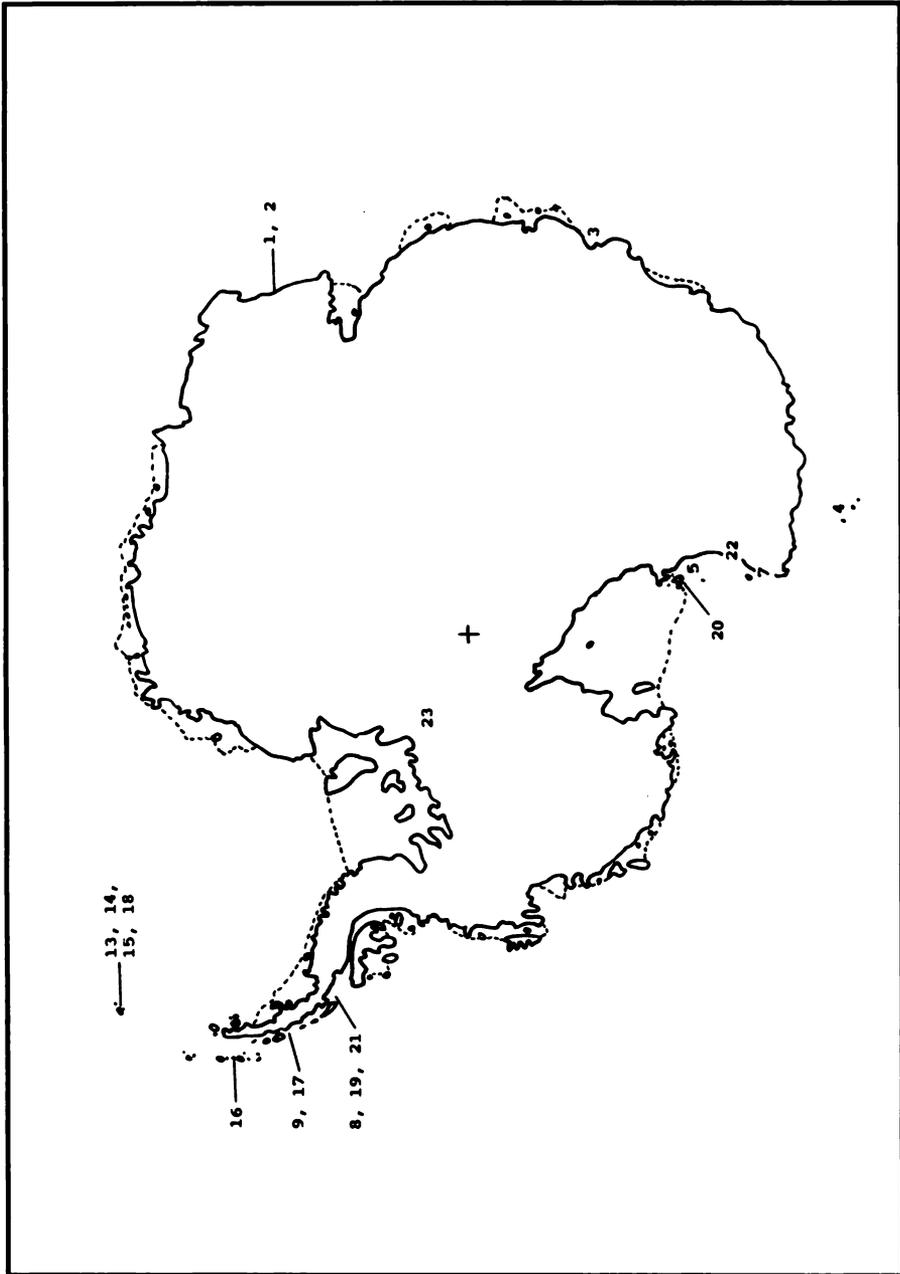


FIG. 1. The location of Specially Protected Areas in Antarctica

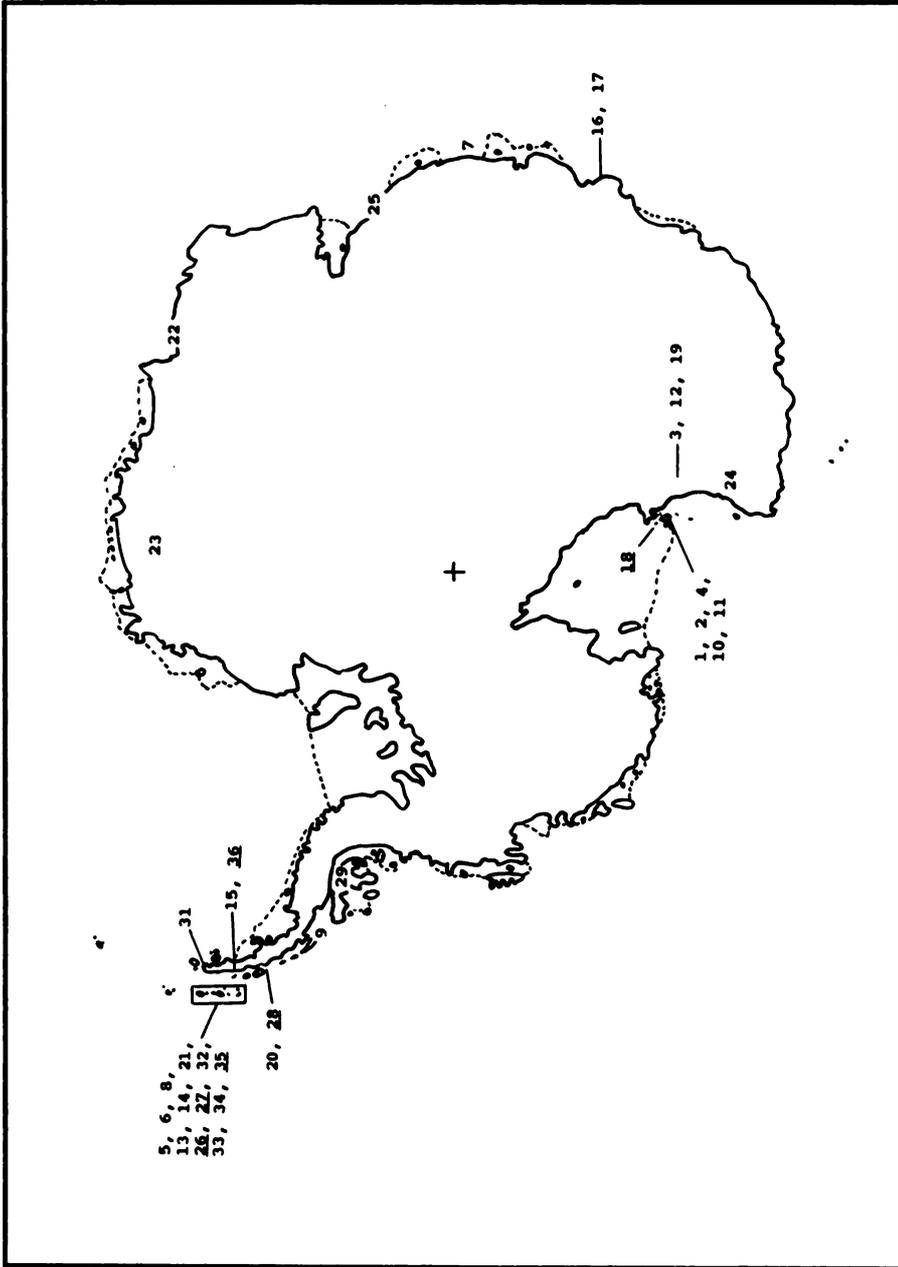


FIG. 2. The location of Sites of Special Scientific Interest in Antarctica (marine sites underlined)

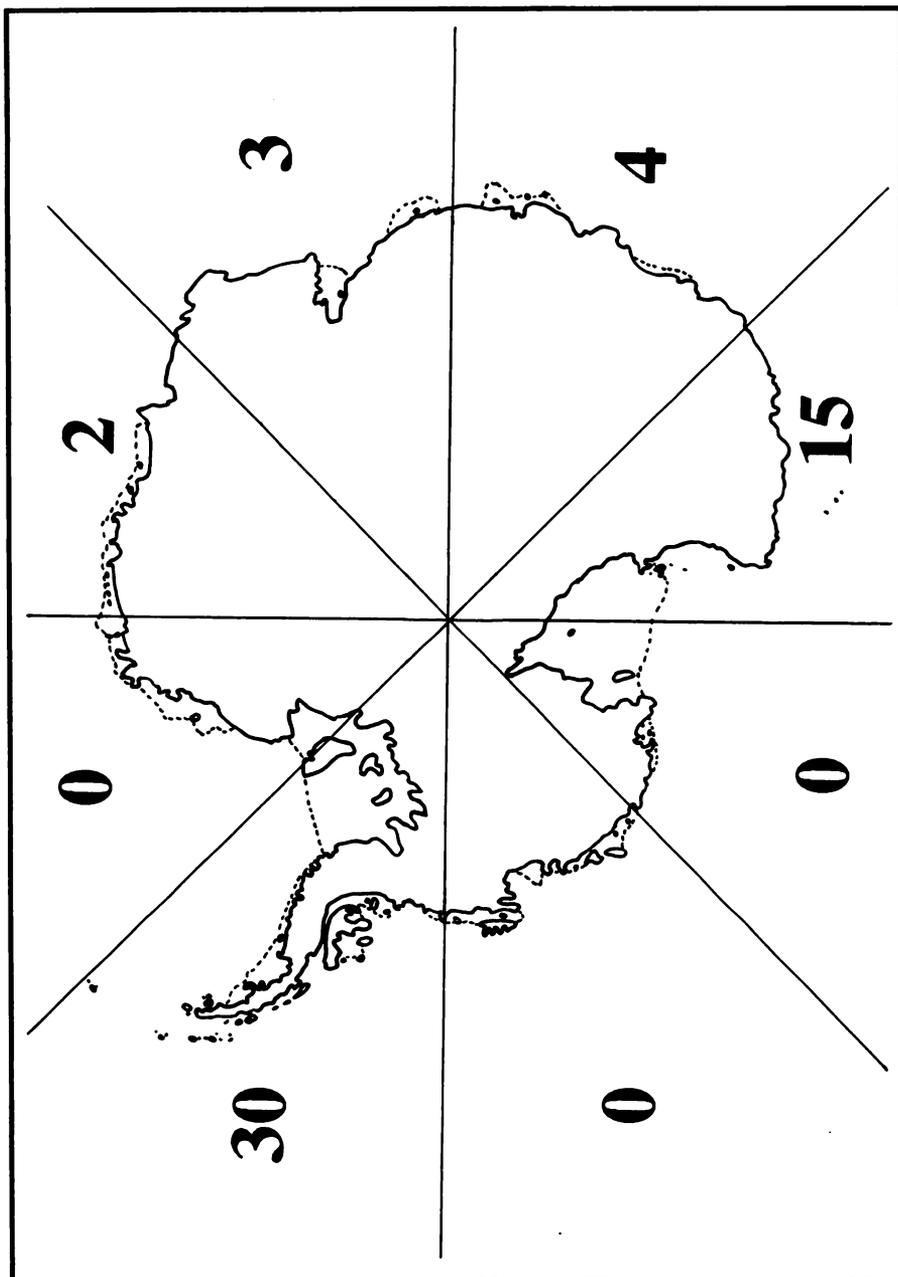


FIG. 3. Geographical distribution of the numbers of Antarctic SPAs and SSSIs in 45° longitudinal sectors based on the Greenwich Meridian

## 2.2 Environmental-Geographic Basis for the Protected Area System

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### 1. Background

The concept of creating a system of classifying Antarctic ecosystems for the purpose of selecting and protecting examples of outstanding biological interest had its origins in the meeting of the SCAR Working Group on Biology at XII SCAR (Canberra, 1972). Because of the increasing importance of conservation a Subcommittee on Conservation was convened under the chairmanship of G.A. Knox. In its terms of reference it undertook

"to establish a comprehensive classification of Antarctic and sub-Antarctic terrestrial, freshwater, and shallow water benthic [marine] ecosystems; to recommend the preservation of representative examples of the various ecosystems as well as areas with unique assemblages of species and outstandingly interesting breeding colonies of birds and mammals; to develop criteria and procedures for the establishment of shallow water marine reserves; ..."

This principle was adopted by the Antarctic Treaty at VII ATCM (Wellington, 1972) as Recommendation VII-2, requiring that

- "1. In due course they [AT Governments] include in the series of Specially Protected Areas ...
  - (a) representative examples of the major Antarctic land and freshwater ecological systems;
  - (b) areas with unique complexes of species;
  - (c) areas which are the type locality or only known habitat of any plant or invertebrate species;
  - (d) areas which contain specially interesting breeding colonies of birds or mammals;
  - (e) areas which should be kept inviolate so that in the future they may be used for purposes of comparison with localities that have been disturbed by man".

The Subcommittee on Conservation was reconstituted as a more formal group with a new convener (W.N. Bonner) at XIII SCAR (Jackson Hole, September 1974). No further action was taken until a meeting of the Subcommittee (*Consideration of a classification of Antarctic and sub-Antarctic terrestrial, freshwater and inshore marine benthic ecosystems*, Cambridge, May 1976) formulated a systematic environmental-geographic framework which would allow adequate representation of biota and habitats in a comprehensive Protected Areas System. This framework comprised three matrices (marine, terrestrial and inland water) based on biological and environmental variables. Biota and habitats for any site could be allocated to one or more cells within the appropriate matrix. This was presented at an informal meeting of the SCAR Working Group on Biology (Cambridge, May 1976) and subsequently included as Appendix 1 in the report of the meeting (see *SCAR Bulletin*, 55, 1977, 413-416).

The WG report noted:

- "(a) Classification of Antarctic ecosystems. The three proposed sections, for marine, terrestrial, and inland waters ecosystems, were discussed and approved for use in connection with matters of biological conservation and protection.
- (b) *Review of the adequacy of existing scheduled sites to represent categories of the classification, and recommendation of further sites for scheduling as representative areas.* The group endorsed the Subcommittee recommendations and proposed [to the IX ATCM (London, October 1977)]:

Recommendation 1976-BIOL-1, that National Committees consider

- (i) Proposing extensions to boundaries of existing Specially Protected Areas (SPA's) so as to include representative areas at present unscheduled (for example, coastal sites could be extended seaward so as to include the littoral and sub-littoral).
- (ii) Identifying areas, particularly inland areas and marine areas of enclosed waters vulnerable to disturbance, which will fill the voids in the classification proposed". [Note that no mention of the classification per se was included in this recommendation].

Unfortunately, this recommendation received no specific attention at IX ATCM, and no further development of the proposed classification and its three ecosystem matrices was undertaken. However, a report entitled *The Protected Area System in the Antarctic* (SCAR, Cambridge, 1987) was presented at XIV ATCM (Rio de Janeiro, October 1987), focusing on five proposals. SCAR Proposal 4 was concerned with the representativeness of the then current protected areas, a matter which had already been identified by Bonner and Smith (1985). Thus paragraph 88 of the XIV ATCM Report stated:

"The Meeting noted SCAR's call for the submission of proposals for additional protected areas to provide for geographically distributed representative examples of all Antarctic terrestrial, inland water and marine ecosystems", while paragraph 90 commented:

"The Meeting, recalling Recommendation VII-2, recognized that the existing SPAs and SSSIs still do not fully cover representative examples of the major Antarctic land and freshwater ecological systems, and it urged national organizations to conduct surveys and take such other steps as may be feasible to identify potential areas, and to draft proposals for new SPAs and SSSIs that would fill gaps in this representation", and paragraph 91 added:

"In this connection, the Meeting noted that the classification of Antarctic ecosystems published in SCAR Bulletin no 55 (SCAR, Cambridge 1977) would be helpful in identifying such gaps".

This consideration opens with the statement "While an elaborate classification might be possible, the objectives and time available indicated the need for a simple, but nevertheless comprehensive, and workable system which would enable a general type classification of ecosystems to be made. The final classification would need to relate to conservation, and so a uniform system for marine, terrestrial and inland water ecosystems might not be appropriate". The classification matrices were adopted by Bonner and Smith (loc. cit.) who, in their presentation of SPA and SSSI site accounts, ascribed each site to one or more of the relevant ecosystem cells. The cells of the matrices were not exclusive, hence any protected area might fall into more than one

cell. However, the scheme was considered sufficiently comprehensive so that any site could be assigned to at least one cell of the matrix.

## **2. Application of the SCAR Ecosystems Classification Matrix**

Bonner and Smith (1985) recognised that in an ideal situation every cell of each matrix would be represented by one or more conservation areas, preferably distributed in different geographical regions. That this is not the case is to some extent a consequence of the nature of the ecosystems themselves as well as a failure to recognize the need for active conservation measures beyond those already provided by the Agreed Measures. Many of the biological and/or environmental cells in the respective ecosystem matrices remain blank since no attempt has been made to propose suitable sites. Furthermore, the geographical distribution of the 54 (as at 1 June 1992) SPAs and SSSIs is very uneven, with 83% occurring within two relatively small regions (see Smith, this volume, Fig. 3). Conversely, no protected areas have yet been established on the many millions of square kilometres of ice sheet covering the greater part of the Antarctic continent and, indeed, there are only two areas more than 100km inland from the coast of the continent. No conservation areas have been proposed for large sectors of the continent, such as those between longitudes 70°W and 180°W, 0°W and 40°W, 5°E and 35°E, and 112°E and 160°E.

To assist in rectifying this situation some suggested locations, together with their conservation interest, for new ASPAs are given in Appendix 1 in an attempt to provide a better geographical distribution of the systems and values outlined in The Protocol (Article 3).

## **3. Review of the SCAR Ecosystems Classification Matrix**

In reviewing the SCAR Ecosystems Classification Matrix for the present Workshop an attempt has been made to improve the principal biological and environmental categories. No major changes are proposed, although a fundamental modification is that each of the three environments (terrestrial, inland waters and marine) now comprises several interacting ecosystems rather than only one as in the original matrices. Both the terrestrial and inland waters ecosystem matrices contain a "sterile" category. Recent research on soil, sediment, water and ice core microbiology indicates that total sterility may, in fact, not exist. It should be considered in terms of "minimal microbial presence".

**(a) Terrestrial Ecosystems Matrix** (Fig. 1). Terrestrial ecosystems are a complex mosaic of habitats and their associated biota, although glacial habitats (which are included in this matrix) are, by their nature, biologically depauperate. These habitats are characterised by a range of environmental variables which determine the biological composition. The environmental features are grouped into several categories according to glacial condition, distance from sea, altitude and geothermal activity, while the biological components include all the major life forms occurring in the Antarctic.

Of the biotic variables the main addition is that of a significant presence of invertebrates. For the environmental variables, greater distinction is made between coastal (<10km from seasonally open sea) and inland (>10km from seasonally open sea) for both seasonally ice-free substrata and associated late snow beds, and permanent ice. In the former category an important inclusion for both coastal and inland areas is geothermal sites which are of especial biological significance. No distinction has been made (as in the original matrix) between valley and mountain in inland areas. Altitude plays a more important role in controlling the distribution of biota in terrestrial habitats than in glacial habitats (colonized only by snow algae and other microorganisms). Consequently,

the three-tier ranking of altitudes in the ice cap/glacier category of the original matrix (<100, 100–1000, >1000m altitude) has been amended to <500 and >500m for both coastal and inland areas.

As an example of the unevenness of representation of the existing SPAs and SSSIs the number of occurrences in the different valid cells is included in Fig. 1. Of the total 99 cells 45 (crossed in the matrix) cannot support certain categories of biota. Most sites fall within the seasonally ice-free coastal zone below 1000m altitude (8 cells). Very few sites are represented in the remaining 46 cells, with no representation in 21 of these. Of the current 19 SPAs, eight were specifically designated to protect bird or seal colonies (SPA Nos. 1, 2, 3, 4, 5, 8, 15, 21), six for their exceptional vegetation (Nos. 9, 13, 14, 19, 20, 22), and four for their general ecological representativeness (7, 16, 17, 18). Only three contain areas which may be deemed "sterile" (Nos. 18, 22 and 23), although a few of the SSSIs also contain an element of sterility (SSSI Nos. 3, 11, 19, 24). To date only one terrestrial site has been designated for a non-biological reason (SSSI No. 2, Arrival Heights). No sites have been designated to protect the type locality or unique habitat of any named plant or invertebrate species (some geothermal areas protect the site rather than biota specifically).

**(b) Inland Waters Ecosystems Matrix (Fig. 2).** To some extent every lake is unique and the complexity of their chemical and thermal stratification render classification difficult. Water chemistry is simplified to salinity in the broadest sense, but temperature stratification has been omitted. "Permanent" water bodies are those with year-round water in the liquid phase, while "ephemeral" refers to bodies completely frozen (i.e. solid) for part of each year, as well as to temporary melt pools. Biotic variables are ranked according to trophic level. The principal change to the biotic variables categories is the division of the original algal felts into annual and perennial communities, the development of which is considered by limnologists to be particularly significant. Ponds are included with lakes, while the salinity categories have been renamed.

Because of the environmental complexity of Antarctic inland water bodies and stream systems, few of the those occurring in existing SPAs and SSSIs have been allocated to matrix cells. Of the 96 cells nine (crossed) are considered unlikely to have any representation. While many of the terrestrial SPAs and SSSIs contain inland water bodies, few have been designated specifically to protect their lake and/or stream ecosystems. The only SPA designated to do so is SPA No. 23 (Forlidas Ponds), while several SSSIs contain lakes and catchments (notably SSSI Nos. 1, 3, 6, 8, 10, 12, 21, 22, 25, 29); No. 21 (one of five terrestrial areas on Deception Island) was designated to protect a unique alga-rich geothermal pond (but sometimes breached by the sea).

**(c) Marine Ecosystems Matrix (Fig. 3).** This matrix remains almost unaltered from the original SCAR version. There are no biotic variables included because the dominant factors are water/ice and depth/substratum characteristics. Inclusion of biota would introduce a third very complex dimension.

Although several existing coastal terrestrial sites include the littoral, and occasionally sublittoral, within their boundaries this is not always clear from the original site description. Where a site includes a group of islands the intervening sea is included only if this is specified in the site description. At present there are no entirely marine SPAs, although one (SPA No. 18, North Coronation Island) specifically includes a substantial marine component. There are, however, six wholly marine SSSIs (Nos. 18, 26, 27, 28, 35, 36) and one (No. 1) which also contains a small terrestrial component. SSSI Nos. 35 (Western Bransfield Strait) and 36 (East Dallmann Bay) are by far the largest of the SPA/SSSI categories (about 1100 and 710km<sup>2</sup>, respectively). So far, however, little attempt has been made to classify the component habitats of the marine sites.

#### **4. Criteria for selecting ASPAs for the protection of biota, habitats and ecosystems**

If the designation of future ASPAs is to take into account the diversity of biota (living or fossil) and habitats, as well as reasonable geographic representation within a systematic environmental-geographical framework (Protocol, Annex V, Article 3), the following list of criteria may be helpful as a guideline for their selection.

**(a) Species distribution**

Widespread/abundant  
Localized  
Disjunct  
Endemic  
Rare  
Single known occurrence  
Type locality

**(b) Biodiversity**

Species-rich/species-poor  
Breeding populations/gene pools  
Ecological gradients/zones  
Absence of biota (sterile)

**(c) Ecosystems/communities**

Marine/inland water/glacial/terrestrial/(atmosphere?)  
Widespread/common/rare/unique  
Typical/atypical of region  
Extensive/small area  
Palaeo-ecosystems/communities

**(d) Habitat**

Common/restricted  
Very rare/unique  
Foraging zone associated with breeding birds and seals

**(e) Physical characteristics**

Area/scale  
Topography/surface  
Geology/petrology  
Substratum (rock, soil, sediment etc.)  
Geomorphology  
Water (fresh/saline/ocean)  
Ice (temporary/permanent; land/sea/shelf; "warm"/"cold")  
Geothermal activity  
Rapid environmental change  
Natural/anthropogenic disturbance

In addition, there are four more general questions concerning any new proposal:

- (i) Are there already good examples of this category represented within other geographical regions of the Antarctic?
- (ii) Should there be a minimum size for SPA-type ASPAs (with the exception of islands, nunataks, etc.)?
- (iii) Is there a need for buffer zones around sensitive protected areas?
- (iv) Is there a need for biological/environmental baseline monitoring?

## 5. Conclusions

This account has considered only ASPAs in terms of an ecosystems classification, since the habitat matrices were conceived specifically for SPAs and SSSIs. With regard to historic sites it is unlikely that they should be treated in the same way as there is no valid reason for aiming to have a more uniform geographical distribution of such sites. Classification matrices to cater for SRAs and MPAs would also be impracticable, although there may be good reasons for designating a buffer zone within an ASMA to protect a biologically or environmentally sensitive area. For example, within the South-west Anvers Island MPA, it may be considered desirable for the protection of Litchfield Island ASPA (currently SPA No. 17) to create a surrounding buffer zone with its own management plan (also designated as an ASPA) or, when the reformatted management plan for Litchfield Island is prepared, to include the buffer zone in the overall site plan. The concept of buffer zones has previously been applied to New College Valley (SPA 20, surrounded by SSSI 10) and to Cryptogam Ridge (SPA 22, surrounded by SSSI 24).

To date relatively few countries have proposed protected area sites in the Antarctic. It is important to the development of a more biologically, environmentally and geographically representative network of protected areas that more national organizations are involved in proposing new sites. However, to do so requires reasonably intimate knowledge of the area being considered. If a site is to be proposed, but such information is not available, every effort should be made to send appropriate specialists to the area to make the necessary surveys (*sensu* XIV ATCM, paras. 90–91) so that a comprehensive and meaningful management plan may be prepared. If such expertise cannot be provided by the authority planning the site proposal, international collaboration should be sought.

## 6. References

- Bonner, W. N. and Smith, R. I. Lewis 1985. *Conservation Areas in the Antarctic*. SCAR, Cambridge.
- Smith R.I. Lewis, 1994. *Introduction to the Antarctic Protected Area System*. This volume, 15–26.

## APPENDIX 1.

### **Suggested regions where new ASPAs might be designated to improve the geographical representation of protected areas or where human impact may threaten specific conservation values**

#### **South Shetland Islands:**

*Deception Island* (biologically unique geothermal areas under threat from excessive impact by scientists and tourists).

#### **Antarctic Peninsula:**

*James Ross Island* (palaeontology, vegetation, lakes/streams, wilderness, terrain sensitive to impact);

*Seymour/Snow Hill Island* (palaeontology, topography);

*Selected islands off west coast* (important bird-breeding sites vulnerable to tourist impact).

#### **Coats Land:**

*Shackleton Mountains* (geomorphology, wilderness, lakes, vegetation).

#### **Dronning Maud Land:**

*Shirmacher Oasis* (wilderness, geomorphology, biology, lakes);

*Unspecified nunataks and mountain ranges* (wilderness, geomorphology, bird colonies, etc.).

#### **Mac.Robertson Land:**

*Prince Charles Mountains* (wilderness, geology, geomorphology, lakes, vegetation).

#### **Princess Elizabeth Land:**

*Larseman Hills* (wilderness, lakes, vegetation, birds);

*Vestfold Hills* (wilderness, glaciated terrain, glacial geology, geomorphology, lakes).

#### **Queen Mary Land:**

*Bunger Hills* (wilderness, geomorphology, lakes).

#### **Oates Land, Victoria Land and Transantarctic Mountains:**

Numerous potential coastal and inland sites, notably in "dry valleys", nunataks and mountain ranges with good representation of geomorphological, biological and limnological features.

#### **Marie Byrd Land:**

Extensive tracts of the polar plateau throughout the continent could serve as valuable biologically and chemically uncontaminated sites, never visited by people or overflowed by low-flying aircraft. However, identifying and marking such pristine areas could pose problems. Marie Byrd Land, together with part of Edward VII Land and Ellsworth Land, comprise the largest unclaimed sector of Antarctica. It is therefore politically "stable" and could, if suitably managed, serve as a crucial baseline environment with which to compare any other region of the world which has been historically influenced by humanity. Such a reserve could go a long way to fulfilling the IUCN General Assembly (Caracas, 1992) guideline of achieving protected area status for 10% of the Antarctic.

Environmental features (locally abundant)	Seasonally ice-free substrata and associated late snow beds										Permanent ice		
	Coastal (<10km from seasonally open sea)			Inland (>10 km from seasonally open sea)			Adjacent to ice shelf			Coastal (<10 km from seasonally open sea)		Inland (<10 km from seasonally open sea)	
	<1000 m alt.	>1000 m alt.	(ice-thermal)	<1000 m alt.	>1000 m alt.	(ice-thermal)	<500 m alt.	>500 m alt.	Adjacent to ice shelf	<500 m alt.	>500 m alt.	<500 m alt.	>500 m alt.
Vascular plants	3		.			.							
Bryophytes	6		.			.			.				
Lichens	7		.			.			.				
Macroualgae/cyanobacteria	16		1	2		.			1				
Snow algae	14		.	.	.	.			.				
Microorganisms	20		.	1	1	.			1				
Invertebrates	13		.	.		.			.				
Birds/seals	17		.	1		.			.				
Sterile	3								1	1			
	11								.	.			
	? All		.	.	1	1			.				
	? All		1	3	5	2			1				
	10		.	.	.	.			.				
	11		.	.	.	.			.				
	16		.	.	.	.			.	2			
	16		.	.	.	.			1	1			
	.		.	1	2	1			.	1			
	.		.	2	4	2			1	.			1

Upper values : SPAs  
 Lower values : SSSIs (no significant biotic variables in SSSI Nos. 2, 25, 26, 27, 28, 35, 36)

FIG. 1. Proposed Antarctic terrestrial ecosystems classification matrix



Environmental variables	PELAGIC/NERITIC		BENTHIC				LITTORAL			
	Bathyal >500 m	Shelf zone (c. 500-200m)		Sub-littoral (c. 200-5m)		Rock/boulder	Pebble	Sand, mud and/or shell	Ice	
		Hard bottom	Soft bottom	Hard bottom	Soft bottom					
Permanent ice										
Seasonal ice			X	X						
Absence of ice									X	
Fresh water influence			X	X						
Enclosed water mass			X	X						
Geothermal influence										

FIG. 3. Proposed Antarctic marine ecosystems classification matrix

## 2.3 Identification and Selection of Protected Areas

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### 1. Introduction

This paper examines key factors in the identification and selection of Antarctic protected areas. In doing so it is realised that the study of the Protected Area System provides a valuable and strategic insight into the complexity of Antarctic natural resources management.

Firstly, the paper summarises some key factors in the evolution of the range of protected area categories. Secondly, the issues affecting identification and selection are discussed, including the contributions and interactions of the agencies involved. Finally, recommendations are made for ways and means of improving the identification and selection of categories introduced to the Antarctic Treaty Area since 1989.

### 2. Protected Area Categories

Protected areas under the Antarctic Treaty System have changed greatly since the *Agreed Measures for the Conservation of Antarctic Fauna and Flora* (1964) first recognised the Antarctic Treaty Area as a Special Conservation Area (Table 1). Smith (this volume) has provided a detailed history of the changes.

The categories developed under the *Agreed Measures* were typical of their time and drew heavily upon SPA and SSSI concepts introduced in Britain in the 1940s, and operated in parallel to National Park systems worldwide (Kriwoken and Keage, 1989). The ratification of the *World Heritage Convention* and the introduction of UNESCO's *Man and Biosphere Programme* in the 1970s increased the spectrum and richness of protected area categories, although focusing mostly on the terrestrial environment. In Australia, the formation of the Great Barrier Reef Marine Park (1975), established the largest marine protected area in the world, and set new protection standards for the marine environment.

The international network developed at a greater rate than that adopted under the *Agreed Measures*. Specifically, SPA status had been applied mostly to coastal bird breeding sites. Few non-marine aquatic ecosystems were represented. Part of the problem was that SPA status could only be applied to biological sites and, in accordance with ATCM VII-2, the number and area of SPAs were to be kept to a minimum.

By ATCM XV (1989) several ATCPs were concerned by the inadequacy of the system to respond to increasing human activity (government and non-governmental), and developments in protected area management outside the Antarctic Treaty Area. Australia, the United States of America and other ATCPs considered it important to identify and protect areas in addition to those with outstanding ecological, scientific and historic values identified earlier under the *Agreed*

**Measures.** In 1989 ATCM XV-10 provided for the designation of Specially Reserved Areas (SRAs) and Multiple-use Planning Areas (MPAs). This initiative was largely a result of a SCAR Report entitled *The Protected Area System in Antarctica*.

These new categories were a significant advance. Further progress was made when, in 1991, the *Protocol on Environmental Protection to the Antarctic Treaty* (Madrid Protocol) recognised protected areas as an integral component of Antarctic natural resources management. This 17 year evolution has been characterised by periods of stagnancy and recent activation to recover ground with international developments in protected area identification and selection.

### **3. Issues in Protected Area Identification and Selection**

The identification and selection of protected areas can be assessed in several ways.

The traditional, and most popular, approach has been to review the Protected Area System within the context of the development of the Antarctic Treaty System. These treatments highlight the achievements of early protected area categories. The *Convention on the Conservation of Antarctic Seals* (CCAS) and the *Convention for the Conservation of Antarctic Marine Living Resources* (CCAMLR) have been reviewed extensively for their contribution to conservation and environmental protection. This approach has been supported especially by ATCPs.

An alternate approach, commencing with the inaugural SCAR/IUCN Joint Meeting (1984), is to view the development and operation of the Protected Area System with respect to environmental values and management objectives introduced for other comparable areas, species, communities and habitats outside the Antarctic Treaty Area (Keage 1986). For example, the recent introduction of ASPA and ASMA categories can be assessed against more elaborate protected area categories in operation elsewhere.

Clearly, an assessment of the effectiveness of the Protected Area System (including identification and selection) will vary depending upon which of the above standpoints is taken. We consider that the alternate approach is more appropriate and should address three features—the adequacy of protected area categories, institutional involvement and human activity.

#### **3.1 Adequacy of Protected Area Categories**

A major weakness of identification and selection is a lack of understanding of the extent, diversity and abundance of populations, communities, habitats, ecosystems and biomes. A detailed biogeographical framework is required, and could possibly be developed by SCAR/IUCN specialists. The matrices adopted by SCAR (1977) to classify the range of terrestrial, inland waters and inshore marine ecosystems should be extended to include, *inter alia*, information on non-living environments, soils, vegetation and lake ecosystems. Matrices can be improved to fully describe the range of ecosystems for which protected areas may be appropriate.

The terrestrial, freshwater and inshore marine ecosystems are under-represented or totally absent in protected areas classified according to the existing SCAR matrices, while littoral and inland fluvial and continental ice systems are absent. There is concern that existing protected areas do not give due recognition to representative habitats, communities and ecosystems for which special protection is required against the continuing increase of human activity on the Antarctic Peninsula (Bonner and Lewis Smith 1985; Keage 1986). Additionally, several historic and cultural protected areas have questionable value or have little meaning from a land management viewpoint.

To enhance environmental protection and awareness, there is merit in a SCAR/IUCN exercise to compare Antarctic habitats and environments worthy of special protection with internationally accepted categories. This could be an important area for future SCAR/IUCN collaboration, especially in the light of IUCN support for a systematic review of the concepts and methods underlying the designation and management of protected areas in Antarctica (IUCN 1991:52).

### 3.2 Institutional Relationships and Processes

In addition to the SCAR matrix and the criteria listed in Table 1, identification and selection of protected areas must be considered with respect to institutional arrangements—*who identifies and who selects?*

SCAR is empowered to identify protected areas and to recommend protection standards to ATCMs. SCAR's constitution limits its activity to the provision of scientific advice, while its structure provides for single discipline scientific Working Groups. Environmental management-related issues are considered by the Group of Specialists on Environmental Affairs and Conservation (GOSEAC) in preference to a permanent (environment) Working Group. The question arises whether SCAR would be better placed to advise on identification and selection if it had a permanent Environment Working Group. Also, the operation of the Protected Area System relies on the active involvement of each SCAR National Committee. Thus there is a close relationship between identification and selection, and the capacity of the respective SCAR National Committee.

ATCPs are empowered to select protected areas and implement management arrangements; they can seek specialist advice from SCAR when required but need not accept such advice. Other concerns arise because of the division/separation of responsibilities between those who identify protected areas (SCAR National Committees) and those who select and manage them (individual ATCPs). The separation of identification and selection (and management) processes, with no formal linkage between institutions, is unusual from an environmental planning and management perspective. It would be more satisfactory if identification, selection and management could be integrated with defined feedback systems in place.

In addition to difficulties that might arise from the separation of site identification and selection processes, it should be noted that few ATCPs employ qualified conservation and environmental management staff, thus resulting in little continuity in national and international consideration of protected areas. This has produced some remarkable anomalies. For example, Australia's claim to 42% of the Antarctic continent area is not matched by protected area work, past or present. Endorsements of protected area concepts were tied to the *Agreed Measures*, and recommendations for additional environmental protection have not been stimulated. Institutions beyond national operators and the SCAR National Committees (e.g., non-governmental organisations and specialists) have no active part in identification and selection.

The evolution of the Protected Area System is tied closely to, and impacted by (in both positive and negative ways) national Antarctic operations (Headland and Keage 1985; Harris 1991). In parallel with increasing human activity in Antarctica, the reasons for proposing new areas have changed, to give greater recognition to the need for larger areas. The level of activity is such that it is now difficult for individual nations to propose protected or managed areas without considering the activities of neighbouring or overlapping national operations (Kriwoken 1991).

## 4. The Changing Agenda

The past three years have been a period of development for Antarctic conservation. Protected area categories have moved from small site-specific values to a natural resources management tool, incorporating regional planning. There is now an acceptance of marine protection in the Treaty Area, through the use of protected areas, although its implications are still poorly understood. This period of development does not signal an end to identifying and selecting small, discrete protected areas which are still appropriate for particular objectives. However, the attention on these smaller protected areas is likely to shift, with greater emphasis being given to a regional planning approach. With increasing human activity and overlapping impacts, we foresee a growing number of ASMAs.

### 4.1 The Burden of Proof

Recognition of the Treaty Area as a Special Conservation Area under the *Agreed Measures* has meant little in terms of providing it with an effective protected area system. Under the Antarctic Treaty System protected areas have had to prove their significance within the system and, by default, areas outside have proceeded largely with few restrictions. By reversing the burden of proof, the designation of the Antarctic Treaty Area as a nature reserve, devoted to science and peace, would place the onus on the ATCPs. Each Party would need to prove that adequate environmental management arrangements were in place (possibly with the identification of an ASMA) and no adverse impacts would be associated with development activities (as outlined in Annex I of the Protocol—*Environmental Impact Assessment*). Small areas of permanent development could be identified, declared and managed within an ASMA. A moratorium on permanent stations could be declared until ATCPs could provide evidence of minimal impact. For instance, in certain regions authorised vehicle transit corridors would be identified to concentrate impact and minimise disturbance. In other regions no development would be allowed.

### 4.2 Contemporary Protected Area Concepts

The ATS has formulated its protected area concepts from those developed outside the Treaty Area, adapting identification and selection criteria from elsewhere. The adoption of concepts, and their modification for use in Antarctica, is additionally complicated by national/cultural interpretations of site identification and selection criteria.

Thus, each ATCP continues to conduct its environmental affairs within the context of its own standards (and margins) of acceptability. The need to better define environmental standards and criteria, including those of protected area identification and selection, is a matter deserving closer attention. For instance, the identification and selection of wilderness areas will test the Antarctic Treaty System. Wilderness protected area criteria adopted outside the Antarctic Treaty Area for geographically large terrestrial, ice and marine areas could restrict permanent settlement and activities if transposed to Antarctica. Suggestions have been made that large wilderness ice shelves of over 100,000km<sup>2</sup> be identified and selected (Keage 1987). Areas of marine wilderness, although more difficult to identify and select, must also be assessed.

In Australia, the designation of large, remote natural (wilderness) areas is now accepted as, indeed, it has been for several years in the USA and Canada. The management procedures proposed for Australian wilderness areas would, if transposed to Antarctica, significantly impair operations and require closer regulation and monitoring of activities. The announcement in June 1992 by the Australian Antarctic Foundation (Department of Foreign Affairs and Trade) of a *Conservation Strategy for the Australian Antarctic Territory* is likely to bring into sharp focus the need for

consistent environmental objectives between the Australian Antarctic Territory and continental Australia. The Strategy could influence the need for regional planning discussed above.

For the above reasons, to enhance environmental protection and awareness in Antarctica, there is merit in a SCAR/IUCN exercise aimed at identifying:

- Habitats and environments worthy of special protection for evaluation against internationally accepted protected area categories; and,
- Prospective ASMAs as a basis for forward-planning human (present and future) activities.

### 4.3 Madrid Protocol

The Madrid Protocol declares Antarctica, including the Southern Ocean south of 60°S as a "nature reserve, devoted to peace and science" (Article 2). If the "burden of proof" argument is to be accepted, then the Protocol would have special significance. As such, Antarctic terrestrial and marine environments should be recognised and managed as ecologically significant entities within a single protected area.

The Protocol raises many specific questions about the operation of the Protected Area System that are relevant to identification and selection procedures. For example:

- *Representativeness*. No mention is made of what a "systematic environmental-geographical" framework consists of, who will develop it and what period is involved in its implementation? Also lacking is an outline of how systematic monitoring of protected areas will proceed and be enforced.
- *Monitoring*. Without a monitoring system (encompassing reference protected areas), disturbance caused by humans or natural changes cannot be readily assessed. This has already resulted in sites being nominated for SPA or SSSI status that have been disturbed significantly.
- *Human Activity*. There is no limitation on expanded operations, or on the siting of new stations and facilities, despite them posing the greatest potential disturbance to existing protected areas.
- *Committee on Environmental Protection (CEP)*. The CEP will comprise representatives from all ATCPs, and their expert advisers (Articles 11 and 12). The CEP will "provide advice and formulate recommendations to the Parties" including "the operation and further elaboration of the Antarctic Protected Area system" (Article 12 [g]). The operative word is "advice". Since the CEP will have no regulatory powers, the problems of practical implementation and enforcement of protected area measures are likely to remain. Consideration should be given to including active "independent members" on the CEP, and providing for "independent" reviews of recommendations affecting existing or proposed protected areas.

These questions are worthy of detailed consideration for they go to the heart of the long term commitment needed, without which there seems little advance over the way protected areas have been regarded previously.

## 5. Acknowledgements

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**TABLE 1. Antarctic Protected Area Category Descriptions**

**Specially Protected Areas (1964)**

- Outstanding scientific importance
- Rarity of ecological systems
- Representative Antarctic land and inland water ecosystems
- Unique complexes of species
- Type locality or unique habitat of plant or animal species
- Rare breeding habitat of plants or invertebrate species
- Breeding colonies of birds or mammals
- Inviolable reference sites

**Sites of Special Scientific Interest (1972)**

- Biologically active, inactive and geological sites proclaimed for specified periods and requiring Management Plans to protect scientific investigations

**Specially Reserved Areas (1989)**

- Geological, geomorphological and glaciological features
- Aesthetic, scenic and wilderness values

**Multiple-use Planning Areas (1989)**

- Cooperative planning and coordination of human activities where such activities may interfere with one another and would help avoid or minimise the cumulative impacts of such activities on the Antarctic environment

**Antarctic Specially Protected Areas (1991)**

- Outstanding environmental values and scientific interest
- Wilderness and aesthetic values
- Inviolable areas
- Representative terrestrial, glacial, inland water and marine ecosystems
- Geological and geomorphological features
- Important or unusual habitats and assemblages of species, including native birds and mammals
- Historic sites and monuments

**Antarctic Specially Managed Areas (1991)**

- Areas where activities pose risks of mutual interference or cumulative environmental impacts
- Historic sites and monuments



## 2.4 Summary and Conclusions

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R. I. Lewis Smith introduced the background to the Protected Area System and the current list of SPAs and SSSIs. He also reviewed the existing SCAR ecosystem classification matrices (prepared in response to a recommendation from VII ATCM, 1972, and formulated by the SCAR Conservation Subcommittee in 1976) and introduced a revision of the terrestrial and inland waters matrices. It was accepted that additional categories of environmental variables, ice scoured areas and submarine rock walls, might with advantage, be introduced in the marine ecosystem classification matrix. There was agreement that the classification of habitats on an environmental/biota basis for the terrestrial and inland water ecosystems was generally acceptable. However, the complexity of the marine ecosystem makes it impossible to devise a satisfactory two-dimensional matrix. The scheme developed and modified here for SCAR does not include biotic elements.

The extent to which terrestrial protected areas extended into the littoral zone, or the limits of this zone, was unclear. However, it was accepted that in general a terrestrial protected area should, unless otherwise defined, be assumed to extend to low-water mark. When defining new protected areas with sea coasts, the advantage of including surrounding areas of sea should be considered.

The existing geographical distribution of protected areas was noted. Areas tend to be concentrated in regions of greater human activity. A purely sectorial approach to the distribution of protected areas was less satisfactory than an approach based on geographical features. The use of the 13 ice-catchment areas proposed by Keage (1987) may be a more logical basis for ensuring geographical representativeness of protected areas.

L.K. Kriwoken introduced a paper on the identification and selection of Antarctic protected areas. The evolutionary change from the Agreed Measures to the Protocol had raised issues of identification and selection of protected areas, a weakness of which is a lack of understanding of the extent, diversity and abundance of population, communities, habitats, ecosystems and biomes. Institutional arrangements were also important, in particular *who identifies and who selects?*

The meeting noted that for some areas a selection system based on random stratified sampling might prove the best and most scientific method of ensuring representativeness. This would avoid many of the difficulties of selection associated with logistic limitations and available expertise for site evaluation but might make for management difficulties. An important factor would be that the sites selected should be of sufficient size to avoid dominance by minor features.

It was accepted that the ecosystem classification matrices were to some extent artificial and, if over-complex, might never be utilised. Whatever system is adopted must be practicably applicable.

Most protected areas had been designated for biological reasons. The need for access by earth scientists had to be considered. Geologists were generally unwilling to designate protected areas in case this encouraged illicit fossil collecting. On the other hand, geological, geomorphological or pedological features often merit protection. The Antarctic Treaty should ensure that such features are accorded adequate protection to conform with geopreservation systems being developed and implemented in other parts of the world.

Recommendation VII-2 and Article 3(2) of Annex V to The Protocol give the potential for a structured approach to establishing a system of protected areas. Article 5(1) of Annex V defines who can originate proposals for new protected areas. Although interested NGO's are not included in this, it was felt that sufficient avenues are available for all serious proposals to be considered. It is likely that SCAR GOSEAC will continue to provide an important function in vetting proposals before their consideration by the Treaty. Any body responsible for evaluating new protected area proposals must include persons with a broad knowledge of the Antarctic and must continue to rely on the competence of proposers with specialist knowledge of sites.

Although it was accepted that only a very small proportion of the Antarctic is included in a protected area category, there was broad agreement that it is impracticable to contemplate applying the Caracas (IVth World Parks and Protected Areas Congress) guideline of 10% representation before 2000 AD to the Antarctic. It was noted that the Agreed Measures, and eventually the Protocol, provide a high measure of protection to the whole of the Antarctic.

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## **CHAPTER 3**

# **DESIGN AND MANAGEMENT PLANNING FOR ANTARCTIC PROTECTED AREAS**



*Part of Barwick Valley (SSSI No. 3), the largest of all the Specially Protected Areas and Sites of Special Scientific Interest (c., 279km<sup>2</sup>). The primary reason for its designation was that it represented one of the least disturbed and contaminated of the Dry Valleys of Victoria Land, which was environmentally unique and possess extreme polar desert ecosystems. Lake Vashka is in the middle ground.*

Photo: D. D. Wynn-Williams

## 3.1 Design and Delimitation of Protected Areas

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### 1. Size and extent of protected areas

It is not possible to be definitive about the optimum size of protected areas since characteristics of the site locality, the features requiring protection and the reasons for designation vary so much. However, it is possible to propose some general guidelines. Protected sites should be as large as possible, and certainly sufficient to encompass substantial areas of natural ecosystems. For biological protection, areas should be no less than the minimum size required to allow permanent maintenance of the protected species or communities and their habitat. The extent of an area may be required to take account of either seasonal or year-round habitat requirements, there may be a need to provide buffering from externally derived damage or disturbance, and potential for loss must be considered, for example from natural catastrophic events.

Previously existing criteria for establishment of Antarctic protected areas, while not setting absolute limits, required that the size of areas be the minimum required to serve their intended purposes. In practice, this has resulted in the creation of many protected areas of very limited extent. Twelve of the 19 SPAs, and 10 of the 35 SSSIs are 100ha or less in area (Smith, this volume). SPAs range in size from 10–5,000ha (mean 500ha). Terrestrial (or mixed terrestrial/marine) SSSIs range from 1–32,500ha (mean 2,300ha), and marine (or iceshelf) SSSIs range from 50–130,000ha (mean 29,200ha). By comparison, the more than 130 protected areas of equivalent types in New Zealand average approximately 2,100ha in size.

### 2. Shape and boundary location of protected areas

The configuration of a protected area, its shape and boundary location, can have a crucial influence on its ecological integrity, long-term viability and ease of management. In Antarctica only rarely is the shape of protected areas and choice of boundary explained in terms of their ecological significance. Often boundaries are ill-defined and appear unsuitable from the viewpoint of managers and users of areas. Boundaries should preferably be natural features, such as coastlines and ridgelines which can act as natural buffers and are readily identifiable.

Some protected areas have well-defined natural boundaries. Thirteen of them are entire islands, though it is often unclear whether or not the intertidal zone is included. Many protected areas have arbitrary straight line boundaries. Eleven SSSIs are delimited entirely by straight lines joining either geodetic reference points, trig points or prominent geographic features. Some boundaries are determined by inappropriate features, such as lake shorelines which become indistinguishable in winter when frozen lake surfaces merge with localised snowdrifts.

Boundaries should be selected to reflect the stated objective of protection. Some appear illogical in this regard. The original co-ordinates given for SPA No. 2 (Rookery Islands) excluded the majority of islands in the Group, including Giganteus I., which is the feature of greatest conservation significance. However, this error has now been corrected. SSSI No. 32 (Cape Shirreff)

was extended to include the Telmo Island group as a CCAMLR monitoring site to record possible impacts of krill harvesting on fur seals and penguins, but incorporates only terrestrial areas.

Boundaries should be simple. Some are very complex. SSSI No. 25 (Marine Plain), for example, has an irregular boundary described by a line joining six specified map grid points.

Protected areas should be geographically contiguous sites. Some are very fragmented. SSSI No. 21 (Deception Island), for example, consists of five separate coastal sites (combined area of 100 ha) each protecting a specific feature. Similarly, two marine protected areas—SSSI No. 26 (Chile Bay) and SSSI No. 27 (Port Foster)—each consist of two sites protecting benthic habitat between specific depth contours. To locate such marine sites accurately is virtually impossible without permanent floating markers.

Buffer zones should be incorporated in protected areas. An excellent illustration exists at Cape Bird, Ross Island, where SSSI No. 10 (Caughley Beach) is a buffer reserve surrounding SPA No. 20 "New College Valley".

Historic Sites and Monuments, in particular, may require buffer zones to ensure their physical and aesthetic integrity, especially in areas of considerable logistical activity around scientific stations. Previous provisions for listing Sites applied only to historic features and structures, not to areas. The site surrounding Scott's "Discovery" Hut (HS No. 18) at Hut Point on Ross Island has deteriorated since McMurdo station was established, through construction of an access road, fuel pumping station, tanks and piping, creating physical and visual impacts and posing a fire hazard (Ritchie, 1988). Erection of a protective heavy chain fence around the hut is itself a visual intrusion. Protected areas can buffer historic sites. SSSI No. 1 (Cape Royds) acts as a partial buffer for Shackleton's historic hut (HS No. 15).

Management requirements should be taken into account in locating and designing protected areas, including the need for a degree of isolation from neighbouring heavily used and modified areas, i.e. station sites in Antarctica. There are many reported incidences of violations of boundaries of protected areas, some of them serious. For example, SPA No. 12 (Fildes Peninsula) on King George Island was disturbed by station construction, leading to revocation of protective status, and replacement by two smaller SSSIs (Headland & Keage 1985; Harris 1991). Construction of the new Casey station in Wilkes Land in 1986/87, immediately adjacent to SSSI No. 16 (North-east Bailey Peninsula) caused disruption of the area, including damage to protected moss beds by deposition of alkaline cement dust and the ground emplacement of radio transmission cables (Kriwoken 1991). Trampling of vegetation in SSSI No. 13 (Potter Peninsula) and occasional recreational skiing in SSSI No. 5 (Fildes Peninsula) by station personnel, have also been reported (Greenpeace 1990). SPA No. 2 (Rookery Islands) is located on a routeway across sea ice for scientific parties heading west from Mawson station.

Visual and other aesthetic impacts also require consideration. Construction of the World Park (Greenpeace) Base (now removed) within 200m of Scott's Hut (HM No. 16) at Cape Evans on Ross Island, was criticised as a deliberate intrusion to gain publicity (Ritchie 1988). For example, it was difficult to photograph the hut without including modern structures.

### **3. Boundary marking of protected areas**

Much of the illegal entry into protected areas may be inadvertent, due to inadequate marking of site boundaries. Difficulties in locating insufficiently identified protected area boundaries is one

of the most commonly recorded criticisms in inspection reports (US Department of State 1989; Handbook of the Antarctic Treaty System 1990).

Many Historic Sites and Monuments are well-signposted, some in all the Treaty languages, but most other protected areas are poorly marked on the ground (Cape Royds SSSI No.1, Rothera Point SSSI No.9, and Cape Hallett SPA No.7 are among the notable exceptions). However, many areas are completely without ground markings, and some boundary markers bear no apparent relationship to mapped boundary locations. On King George Island unofficial signs have proliferated to mark research sites. In October 1989, the Greenpeace inspection team erected signs, in English and Spanish, marking boundaries of two areas of SSSI No.21 (Deception Island) in areas frequented by tourists (Greenpeace 1990).

A wide range of devices is used to locate boundaries, including flags, signposts, plaques, painted drums and rocks, and rock cairns. Many markers have failed to withstand the elements, or have been stolen.

The Australian authorities have developed a prototype boundary marker (based on a Canadian design), comprising an aluminium canister, mounted on a guyed pipe, which is capped and large enough to store documents, such as site visit records, and some emergency food supplies (Fleming & Keage 1987). This appears suitable for wider adoption. [In 1994 the UK authorities designed and erected a new site sign (see cover illustration) at three SPAs in the South Orkney Islands. All SPAs and SSSIs for which the UK is responsible will be similarly signposted].

Management problems which can arise from imprecise and improperly identified protected area boundaries are graphically illustrated by recent events at SSSI No.2 (Arrival Heights) on Ross Island. To provide improved communications for New Zealand's Scott Base, Telecom Network and International Ltd. constructed a Satellite Earth Station (SES) on First Crater, which delimits the southern boundary of the SSSI (NZ. Antarctic Society 1992). The United States authorities protested that sensitive measurements on the ionosphere and magnetosphere, which is the designated purpose for the SSSI, are likely to be disrupted by the SES transmissions. Angered scientists involved described the construction as "... like putting a nuclear power station in a penguin rookery" (Anderson 1992; Fraser-Smith 1992). The New Zealand response included the claim that imprecision in the management plan relating to boundary definition makes it impossible to determine whether or not the construction is within the boundary of the SSSI. Prior liaison between the New Zealand and United States could have resolved this situation.

## **4. Revised Treaty provisions for protected area design**

Recent agreements under the Antarctic Treaty provide rules for much improved approaches to protected area design and delimitation, within the context of area management planning.

In Annex V of the Protocol on Environmental Protection to the Antarctic Treaty:

- Article 5.2 requires that areas proposed for designation as Antarctic Specially Protected Areas or Antarctic Specially Managed Areas shall be of sufficient size to protect the values for which special protection or management is required.
- Article 5.3 requires that proposed management plans include a description of the area, including geographical co-ordinates, boundary markers and natural features that delineate the area, and that maps and photographs are included that show clearly the boundary of the area in relation to features surrounding and within the area.

Conservation Measure 18/IX, adopted in 1990 by CCAMLR, provides for introduction of management plans for establishment of protected sites where colonies of seabirds and seals are being monitored under the CCAMLR Ecosystem Monitoring Programme (CEMP). Prescriptions for such management plans include provision for a description of the site and any buffer zone within it, including reference to natural features that define the site and boundary markers, all of which are to be mapped.

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## 3.2 Maps Required for Protected Areas

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Article 5.3 of Annex V of the Protocol on Environmental Protection to the Antarctic Treaty requires that proposed management plans for protected areas include, *inter alia*, "maps that show clearly the boundary of the area in relation to features surrounding and within the area". This is not a new requirement for Antarctic protected areas but many previous maps have failed to "show clearly" the area being protected.

The purpose of this account is to provide some guidelines for drafting acceptable maps to enable the designated area to be readily identifiable from the maps.

Ideally three maps should be provided (see Fig. 1):

1. An index map of Antarctica to locate the particular region on the continent.
2. An index map of the region to locate more closely the protected area and the position of the third map.
3. A large scale map of the protected area and its immediate environs.

The first two maps are straightforward and may even be shown as large scale insets on the third map if space allows. In future, the first two maps should be based on datasets provided by the SCAR Antarctic Digital Database (SCAR, 1993: a topographic database on compact disk (CD-ROM) with *User's Guide and Reference Manual*). Use of these data sets will ensure standardised maps and coordinates for regional and continental maps.

The third map is the most important. The scale will vary from area to area but the overriding criterion is that it should be reproducible on a standard page size (typically A4: 210mm by 297mm). The map will not be reproduced in colour in Antarctic Treaty documents so that the original must be a black and white line diagram with black and white ornament and legend as necessary. The margins of all maps must show latitude and longitude coordinates and there must be a linear scale in kilometres. Do not use numerical scales (e.g. 1:10,000) as these will not be valid if the original map is enlarged or reduced for publication. By convention, north should always be at the top of the map and for maps of the whole continent, the Greenwich meridian (0°) should be vertical and pointing towards the top of the map.

The large scale map should be based on the most up-to-date maps and charts available. It will be worthwhile considering if the Antarctic Digital Topographic Database can supply adequate detail. Additional detail may be usefully obtained from air photographs and satellite images, but care should be exercised when taking data from unofficial or unpublished field maps to ensure their accuracy. The sources of information used could be usefully appended to the map and the map itself should show the date of compilation. This is particularly important where ice features are shown because these can change significantly on short time-scales (e.g. glacier advance, ice cliff collapse and retreat).

This is essentially a topographic map showing clearly the principal land form features of the protected area and its immediate environs. Features to be shown will include coastlines, streams, ponds, lakes, ice margins, ridges, peaks and other major diagnostic features. Form lines or

contours, where available, also help to provide a third dimension to the map which can be invaluable for forming a mental picture of the terrain and they will help in the development of 3-dimensional models for Geographic Information System (GIS) applications. This much will enable the reader to recognize the area on the ground. Superimposed on the map will be the boundaries of the protected area.

The map so far described should now contain all the essential ingredients. However, there are many other details which can be added to facilitate use of the map. Further topographic features may be included (e.g. cliffs, scree slopes, bedrock areas, beach areas, moraines, etc.) and biological features (e.g. vegetated areas, seabird and seal breeding colonies) which can assist identification and location and may also be necessary (especially in the case of biological features) where that is the particular feature being protected. Marking areas of animal use or concentration (other than breeding sites) is not always so useful as these can vary from year to year.

The map should also show essential management information, such as approach routes from the land or the sea, recommended pathways and, in the case of helicopter landing sites, camp sites, huts, recommended view points and so on, where these should be located inside or outside the area. Official place-names are also a useful addition to make written descriptions easier, but unofficial place-names should be avoided.

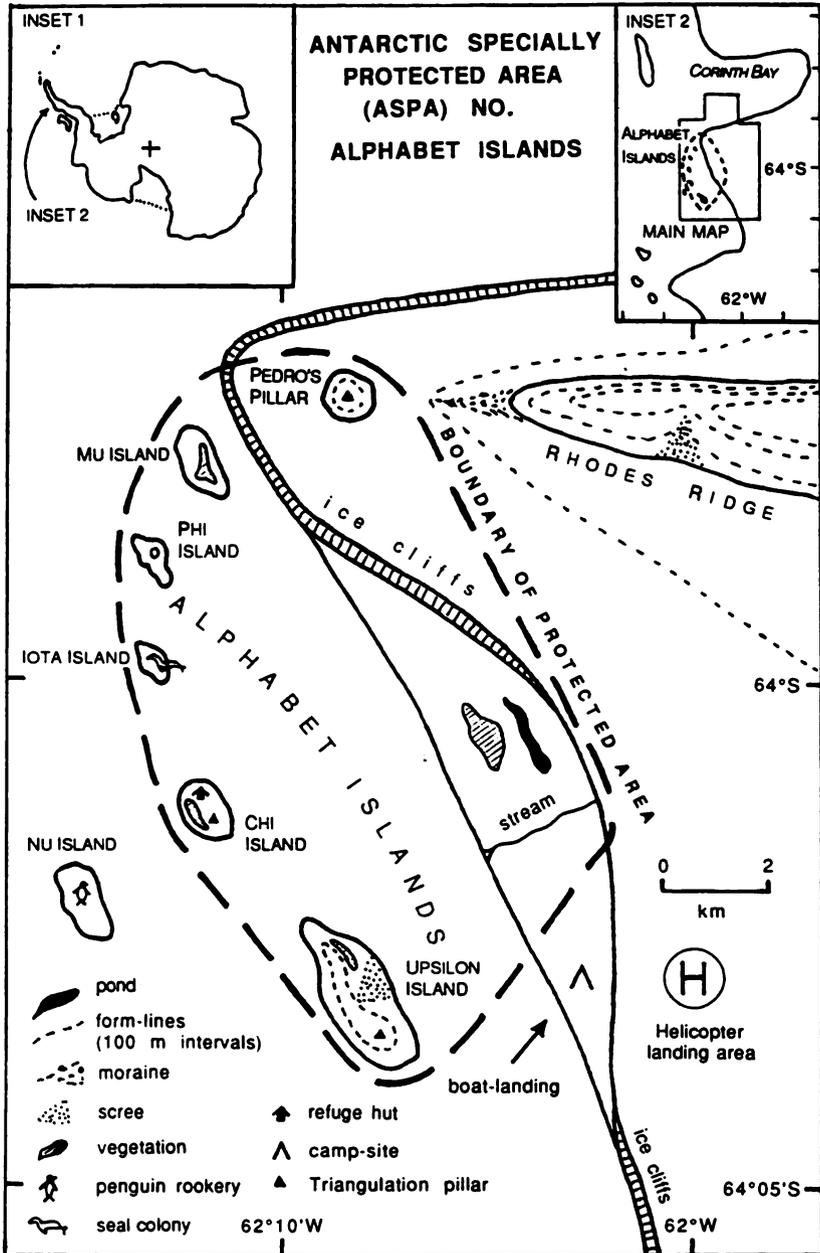
All symbols and ornaments used on the map must be clearly identified, either on the map or in a comprehensive legend. The use of standard symbols is recommended and those approved by SCAR may be most appropriate. Note that aquatic features (marine, inland water and ice) are italicized. (*Standard symbols for use on maps of Antarctica*, Edition 2; compiled by the SCAR Working Group on Geodesy and Cartography, 1980. ISBN 0 642 51475 5. This publication is currently being revised by the SCAR Working Group on Geodesy and Geographic Information).

This list of criteria for preparing maps for protected areas is neither prescriptive nor exhaustive, merely illustrative. However, it will be apparent that the first listed requirements are effectively prescriptive. When drafting any map, the principal objective must be to make the map as effective and easy to use as possible by the reader. It is also important to ensure that the map is clearly drawn and lettered at a size that can withstand reduction to a final published size. It is also essential that, while all relevant information is included, the map is not cluttered by an excess of features or placenames.

An example map of a fictitious Antarctic Specially Protected Area (ASP) is given in Figure 1 to illustrate most of the points made in this paper.

As a final note, now that the Antarctic Digital Database has been published and increasing emphasis is being given to GISs, it would be extremely valuable if all the information required for GIS applications could be submitted with the management plans, perhaps as an appendix or annex.

**FIG. 1** Example of maps required for a hypothetical ASPA showing typical features which should be marked.





### 3.3 Site Surveillance and Regulation of Use of Protected Areas

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#### 1. Background

There are a number of weaknesses in the present Protected Area System. For example, Article VIII of the Agreed Measures for the Conservation of Antarctic Fauna and Flora provides that entry into Specially Protected Areas (SPAs) shall be prohibited except in cases where a permit has been issued for a compelling scientific purpose which cannot be served elsewhere. There is, however, no common set of criteria to guide governments in assessing the compelling scientific purpose for which permits could be authorized for entry into SPAs.

Another flaw is that the Antarctic Treaty Parties are not obligated to comply with management plans for Sites of Special Scientific Interest (SSSIs), even though the management plans have been endorsed by SCAR and approved by an Antarctic Treaty Consultative Meeting. Recommendations designating SSSIs call upon governments to "voluntarily take account of the management plans" annexed to them. Also, there is no requirement or specified procedure for notifying other governments of activities authorized to be conducted in either SPAs or SSSIs, or for recording violations of the approved Management Plans.

These weaknesses were generally recognized and taken into account in the development of Annex V of the Protocol on Environmental Protection to the Antarctic Treaty, concluded in 1991. Among other things, the Annex provides that:

- Any area, including any marine area, may be designated as an Antarctic Specially Protected Area to protect outstanding environmental, scientific, historic, aesthetic, or wilderness values, or any combinations of those values, or ongoing or planned scientific research;
- all existing SPAs and SSSIs shall be designated as Antarctic Specially Protected Areas (ASPAs) when the Protocol enters into force, and shall be renamed and renumbered accordingly;
- entry into an Antarctic Specially Protected Area shall be prohibited except in accordance with a permit issued by an appropriate authority;
- proposals for designating an area as an Antarctic Specially Protected Area must be accompanied by a proposed management plan describing, among other things, the

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<sup>1</sup> The views expressed in this paper reflect those of the authors and not those of the United States Government.

conditions under which permits may be granted to authorize entry into and various activities in the Area; and

- upon approval, Management Plans shall be circulated promptly by the Depository to all Parties. The Depository shall maintain a record of all currently approved Management Plans.

Article 7 of the Annex specifies that "Each Party shall appoint an appropriate authority to issue permits to enter and engage in activities within an Antarctic Specially Protected Area in accordance with the requirements of the Management Plan relating to that Area. This Article also specifies that:

- The permit shall be accompanied by the relevant sections of the Management Plan and shall specify the extent and location of the Area, the authorized activities and when, where and by whom the activities are authorized to be conducted, and any other conditions imposed by the Management Plan; and
- permit holders shall be required to carry a copy of the permit when in the Antarctic Specially Protected Area concerned.

Article 9 of the Annex calls upon Treaty Parties to ensure that all persons visiting Antarctica (e.g. scientists, station personnel, tourists) understand and observe the "do's-and-don'ts" related to Antarctic Specially Protected Areas. Article 10 of the Annex specifies, among other things, that:

- Each Party conducting, funding or authorizing research or other activities in Antarctic Specially Protected Areas shall maintain a record of such activities and in the annual exchange of information in accordance with the Antarctic Treaty shall provide summary descriptions of the activities conducted by persons subject to its jurisdiction in such Areas and any instances of activities in contravention of the provisions of the approved Management Plans for Antarctic Specially Protected Areas.

Article 10 also specifies that the Parties shall make arrangements for:

- (a) Collecting and exchanging records, including records of permits and reports of inspection visits to Antarctic Specially Protected Areas;
- (b) obtaining and exchanging information on any significant change in or damage to any Antarctic Specially Protected Area; and
- (c) establishing common forms in which records and information shall be exchanged.

## **2. Analysis**

Successful implementation of the Annex will require that the Antarctic Treaty Parties take several actions, individually and collectively.

- (a) Most importantly, all Parties must ratify or otherwise accept or accede to the Protocol so that it will enter into force.
- (b) Each Party that has not already done so must establish a permitting system and designate an "appropriate authority" to issue permits authorizing its nationals to

enter and engage in activities within ASPAs in accordance with the requirements of the approved management plans for such areas.

- (c) Each Party that has not already done so must establish procedures for ensuring that **all** of its nationals visiting Antarctica (tourists and station support personnel, as well as scientists) are aware of (i) the locations of any ASPAs in and near areas that they may visit or work in; (ii) the ways that these Areas are marked and can be recognized on sight; and (iii) the prohibitions on entering such areas except in accordance with a permit issued by an appropriate authority. Each Party also must take such steps as necessary to ensure that its nationals comply with the prohibitions on entering Specially Protected Areas and, in cases where entry is authorized by permit, to ensure that the permit holder is aware of and complies with the provisions of the Area Management Plan.
- (d) The Parties must agree collectively and make arrangements for: exchanging information on the number and nature of permits issued and on activities carried out in ASPAs; and obtaining and exchanging information on any significant change in or damage to any Antarctic Protected Area, and steps taken to address any instances of activities in contravention of the provisions of the approved Management Plan for a Specially Protected Area.

### **3. Recommendations**

To assist the Antarctic Treaty Parties implement the above-referenced provisions of Protocol Annex V four recommendations are made.

- (a) **Develop an Effective Permitting System** : (i) provide for a qualified authority to review applications in writing for permits before any field work is endorsed, to ensure that the activities specified can be carried out in accordance with the approved Area Management Plan; (ii) ensure that persons carrying out approved activities are fully aware of what they can and cannot do by providing with the permit a copy of the relevant sections of the Management Plan together with location maps of the area, the authorized activities and when, where and by whom the activities are authorized; and (iii) establish reporting requirements and a record of activities carried out in Specially Protected Areas. Reports should include: a brief description of when, where and what activities were carried out; any observations made in the course of the authorized activities of changes in or damage to any of the special features of the Specially Protected Area; any observations of activities carried out in or near the area in possible contravention of the Management Plan for the area; and the name, institutional affiliation, and telephone, fax and e-mail numbers of a person (usually the Permit Holder) who can be contacted to obtain additional information on the activities that were conducted. Reporting requirements should be specified in the permits, and subsequent permit applications by the Permit Holder should not be acted upon if the reports required by previous permits have not been submitted.
- (b) **Provide Information and Education**: To ensure that persons working in or visiting Antarctica (i) know the locations of Specially Protected Areas; (ii) know that entry into such areas is prohibited except in accordance with a permit issued by an appropriate national authority; and (iii) can determine when they are approaching or entering a Specially Protected Area, each Antarctic Treaty Party should (a) identify all

existing SSSIs, SPAs and Historic Sites and Monuments in areas where its nationals are likely to work or visit; (b) as far as possible, review the site descriptions and visit each area at least once every five years to ensure that these are accurate and that the borders of the areas are clearly marked; and (c) ensure that the locations and, as far as possible, the boundaries of existing SPAs, SSSIs and Historic Sites and Monuments are shown on topographic maps, hydrographic charts, and any other publications pertaining to the Antarctic.

- (c) **Improve Site Surveillance:** ATCM XIV called upon the Contracting Parties to undertake visits to as many Areas, Sites and Monuments as possible, when access and opportunity exist, and provide reports of such visits for review by the Consultative Meetings. The meeting recognized that such visits might have adverse, as well as beneficial effects. It cautioned that, in undertaking inspection visits, relevant management provisions should be strictly adhered to, so as to ensure that they do not have adverse environmental impacts. The meeting also developed, and appended to the meeting report, a list of the types of information that should be collected during site visits. [More recently ATCM XVII has requested SCAR to provide a revised version of this checklist].

Each Contracting Party should therefore identify areas that have been afforded special protection in and near areas where its nationals are carrying out scientific research programmes and, as feasible, include in its annual operations plan, provisions for periodically inspecting such sites.

- (d) **Improve Exchange of Information:** Although Article 10 of the Protocol calls upon the Parties to make arrangements for collecting and exchanging information, it does not specify what, or in what form, information should be collected and reported. It would be useful to ask SCAR, COMNAPs, IUCN and other appropriate organizations for advice on what types of information are required and what type of data collection and dissemination system should be implemented for the management of protected areas.

It is not unreasonable to expect that instances of activities in contravention of approved management plans will be observed and reported. Each Party will be responsible for dealing with actual or possible violations by its nationals. Knowledge of violations, and consistency in dealing with them, might be enhanced by (a) constituting a formal or *ad hoc* "Infractions Committee" to meet during and report to the regular meetings of the Antarctic Treaty Consultative Parties; and (b) require that instances of activities in contravention of approved management plans, and steps taken to address such instances, be reported to the Infractions Committee at or in advance of each Consultative Meeting.

## 3.4 Active Management of Protected Areas

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### 1. Introduction

The purpose of conservation is to prevent the loss of something considered valuable. The old concept of management for protected areas was to ban various activities within them, e.g. killing animals, damaging vegetation or even entry. If enough prohibitions were in place, the area was deemed to be adequately protected, change would be prevented and conservation achieved.

Passive management, based solely on restrictive measures, is now widely recognised as inadequate for fulfilling all the objectives of conservation. Taking active steps, so as deliberately to prevent or reverse change in the area protected, is seen as essential in many cases.

Passive management was the type of management provided under the Antarctic Treaty by the Agreed Measures for the Conservation of Antarctic Fauna and Flora for Specially Protected Areas (and to a large extent, to the Antarctic Treaty Area generally). Prior to 1989, no specific management plan was required for a Specially Protected Area (SPA). Such general management measures as existed were set out in Article VIII of the Agreed Measures and there was no provision for the adoption of further management measures designed specifically for particular sites.

### 2. The legal framework

In response to a request for advice contained in Recommendation XIII-5 from the XIII Antarctic Treaty Consultative Meeting, SCAR presented a paper *The Protected Area System in the Antarctic* (SCAR, 1987) that recommended, *inter alia*, that a management plan should be prepared for each existing, and all future, SPAs. SCAR's paper was only briefly considered at the XIV ATCM, but at the XV ATCM two recommendations were adopted. Recommendation XV-8 allowed the insertion of wording in Article VIII of the Agreed Measures that referred to a Management Plan accompanying the description of a Specially Protected Area. Recommendation XV-9 dealt with the development of improved descriptions and management plans for SPAs. This recommended (para. 2) that:

"Future proposals for designating Specially Protected Areas include:

- (a) a clear description of the location and the key physical and biological features of the area to be protected, including a description of the markers and/or natural features that delineate the area;
- (b) a map and/or photographs showing the boundaries and key features of the proposed Specially Protected Area;
- (c) a detailed description of the key components of the unique natural ecological system intended to be preserved by designating the Area as a Specially Protected Area;
- (d) descriptions of the types of activities (including activities outside the Area) that could jeopardise any of the components of the unique ecological system intended to be preserved;

- (e) descriptions of steps that should be taken to avoid or minimise damage in cases where access to the area may be authorised for a compelling scientific purpose which cannot be served elsewhere; and
- (f) descriptions of measures necessary to ensure preservation of the area's unique or representative natural ecological systems".

It is the final sub-paragraph that is most significant in terms of active management. Not only does it introduce the term "representative" for the first time in the Recommendation, thus broadening the scope of designation from uniqueness, as required by Recommendation VII-2, *Review of Specially Protected Areas*, but also provides the opportunity for policies of active management.

What are the essentials of active management? First a clear definition of the objective to be achieved by protection. Once the objective has been decided, it is possible to design a programme of activities to achieve this. These activities constitute what is more generally considered as active management.

Recommendation XV-9 does not contain reference to the objective of designation. This Recommendation has not come into force and is likely to be overtaken by Recommendation XVI-10 which introduced Annex V on Area Protection and Management to the Protocol on Environmental Protection to the Antarctic Treaty.

Despite some evidence of having been negotiated in haste, Annex V contains many valuable ideas. Article 5, *Management Plans*, para. 3 (b) states that each designated area shall have a management plan containing, *inter alia*, "a statement of the aims and objectives of the Management Plan for the protection or management of those values [for which special protection or management is required]". Para 3 (i) (ix) refers to the granting of permits authorising "measures that may be necessary to ensure that the aims and objectives of the Management Plan can continue to be met". This is a clear statement that active management is permitted, since the appropriate authority of each Party can issue permits to enter and engage in activities within an Antarctic Specially Protected Area (ASPA—the Annex 5 analogue of the Specially Protected Area of the Agreed Measures).

The legal mechanism for active management in the Antarctic is thus in place. What are the essentials that this should cover?

### **3. Definition of objective**

It is of prime importance that when an area is designated very careful thought is given to defining objectives. The objective may imply minimal management. For example, setting aside an area of near-pristine ice-cap to remain inviolate so that in the future it may be used for purposes of comparison with localities that have been disturbed by people (para 1 (e) of Recommendation VII-2) may require almost only passive management. Much more active management might be required for an area designated to protect a particular lichen community, should non-human impacts arise. In general, management plans, including those adopted under Rec. XVI-6, do not state objectives sufficiently clearly. Objectives have to be deduced from Section 2 (ii) of the plan, *Reason for designation*. This usually describes the salient features of the area, but does not clearly identify the objective which has to be attained.

## 4. Site boundary and zone markers

These are essential for proper management, since under field conditions the status of any particular area may not be obvious. If an area is not known to be protected, it is unlikely that any of the provisions of its management plan will be observed. A site may be divided into different zones, with differing degrees of protection or permitted activities. If such a zoning system is to work the boundaries between the zones must be either self-evident or clearly marked.

## 5. Recording and auditing

Recording information about a site and auditing change in key components of its ecosystem is an essential part of any management plan. Without initial base-line data it is rarely justifiable to designate a site or draft a management plan. Without audit it is impossible to determine whether the objective of designation is being achieved. It is not entirely clear whether the framework for management plans given in Article 5 of Annex V requires the provision of adequate base-line data. Para 3 (a) requires the inclusion of "a description of the value or values for which special protection or management is required", but it is not explicit that this should provide sufficient data against which to design an audit programme to detect change. There is no reference in Annex V to auditing requirements, though there is provision for the exchange of information about inspection visits (Article 10).

## 6. System manipulation

If a protected area has been designated with the objective of preserving a unique community and, following the designation, a vigorous invader shows signs of destroying or dominating the community, then management measures may be called for. On long time scales, natural successional changes may occur. Many conservation management plans in temperate regions call for activities such as scrub clearance, or coppicing, to check such successions. It is difficult to imagine a management system in the Antarctic lasting long enough to have to deal with such natural successional changes, even if this were thought appropriate, but climatic changes induced by the anthropogenic greenhouse effect may cause problems in the medium term.

An outstanding, but exceptional, example of change in the Antarctic Peninsula region has been caused by the sudden increase of Antarctic fur seals. Two protected areas in the South Orkney Islands, Lynch Island (SPA No. 14), and, to a lesser extent, Moe Island (SPA No. 13) have been significantly affected by fur seal activity. Lynch Island was designated an SPA because the island supports one of the most extensive and dense stands of Antarctic hair grass (*Deschampsia antarctica*) known in the Treaty Area. Trampling and manuring by the seals has destroyed extensive areas of cryptogamic vegetation and stands of the grass and permitted invasion of the nitrogen-enriched eroded soil and peat by the terrestrial thallose alga *Prasiola crispa*. Similar, but not such extensive, damage has occurred at Moe Island. Extensive destruction of vegetation by fur seals is also occurring on Litchfield Island (SPA 17).

At Signy Island, the erection of fences has proved successful in preventing the incursion of seals into restricted parts of the island. Following an inspection visit report for Lynch and Moe Islands, this matter was discussed at the XV ATCM. Because of the potentially very serious damage that might be caused to the vegetation of these sites by fur seals it had been proposed that seal-proof fences might be erected to deny the seals access to the main vegetated areas. However, some

delegates were reluctant with what they considered to be a "natural" process and that such action would be inconsistent with the existing Agreed Measures, since there was no provision for granting permits to enter the site except for a compelling *scientific* purpose.

The reason for the sudden eruption of fur seals (almost exclusively young non-breeding males) in the South Orkneys and Antarctic Peninsula is not known. It matches the great increase at South Georgia, especially since the early 1970s. The fact that the grass swards which are being destroyed by the seals in the South Orkneys (and in South Georgia) pre-date the earliest sealing activities indicates that this is not simply the recovery of a population depressed by sealing, but a new phenomenon. This may be associated with the elimination of most of the great whales in the area which, like the fur seals, feed on Antarctic krill. The seals may be exhibiting competitive release as a consequence of the severe perturbation of the higher predator stratum of the marine ecosystem as a result of commercial whaling. If this is in fact the case, the eruption of the fur seals should not be regarded as a natural phenomenon but rather as a consequence of earlier human impacts.

## **7. Application of active management**

Now, in accordance with Article 5 of Annex V of the Protocol, active management "to protect the values for which special protection or management is required" is permitted, but should be stated in the new management plan for respective sites. In the case of Lynch Island fencing will be erected to prevent access by the seals to the island's special grass swards and other well-developed vegetation.

Management of any form, if it is to be meaningful, requires a manager. This presents difficulties to the Antarctic Treaty since Parties are reluctant to accord special powers to any single Party, lest this imply some aspect of sovereignty, contrary to Article IV (2) of the Treaty. The effective manager under the Antarctic Treaty is the Consultative Meeting, since all Parties are represented and decisions are reached by consensus. However, the Consultative Meeting is never in a position to make management decisions in the field and even with annual Treaty meetings, lengthy delays are inevitable.

The same objections would apply to the Committee for Environmental Protection, when that comes into operation under the Protocol. A possible solution would be for the CEP to set up a small working group of interested Parties to make management decisions inter-sessionally for a particular protected area, or group of protected areas, or geographical region. In this way decision making might be speeded up and persons with field experience of the areas in question might be brought into the group.

An even simpler solution might be for the management responsibility to devolve onto the Party which originally proposed the designation of the protected area. Some management activities (e.g. preparation of a site description, site marking) already fall to the designating Party, and management might be seen as a logical extension of this.

## **8. Conclusions**

Management of protected areas is a subject which so far the Antarctic Treaty has barely addressed. The need for at least minimal active management procedures, such as signing, is apparent to anyone with field experience of protected areas in the Antarctic and this need may be expected to grow should, as is very likely, tourism increase in the Antarctic.

A further point which should not be overlooked is that almost any active management activity is likely to be expensive in terms of logistic support. Managers of National Antarctic Programmes may be reluctant to provide logistic support for environmental activities to which they are not fully committed by the Treaty or its Protocol. It is possible that a role may exist here for a non-governmental organisation, bearing in mind that most management activities might involve no more than a small party with minimum equipment and that many protected areas are accessible by sea during the summer.



## 3.5 The Role of COMNAP in Implementing Annex V of the Protocol on Environmental Protection to the Antarctic Treaty<sup>1</sup>

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### 1. Background

Annex V [*Area Protection and Management*] has not drastically changed the existing system of Protected Areas or their management. Rather, it has effectively rationalised what had become a clumsy and confused system in which there were at least eight categories of protected area.

At ATCM XVI, Bonn, the Protected Area System was revised and reduced to two categories, distinguished by their respective management plans; both may include marine areas and historic sites. These are:

1. *Antarctic Specially Protected Areas* (ASPAs) [Article 3], defined as "Any area...designated...to protect outstanding environmental, scientific, historic, aesthetic or wilderness values, any combination of those values, or on-going or planned scientific research". They will include all previously designated SPAs and SSSIs, which shall be renamed and renumbered accordingly, as well as some Historic Sites and Monuments and sites which would have been considered suitable as SRAs.

2. *Antarctic Specially Managed Areas* (ASMAs) [Article 4], defined as "Any area ... where activities are being conducted or may in the future be conducted, ... designated ... to assist in the planning and co-ordination of activities, avoid possible conflicts, improve co-operation between Parties or minimize environmental impacts". This category will include some Historic Sites and Monuments, as well as sites which would have been considered suitable as MUPAs. An ASMA may contain one or more ASPA.

### 2. Practical considerations to be addressed by the Council of Managers of National Antarctic Programmes (COMNAP)

New protected areas and their associated management plans can be proposed by any Consultative Party, the Committee for Environmental Protection, SCAR or CCAMLR. It would be better if this were done only after consultation with a national operator so that the relevant scientists and COMNAP can be fully involved. This is advisable to ensure that the site not only fulfills the criteria for designation, but also that its establishment and management are logistically feasible. The proposed management plan, supported by professionally drawn and accurate maps, is then to be forwarded to the Committee on Environmental Protection (CEP), SCAR (through its Group of Specialists on Environmental Affairs and Conservation—GOSEAC) and, as appropriate,

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<sup>1</sup> This paper was presented at the COMNAP Meeting, Bariloche, Argentina, 8–12 June 1992 (see *SCAR Bulletin* No. 109, 10, para. 8).

to CCAMLR, prior to being passed to ATCM for approval and ratification. It is not clear at present, since the CEP has yet to be formed, if the CEP will require new proposals **only after** GOSEAC has approved these, or at the same time as the initial submission to SCAR.

Once designated, a protected area becomes the responsibility of the proposer nation/nations with regard to the implementation and operation of its management plan. For most types of ASPAs and ASMA's this will involve both scientific and logistic commitment, although for some (e.g. Historic Sites and Monuments, see Article 8) management may be wholly a COMNAP responsibility, although its implementation must rely heavily on action by SCALOP.

### **3. The role of COMNAP in managing Protected Areas**

Article 5 [*Management Plan*] of Annex V details the requirements for ASPA and ASMA management plans. Of particular relevance to COMNAP are the following:

**(a) Identification of sites and demarcation of site boundaries**

Article 9 [*Information and Publicity*, section 3] states that:

"Parties shall co-operate to ensure that, where appropriate, the boundaries of Antarctic Specially Protected Areas, Antarctic Specially Managed Areas and Historic Sites and Monuments are suitably marked on the site".

As yet very few sites are identified on the ground by name, or have their boundaries demarcated. It is imperative that all non-island protected areas have suitable marker posts erected at intervals around their perimeter, especially at positions where the boundary changes direction, and at main access points. It is also important to erect signs specifying clearly and simply the name, number and purpose of the site. These should ideally be in more than one language (not necessarily the Treaty languages, depending on site location). However, while GOSEAC has discussed the need to standardise a system of marking and signposting protected area sites for several years, no agreement has yet been reached on how this may be achieved most satisfactorily. This was stated in the Report of the GOSEAC II meeting, Sao Paulo, July 1990, (*SCAR Report*, No. 7, January 1992, p. 8) as follows:

**"6.2 Identification of Protected Areas**

The Group advocated the desirability of developing and erecting a standard sign to demarcate, as appropriate, major access points to protected areas, and that, if acceptable, such a sign be designed to include the Antarctic Treaty logo, site name and category [e.g. ASPA, ASMA]. Also, SCAR should be urged to investigate the design, production, and placement of such signs through the COMNAPs".

Further concern was expressed at GOSEAC III, Woods Hole, May 1991, regarding the lack of official guidelines for the type of marking which should be employed and the information which should be displayed. Some nations, while keen to mark areas, are reluctant to commit resources to this while there is still uncertainty about what is required. The Group recommended that the Antarctic Treaty System should be encouraged to define such guidelines.

Now that the new Protocol has been approved by AT, and considering the rapid increase in tourist activity in the Antarctic), there is an urgent need to implement this requirement, both in the design of suitable signs and the deployment of these and boundary markers. It is worth noting that

signs already erected by some nations, and by Greenpeace, have been removed/stolen. [The UK has designed a standard site marker sign in 1994 and emplaced several at SPAs 13, 14 and 15 in the South Orkney Islands. All other SPAs and SSSIs for which the UK is responsible will be similarly signposted].

**(b) Issue of Permits**

Article 3 states that, for ASPAs:

"Entry into an Antarctic Specially Protected Area shall be prohibited except in accordance with a permit issued under Article 7". Note that Article 4 states that, for ASMAs: "Entry ... shall not require a permit".

Permits are issued by the Participating Government, but this responsibility is passed to the appropriate national operator (Article 7 [*Permits*]).

The permit must be accompanied by the relevant sections of the Management Plan, in particular those conditions outlined in Article 5, section 3.i, under which the permit may be granted. It should be noted that there is at present no standard permit for entry into ASPAs (or, in fact, for former SPAs). This subject had been discussed at GOSEAC I and II meetings, but not followed up because, as reported in the Report of the GOSEAC II meeting (*SCAR Report*, No. 7, January 1992, p. 7, section 5.11), "it is beyond SCAR's jurisdiction to design and issue permits for entry into protected areas, since these may come under national jurisdiction, ... ". However, GOSEAC did prepare a draft permit (Annex 19a) which was offered as a model to those national operators who may wish to adopt its format (*SCAR Report*, No. 7, p.49–50). The design of the form was endorsed by the Group. COMNAP may wish to consider producing a definitive Permit form, available in several languages.

**(c) Monitoring visits to protected areas**

The current system of monitoring activities in SPAs is for National Committees to submit a report of such visits, under permit, to the Antarctic Treaty Annual Exchange of Information. It is now a requirement, specified in Article 5 [*Management Plans*], section 3.i.x, of management plans for both ASPAs and ASMAs for "reports to be made to the appropriate authority regarding visits to the area". This topic was addressed by GOSEAC II which "agreed that a standardized form recording information derived from visits to protected areas would be of value in monitoring activities in such sites, and that National Committees and operators could be encouraged to use such a form. A [draft] form reporting on visits ... has been designed for completion after the visit has been undertaken, in accordance with specifications stated in an appropriate permit issued for the purpose of entry into the site" (see *SCAR Report*, No. 7, p. 7, section 5.11; and p. 51, Annex 19b). GOSEAC again endorsed the design of this form and welcomed its use as a means of monitoring visits to protected areas.

In conjunction with the production of a permit form, COMNAP may wish to consider a definitive *Report on Visit to ASPA* form.

**(d) Inspection and Maintenance of Protected Areas**

The Management Plan of an ASPA will include "measures that may be necessary to ensure that the aims and objectives of the Management Plan can continue to be met" (Article 5, section 3.i.ix).

It is important that all protected areas (i.e. ASPAs and ASMAs [notably Historic Sites and Monuments within this category]) are inspected from time to time to provide a report on their condition and possible changes since the previous inspection. Site markers, signs, structures, etc. may require attention and maintenance. Unless a research programme is planned specifically within an ASPA, it is seldom possible for scientists to visit such sites except on an opportunistic basis. It will therefore be necessary for COMNAPs to ensure that logistical arrangements are made on a regular time scale for ASPAs, for which they are responsible (i.e. those which were proposed by their National Committee), to be visited by an appropriate inspection team (which should include one or more scientists experienced in the attributes for which the site has been designated). A report of their findings should be provided in the AT Annual Exchange of Information, in accordance with Article 10 [*Exchange of Information*]. It is suggested that, for those sites which are not regularly (i.e. annually or biennially) visited by scientists or non-scientists, inspection visits should be made at least once every three to five years to assess the state of the site and to monitor any significant biological or environmental changes.

**(e) Education and Consultation**

The success of implementing the Protocol and, in particular, the protected area management plans, will be dependent on the willing support and cooperation of those personnel living and working in the Antarctic, as well as on those home-based national operators responsible for planning Antarctic science and logistic activities. This is a prerequisite of Article 9 [*Information and Publicity*], which states that:

"With a view to ensuring that all persons visiting or proposing to visit Antarctica understand and observe the provisions of the Annex, each Party shall make available information setting forth, in particular:

- a. the location of Antarctic Specially Protected Areas and Antarctic Specially Managed Areas;
- b. listing and maps of those Areas;
- c. the Management Plans, including listings of prohibitions relevant to each Area;
- d. the location of Historic Sites and Monuments and any relevant prohibition or restriction."

The Article also requires that each party ensures that the location and limits of ASPAs, ASMAs and Historic Sites and Monuments are shown on topographic maps and hydrographic charts. In each instance, COMNAP should be directly involved in providing this information and ensuring it is readily available.

It is crucial that all such persons under the control of each National Operator (managerial, scientific and support personnel alike) are well informed about the location, boundaries, purpose, management plan and, especially, restrictions and prohibitions, etc. pertaining to each ASPA or ASMA within their operating area. It is particularly important that station commanders, principal investigators of research programmes, ship officers, and aircraft crew are familiar with these details.

To achieve this will require a greater degree of education and publicity than currently exists for most Antarctic operating nations. It is most important that all personnel departing for the Antarctic, in whatever professional capacity, attend a briefing lecture explaining the relevant aspects of the Protocol and details of any protected areas, and their respective management plan, that these persons may encounter during their work in the Antarctic. It is the responsibility of each national

COMNAP member to ensure his/her National Operator provides such up-to-date education. This will require close collaboration with the AT CEP and SCAR GOSEAC.

Dissemination of relevant information may be achieved verbally and visually (films, videos, etc.), but it is helpful to have educational posters, leaflets, brochures, etc. permanently and prominently displayed at Antarctic stations and on ships. To this end, COMNAP can play a vital role in producing suitable educational material to publicise the purpose of protected areas and the need for responsible behaviour within such areas. There is an urgent need for a simplified *Protected Areas Guide* to be produced for station commanders, ships' officers, aircraft crew, etc. This should be an official SCAR production, along the lines of the excellent *Southern Ocean Cruising Handbook* by S. and J. Poncet (Falkland Islands Government Printing Office, 1991). It would be most beneficial if COMNAP would consider preparing such a (multilingual?) manual, to include a Code of Conduct for personnel intending to enter such areas. This should be provided to personnel prior to departure from their home country, as well as being available at the station or on the ship, etc. from which they will be operating.

It is imperative that there is regular consultation between COMNAP members before proposing new activities in the Antarctic, whether these relate to station development or scientific programmes. This must allow adequate time for possible conflicts of interest to be discussed and mitigation procedures agreed. The recent situation regarding the installation of a Satellite Earth Station within SSSI No. 2 on First Crater, Arrival Heights, Ross Island, is an example of a serious situation which could have been avoided if there had been consultation between the Parties concerned.

In order to prevent such unfortunate incidents in the future, it is most important that national members of COMNAP take Annex V [*Area Protection and Management*] seriously. Environmental protection and management will, if it has not already done so, become the most critical aspect of the future use of Antarctica, and COMNAP has a crucial role to play in achieving the requirements laid out in Annex V of the Protocol.

**(f) Recommended action to be considered by COMNAP**

1. Design a standard sign and boundary marker posts for protected areas;
2. Coordinate the arrangements for installation of protected area signs and boundary markers;
3. Design a standard Permit form for entry into ASPAs;
4. Design a standard "Report on Visit to ASPA form" (for AT Annual Exchange of Information);
5. Coordinate the arrangements, through individual operators, for occasional (3–5 year) inspection and maintenance visits to protected areas;
6. Preparation, publication and distribution of multilingual educational and information material, including a basic "Protected Areas Guide and Code of Conduct".

At XVII ATCM (Venice, 1992) COMNAP initiated a series of actions to be developed over the following year, and offered to the ATCM to assist in the implementation of the above recommendations.



## 3.6 Summary and Conclusions

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Under the "Agreed Measures for the Conservation of Fauna and Flora", protected areas were required to be the minimum size necessary to achieve the required protection. There was general agreement that this was no longer a valid concept and that an opposite approach was needed, to protect the maximum areas practicable to guarantee the required protection. This immediately led to a discussion of buffer zones to protect the core of the protected area. An example given was the protection of the foraging range of an animal whose breeding area on land was protected. However, it was pointed out that this might be unrealistic in the case of a bird species, such as the giant petrel, with a foraging range along the length of the Antarctic Peninsula and up to several hundred kilometres offshore. In this respect, the concept of proposing a protected area to protect a process received general agreement. For example, the foraging area itself should not necessarily be protected but the process of foraging should be protected; similarly, protection of some areas of vegetation may be of lesser importance than protection of the process of plant growth.

Buffer zones should be a more widely-used concept in proposing protected areas. Attention was drawn to the examples of Caughley Beach and Mount Melbourne, where an SPA is partly or completely surrounded by an SSSI. However, it was generally felt that buffer zones would be better built into the overall shape and size of the protected area rather than being a part of the area explicitly described as a buffer zone.

The shape of protected areas should be dictated by natural features as far as possible, especially where inland waters or vegetated areas are concerned because they can be used effectively to protect the entire catchment area of the principal protected feature of the site. However, accurate definition of boundaries needs to be addressed more carefully than hitherto, particularly in the case of coastlines. Even when declaring an entire island as a protected area it must be clearly stated whether or not the intertidal zone is included and even whether a "buffer zone" in the adjacent waters is to be included.

The value of GPS (Global Positioning System) data for fixing boundary positions was stressed as these can be accurately displayed on maps. These data also provide unequivocal positions although care needs to be taken, particularly on large-scale maps, to ensure that the map projection and the graticule of the GPS data are identical, otherwise systematic errors may occur.

Few, if any, protected areas are adequately marked on the ground at present. Some national operators and Greenpeace had erected signs of various types and with varying degrees of success. The permanence of signs was considered important, not simply to withstand the rigours of the Antarctic weather but also to prove unattractive and difficult to collect as souvenirs. Operators who had erected signs had experienced a high attrition rate through natural and other causes.

In most cases the type of sign would depend very largely on the type and amount of information it would carry. Some people favoured a simple "Protected Area—Keep Out" type of sign, others favoured a much more informative type which might have a canister containing a copy or copies of the management plan including a map. It was agreed that only the ATCPs have the right to erect

signs although the efforts of others were applauded as being in the correct spirit of environmental conservation. It was also agreed that having a single authority responsible for the design and erection of signs would lead to uniformity and consistency of signs, making a protected area boundary marker immediately recognizable wherever it was found. Under the Protocol it is clear that the responsibility for marking sites lies with the ATCPs. One principle of marking sites which was agreed was that signs should be placed at the usual approach route or routes to the sites.

The Chairman (D. W. H. Walton) summed up the first part of the session as follows:

1. It was agreed that protected area boundaries should be clearly defined and follow natural boundaries as far as possible.
2. It was agreed that GPS techniques should be used for fixing the positions of protected area boundaries as far as possible.
3. It was agreed that protected area boundaries should be marked on the ground by appropriate signs.
4. It was agreed that only the ATCPs have the right to erect or arrange to have erected such signs.
5. There was no agreement on either the type of sign to be used or the extent of the information it should carry.
6. It was agreed that the concept of buffering should be employed wherever this was appropriate.

D. W. H. Walton introduced three papers two on behalf of their authors *in absentia*:

Management planning for Antarctic protected areas by S. B. Abbot. (Note this paper is not included in these Proceedings, but is intended to be published elsewhere);

Information to be included in management plans for CEMP sites by CCAMLR;

Annex V to the Protocol on Environmental Protection to the Antarctic Treaty: Area Protection and Management.

Reference was made to the new management plans for SPA Nos. 1, 2 and 3 which had been prepared by Australia in the format required for ASPAs under Annex V of the Protocol (See XVII ATCM, Recommendation-2). It was reported that writing the plans had been relatively straightforward but that gathering the information, collating and checking it had been very time-consuming. Furthermore, some guidance on preparing maps to accompany the management plans would have been particularly helpful. It was felt that a guide to writing management plans, in a similar vein to "*The Antarctic Environmental Assessment Process: Practical Guidelines*" prepared by COMNAP, would be useful for persons writing such plans for the first time, particularly persons from countries new to Antarctic work. Canada and Australia both produce guides for preparing plans for protected areas in these countries and they are used extensively. It was suggested that a handbook would assist with consistency of terminology although there may be some difficulty with translation into the official Antarctic Treaty languages. Thus it was agreed that a handbook on writing management plans would be very valuable and that a section on preparing maps could usefully be included.

Other aspects of management plans were also discussed. A common, almost universal shortcoming of existing management plans of SPAs was the lack of a clear statement of the objectives

of protection in an area. When the Protocol does come into force, all existing SPAs and SSSIs will automatically become ASPAs and will require management plans but the legislation does not specify revision of any existing plans. How will this be done, and by whom? A suggestion was made that all existing management plans should be re-ordered as far as possible to conform with Annex V and then submitted to the originators for comment and revision. This approach might be more successful in prompting action than simply requesting originators to rewrite the management plans. However, the question "by whom" remained unanswered. Further difficulties were foreseen in the relationship between areas protected under the Antarctic Treaty and those protected under CCAMLR (i.e. the CEMP sites). This was seen as a problem requiring legal clarification.

Management of protected areas was also cited as a potential problem because of the absence of sovereign territory in the Antarctic Treaty Area. The opinion was expressed that this would not actually be a problem in the case of ASPAs but that it might be a problem for an ASMA where a non-claimant state could be charged with the management of an area. However, the resolution of these matters was considered to be beyond the competence or remit of the workshop members and the Chairman suggested that such legal aspects should be best left to the ATCM.

The Chairman closed the second part of the session with the following conclusions:

1. A handbook or guide to writing management plans for protected areas would be a valuable document.
2. Management Plans should have clearly stated objectives.
3. The work should include a section on the preparation of maps for protected areas.
4. The completed document should be reviewed by SCAR.

The effectiveness of any system for granting permits for entry to protected areas depends on a number of elements. The key requirement is a management plan that clearly sets out the values to be protected, and the way in which the site will be managed. Management plans must give unambiguous guidance to both the administrator of the permit system so that the conditions regarding visits to protected areas can be specified, and to permit holders so that they understand the sensitivity of the area which they wish to enter. The administering authority must be qualified to make competent judgements on the extent to which proposed activities are consistent with management plans, and be able to review activities in protected areas (including past activities) and procedures to ensure compliance.

Proposals for activities within protected areas should be scientifically and environmentally sound—this may involve, where relevant, an element of peer review of applications for permits. To avoid misunderstandings of the management decisions subsequently taken permits should be in writing, specifying how and when activities may be undertaken, and by whom.

One way in which the effectiveness of the permit process may be indicated would be to require a report of activities undertaken in accordance with the permits (cf. Annex V, Article 10, *Exchange of Information*). Such reports could include subjective views on the conditions of the site and the extent to which management plans are achieving protection of the values for which the site was designated.

It was agreed that, to be effective and supported by users of protected areas, the permit system should be practical, simple, and clearly understood so as not to discourage people from applying for permits. Permits should be issued as quickly as possible, even when it becomes necessary to change the original activities.

A need to visit protected areas to establish the extent to which management plans are achieving protection of the values for which sites were designated was clearly identified. It was noted, however, that such a visit should not be approved if it is likely to degrade the values of the site. Management plans should indicate the inspection provisions appropriate to sites on a case by case basis. Visits solely for inspection purposes should only be required where there has been an extended period between scientific visits or where there are convincing management purposes to be served. This might include inspection of sites because the values for which the site was designated are under threat from natural or human induced incidents.

The distinction between Antarctic sites, which need protection, and those that need management was recognized. In the latter category, which could include both ASPAs and ASMAs, it was noted that either passive or active management techniques may need to be applied, depending on the values which need to be protected in individual sites. It was acknowledged that at some sites it may be desirable to do nothing within the site itself—because any action in the site may have the potential to interfere with vulnerable or poorly understood processes. On the other hand active management techniques are desirable where human or natural activity may pose a threat to the integrity of the site. Thus, it was recognised that it is the nature of the impact which determines the kind of management.

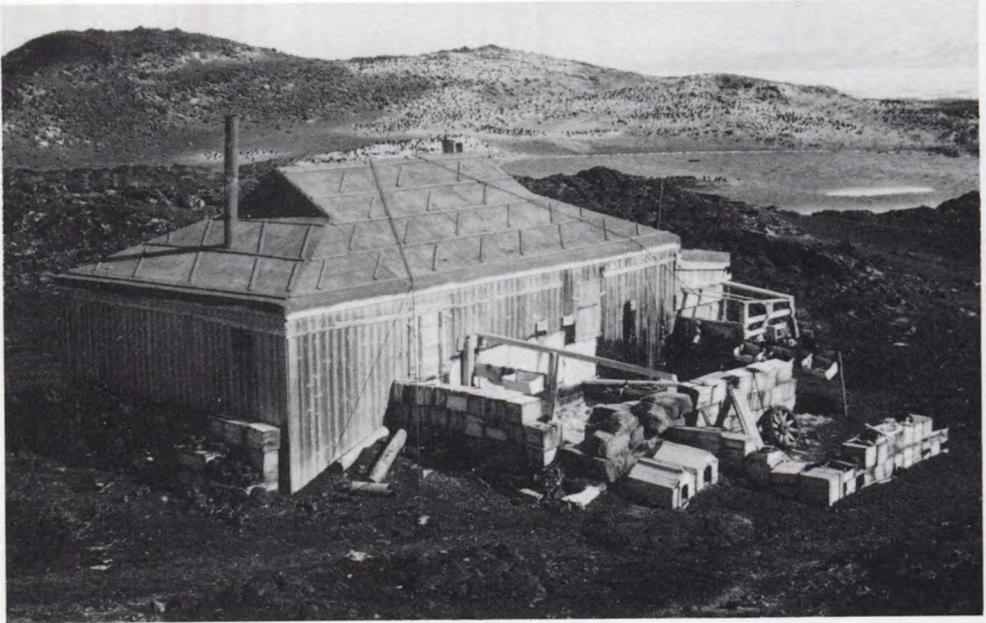
Procedures which involve the manipulation of natural systems may be indicated when essential scientific opportunities or ecological processes may be lost if the action is not taken. However, in the Antarctic context it was agreed that such circumstances would be exceptional and, in any event, would depend on accurate baseline information. In most existing protected areas there are few, if any, such data on which to base management guidelines.

Monitoring the effectiveness of the management techniques employed is not simple. What should be monitored? What resources would need to be committed to monitoring? Who would undertake the monitoring? Who would collate the data? To what extent would monitoring be on a scientific basis, and to what extent on the basis of auditing for compliance with the regulatory framework? There were no clear answers to these issues at present, although the ATCM interest in providing guidelines for environmental monitoring may provide the necessary framework in due course.

COMNAP members have an essential role to play in ensuring that the protected area system is effectively implemented. In this regard the workshop noted COMNAP's intention to develop proposals for boundary marking of protected areas, procedures for issuing permits, recording site visits, maintenance of sites, where relevant; and education of site users. The workshop welcomed COMNAP involvement as it would go a long way towards meeting the workshop's concern that the Protected Area System should operate at a practical level, and that there should be a high degree of consistency between Treaty Parties.

## **CHAPTER 4**

# **MANAGING TOURISM AND PROTECTING HISTORICAL FEATURES**



*The hut (Historic Site No. 15) built by members of the British Antarctic Expedition under the leadership of Lieutenant E.H. Shackleton at Cape Royds, Ross Island, in February 1908. It was restored by the New Zealand Department of Scientific and Industrial Research in January 1961 as nearly as possible to the condition it was in when occupied. Frozen Pony Lake lies behind the hut and colonies of Adelle Penguins cover the ridge beyond.*

Photo: W. Block

## 4.1 Tourism and Protected Areas

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#### 1. Tourism and the Antarctic Treaty System

The Antarctic Treaty, drafted during the period when the first commercial tourists arrived, includes few reference to human activities in Antarctica other than those of scientists and their logistic supporters. Subsequent discussions and recommendations relating to tourism arising from Antarctic Treaty Consultative Meetings (ATCMs) are highlighted in Heap (1990; pp.2601–08) and Harris (1991a, b).

Impacts of tourism were first discussed in 1966 at the IV ATCM. Arising from this meeting, the earliest Treaty recommendation was concerned chiefly with protecting scientists and their research from visiting tourists. Recommendation IV–27, recognizing that "... the effects of tourist activities may prejudice the conduct of scientific research, conservation of flora and fauna and the operation of Antarctic stations" provided guidelines covering the conditions by which tourist or other non-scientific expeditions may be permitted to visit scientific stations.

The VI ATCM in 1970 noted increases in numbers of tourists and of visitors who were not sponsored by Treaty Consultative Parties. Again, concerned with protecting scientists first and the environment incidentally, it considered that the activities of such visitors could have "... lasting and harmful effects on scientific programmes, on the Antarctic environment, particularly in Specially Protected Areas, and on historic monuments". Recommendation VI–7 provided guidelines for visits to stations, requiring tourists and other visitors to comply with conditions or restrictions on their movements stipulated by station commanders, not to enter Specially Protected Areas, and to respect historic monuments.

The VII ATCM in 1972 noted further increase in the number of "... visitors ... who were not sponsored by Consultative Parties", a term used increasingly from then onward to include tourists, members of private expeditions and others who were not part of national Antarctic operations. The delegates considered that such visitors would benefit from having available to them an "agreed statement of accepted practices" in the Treaty Area. Recalling earlier recommendations concerning harmful effects of visitors on scientific programmes and on the Antarctic environment, convinced of the need to avoid unnecessary interference with "... the natural ecological systems which are not sufficiently understood and continue to be the subject of research", and conscious that "... the Treaty Area contains many unique features of historical, scenic and general scientific interest" the delegates recommended (VII–4) that governments consider drawing up at the next meeting "... a statement of those accepted practices and relevant provisions about which all visitors to the Treaty Area should be aware".

More liberally toward tourists and to the environment, the delegates recommended further that governments "... consult each other well in advance about the possibility of designating at the Eighth ATCM an adequate number of areas of interest to which tourists could be encouraged to go, and about the criteria to be used for such areas" (Heap 1990: 2602). Liberality indeed took a further tentative step at the VIII ATCM, which recognized (VIII–9) that "... tourists and other

persons not sponsored by Consultative Parties" were visiting the Treaty Area in increasing numbers, and acknowledged that tourism was "... a natural development in the Area" which required regulation. It recognized also "... the necessity to restrict the number of places where large numbers of tourists may land so that the ecological effects may be monitored".

Annex A of Recommendation VIII-9 presented a "Statement of accepted principles and the relevant provision of the Antarctic Treaty", intended for the guidance of all who visit the Antarctic. These included notes on environmental protection and wildlife conservation, restating some of the provisions of the Agreed Measures for the Conservation of Fauna and Flora promulgated in an earlier Treaty recommendation (III-8 of 1964), and listed "Special measures relating to tourists and non-governmental expeditions" concerned mainly with visits to scientific stations. An appended section on "Guidance for visitors to the Antarctic" was essentially a list of prohibitions covering disturbance of wildlife, litter, use of sporting guns, introduction of alien species, collecting eggs and fossils, avoiding SPAs and SSSIs, and interfering with scientific work or study sites.

Following the intention of the previous Treaty meeting, Annex B of Recommendation VIII-9 provided for Areas of Special Tourist Interest (ASTI) noting, however, that no such areas were being designated. This gesture toward accepting the reality of tourism in Antarctica was not followed up. The concept was discussed at the XI ATCM when it was agreed "... that there should be further studies of the issues raised in discussion with a view to further consideration of the topic" (Heap 1990 p. 2606). Since then SSSIs, SPAs and Sites of Historic Interest have proliferated, but not a single ASTI has been proposed. The purpose of such sites—clearly not to gratify tourists, but to gather them into areas where they could be controlled, and their effects monitored by long-term studies—appears to have been completely ignored, an omission representing many missed opportunities for research.

To the contrary, several unprotected sites known to be scientifically exceptional, were being used by tour operators, but have subsequently been alienated from them by designation as protected areas (e.g. Lions Rump, Ardley Island, Harmony Point and Deception Island, all in the South Shetland Islands, were designated SPA or SSSI as quickly as Antarctic Treaty processes allowed, to keep visitors, including tourists, out). With no voice or representation where such decisions are made, tour operators have had no remedy but to find more sites, as yet unclaimed by scientists as research sites, to maintain the interests of their clients.

At the X ATCM Recommendation X-8 set out a statement of accepted practices for non-governmental expeditions, encouraging commercial operators to carry tour guides. This practice had in fact been established from the outset by Lars Eric Lindblad (see below), and became an important feature of almost all commercial tour operations in Antarctica.

More usefully, Recommendation X-8 noted that commercial tourist overflights exceeded existing capabilities for air traffic control, communications and search and rescue, pointing out that they might interfere with operational flights in support of scientific expeditions, and would exceed the capacity of expeditions to respond in case of emergency. This proved a timely warning; the XI ATCM had the melancholy task of recording the disaster of November 1979, in which a New Zealand tourist aircraft overflying McMurdo Sound crashed on the lower slopes of Mount Erebus, with the loss of 257 passengers and crew.

At all subsequent ATCMs tourism was discussed briefly, with mild but mounting concern. The report of the XV ATCM, held in October 1989, acknowledged for the first time that Antarctica should in general be open to tourism and non-governmental activities, "... which could be valuable in broadening public awareness and appreciation of the continent". However, it recorded continuing

concern that "... such activities, if uncontrolled or excessive, could have potentially serious adverse impacts on scientific investigations and the Antarctic environment".

The meeting agreed on the need for a comprehensive review of the issue, several delegations stressing the desirability of such a review "... leading to further measures to regulate tourist and non-governmental activities, in order to reduce or avoid their possible adverse impacts". Particular emphasis was placed on "... the need to avoid interference with scientific investigations, and their logistic support, and harmful environmental effects", an ordering which no doubt still expressed accurately the priorities of many of the delegates at that time. From the subsequent XI AT Special Consultative Meeting emerged the Protocol on Environmental Protection to the Antarctic Treaty which rationalizes and formalizes many of the preceding recommendations (Harris 1991b) and, seeking to regulate all human activities in Antarctica, applies impartially to scientists, tourists and all other visitors.

## **2. Tourist numbers and trends**

Commercial tours providing recreational visits to Antarctica began in 1958. The industry's early history and evolution were documented by Reich (1980) and Codling (1982). Later developments have been discussed by Enzenbacher (1992, 1993) whose evidence indicates an erratic build-up of tourist numbers during the 1980s, reaching an influx of about 5000 in 1990–91 and 6500 in 1991–92. Some effects of tourism on King George Island, South Shetland Islands, are discussed by Harris (1991a). Bearing in mind that Antarctica, defined in Antarctic Treaty terms, is a "continent for science", the number of tourists visiting the Antarctic Treaty Area each year now well exceeds the number of scientists and support staff, whose monopoly of the continent has hitherto been virtually exclusive (Stonehouse 1992a).

Most Antarctic tours are seaborne, involving cruise ships carrying between about 40 and 400 passengers; some smaller vessels take around a dozen tourists. Typically these leave ports in southern South America (notably Ushuaia and Punta Arenas) to visit the maritime or South American sector of Antarctica including the South Shetland and South Orkney Islands, the west coast of Antarctic Peninsula and South Georgia. Landings at Cape Horn and the Falkland Islands are often included in cruise itineraries. Fewer tourists, seldom more than a few hundred annually, sail from New Zealand and Australia to visit the Ross Sea and neighbouring sectors (including stations in Wilkes Land and Enderby Land), sometimes calling at Macquarie, Campbell and other Southern Ocean islands on the way. Cruises usually take 10–21 days, most cruise ships typically making several voyages per season. Some, but not all, of the larger ships (90 to 400 passengers) are ice-strengthened: 1991 saw the introduction of small Russian icebreakers carrying 40 to 50 passengers, which would be capable of visiting areas that are denied by pack ice to the larger ships. There is also a possibility of tourists being transported to more remote sites from cruise ships by helicopters, a development which will give cause for concern.

Privately-owned and chartered yachts, some with paying passengers, add slightly to the traffic. The season for shipborne visits extends between November and March, taking advantage of optimal weather, ice conditions and presence of wildlife. A few yachts overwinter each year.

A very few tourists (currently less than 5% of the annual total) travel by air, flying mainly from Punta Arenas in southern Chile to Teniente Marsh Station on King George Island, South Shetland Islands. Tours from there include scenic flights over the South Shetlands and Antarctic Peninsula, camping at an emperor penguin colony on the Weddell Sea coast, and visiting the inland Ellsworth Mountains for climbing and adventure expeditions (Swithinbank 1992a, b). The season for airborne tourism activities is similar to that of cruise ships, but less restricted by ice conditions.

Operators of airborne tours may extend their active season by flying also in support of both government and private expeditions. Adventure Network International, the most active company in this field, in 1989–90 operated a nine-month season in Antarctica from July to March (Swithinbank 1990), supporting expeditions as far afield as the South Pole from their base and blue ice runway at Patriot Hills in the Ellsworth Mountains.

### **3. Visitor impacts**

Most shipborne visits are made in December and January. During the single month of January 1992 a team from the Scott Polar Research Institute (SPRI) working on Half Moon Island, South Shetland Islands, recorded 14 visits from six cruise ships, bringing over 2000 tourists ashore (Stonehouse 1992a). The advent of more and larger ships each year, involving new operators and cheaper cruises, suggests that further increases in numbers may be expected in the near future.

Except in areas currently designated as Specially Protected Areas (SPAs), Sites of Special Scientific Interest (SSSIs), and the immediate environs of stations, tour operators remain free to land their clients anywhere within the Antarctic Treaty Area. In the Antarctic Peninsula and Scotia Ridge islands area over 70 sites have been identified where ship-borne tourists are known to go ashore: a further 20 have been identified in the Ross Sea sector. Though some of these sites have been visited regularly for over 30 years, no attempts have been made to monitor them or collect data on possible impacts, nor to designate any ASTIs.

The recent doubling of visitor numbers, and near-certainty of further increases within the next few years, in an area considered sensitive to human impact, have prompted expressions of concern among scientists and managers of national expeditions—concern which is directed largely toward possible interference of tourists with scientific research programmes (see below), leaving environmentalists to sound warnings on potential environmental impacts. There have accordingly been many calls to restrict tourism, but few attempts to assess its effects on the natural environment. It is perhaps remarkable that, on a continent set aside primarily for the use of scientists, no scientific enquiry has so far been directed toward impartial examination of the possible ecological effects of this rapidly-growing industry and its incursions.

Project Antarctic Conservation was initiated by the Polar Ecology and Management Group of the Scott Polar Research Institute, under the author's direction. Its objective is to monitor tourist activity and includes field studies of tour parties, and their management and impacts on vegetation, animal life and other environmental features, combined with desk studies of the growth and development of the tourist industry, its economics and potential (e.g. Nimon & Stonehouse, in press). It aims to provide sound data to support the development of sound regulatory and management policies under both national legislation and the Antarctic Treaty System (ATS), to deal with the new situations and possible threats arising from the increase in visitors (Stonehouse 1992a, 1993).

### **4. Tourists ashore**

Sensible legislation to cover the activities of so well-established an industry demands knowledge of how the industry operates in the field. From its earliest days Antarctic shipboard tourism has presented an image of strong environmental concern, due largely to the influence of its earliest practitioner, Lars Eric Lindblad. Most operators now follow the Lindblad pattern (described in Codling 1982), in which tours are treated as "expeditions", with shipboard lectures and briefings, and one or two landings per day at sites especially chosen for their natural history, historical

associations, scenic beauty or other features of interest. Environmental concern is cultivated by the lecturing staff, and communicated to crew and passengers alike. Similar recipes have generally been found successful in promoting ecotourism, not only in Antarctica but worldwide.

Typically, passengers before landing are briefed on behaviour, possible hazards, and the need to avoid interference with or damage to wildlife. Put ashore by inflatable boats in parties of ten to 15, they are accompanied and closely supervised by well-informed experienced guides. Once ashore, individuals may be free to leave the parties, but are usually required to stay within sight of the embarkation point. They remain ashore for one to three hours, most of them wandering within a radius of a few hundred metres, seeking vantage points for photography and watching penguins, seals and other wildlife.

Landing sites are chosen by the cruise leader, who has usually visited the area several times previously and knows what is interesting, available, and safe in the weather circumstances prevailing. Of over 70 sites currently in use (Stonehouse, 1993), some of the more popular (for example Half Moon Island, see above) may be visited every second or third day throughout a season of two to three months. Most cruise leaders, communicating freely with each other by radio-telephone, space their visits to such sites so that ships and landing parties remain out of each others' way.

This approach works well for ships of 30 to 140 passengers, a range encompassing most tour ships currently operating in Antarctica. Larger ships of 150 to 500 passengers, which provide cheaper tours, dilute the expedition spirit with cabarets, casinos and other standard cruise activities. Those concerned to limit tourism in Antarctica are often particularly apprehensive of the possible environmental impacts of large numbers of passengers disembarking from these ships. However, responsible operators tend for practical reasons to limit numbers ashore to not more than 100 at a time to maintain a satisfactory guide-to-passenger ratio, to avoid swamping the attractions, but particularly to ensure that all passengers can be recalled at short notice in case of bad weather. Requiring the ship to stay longer at each site results in fewer sites being visited per tour—one of several points that may be argued in favour of larger ships.

Following Antarctic Treaty guidelines, cruise leaders and ships' captains have several forms of information and guidance available to them from their own governments, concerning ground rules for parties ashore and the whereabouts and extent of protected areas. Further instruction is available to those whose companies belong to the recently-formed International Association of Antarctica Tour Operators (Stonehouse 1992b). Those responsible on board make themselves aware of the positions of protected areas, so far as is possible from the often inadequate maps and descriptions available, and generally avoid visits that would encroach on areas known to be designated. They seldom have excuse for landing parties inadvertently in a protected area.

However, despite the widely-recognized presence of tourists in Antarctica, those who have designated SPAs and SSSIs have seldom seen the need to mark them in the field. Though there are frequent references to "markers" in Treaty discussions (see, for example, Heap 1990, p. 3103), there is no record of discussions leading to agreed systems or standards of boundary marking. On-the-spot markers are extremely rare. Passengers landing near the boundary of a protected area, for example those bathing at the intertidal warm springs on Deception Island, may have been briefed by their tours operators on where the boundary lies, but find no evidence for it: nor will they for most other protected areas. Though incursions into protected areas are not unknown, that they happen only rarely is a tribute more to the management of tour leaders than to prevailing standards of official information and protection which is the responsibility of the Treaty Party or Parties who originally proposed the site.

## 5. Summary and conclusions

Shipborne tourism in Antarctica, which has operated continuously for over 30 years, appears at present levels to be well managed, with relatively slight environmental impacts, particularly in relation to SPAs, SSSIs and other designated areas. Tour operators and parties ashore have a record of good behaviour and environmental awareness. However, tourism is widespread throughout the Antarctic Peninsula sector; its recent expansion seems likely to continue, and there is little precise information on possible impacts at any of the 70 or more landing sites currently in use. Project Antarctic Conservation, an internationally-supported research programme currently in its third year (1993–94), is designed to monitor tourism, collect data, assess impacts on vegetation and wildlife, and devise practical management plans and strategies for dealing with this growing industry, applicable within the terms of the Protocol on Environmental Protection to the Antarctic Treaty.

## 6. Acknowledgements

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## 4.2 Historic Sites and Monuments

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### 1. Background

This subject has much in common with many aspects of other protected areas in the Antarctic that have been discussed during this meeting, but there are several important distinctions which present special problems. In the case of historic sites and monuments there are large differences between the many entities involved. This discussion concerns the 59 features designated under Antarctic Treaty provisions.

Several conventions relating to this topic elsewhere in the world (various UNESCO and similar protocols are relevant) provide definitions, but none of them fits the peculiar circumstances of Antarctica especially well. In addition, as they are intended to have a very broad application, much of this material is unduly complicated. There are many other useful parallels to be drawn between Antarctica and the peri-Antarctic islands, and to a lesser extent Svalbard and other Eurasian Arctic archipelagoes.

Sources of information relating to Antarctic Historic Sites include the Antarctic Treaty Handbook (Heap 1990), several sections of Annex V to the Environmental Protocol, the list of the Historic Sites and Monuments compiled by C. W. M. Swithinbank for the World Conservation Monitoring Centre (see Appendix 1) and the thesis by P. J. Warren (1990). The last of these includes a comprehensive bibliography relating to the sites.

It is interesting to note that no declarations of Historic Sites or Monuments had been made prior to the Antarctic Treaty (1959), which certainly simplifies the legal position. All countries with Antarctic historic sites are now adherents of the Treaty and members of SCAR (Sweden, with Nordenskjöld's hut, was the latest). The basis for designation and protection of Historic Sites was adopted by I ATCM Rec. 9. The V and VI ATCM recommended drawing up a list of sites and VII ATCM included, as an annex to Rec. 9, such a list with further suggestions for marking them. The XIV and XV Consultative Meetings considered the question in greater detail and XV ATCM included six visit reports submitted by Australia and the United States (Heap 1990).

National operators have already become associated with Historic Sites and Monuments through logistical necessity. Neither SCAR nor IUCN has any formal responsibility for them but, from a pragmatic aspect, are both involved. Several private organisations, especially the New Zealand Antarctic Heritage Foundation, have been very active in preservation of historic huts in the Ross Dependency. Most monuments and sites near stations are effectively protected by the station personnel. There are, however, many Historic Sites with no formal protection, although some of these should be afforded at least minimal attention.

Annex V of the Environmental Protocol states that Historic Sites and Monuments may be designated as Antarctic Specially Protected Areas (Article 3, 2(h)) or Antarctic Specially Managed Areas (Article 4, 2(b)). Article 8 includes provision for such sites to be listed (in the legal sense) but specifies that "Any Party may propose a site or monument of recognized historic value which has not been designated as an Antarctic Specially Protected Area or an Antarctic Specially

Managed Area, or which is not located within such an Area, for listing as an Historic Site or Monument". Thus, it appears that any new designation may be listed as a Historic Site or Monument with not necessarily being given ASPA or ASMA status.

The provisions given in Annex V Article 8 state "sites or monuments of recognised historic value". However, there is general concern about the potential for a serious proliferation of "paper tigers" where bureaucratic requirements may consume excessive time, money and energy in the protection of Antarctic Historic Sites and Monuments. The quote from Jefferson that "the government that governs best governs least" is appropriate for many of them.

## **2. Historic values to be considered**

What is the value of Antarctic Historic Sites? The comparatively short history of humanity in Antarctica may be recorded more completely than for any other continent. Public interest is strong, as demonstrated by the number of museums with Antarctic themes. Similarly, most visitors to Antarctica show a special interest in the sites. In numerical terms tourists are now the largest single category of visitors to the continent (ahead of scientists and military personnel). The influence of visitors on historic huts is more directly correlated with actual numbers rather than total "impact". Such "living museums", as well as attracting visitors, also take the pressure off various other sites—but this is not without some degree of self sacrifice.

The commercial interest in historical artifacts is also worth considering. There is a potential trade in such items as souvenirs (as shown by inclusion in a recent major auction of items from the Ross Island huts and other Antarctic sites, but which were withdrawn at short notice under pressure). Collectables appear occasionally on the market; some reach Scott Polar Research Institute and arrangements for their return to the original sites are sometimes made. Historic sites could thus be considered as part of the non-renewable exploitable resources of the Antarctic. This must be balanced against the continuing declarations of very recent features as historic monuments. Protection principles must take account of such commercial aspects.

## **3. Diversity of Historic Sites and Monuments**

The variety and relevance of Historic Sites and Monuments is a problem (see Appendix 1). Some are generally accepted as internationally important artifacts from the early days of Antarctic exploration (Borchgrevink's, Nordenskjöld's, Bruce's, Scott's, Shackleton's, and Mawson's huts are good examples, as would have been Amundsen's *Franheim* and Byrd's *Little America* had they not been built on an ice-shelf). Others are solely national memorials with particular political, religious or similar association but with no relevant connection with the Antarctic. In her thesis Warren (1990) defined seven categories of sites. Revised to incorporate the 59 designations current in 1992, these are:

- 16 associated with the Heroic Age of Exploration
- 15 commemorating an expedition
- 15 memorials to the dead (tombs and cenotaphs)
- 5 associated with the first station of a country or opening of a station
- 2 are reference points for scientific work
- 2 commemorate national heroes not connected with Antarctica
- 1 commemorates the visit of a head of state
- 3 have no reason stated

A pragmatic distinction of two classes of Historic Sites and monuments would be those which are "natural" (huts, survey cairns, etc.), and "alien" (statues, political and religious memorials, etc.) but such distinctions could be seriously contentious in many cases.

An additional problem is the official recognition of important sites which have not been declared although they are admirably suitable. Good examples include sealers' relics on several of the South Shetland Islands (although those on Byers Peninsula are indirectly protected by its SSSI status), whalers' relics (including the whaling station at Deception Island), some shipwrecks, and a few early but now abandoned stations (where preservation is practicable). Since history starts at the present there may be just cause to declare some sites with foresight.

#### **4. Maintenance of historic features**

The purpose of conserving these sites is essentially different to protecting biological or environmental phenomena. Indeed the words "preservation" or even "maintenance" are probably more appropriate in regard to anthropogenic features. In many cases the rigours of the Antarctic climate ensure that destruction of some sites is ineluctable in a comparatively short time. In some instances preservation is impossible (e.g. buildings and other features buried in the ice-cap). Others, such as datum marks carved in rock and survey cairns, need virtually no attention although an occasional visit report is appropriate (an instance was when the original 1909 Charcot plaque at Petermann Island was restored by UK. in 1958). Some activities planned to restore huts may have potentially adverse effects. For example, the removal of ice from within a building could be unwise if it is supporting the structure. In various cases the outer timbers of a building may be eroded by over a centimetre, as revealed by nail heads originally level with the surface now standing proud; in some of the oldest buildings over a third of the timber has been eroded and the structure seriously weakened. In some instances it would be appropriate to let nature take its course, assuming other environmental considerations are compatible (although the cosmetic effect may be a matter of disputed opinion). Balanced against this is the requirement in the Protocol to clean up and remove unwanted stations and field sites.

There are many good proposals and ideas for protecting the various Historic Sites and Monuments, but all have two things in common: the constraints of time and money. In some special cases, however, a matter of urgency is involved but, from previous experience, preservation or restoration is likely to devolve on a single national Antarctic operator. As yet there are no examples of international effort to protect or renovate a historic feature, although steps are being taken for the United Kingdom and New Zealand to collaborate on the preservation and maintenance of historic huts on Ross Island.

#### **5. Conclusions**

Some conclusions, developed from those of Warren (1990), may be useful:

1. The Historic Sites and Monuments concept has been a pragmatic assembly of disparate items; it evolved without much coordination or serious consideration of values deserving protection and maintenance.
2. There is great public interest in some of these features.
3. Historic features are not an important element in national Antarctic operations, and few nations have made any effort to maintain those sites originally proposed by them.

4. Such sites have not been considered elements of the Antarctic environment which require environmental impact assessments.
5. Most field work (surveys, restoration, etc.) has been done by volunteers with a variety of qualifications.
6. Designations include a range of historic elements, some of which merely demonstrate national presences.
7. Little consideration is given to the implications of designating a site, as few reports (6 out of 59) have been prepared.
8. Numerous monuments have little international relevance.
9. At present most of the effort and resources protecting and maintaining historic sites are provided from private sources.

## 6. References

- Heap, J. (editor). 1990. Historic Sites and Monuments. In *Handbook of the Antarctic Treaty System. Part 3. The Antarctic Protected Area System*, pp. 3401–3408. Cambridge, Scott Polar Research Institute.
- Warren, P. 1990. *A proposal for the designation and protection of Antarctic historic resources*. M.A. thesis, University of Washington.

## APPENDIX 1. Historic Sites and Monuments in Antarctica

(Information provided by C.W.M. Swithinbank, Scott Polar Research Institute)

1. *South Pole*. Flag mast erected in December 1965 at the South Geographic Pole by the first Argentine Overland Polar Expedition.
2. *Ongul Island, Prins Harald Kyst*. 69°00'S, 39°35'E. Rock Cairn and plaques at Syowa Station in memory of Shin Fukushima, a member of the 4th Japanese Antarctic Research Expedition, who died in October 1960.
3. *Proclamation Island, Enderby Land*. 65°51'S, 53°41'E. Rock cairn and plaque erected in January 1930 by Sir Douglas Mawson to commemorate landing by a party of the British, Australian and New Zealand Antarctic Research Expedition 1929–31.
4. *Pole of Inaccessibility*. 83°06'S, 54°58'E. Station building to which a bust of V I Lenin is fixed, together with a plaque in memory of the conquest of the Pole of Inaccessibility by Soviet Antarctic explorers in 1958.
5. *Cape Bruce, Mac.Robertson Land*. 67°25'S, 60°47'E. Rock cairn and plaque erected in February 1931 by Sir Douglas Mawson to commemorate landing by a party of the British, Australian and New Zealand Antarctic Research Expedition 1929–31.
6. *Walkabout Rocks, Vestfold Hills, Princess Elizabeth Land*. 68°22'S, 78°33'E. Rock cairn erected in 1939 by Sir Hubert Wilkins. The cairn houses a canister containing a record of his visit.
7. *Mabus Point, Queen Mary Land*. 66°33'S, 93°01'E. Stone with plaque erected at Mirny Station in memory of driver-mechanic Ivan Kharma who perished on fast ice in 1956.
8. *Mabus Point, Queen Mary Land*. 66°33'S, 93°01'E. Metal monument-sledge with plaque at Mirny Station in memory of driver-mechanic Anatoliy Shcheglov who perished on 3 August 1960.
9. *Buromskiy Island, Queen Mary Land*. 66°32'S, 93°01'E. Cemetery in which are buried Soviet, Czechoslovak and German citizens, members of Soviet Antarctic Expeditions, who perished on 3 August 1960.
10. *Bunger Hills, Queen Mary Land*. 66°16'S, 100°45'E. Magnetic observatory at Dobrowolski Station with plaque in memory of the opening of Oasis Station in 1956.
11. *Vostok Station*. 78°28'S, 106°48'E. Heavy tractor with plaque in memory of the opening of the station in 1957.
12. *Cape Denison, George V Land*. 67°00'S, 142°42'E. Cross and plaque erected in 1913 by Sir Douglas Mawson on a hill 300m west-by-south of the main hut of the Australasian Antarctic Expedition of 1911–14. The cross and plaque commemorate Lieutenant B.E.S. Ninnis and Dr X. Mertz, members of the expedition, who died in 1913.
13. *Cape Denison, George V Land*. 67°00'S, 142°42'E. Hut built in 1912 by Sir Douglas Mawson's Australasian Antarctic Expedition of 1911–14. This was the main base of the expedition.
14. *Inexpressible Island, Terra Nova Bay, Scott Coast*. 74°54'S, 163°43'E. Remains of rock shelter constructed in March 1912 by Victor Campbell's Northern Party of the British

- Antarctic Expedition 1910–13. The party spent the winter of 1912 in this shelter and a nearby ice cave.
15. *Cape Royds, Ross Island*. 77°38'S, 166°07'E. Hut built in February 1908 by the British Antarctic Expedition 1907–09 led by Ernest Shackleton. Restored in 1961 by Antarctic Division of New Zealand Department of Scientific and Industrial Research.
  16. *Cape Evans, Ross Island*. 77°38'S, 166°24'E. Hut built in January 1911 by the British Antarctic Expedition 1910–13 led by Captain R. F. Scott. Restored in January 1961 by Antarctic Division of New Zealand Department of Scientific and Industrial Research.
  17. *Cape Evans, Ross Island*. 77°38'S, 166°24'E. Cross on Wind Vane Hill erected by the Ross Sea party of the Imperial Trans-Antarctic Expedition 1914–16 led by Ernest Shackleton, in memory of three members of the party who died in the vicinity in 1916.
  18. *Hut Point, Ross Island*. 77°51'S, 166°37'E. Hut built in February 1902 by British Antarctic Expedition 1901–04 led by Captain R. F. Scott. Partially restored in January 1964 by the New Zealand Antarctic Society with assistance from the US government.
  19. *Hut Point, Ross Island*. 77°51'S, 166°37'E. Cross erected in February 1904 by the British Antarctic Expedition 1901–04 in memory of T. Vince, a member of the expedition, who died in the vicinity.
  20. *Observation Hill, Ross Island*. 77°51'S, 166°40'E. Cross erected in January 1913 by the British Antarctic Expedition of 1910–13 in memory of Captain R. F. Scott's party which perished on the return journey from the South Pole in March 1912.
  21. *Cape Crozier, Ross Island*. 77°32'S, 169°18'E. Remains of stone hut constructed in July 1911 by Edward Wilson's party of the British Antarctic Expedition 1910–13 during the winter journey to collect Emperor penguin eggs.
  22. *Cape Adare, Borchgrevink Coast*. 71°17'S, 170°15'E. Hut built in February 1899 during the *Southern Cross* Expedition led by C. E. Borchgrevink. There are three huts. Two date from Borchgrevink's expedition and one from Scott's Northern Party, 1910–11.
  23. *Cape Adare, Borchgrevink Coast*. 71°17'S, 170°15'E. Grave of Norwegian biologist Nicolai Hanson, a member of C. E. Borchgrevink's *Southern Cross* Expedition 1899–1900. This is the first known grave in the Antarctic.
  24. *Mount Betty, Queen Maud Range*. 85°11'S, 163°45'W. Rock cairn, known as Amundsen's Cairn, on Mount Betty, erected by Roald Amundsen on 6 January 1912 on his way back to *Framheim* base from the South Pole.
  25. *Framnesodden, Peter I Øy*. 68°47'S, 90°42'W. Hut and plaque built by Norwegian Captain Nils Larsen in February 1929. The plaque is inscribed "Norvegia-ekspedisjonen 2/2 1929".
  26. *Barry Island, Debenham Islands, Marguerite Bay, Antarctic Peninsula*. 68°08'S, 67°08'W. Abandoned installations of Argentine station General San Martin, with cross, flag mast, and monolith built in 1951.
  27. *Megalestris Hill, Petermann Island, Antarctic Peninsula*. 65°10'S, 64°10'W. Cairn with plaque inscribed with the names of the second French expedition led by J.-B. Charcot who wintered here aboard *Pourquoi-Pas?*. Erected in 1909 and restored by British Antarctic Survey in 1958.

28. *Port Charcot, Booth Island, Antarctic Peninsula.* 65°03'S, 64°01'W. Rock cairn with wooden pillar and plaque inscribed with the names of the first French expedition led by J.-B. Charcot which wintered here in 1904 aboard *Le Français*.
29. *Lambda Island, Melchior Islands, Antarctic Peninsula.* 64°18'S, 62°59'W. Lighthouse named Primero de Mayo erected by Argentina in 1942. This was the first Argentine beacon in the Antarctic.
30. *Paradise Harbour, Danco Coast, Antarctic Peninsula.* 64°49'S, 62°51'W. Shelter erected in 1950 near the Chilean base Gabriel Gonzales Videla to honour Gabriel Gonzales Videla, first Head of State to visit the Antarctic.
31. *Whaler's Bay, Deception Island, South Shetland Islands.* 62°59'S, 60°34'W. Memorial plaque marking the position of a cemetery where some 40 Norwegian whalers were buried in the first half of the twentieth century. The cemetery was swept away by a mud flow caused by volcanic eruption in February 1969.
32. *Greenwich Island, South Shetland Islands.* 62°29'S, 59°40'W. Concrete monolith erected in 1947 near Arturo Prat Base. Point of reference for Chilean hydrographic surveys.
33. *Arturo Prat Base, Greenwich Island, South Shetland Islands.* 62°29'S, 59°41'W. Shelter and cross with plaque near Arturo Prat Base. Named in memory of Lieutenant- Commander Gonzales Pacheco, who died while in charge of the station.
34. *Arturo Prat Base, Greenwich Island, South Shetland Islands.* 62°30'S, 59°41'W. Bust of the Chilean naval hero Arturo Prat erected in 1947.
35. *Arturo Prat Base, Greenwich Island, South Shetland Islands.* 62°30'S, 59°41'W. Wooden cross and statue of the Virgin of Carmen erected in 1947 near Arturo Prat Base.
36. *Potter Cove, King George Island, South Shetland Islands.* 62°13'S, 58°42'W. Metal plaque erected by Eduard Dallmann to commemorate the visit of his German expedition on 1 March 1874.
37. *General Bernardo O'Higgins Base, Trinity Peninsula, Antarctic Peninsula.* 63°19'S, 57°54'W. Statue of Bernard O'Higgins, the first ruler of Chile to foresee the importance of Antarctica.
38. *Snow Hill Island, Antarctic Peninsula.* 64°24'S, 57°00'W. Hut built in February 1902 by the main party of the Swedish South Polar Expedition led by Otto Nordenskjöld.
39. *Hope Bay, Trinity Peninsula, Antarctic Peninsula.* 63°24'S, 56°59'W. Stone hut built in January 1903 by a party of the Swedish South Polar Expedition.
40. *Hope Bay, Trinity Peninsula, Antarctic Peninsula.* 63°24'S, 56°59'W. Bust of General San Martin, grotto with a statue of the Virgin of Lujan, and a flag mast at Base Esperanza. Erected by Argentina in 1955; together with a graveyard with stele in memory of members of Argentine expeditions who died in the area.
41. *Paulet Island, Antarctic Peninsula.* 63°35'S, 55°47'W. Stone hut built in February 1903 by survivors of the wrecked vessel *Antarctic* under Captain C. A. Larsen, members of the Swedish South Polar Expedition led by Otto Nordenskjöld, together with a grave of a member of the expedition.
42. *Scotia Bay, Laurie Island, South Orkney Islands.* 60°46'S, 44°40'W. Stone hut built in 1903 by the Scottish Expedition led by W. S. Bruce; the Argentine meteorological hut

- and magnetic observatory, built in 1905; and a graveyard with seven graves dating from 1903.
43. *Filchner Ice Front, Weddell Sea.* 77°49'S, 38°02'W. Cross erected in 1955, 1300m north-east of the Argentine base General Belgrano.
  44. *Nivlisen Ice Front, Princesse Astrid Kyst, Dronning Maud Land.* 70°45'S, 11°38'E. Plaque erected at the Indian station Dakshin Gangotri listing the names of the members of the First Indian Antarctic Expedition which landed nearby on 9 January 1982.
  45. *Metchnikoff Point, Brabant Island, Antarctic Peninsula.* 64°02'S, 62°34'W. Plaque mounted at a height of 70m on the crest of the moraine separating Metchnikoff Point from the glacier, erected by members of the UK Joint Services Expedition 1983–85 to commemorate the first landing on Brabant Island by the Belgian Antarctic Expedition 1897–99 led by Adrien de Gerlache.
  46. *Port Martin, Terre Adélie.* 66°49'S, 141°24'E. All buildings and installations of Port Martin base constructed in 1950 by the 3rd French expedition and partly destroyed by fire during the night of 23–24 January 1952.
  47. *Ile des Péterls, Terre Adélie.* 66°40'S, 140°01'E. Wooden building Base Marret where seven men under the command of Mario Marret wintered in 1952 following a fire at Port Martin base.
  48. *Ile des Péterls, Terre Adélie.* 66°40'S, 140°01'E. Cross erected on the north-east headland of the island in memory of André Prudhomme, chief meteorologist of the 3rd French International Geophysical Year expedition, who disappeared during a storm on 7 January 1959.
  49. *Bunger Hills, Queen Mary Land.* 66°16'18"S, 100°45'E. Concrete pillar erected by the First Polish Antarctic Expedition at Dobrowolski station in January 1959 for gravity measurements.
  50. *Fildes Peninsula, King George Island, South Shetland Islands.* 62°12'S, 58°54'W. Plaque mounted on a sea cliff south-west of the Chilean station Rudolfo Marsh in memory of Professors Siedlecki and Tazar, members of the first Polish Antarctic maritime research expeditions, who landed here in February 1976.
  51. *Admiralty Bay, King George Island, South Shetland Islands.* 62°09'S, 58°28'W. Grave of Włodzimierz Puchalski, surmounted by an iron cross, on a hill south of Arctowski station. Puchalski was an artist and producer of documentary nature films who died on 19 January 1979.
  52. *Fildes Peninsula, King George Island, South Shetland Islands.* 62°13'S, 58°58'W. Monolith erected to commemorate the establishment of the Chinese Great Wall Station on 20 February 1985.
  53. *Elephant Island, South Shetland Islands.* 61°03'S, 54°50'W. Monolith and plaque commemorating the rescue of survivors of the British ship *Endurance* by the Chilean navy cutter *Yelcho* on 30 August 1916. Replicas are sited at the Chilean bases Arturo Prat (62°30'S, 59°49'W) and Rodolfo Marsh (62°12'S, 62°12'W).
  54. *McMurdo Station, Ross Island.* 77°51'S, 166°40'E. Bronze bust on black marble commemorating the polar achievements of R E Byrd, erected in 1965.

55. *Stonington Island, Marguerite Bay, Antarctic Peninsula.* 68°11'S, 67°00'W. Buildings and artifacts at and near East Base of US Antarctic Service Expedition 1940–41 and Ronne Antarctic Research Expedition 1947–48.
56. *Waterboat Point, Danco Coast, Antarctic Peninsula.* 64°49'S, 62°52'W. The remains and immediate environs of the Waterboat Point hut, situated close to the unoccupied Chilean station Presidente Gabriel Gonzales Videla. Only the base of the boat, roots of doorposts and an outline of the hut and extension still exist. It was occupied by the UK two-man expedition of Bagshawe and Lester in 1921–22.
57. *Yankee Bay, MacFarlane Strait, Greenwich Island, South Shetland Islands.* 62°32'S, 59°45'W. Commemorative plaque near a Chilean refuge. Erected to the memory of Captain Robert McFarlane, who in 1820 explored the South Shetland Islands area in the brigantine *Dragon*.
58. *Whaler's Bay, Deception Island, South Shetland Islands.* 62°59'S, 60°34'W. Cairn with memorial plaque in the vicinity of the whaler's cemetery (HM No.31). Erected to honour captain Adolfus Amandus Andersen, Antarctic pioneer, who was first to establish a whaling operation on Deception Island in 1906.
59. *Half Moon Beach, Cape Shirreff, Livingston Island, South Shetland Islands.* 62°29'S, 60°47'W. Cairn commemorating the officers, soldiers and seamen on board *San Telmo* which sank in September 1819; possibly the first people to die in Antarctica.
60. *Penguin Bay, Seymour Island.* 64°16'S, 56°39'W. Wooden plaque placed on 10 November 1903 by the crew of a rescue mission of the Argentine Corvette *Uruguay* at the site where they met members of the Swedish expedition led by Dr. Otto Nordenskjöld. The plaque reads "10.XI.1903 'Uruguay' (Argentine Navy) in its journey to give assistance to the Swedish Antarctic expedition". In January 1990, at the same site, a rock cairn was erected by Argentina in memory of this event. [Proposed at XVII ATCM, Recommendation 3].



## 4.3 Summary and Conclusions

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Various initiatives are underway dealing with tourism, the most significant of which are discussions between some ATCPs about whether an Annex to the Protocol is required for tourism. It was noted that a two day meeting prior to the XVII ATCM in November 1992 will be held on tourism. There is also a proposal by COMNAP to hold a special meeting in 1993 to provide agreed guidelines on tourism for all national operators. The workshop noted the value of the annual public meeting organised in Washington between NSF and the tour operators, normally in the first week of July each year.

Tabled papers together with information on tourist visits to Palmer Station in 1991–92 clearly illustrated the growth of the ship-based tourist industry. As yet there was relatively little accurate data on tourist activities and impact. Several projects had already started or are being considered that would provide data on tourist expectations and whether these were being met, the attractions offered by specific sites, the behaviour of tourists on land, and the variety and extent of impacts caused by visitors. Whilst there was evidence that well-established tour operators went to considerable lengths to brief and control their clients on their ships it was suggested that this was not always the case for some of the newest operators using charter ships. In addition, there is a persistent and growing problem with private yachts. General problems identified were the significant degree of disruption of normal scientific station activities, the lack of adequate information in some instances on how to behave, where protected areas are situated and their lack of identification where they are known, and the difficulties of ensuring enforcement of any agreed code of behaviour. In some cases, notably private yachts, the lack of any means of dealing with an emergency, is regarded as a serious problem.

A range of possibilities were discussed which included the value of observers on each tour ship, the use of dedicated guides to deal with visits to stations, the collection of a tourist fee to provide for facilities within the Antarctic and more extensive provision of information including the provision of protected area information in navigational Pilots and on maps and charts.

The impacts of tourism are expected to increase, especially in the Antarctic Peninsula area. Scientific data are needed on impacts to allow framing of clear management rules for each site and an assessment of the degree of impact that could be permitted on any one site before reducing tourist pressure. ASPAs may be required as control areas against which to measure impact. Under the present legislation Areas of Special Tourist Interest could have been designated, but none has. Under the Protocol tourist sites could be treated as ASMAs. To implement this would require the drafting of management plans which recognised that tourism was the principal objective for these sites.

It was agreed that information and education about protected areas are of key importance in dealing with all visitors. There was some support for the provision of special tourist facilities in particular locations and for the implementation of charges for using them. It was not clear what the legality for charging might be. It was agreed, however, that an increasing sophistication in handling all visitors would be essential. With a large number of sites already in use by sea-borne tourists there may be potential conflicts of interest if any of these were designated as ASPAs and closed to tourism. A more logical approach would be to rotate activities through a large pool of

sites so that all the features valued by tourists were always available but that no sites were too heavily impacted. Management plans and co-ordinated international agreement would be essential to such a framework.

The 59 locations and artifacts designated at present as Historic Sites and Monuments present a diversity of management needs, since they include over 30 historic huts, 15 memorials to the dead, and various forms of commemorations of the establishment of stations and significant visitors. A variety of other sites and monuments could be considered for designation, namely sealers' relics, Deception Island whaling station, Signy Island whalers' cemetery, and the oldest station on the continent (Mawson).

Considerable controversy was identified over the value of leaving relics *in situ* and their removal to a secure museum for continued preservation (e.g. the unauthorised removal of artifacts from Nordenskjöld's hut on Snow Hill Island to a museum in Buenos Aires). Equally important was the establishment of ownership and responsibility for the existing abandoned work sites and stations. SCAR as a scientific organisation was considered to have neither the remit nor the expertise to handle this problem. IUCN is equally lacking in expertise. The meeting, however, felt that many of these huts and sites are an important part of the cultural heritage of the Antarctic and as such are worth conserving. The resource costs for such an exercise should not fall on the recurrent science budget. The value of utilising specialist advice from appropriate national museums etc. for survey, selection, restoration and management was stressed.

The New Zealand Antarctic Heritage Historic Huts Trust had been very successful in conservation activities on Ross Island. It was suggested that charitable bodies such as that may be valuable in providing some support for this field of activity. Caution was expressed against attempting to preserve everything which could be conceived as historical. A conflict of interest was noted for abandoned work sites in that the waste management Annex requires them to be removed from Antarctica. All Antarctic operators are urged to carefully examine the historic value of each site before undertaking any removal. A logical framework for selection of material for preservation might be a thematic approach, selecting good examples of each type of activity (e.g. sealing, whaling, expedition huts etc.). However, proclaiming an abandoned station as a Historic Site should not be used as a criterion for not removing the structures.

## **CHAPTER 5**

# **INTERNATIONAL, LEGAL AND POLICY ISSUES**



*Despite its abundance, the Antarctic fur seal (*Arctocephalus gazella*) remains one of only two species with protected status in Antarctica. However, the other species (Ross seal, *Ommatophoca rossii*) lives an entirely marine existence. The rapid increase in numbers of fur seals in the South Orkney and South Shetland Islands and extension of their range to Marguerite Bay, south-western Antarctic Peninsula, during the past two decades has caused widespread destruction of terrestrial and freshwater ecosystems, as seen here at Lynch Island (SPA No. 14). Approximately 0.01% of the population have "white" coats.*

Photo: R. I. Lewis Smith

## 5.1 International Designations

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### 1. Introduction

Virtually all the world's protected areas are designated, owned and managed either by national governmental agencies or by private sector bodies. However, international designation has been found a useful process, especially to:

- Strengthen protection of key sites;
- draw world attention to them;
- incorporate them in worldwide monitoring networks; or
- make international funds available to supplement national capacity for management.

An international approach is obligatory in Antarctica, given the absence of universally-accepted sovereignty. It is already well established under the Antarctic Treaty, with the provisions under the Agreed Measures for designation of Specially Protected Areas and Sites of Special Scientific Interest, extended by Specially Reserved Areas and Multiple-use Planning Areas. However, the current system under the Treaty has certain shortcomings, not least the minimalist philosophy stemming from ATCM Recommendation VII-2 which required SPAs to be of the minimum area which can serve their purpose, reflected in the later instruction that the number and size of MPAs should be kept to the minimum necessary. The system also bears manifest marks of incremental growth, and is not easily comparable with systems used elsewhere in the world. The result is a needless perpetuation of the view, held in many international circles, that the Antarctic is being managed outside generally accepted international norms.

The recent adoption of the Environmental Protocol to the Treaty establishes both a new opportunity and a new need to review both the extent, location and rationale of Antarctic protected areas, and the types of designation which should be assigned to them. This discussion paper focusses on the latter question.

### 2. Systems of International Designation

Current international designations of protected areas fall into 2 broad categories: listings with no legal significance, and statutory designation under a binding international legal instrument.

Inclusion of sites in the World List of National Parks and Equivalent Reserves (now retitled United Nations List of National Parks and Protected Areas), published by IUCN in pursuance of a UN General Assembly mandate given in 1962, is an example of the first category. While all the sites included have statutory protection (it is a requirement that they are managed by the "highest competent authority" of the government concerned), the list of itself confers no new status.

The same is true of designation as a Biosphere Reserve within the network established by the UNESCO Man and Biosphere programme. However, listing can carry with it considerable influence. IUCN maintains a register of Threatened Protected Areas of the World and the inclusion of sites in such a list can often stimulate remedial action by the Government or authority concerned. Designation as a Biosphere Reserve requires a formal commitment on the part of the state concerned, and carries both prestige and global visibility which unquestionably strengthens protection.

The second category of designation is carried out under international legal instruments, generally Conventions. Two are particularly relevant to our concerns in Antarctica: The Ramsar Convention (on Wetlands of International Importance especially as a Waterfowl Habitat) and the World Heritage Convention (strictly the Convention concerning the Protection of the World Cultural and Natural Heritage). Both involve the nomination of sites for inclusion in a global list established under the Convention. Ramsar sites (which include peatlands, freshwater marshlands, lakes, rivers, estuaries and shallow seas) are nominated by the States Parties (nomination of at least one site is a condition of adherence to the Convention), and are not subject to any supra-national approval: once nominated, they are expected to be safeguarded and managed in accordance with the terms of the Convention. Failure to protect them carries the risk of at least moral sanctions, while a fund established under the Convention allows some help to countries that need it for management purposes.

The World Heritage Convention has a more elaborate procedure. Sites (both natural landscapes and cultural, or built, monuments) are again nominated by the states concerned, but before acceptance they are scrutinized by two independent agencies—International Council on Monuments and Sites (ICOMOS) for cultural sites and IUCN for natural sites. The scrutinizing bodies report confidentially to the Standing Committee of the Parties (World Heritage Committee) on the extent to which the sites comply with criteria established under the Convention: decision to add a site to the List is a matter for the Committee, which can of course reject the advice of IUCN or ICOMOS. Listing confers considerable prestige, and opens the possibility of some international financial support, but again the primary responsibility for maintaining and managing the site rests with the national authorities concerned.

The recently adopted Convention on Biological Diversity, signed by over 150 states at the Earth Summit in Rio de Janeiro in June 1992, will follow a comparable pattern to Ramsar. "Top-down" listing is rejected. States parties will themselves be responsible for identifying their key sites, and for taking measures to conserve them. Any global list will be built up from the national lists and will not supersede or detract from them. The mood in the negotiating committee was very clearly against any listing process which detracted from, or imposed upon, national authority over a State's natural resources.

Certain common features can be seen in the various approaches adopted under these Conventions (and, indeed, under the non-statutory listing procedures). They are:

- a) An objective procedure, including criteria for inclusion of a site, is established;
- b) sites are then chosen and nominated by appropriate national authorities, which thus retain control over whether or not an area within their jurisdiction goes into the list;
- c) whether or not there is any supranational approval mechanism (and there generally is not), once a site is in the list the responsible State incurs obligations for maintenance, management, monitoring, and the supply of information regarding the condition of the site;

- d) there is commonly an international database and monitoring mechanism which can detect failure to maintain the site, and ask questions regarding it;
- e) there may also be a mechanism for supplementing national finance with international funding to promote the sound management of the site.

It should be emphasised that the listing of sites under these Conventions, and their inclusion in the UN List maintained by IUCN or in the UNESCO Biosphere Reserve network does not generally exclude the use of the sites by local human communities, or for scientific research. Of the 10 categories of area listed in the 1990 UN List, only the first (Scientific Reserve/Strict Nature Reserve) requires that direct human uses are excluded, thus preventing tourism, recreation, and public access. Category II (National Park, as traditionally defined) must be available for public visitation, and may well be organized as a mosaic with wilderness zones, strict natural zones, tourist zones, and areas where indigenous and other people live in fashions compatible with the maintenance of the Park. The lesson of the IVth World Congress on National Parks and Protected Areas held at Caracas, Venezuela, in February 1992 was that the integration of protection of the basic scenic and biological features of an area and the sustainable use of the area by human communities was commonly the key to success, especially in developing countries.

The Biosphere Reserve concept has proved especially valuable in this respect because from the outset it has established a model based on zonation: a core area, often of strictly protected land or land safeguard for scientific study, surrounded by zones of natural habitat, used sustainably by tourism or by compatible extractive industries, and a buffer zone where a wide range of human activities takes place, but in a fashion compatible with the maintenance of the whole system, and with the protection of the core areas.

### **3. Applications in Antarctica**

It is an often-stated fact that the World Heritage and other Conventions cannot be applied in Antarctica because they depend on the exercise of unchallenged sovereignty. Although there has been a nomination of a site (the old City of Jerusalem) for the World Heritage list by a group of States which did not include the State administering the site, that was self-evidently exceptional (and controversial). It is conceivable that the unanimous nomination by all ATCPs of a site in Antarctica for consideration by the World Heritage Committee might succeed, but there would clearly be legal questions (especially if not all the nominating States were Parties to the Heritage Convention, or if some Parties to the latter who were not ATCPs wished to challenge the validity of the Treaty system). The IUCN Strategy for Antarctic Conservation recommended that these legal issues be discussed between the Antarctic Treaty Parties and UNESCO, but the current presumption must be that the World Heritage Convention cannot be directly applied in Antarctica.

It is clear that there are natural sites in Antarctica that would be likely to qualify for consideration as World Heritage sites. The Strategy for Antarctic Conservation suggested that these might include the McMurdo Dry Valleys in southern Victoria Land, perhaps extended to take in some of the adjacent mountains and Ross Island, with its volcanoes and historic sites. Other areas mentioned were the Beardmore Glacier and adjacent ranges, the Vinson Massif and part of the Antarctic Peninsula. Equally clearly, many existing SPAs and SSSIs would not necessarily qualify (unless they happened to fall within wider tracts with World Heritage status, as some do).

The alternative option to seeking to apply the World Heritage Convention directly in Antarctica would be to evolve parallel machinery for designation of sites within the Antarctic Treaty system. Such machinery could (and should) use strictly comparable criteria and procedures, and apply a

designation title which makes the comparability evident. In this way the legal problems would be side-stepped, but consistency assured. The results of the process could be notified to the Committees and Conferences of Parties of the World Heritage Convention for information, and even listed in appendices to their lists. Analogous procedures could be followed for sites that appeared to qualify under the criteria of other Conventions (for example, lakes or areas of especial importance for their biological diversity).

#### **4. Antarctic designations: a proposal for discussion**

It is suggested that the attractiveness of the following system of designations for Antarctica be explored:

**a) Antarctica as a natural reserve devoted to science**

The ATCPs have already achieved this position by the adoption of the Protocol on Environmental Protection. This establishes the comprehensive protection of the environment and dependent and associated ecosystems as a commitment by all Parties. Actions to strengthen various aspects of management of logistic and scientific activities, tourism, waste disposal etc. are important elements in the overall machinery for conservation and sustainable use of the region.

The ATCPs could consider drafting a general statement of commitment to conservation and sustainable use for the region as a whole as a "Charter for Antarctica", which could rehearse the key elements of the World Charter for Nature, already adopted by the General Assembly of the United Nations, and the proposed Covenant on Environmental Protection and Sustainable Development being developed by IUCN (and possibly forming the basis of the Earth Charter, discussed but not adopted at the Earth Summit in Rio de Janeiro). Should such a Charter also be adopted by the UN General Assembly, it might play an important part in affirming global commitment to Antarctic conservation among non-Party States as well as among the Parties to the Antarctic Treaty and to CCAMLR and other relevant Conventions.

**b) Antarctic Heritage Landscapes**

Within Antarctica, the criteria of the World Heritage Convention might be used to define the most outstanding natural areas. The procedure would need to be:

- i) Formal adoption of the process and criteria by an ATCM (the criteria should be identical with those for World Heritage sites, and the procedures as close as possible to the World Heritage ones);
- ii) use of the agreed procedure to select sites, defining their boundaries and specifically agreeing on ways in which they would be conserved and managed. Existing and additional SPAs and SSSIs within such sites would of course continue to be managed as those designations require;
- iii) submission of the nominations for independent scrutiny and report - to a body different from the one responsible for the nominations;
- iv) evaluation of the independent scrutineer's report, by a body different from the one responsible for the nominations;
- v) confirmation of the judgement of the evaluating body by the ATCM.

The Site Proposal Committee could well be made up of individuals with experience of World Heritage procedures from ATCPs, plus a group of experts from SCAR. IUCN could be designated as the body undertaking the scrutiny. The ATCPs should establish the Evaluation Committee, which could well operate as a special group during an ATCM. This machinery would, of course, need funding.

**c) Antarctic Biosphere Reserves**

- i) The Biosphere Reserve model seems particularly suited to Antarctica. It would be applicable to areas, either within or outside Antarctic Heritage Landscapes, which needed special protection for scientific research, as representative samples of ecosystems, or for other purposes (The Antarctic Conservation Strategy emphasised the need for a systematic look at the extent to which current protected areas safeguarded the range of ecological diversity in Antarctica, and this is especially important given the adoption of the Convention on Biological Diversity). Such sites should generally be surrounded by buffer zones managed in a fashion compatible with the safeguarding of the core SPA or SSSI, and the MPA approach could be used to define such management regimes. This would effectively mean that each core site had an MPA-type surrounding area.
- ii) All of the sites designated as ASPAs with biological conservation as their objective could be considered as Biosphere Reserves.
- iii) The Antarctic Conservation Strategy recommended a dialogue with UNESCO over the application of the Biosphere Reserve system in Antarctica, and this should be done. It would also be important to establish how the process for incorporating Antarctic Biosphere Reserves in the world network should be developed. There would be considerable advantages in achieving this.

**d) Antarctic Historical and Geological Monuments**

- i) Parallel with the Biosphere Reserve system, the many Historic Monuments designated in accordance with Treaty Recommendation VII-9 should of course continue to be listed and to receive special protection (and maintenance). It is unlikely that many of these would qualify as Cultural Sites within the meaning of the World Heritage Convention, but some (notably the huts on Ross Island) might do so: that is one reason for their inclusion in an Antarctic Heritage Site. If such monuments are included in a proposed Heritage Site, then ICOMOS should be asked to advise on their global status in parallel with IUCN's evaluation of the natural elements of the nomination, within the process described above.
- ii) There are many striking geological structures in Antarctica. Some of these may fall within Heritage areas, but others will not, and may not fit within the Biosphere Reserves frame either. Hence it may be desirable to establish a category of Geological Monument (to which the geological ASPAs could be assigned). The procedures for designating and managing these need to be developed in parallel with those for Biosphere Reserves.

## **5. Conclusions**

The principal conclusion of this paper is that it would be most desirable for the designation of areas of environment subject to various special protection regimes in Antarctica to proceed on a basis, and using terms, as close as possible to those adopted in other regions of the world. Such an approach not only helps establish genuine compatibility and comparability, but will help in the wider process of reassuring the world community that the Antarctic environment, which some regard as a "global common", is being safeguarded appropriately.

The adoption of the Protocol on Environmental Protection has done much to reassure the world conservation community. It needs to be carried forward to speedy and effective implementation. But the case for formal designation of Antarctica as a whole as a Natural Reserve and Scientific Area should be considered, and some special Charter or Covenant adopted by the whole world community could have merit.

Within this context, the designation of Antarctic Heritage Areas under criteria and procedures fully compatible with those used elsewhere to designate World Heritage sites should proceed.

The establishment of Antarctic Biosphere Reserves appears possible using mechanisms compatible with those adopted for other continents, especially since the Biosphere Reserves are not established under a specific Convention or Treaty. Many existing protected sites could well be brought within the compass of such Reserves.

The final categories of designation needed are of Antarctic Historic Monuments and Antarctic Geological Monuments, and these can be established using processes comparable with those for Biosphere Reserves.

## 5.2 Legal and Policy Issues

**M. Prebble**

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### 1. Introduction

Adoption of the Protocol on Environmental Protection to the Antarctic Treaty in Madrid in 1991 and the completion of Annex V to the Protocol, on Area Protection and Management, at the XVIth Antarctic Treaty Consultative Meeting (ATCM) in Bonn, October 1991, provides the foundation of a new Antarctic Protected Area System. It now requires careful analysis and interpretation for effective implementation. This paper assesses the legal and policy issues associated with Antarctic Protected Areas and highlights some points which will benefit from discussion by this Workshop.

### 2. The Relationship of Annex V to the Protocol

The Protocol on Environmental Protection to the Antarctic Treaty and the first four annexes (on Environmental Impact Assessment, Conservation of Antarctic Fauna and Flora, Waste Disposal and Waste Management, and Prevention of Marine Pollution) were signed by 23 of the 26 Antarctic Treaty Consultative Parties (ATCPs) in early October 1991 in Madrid. All the annexes (including Annex V) thus do not have a life of their own but should be seen as an integral part of the whole Protocol. In this respect what is enunciated in Article 2 and Article 3 of the Protocol is significant.

Article 2 of the Protocol (*Objective and Designation*) stipulates that Antarctica should be designated as a "natural reserve." This in fact grants a general level of protection to the whole of the Antarctic Treaty Area whereas Annex V to the Protocol provides for areas of "special" protection.

The environmental principles as outlined in Article 3 of the Protocol underpin all activity in Antarctica (*viz* Article 3.1) and protection of the Antarctic environment is a fundamental consideration. It is further stated that activities should be planned and conducted to limit adverse environmental impacts including degradation of, or substantial risk to, areas of biological, scientific, historic, aesthetic or wilderness significance (*viz* Article 3.2.b iv). In order to make decisions on impacts the environmental principles call for sufficient information to be made available, including the capacity to monitor key environmental parameters and ecosystem components (*viz* Article 3.2.b v), as well as to allow assessment of the impacts of on-going activities (*viz* Article 3.2 d) and to provide early detection of unforeseen effects of activities (*viz* Article 3.2.c v).

Articles 14 (*Inspection*), 15 (*Emergency Response Action*) and 18 to 20 (*Dispute Settlement*) include the provisions to ensure observation and detection of any breaches in respect of the Protocol, prompt and effective response to environmental emergencies, and for inquiry, arbitration and settlement of any dispute regarding the application of the Protocol.

Annex V on Area Protection and Management arose out of the need to rationalise the existing Protected Area System. Annex V had, in fact, been in gestation since the inception of the Protocol's negotiation in Viña del Mar and later in Madrid. At the XVI ATCM in Bonn two fairly similar versions were presented, both of which reviewed the present rather *ad hoc* provisions for the

Protected Areas System and identified the need for something more coherent in its structure, and preferably simpler to operate.

Annex V provides very comprehensive measures for area protection and management. It replaces the existing five-fold classification of protected areas with just two categories—Antarctic Specially Protected Areas (ASPAs) and Antarctic Specially Managed Areas (ASMAs). The terminology used for ASPA and ASMA indicates that, although all of Antarctica is a protected area, there are some areas that require special protection for the values and qualities that they contain and represent. ASPAs require permits for entry and basically replace the former SSSIs, SPAs and SRAs (although this last category has not been implemented). ASMAs are multiple-use management areas where permits do not apply and replace the MPAs (also yet to be implemented). Historic Sites and Monuments may be protected as either ASPAs or ASMAs or through listing as at present.

Annex V stresses the importance of management planning. Management plans become the tool by which areas are protected and will be approved by ATCMs on the advice and recommendation of the Committee for Environmental Protection (the CEP) and bodies such as the Scientific Committee for Antarctic Research (SCAR) and other parts of the Antarctic Treaty System (*viz* Articles 11 and 12 of the Protocol). Every Contracting Party is entitled to be a member of the CEP and observer status is granted to any Contracting Party which is not a Party to the Protocol. The President of SCAR and the Chairman of the Scientific Committee for the Convention for the Conservation of Antarctic Marine Living Resources (CCAMLR) will also be entitled to attend meetings of the CEP as observers. With the approval of the ATCM the Committee may also invite other relevant organisations (e.g. IUCN) to participate as observers.

The function of the CEP (when it comes into force) will be to provide advice and to formulate recommendations to the Parties in connection with the implementation of the Protocol. One of these functions is listed in Article 12.1 g of the Protocol as the operation and further elaboration of the Antarctic Protected Area System. It is also stated in Article 12.2 that in carrying out its functions the CEP shall consult, as appropriate, with SCAR, CCAMLR and other relevant scientific, environmental and technical organisations where they can make a contribution to the work of the CEP. It is opportune to note that at the XVII ATCM, Venice in November 1992, the terms of reference of the CEP were on the agenda to be considered, while it was hoped that attention would be given to the "whistle blowing" function of the CEP mentioned in Article 12.4 and 12.5 of the Protocol with a view to making more specific how a Party, or the ATCM, should address activities by either Parties to the Protocol, or by other States, which affect the implementation of the objectives and principles of the Protocol.

### **3. Ratification and interim application of the Protocol**

Where do we go from here? Following the adoption of the Protocol, Antarctic Treaty Consultative Parties (ATCPs) enthusiastically affirmed, at the XVI ATCM, that the Protocol should be ratified and enter into force as soon as possible. Each Treaty Party now has the need to implement the Protocol in their domestic law. Even with the best will in the world this may take several years. Thus Treaty Parties stressed at Bonn the absolute priority for the earliest possible ratification of the Protocol and have agreed that in the interim the provisions of the Protocol should be voluntarily applied as far as possible by all the Parties.

It was intended that the Recommendations of this Workshop should be presented at the XVII ATCM, Venice, November 1992, to serve as possible guidelines for the Consultative Parties in their process of voluntarily implementing Annex 5 of the Protocol. They were duly received but,

while all 22 Recommendations had been approved by the President of SCAR and by the Director General of IUCN, they have not yet been adopted by these organisations (Final Report of the XVII ATCM, Annex B iii, Section 5). Special attention was given to the implementation of the Protocol and establishment of the Committee for Environmental Protection (Final Report of the XVII ATCM, Item 6). At that time 36 Contracting Parties, including 26 Consultative Parties, had signed the Protocol. However, before it can enter into force it must be ratified by all Consultative Parties. This is not expected to be achieved before 1995. The Meeting also considered draft rules of procedure involved in the establishment of the CEP. These will need to be adopted by the Committee itself and approved subsequently by the Consultative Parties. There was general support for the establishment of the CEP and it should be possible for it to commence functioning as soon as the Protocol enters into force. Thus, until the CEP is in operation any combined Workshops held by SCAR/IUCN recommending steps on how the Protocol can be implemented will fill an important gap.

#### **4. The implementation of Annex V**

There are no guidelines on how best to implement Annex V nationally. As an example (a) below illustrates the steps that may be followed by New Zealand when the Annex is implemented.

A policy committee (or reference group) on Protected Areas should be established to:

- (a) Guide the translation from the old to the new, to identify the tasks required and to consult with appropriate bodies on the actions that will be necessary. These bodies would (in the New Zealand context) be:
  - The Royal Society of New Zealand;
  - the National Committee on Antarctic Research (NCAR);
  - the Universities with an interest in Antarctica;
  - the Ross Dependency Research Committee (RDRC), or its successor (committee advising Government on the scientific component of the Antarctic programme);
  - the Department of Conservation (DOC);
  - appropriate non-governmental bodies with an Antarctic interest and expertise; and
  - the New Zealand Antarctic Programme (NZAP), which as from 1 July 1992 replaced the Department of Scientific and Industrial Research (DSIR) as the body responsible for Antarctic logistic support and operations and will function as a separate unit within the Ministry of Foreign Affairs and Trade.
  
- (b) Formulate national policies which translate the elements of the Annex into effective practices and to communicate these widely. These policies should cover, among others:
  - (i) Evaluation of the coverage of Antarctic Protected Areas in the Ross Sea Region. For example, what is the environmental-geographical framework for the identification and designation process? What objectives should be followed in this regard so

that the protected area system in the Ross Sea Region, and continentally, is fully representative of the diverse ecosystems in Antarctica?

- (ii) Consideration of the planning and management guidelines for each Protected Area category and the procedures for the establishment and marking of boundaries, including the concept of buffering (see Article 5.2 of the Annex) so as to protect the values for which special protection or management is required.
- (iii) Establishment of the information, surveillance and monitoring requirements that will be necessary under Annex V as well as the reporting requirements that ATCPs will need to make on an annual basis to the CEP and the ATCM.
- (iv) Encouragement of the cooperative development of regional management plans for areas such as Ross Island and King George Island where more than one Treaty Party is operating and different types of protected areas exist within a multiple land use management system.

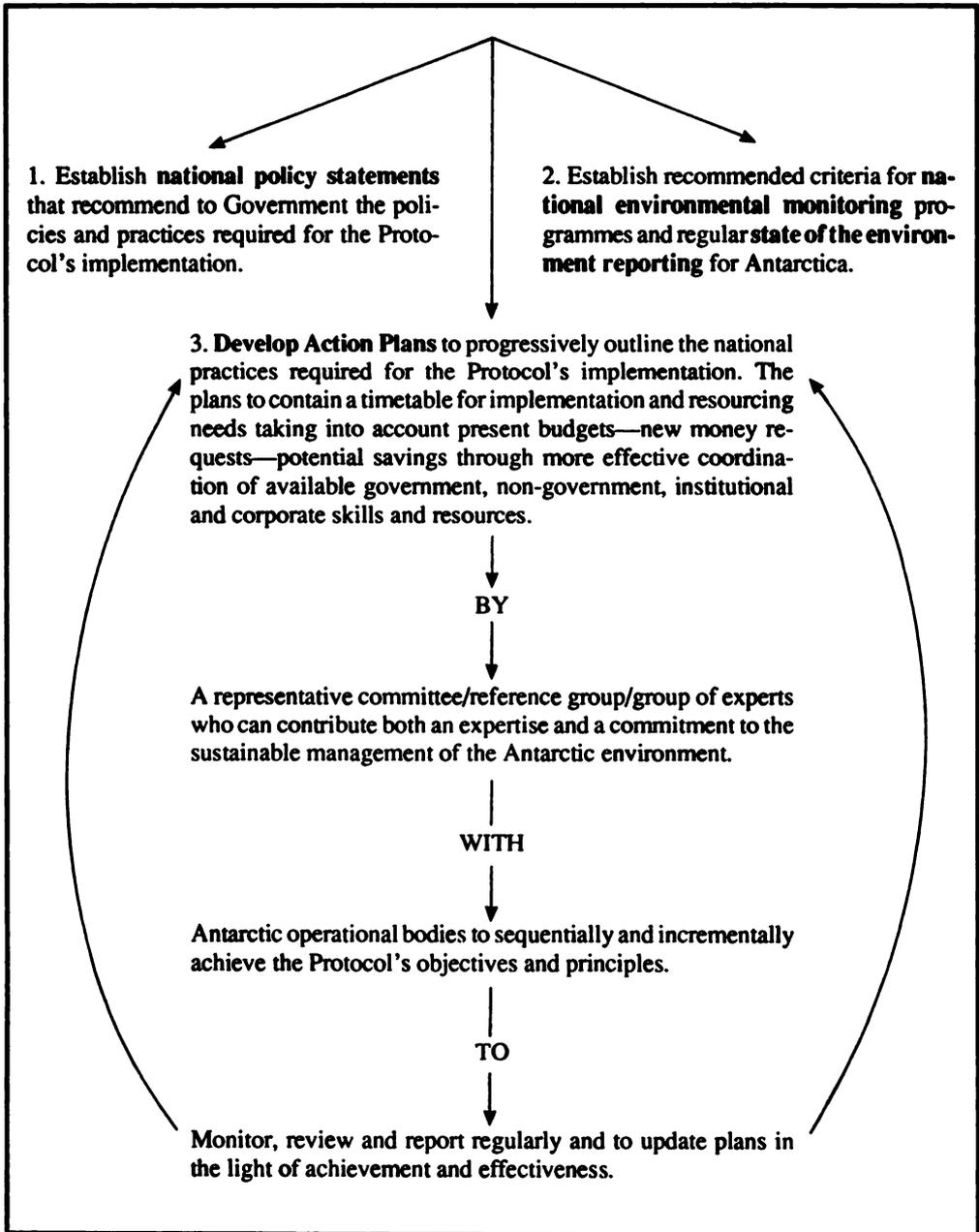
## **5. Summary and Recommendations**

A checklist should be developed which ATCPs and the appropriate national bodies could use as guidelines for the implementation process that converts the Protocol's objectives and the objectives of Annex V into effective policies and practices for Area Protection and Management (Appendix 1).

To begin this process:

- (i) Treaty Parties should set in train procedures to implement Annex V of the Protocol and to include a checklist as a guideline for the implementation process; and
- (ii) further collaboration between SCAR/IUCN and the Treaty Parties should take place, to develop a close working relationship over the implementation of Annex V and the Protocol.

## APPENDIX 1. Implementation of the Protocol to the Antarctic Treaty on Environmental Protection by a national authority.





## 5.3 Summary and Conclusions

### Beth Marks

The Antarctica Project, 424 C Street NE, Washington DC 20002, USA.

There is clearly value in relating the protected area policies adopted in Antarctica to the wider world. If Antarctic Protected Areas could conform with international categories this would ensure a global policy of conservation. International designation had been found to be a useful process in the rest of the world. It had strengthened protection of key sites by drawing world attention to them, incorporating them in worldwide monitoring networks, and made international funds available for management.

Discussion centered on the appropriateness of the various international designations for the Antarctic Protected Area System.

The meeting emphasised that although the minimalist approach may have been true of the ATS in the past, the Environmental Protocol and its Annex V are now much more forward-looking regarding environmental protection, and should be able to introduce more than adequate measures for site protection.

The following conclusions were reached:

- (a) It was agreed that it would be inappropriate at present to designate Antarctic conservation sites under existing international conventions, i.e. Ramsar, Biosphere, Reserves and World Heritage Sites because of the Treaty's unique international legal and political status.
- (b) There was some sympathy for the proposal that some form of Antarctic Treaty designations which paralleled international conservation sites might be considered in the future.
- (c) Concern was expressed over the appropriateness of paralleling Ramsar sites and Biosphere Reserves, the latter because the element of human activities, inherent in the Man and Biosphere Programme, was missing.
- (d) The meeting believed that sites which met the World Heritage criteria should be considered by the Treaty Parties for inclusion in the Antarctic Protected Area System, and that the selection of such sites should parallel the criteria and selection methods used by IUCN for World Heritage listing. However, until the Protocol is ratified and the Protected Areas Annex is in force, no further changes should be considered. Some concern was expressed that since Annex 5 had been introduced to simplify the plethora of designated areas in Antarctica, adding additional categories of protection might further complicate the system in the short term. There was, however, scope for a dialogue between the Treaty Parties and those responsible for international designations.

Discussion on the legal and policy issues focussed on the need for immediate action, during the interim period before the Protocol and Annexes enter into force. In particular, there is a need to provide guidance on criteria for area designation, management plan formulation and voluntary compliance with the system.

The meeting agreed that the following points should be recommended to the Treaty Parties:

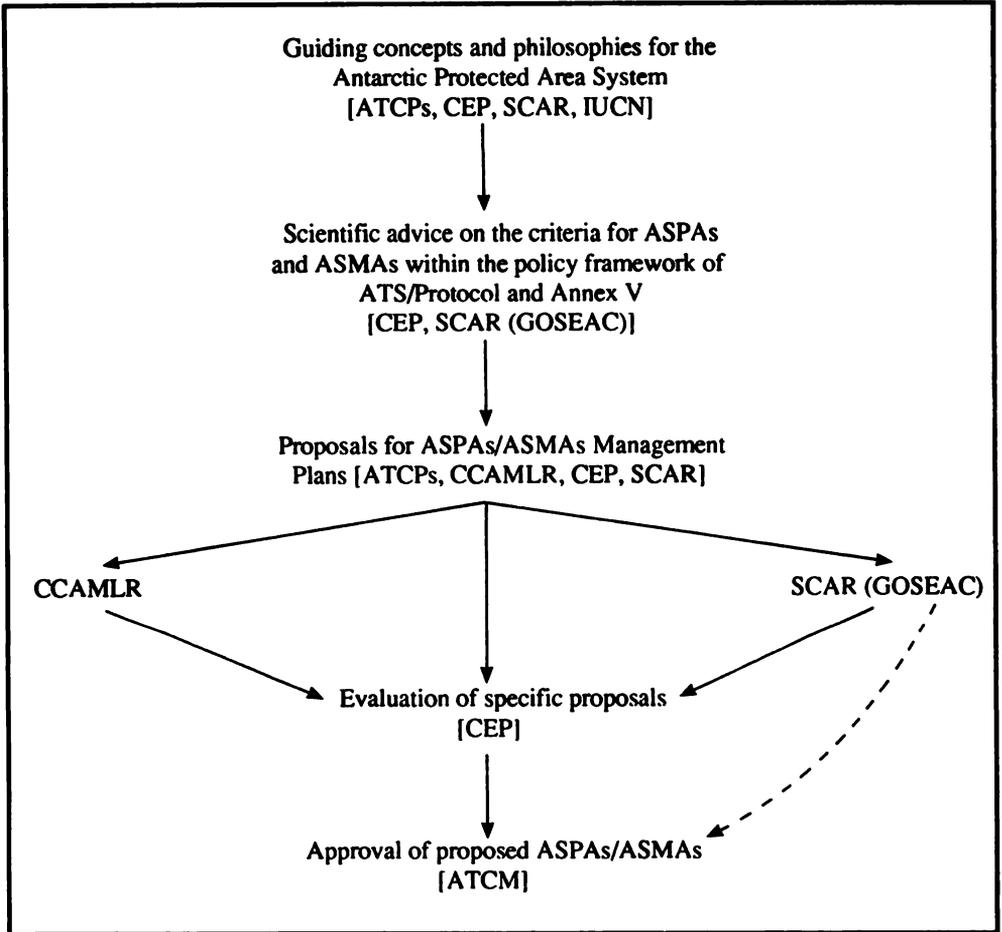
- (a) That during the period of transition from the existing to the new Protected Area System the Treaty Parties encourage further collaboration with SCAR/IUCN, through workshops or other fora, to facilitate the effective and timely implementation of Annex V.
- (b) That in accordance with Article 3(3) of Annex V existing SSSIs and SPAs should not only be renamed and renumbered before becoming ASPAs, but that management plans which conform with Article 5 of Annex V should also be prepared.
- (c) That in the voluntary application of the Environmental Protocol Treaty Parties continue to propose and approve designations of new protected and managed areas, and that the management plans for such areas should be consistent with the elements of the guidelines set out in Article 5 of Annex V, but in the order proposed in Appendix 1.
- (d) To achieve consistency Treaty Parties, when preparing management plans, should each establish a national committee to review and formulate policies which translate Annex V into effective practices. Such national committees should consider adopting the following checklist:
  - (i) Evaluate the Antarctic Protected Area network to assess the adequacy of the existing environmental-geographical coverage (Appendix 2);
  - (ii) identify the values for which special protection or management is required. Management plans should ensure adequate protection of those values through the use of, as appropriate, the concept of buffering and procedures for establishing and marking boundaries (Appendix 3);
  - (iii) establish common methodologies for site surveillance and monitoring, information exchange and reporting through cooperation amongst Treaty Parties; and
  - (iv) examine the appropriateness of cooperative management planning for those areas where more than one Treaty Party is operating and/or where different values requiring protection exist. Consideration should be given in such areas to protecting those values within a single larger site.
- (e) That in the Terms of Reference of the Committee for Environmental Protection due prominence should be given to the importance of the Protected Area System.

## **APPENDIX 1.**

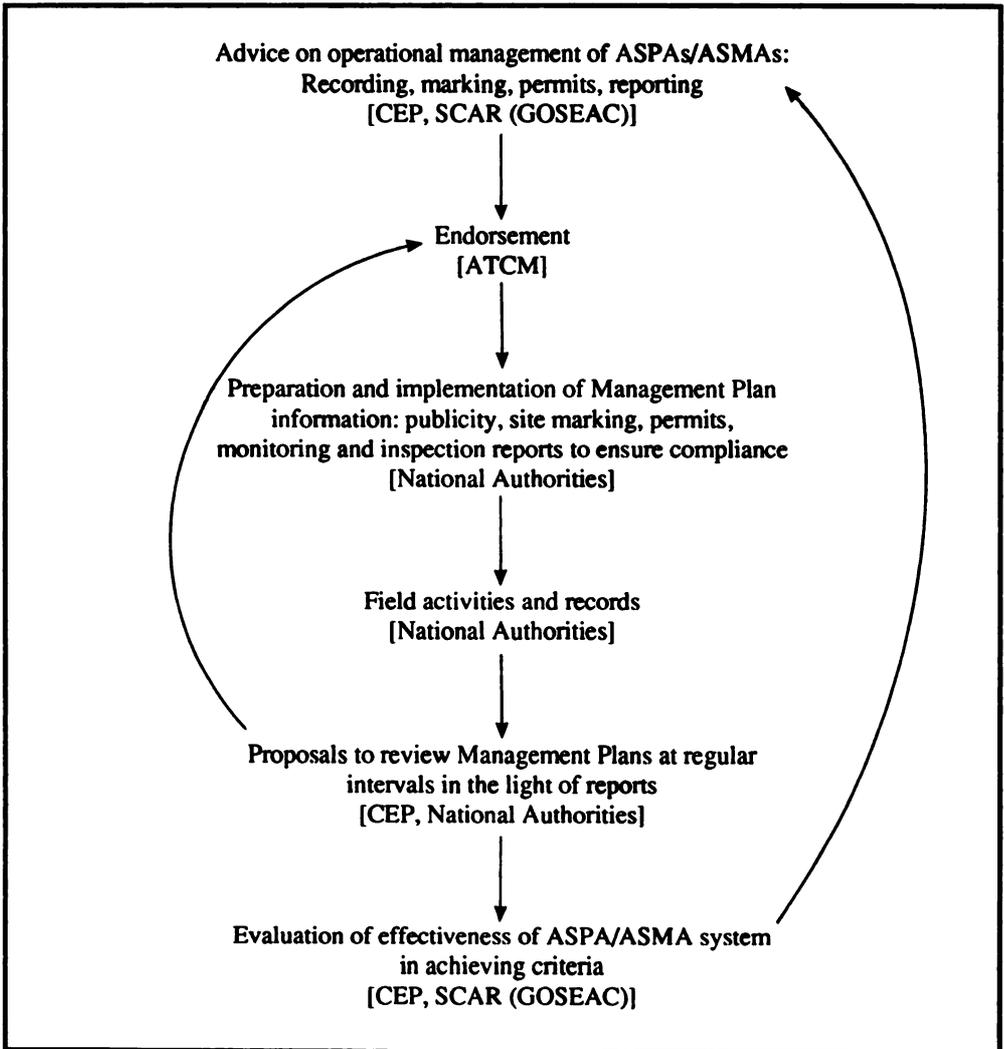
### **Guidelines to national authorities for the formatting of management plans of Protected Areas (in accordance with Article 5 of Annex V of the Protocol on Environmental Protection to the Antarctic Treaty). Figures in brackets refer to the relevant sections of Article 5.**

1. Geographical description of Area (3e), including maps (3g), photographs, etc., and the range of habitats/ecosystems of Area within the SCAR environmental-geographical matrix.
2. Values for which the area is established (3a), including present and proposed use of Area, monitoring and surveillance requirements.
3. Objectives of the Management Plan (3b).
4. Zone by zone specifications (if subzoned) for activities permitted/prohibited, and active management (3c, 3f, 3i, 3j).
5. Responsible agencies for the issue of permits, surveillance, deposition of reports, and arrangements for information exchange (3k).
6. Date of entry into force, period of designation (3d) and review/termination procedure.
7. Supporting documentation provided in an annex (3h), including a physical and biological account of Area, bibliography, and any additional relevant information.

## APPENDIX 2. Process for approval of Antarctic Protected Areas.



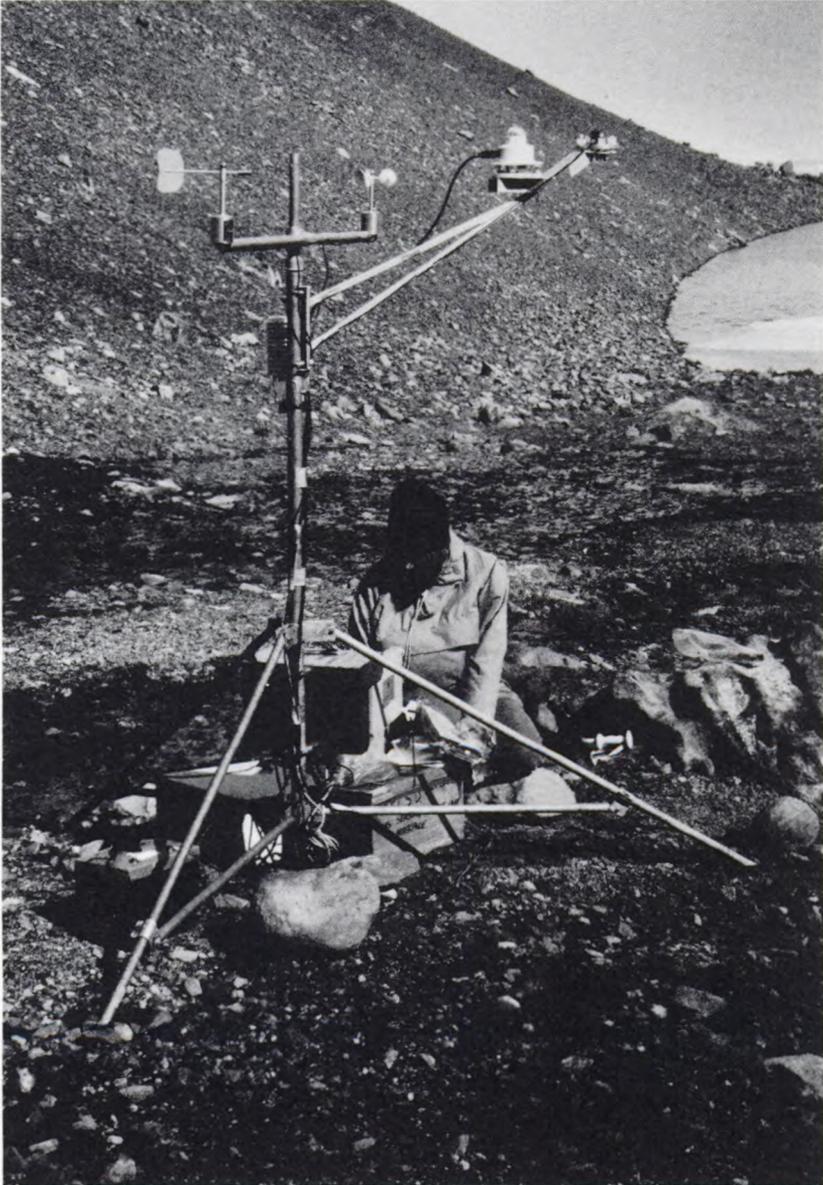
### APPENDIX 3. Management procedures for Antarctic Protected Areas.





# **CHAPTER 6**

# **INFORMATION AND COMMUNICATION**



*In certain areas where scientific investigations are at risk from wilful or accidental interference, protection has been provided by the designation of the area as a Site of Special Scientific Interest. Here, a year-round automatic microclimate station is being checked at a remote biological research site in the Ablation Point-Ganymede Heights SSSI (No. 29).*

Photo: D.D. Wynn-Williams

## 6.1 Scientific Information for Protected Areas

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### 1. Information needs

The primary requirement is the identification of the protected area and of the particular features being protected. These features may be biological, geological, glaciological, atmospheric, aesthetic or wilderness values, or any combination of these. The feature may also be cultural but such designations are not considered here.

Details of the features being protected should include:

- ecosystems, communities, populations
- species and abundance of specific animals and plants
- breeding sites, reproductive success, foraging areas
- area covered
- seasonality
- geomorphological and pedological features
- geological features/fossils/minerals
- glaciological features
- atmospheric conditions
- aesthetic/wilderness values

An inventory of other features of the site is useful, establishing in effect a baseline survey. This may be largely qualitative and will form, with 1.2 above, the basis for any future site "audit" on a regular time-scale as specified in the management plan.

An accurate large-scale map of the area and its environs is essential. It should be as comprehensive as necessary to illustrate all the features described in the inventory. It may require more than one map to achieve this or possibly the use of a topographic base map with thematic overlays. Management plans for ASPAs now provide for the possibility of including half tones.

In all cases the information should supplement the objectives of the protection.

### 2. Data capture methods

Data capture for a protected area is treated here as a field-work project. Ideally, the field data should be as recent as possible and preferably have been collected just prior to site designation, particularly for the specific features being protected. In many instances the latter data will be based on scientific investigation which led to the reason for designation in the first place. Reference to published work should be accompanied by a clear, concise summary of the information relevant and available.

Supporting information to complete the inventory may also be available in published accounts or it may need to be obtained by field survey. Again, any published information should be referenced and a comprehensive summary provided.

All scientific data should be obtained by suitably qualified scientists. Where the reason for site designation is for aesthetic or wilderness values, the features to be protected should be described by qualified scientists in scientific terms and then the opinions of other persons familiar with the area should be sought. Ideally, there will be a large degree of agreement in the opinions to confirm that the aesthetic or wilderness values should be protected.

### **3. Data storage, retrieval and transfer**

It is assumed that the data collected, both qualitative (descriptive) and quantitative (numerical), will be stored in an environmental database using a Geographic Information System (GIS). It would seem logical to have a single database for the entire Antarctic Protected Area System to facilitate data analysis and comparison. Copies of the complete dataset or relevant subsets might be held by different operating agencies. There would be a database manager with responsibility for operating and maintaining the database.

The common problems of data comparability and compatibility when gathering data from a variety of different sources will undoubtedly be encountered. It will be essential for persons submitting data to liaise with the database manager and thereby facilitate data submission by agreement on standards, format and so on.

The choice of organization to run the database will be important. One possibility which might appear particularly attractive would be the World Conservation Monitoring Centre, an independent organization with considerable relevant experience.

An important aspect of the database will be regular up-dating. This might be done by the protected area "auditor" providing information or by up-dating a subset of the data and submitting that for incorporation into the database.

### **4. Resources**

#### **(a) Resources for field studies**

Field studies will almost certainly be undertaken by the appropriate operator whose organization or staff proposed the original designation. In the case of a former SSSI it is possible that the "audit" information could be taken from the results of the scientific programme investigating the features being protected. The scientists involved may well be able to complete a qualitative "audit" of other features of the site. The need for additional resources could be minimal or zero.

In the case of a former SPA which was protected from all human interference, the "audit" would require a special study which would require resources. However, it could be argued that in such a case anything more than a cursory "audit" from a distance would be infringing the terms of protection. Thus, resource requirements might be minimal. In other cases the resources required for an "audit" project could be considerable.

**(b) Resources for a database**

The principal resource needed for the database will be a commitment to long-term funding to ensure continuity. Operational costs will include salaries for a manager and other staff as appropriate.

The responsibility for funding will not rest with WCMC, SCAR or IUCN or whichever organization might host the database. Some funding might be forthcoming from these organizations or other interested sponsors but the responsibility for funding undoubtedly belongs to the ATCPs.

## **5. Data analysis**

The collection and storage of data is of no value unless the data are used. The database manager should be responsible for ensuring that the data are regularly updated and analysed and that appropriate recommendations are made on the strength of the analyses. Recommendations might be for changes in scientific programmes or changes to management plans. Such recommendations are likely to require resources on the part of the operator putting them into effect and the operator may feel that implementation is the responsibility of the ATCPs. However, there would appear to be little chance of receiving funding from the ATCPs as a whole until there is an Antarctic Treaty Secretariat.

The adoption of the Protocol on Environmental Protection to the Antarctic Treaty and its eventual entry into force has highlighted the need for a Treaty Secretariat which will be essential if the Committee on Environmental Protection and other aspects of the Antarctic Treaty are to operate with any degree of effectiveness.



## 6.2 Public Information and Education

**Beth Marks**

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### 1. Introduction

The Antarctic Treaty recognized the importance of setting aside areas for protection at its first Consultative Meeting in 1961, with the adoption of Rec. I-9, which was the first step towards protecting historic sites and monuments. Since then, a series of recommendations, and Article VIII of the Agreed Measures, have defined the current Protected Area System. Annex V of the Environmental Protocol has taken steps to simplify the system of according protection to an area by defining just two categories for protected areas (ASPAs and ASMAs). The accompanying management plans for each area will detail the activities that may, and may not, be undertaken within each area, and regulations for permit entry, if required.

A major deficiency with the system is that many people who travel to Antarctica do not have easy access to adequate information on Antarctic Protected Areas. In the past this has invited unintentional trespass into protected areas, and the disturbance of whatever the site had been designated to protect.

This paper reviews the information needed to guide decisions about protected areas, how it may be optimally used, and how to secure public cooperation and support. There is an urgent need to greatly increase the availability of educational materials and public information on protected areas.

### 2. Target audiences

All visitors, regardless of status, length or purpose of their visit (Table 1), should be provided with some basic information regarding Antarctica, its environment, legal "system", history, and relevance and significance of the Antarctic Treaty and the Environmental Protocol. The hope is that, with a sound understanding of these principles, visitors will strive to leave the region as they found it, for future visitors. Regardless of affiliation, all visits by humans can have impacts; there is no difference between the footprint of a scientist, diplomat or tourist.

The primary reasons for visiting Antarctica, whether scientific, diplomatic, adventure, or pleasure, are based on its unique qualities. Its value as the most pristine region in the world qualifies it as a unique global laboratory, of international importance for much of the research conducted by the programmes of 26 nations. The natural history spectacle of seals, whales, penguins and other birds in their natural habitats unimpeded by the cages, fences and walls of zoos and parks is one of the most thrilling sights in the world. Another unique value is Antarctica's special status under the Antarctic Treaty as a "nature reserve, dedicated to science and other peaceful uses.". The Treaty nations' acceptance of ensuring that 10% of the Earth's land surface remains a nuclear- and military-free zone, a region free of conflict and devoted to peace and science is remarkable. Visitors to Antarctica need to know this proud history to help them contribute to maintaining this special status. Diplomats need to remember the foresight that their predecessors had in signing and ratifying the Antarctic Treaty.

### **3. Information and education needs**

#### **3.1 Public**

The public needs to have access to the "rules" on protected areas. Currently, some countries ensure that all expedition members are informed through briefing conferences, others inform only scientists, some inform tour operators, and some do nothing. This system does not ensure that most visitors are adequately briefed. The worst gaps are probably with ships' crews, who may be nationals of non-Treaty nations, and so not bound in any way to observe regulations. (Whether the crews need to be bound by the regulations of the nation of origin of the tour operator is a different matter).

There is a need for pertinent information to be compiled in an accessible format for visitors. Some national Antarctic organizations produce their own handbook or code of conduct. Some tour operators provide their passengers with basic information booklets, but more is needed. S and J Poncet's *Southern Ocean Cruising Handbook* is an invaluable privately-produced initiative. However, there is a need for a unified, up-to-date, simple but authoritatively written version of the *SCAR Guide for Visitors to the Antarctic*. Perhaps an independent funding source could be found to enable compiling and distribution of information, but its success would depend on the willingness of national operators and scientists to provide information to the compiler.

At the very least, the guide should contain the following information:

- (a) The Protocol Annexes (explained in layman's terminology);
- (b) relevant information from the Antarctic Treaty System pertaining to visitors;
- (c) information on the permitting system and how to comply, including the reminder that entry into ASPAs requires a permit;
- (d) maps, charts, site descriptions, coordinates, etc. to ensure against accidentally entering a protected area;
- (e) key extracts from management plans for ASPAs and ASMAs, explaining in detail why the site has been designated. Descriptions should contain sufficient information to justify the designation and make specific reference to:
  - (i) scientific values—protection of significant scientific research, noting its regional or global significance and objectives, explained in layman's terms and clearly stating why the site may not be entered or has strict prohibitions;
  - (ii) flora and fauna—i.e. the biological importance of the site and the need to protect specific values;
  - (iii) environmental features—drawing attention to environmental sensitivity and ecosystem fragility;
  - (iv) cultural/historical features and site history;
  - (v) aesthetic/wilderness values.
- f) educational materials in the form of illustrated booklets, posters and videos are also needed to publicise:
  - (i) biota/habitat/ecosystems (e.g. The Antarctica Project *Habitat Poster*);

- (ii) the human contribution to the history and development of Antarctica;
- (iii) geological, landscape and other environmental features which emphasise aesthetic and wilderness values.

## **3.2 Governments**

Member nations need to be able to make informed decisions about designating areas for protection. To facilitate this decision making, Articles 3 and 4 of the Protected Area Annex specify the values to be considered when designating an area as an ASPA or an ASMA. In making decisions to set aside areas for protection, the primary objective of the Environmental Protocol needs to be emphasized, namely to preserve Antarctica as a "natural reserve, dedicated to peace and science." Only by preserving exemplary areas within Antarctica can this goal be achieved.

The SCAR Group of Specialists on Environmental Affairs and Conservation (GOSEAC) emphasized in the report of their fourth meeting (Paimpont, 1992), that protected areas are currently clustered in locations which are most densely populated and therefore best known. In keeping with earlier ATCM requests it would be desirable if, in future, there is a more widespread distribution of sites which represents the range of habitats and ecosystems.

## **4. Dissemination of information**

### **4.1 Between ATCP members**

The annual exchange of information should ensure that permit details are circulated between Parties. The following information should be included in such reports:

- (a) Permits issued in the reporting year, with details of activities within each protected area;
- (b) planned activities within protected areas;
- (c) a report of activities within protected areas during the previous year;
- (d) inspection reports.

### **4.2 Between national access points and visitors**

Even if the above information is circulated amongst members, there is no certainty that it will get to visitors. National access points vary widely from country to country. Some are good at publishing rules and enforcing them for their own citizens. Others make little attempt to pass any information along, even to their own scientists and logistics personnel.

### **4.3 Responsible Party**

To protect the integrity of protected areas, relevant information needs to be shared with visitors. The responsibility for disseminating the information must be shared by the Treaty and member nations. To ensure that all visitors are fully informed both prior to their departure and, particularly, during their sojourn in the Antarctic, it is essential that specific persons are appointed whose

responsibilities it will be:

- (a) To act as the national contact to receive all protected area designations, management plans, charts, etc.;
- (b) To act as the national contact to collate and interpret materials (in layman's terms);
- (c) To publicize and distribute relevant up-to-date information.

These responsibilities could be divided between the Treaty and member nations as follows:

### **4.3.1 Antarctic Treaty System**

Appointment of a Secretariat:

- (i) To establish a publicly-accessible database of protected area sites;
- (ii) to act as an information clearing-house and arrange for the translation of relevant materials into the four Treaty languages;
- (iii) to ensure information is communicated to appropriate Treaty members (diplomats);
- (iv) to establish an electronic mail newsletter or bulletin board (many scientists and non-governmental organizations (NGOs) have access to these in some nations (e.g. ECONET). There is a need for these to become more widely available. Perhaps this is an area where NGOs could help.
- (v) to establish and maintain information offices at key ports out of which Antarctic organizations and tour cruises operate (e.g. Christchurch, Ushuaia, Punta Arenas, Hobart, Cape Town, etc.).

### **4.3.2 Member Nations**

An appointed person (or persons) is required:

- (i) To receive information from the ATS Secretariat;
- (ii) to disseminate information to all visitors, including managers and scientists (especially to group leaders) who should be responsible for further distributing the information to the members of the groups;
- (iii) to advertise the availability of information:
  - in a Federal Register, or similar State publication;
  - in scientific journals;
  - in adventure, yachting, sailing, other tourist, etc. magazines;
  - in NGO publications;
  - through travel agents;
  - in bookstores;
  - at stores which carry supplies for recreational sports, adventure travel, camping, food stores (in ports from which visitors depart for the Antarctic – see above).

- (iv) to establish and hook up to electronic bulletin boards.
- (v) to produce information that would be useful to visitors (educational materials, etc.), which could then be sent to the Secretariat for distribution.

#### **4.4 Protected Area Database**

There is currently no provision for any Party to collate permit information. An international depository system for permits needs to be set up and coordinated either through:

- (a) The Treaty Secretariat (which has not yet been accepted by AT);
- (b) the Committee on Environmental Protection (which has not yet been appointed by AT); or
- (c) a non-governmental agency (e.g. SCAR, WCMC).

#### **4.5 Practical matters**

This subject has been discussed elsewhere in these Proceedings. However, the following points are worthy of mention here.

- (a) The importance of consistent and clear demarcation of protected areas, and the need for the signs to be maintained needs to be stressed. Protected Areas need to appear on national/international charts and maps, as called for by XVI ATCM, and their boundaries need to be physically marked. This would seem to be the best way to avoid the inadvertent entry of scientists, tourists, etc. into protected areas.
- (b) In the final analysis, the only way to ensure that the boundaries of protected areas are being respected is through regular inspections. There would also be advantages if a mechanism is established through the ATS for the non-governmental faction of the public to have a reporting system on the state of individual protected areas—through photodocumentation or by completing a form or questionnaire for the sites they visit. This would allow the tourist or whomever to play a small role in protection/ management and become more involved in the Protected Area System, whilst the ATS would benefit from additional sources of information.
- (c) There are obvious financial implications inherent in developing a better public information system, and in physically marking boundaries. Production, copying and distribution of materials will, of course, be costly. It may be possible to find writers, printers, etc., who are willing to donate their services. Or the Treaty might consider paying for initial costs of materials, with member nations paying for copying and distribution. A fund overseen by the Treaty Secretariat, or the CEP, contributed to by tour companies and other user groups might be another option. Collaboration and co-operation between all parties is clearly the most productive way forward.

### **5. Summary**

In some countries there is little or no contact between Antarctic operators, either scientific or recreational, and governments. Consequently, no attempt is made to educate their visitors to the Antarctic. It is important that the public are well informed and given the opportunity to become,

in a small way, involved in the preservation and management of Antarctica. A concerted effort must therefore be made to make information and educational materials available to all visitors. As there may be a special problem with getting compliance from some military personnel and ships' crews, this strengthens the need for:

- (a) Clearly marking the boundaries of protected areas to prevent inadvertent trespass;
- (b) increasing the availability of educational and informational materials;
- (c) a coordinated database of all protected areas;
- (d) a coordinated system of advertising and distributing information to all visitors.

**TABLE 1. Categories of Antarctic visitors.**

<p><b>A. Governmental</b></p> <ul style="list-style-type: none"><li>1. National programmes<ul style="list-style-type: none"><li>a. Scientists</li><li>b. Support staff—on land, ships and aircraft</li><li>c. Managers</li><li>d. Military support personnel</li></ul></li><li>2. Diplomats</li><li>3. Press tours organized by governments and national operators</li></ul> <p><b>B. Non-governmental</b></p> <ul style="list-style-type: none"><li>1. Tour operators<ul style="list-style-type: none"><li>a. Large organized tours</li><li>b. Private yachts, boats, aircraft</li></ul></li><li>2. Tourists<ul style="list-style-type: none"><li>a. On large organized tours</li><li>b. On private yachts, boats, aircraft</li></ul></li><li>3. Crews of tourist and fishery ships</li><li>4. Other non-governmental activities</li><li>5. Scientists, not part of organized national programmes</li><li>6. Press tours, independently organized.</li></ul>
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## 6.3 Information Management

**J. Harrison**

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### 1. Introduction

Within Annex V of the Protocol, which deals with Area Protection and Management, there are a number of references (in Articles) with implications for the management of information on designated sites. In particular:

- i) Art. 5 (*Management Plans*) requires that a proposed management plan be submitted to the Antarctic Treaty Consultative Meeting, as part of the process of designation, and specifies the contents of such a plan.
- ii) Art. 6 (*Designation Procedures*) requires that the Depository maintains a record of all currently approved management plans, and circulates these plans to all Parties.
- iii) Art. 9 (*Information and Publicity*) requires that each Party make available information on the location of protected areas (including listings and maps), management plans (including lists of relevant prohibitions) and the location of historic sites and monuments.
- iv) Art. 10 (*Exchange of Information*) requires that parties maintain and exchange information relating to: records of permits, reports of visits (including inspection visits), significant change or damage to sites, research in sites, and actions taken.

The information management implications of these measures are fairly high, and the role of information manager will become more important as more sites are designated and visits increase. This paper examines two imperatives for information and the questions that flow from them:

1. Establishing clear information management procedures which identify who does what and when;
2. Defining and using standard formats for this information to facilitate comparison, evaluation and analysis.

### 2. Types of information

#### (a) Overview information

It is clear from the Articles of Annex V that the following overview information should be maintained (and can be derived from the management plans):

- lists of approved sites in each category of protected area, and lists of historic sites and monuments
- maps accurately locating each of the sites in the lists, and where possible delineating boundaries
- brief descriptions of each site

In addition, publicity and public relations work would require a summary description of the Antarctic Treaty System, a summary description of Antarctic biological and geographical features, etc.

**(b) Management Plan**

In order to draft the management plan in the form required by Art. 5, the following categories of information must be obtained or defined:

- purpose/value of the site
- physical description
- geographical definition of boundaries, and features within the area (including maps)
- objectives of management
- management activities to be undertaken, including zoning, surveillance/auditing requirements, etc.
- conditions of access and use

In addition, information should be included on who drew up the management plan, and the information sources that were used. Note also that the review/evaluation process will also produce a range of documentation, depending on the mechanism implemented.

**(c) "Monitoring"**

Persons either using the protected area, or permitting its use, have a duty to maintain information on the following, and to exchange it with other parties:

- management activities
- research activities
- other activities (including inspection visits)
- change or damage to sites

Primary mechanisms for doing this are:

- i) *Issuing of permits.* Permits should include at least the following information:
  - who, why, when, where and duration
  - acts which are permitted
  - acts which are not permitted
  - additional tasks to be undertaken
  - who has issued the permit
  
- ii) *Requirement for reporting of site visits.* Reports should include at least the following:
  - who, when and where
  - purpose of visit
  - activities undertaken
  - recommended modifications to site documentation and management plan

- iii) *Environmental Impact Assessments* (IEE and CEE) prepared for activities to be undertaken which are likely to have an impact on protected areas.

**(d) Other useful information**

The following information is not required, but much of it would facilitate activities relating to Antarctic protected areas, including both designation and management. In principle, these points highlight the importance of maintaining site-specific information:

- i) *Directory of contacts.* Who is doing what in the Antarctic, who has what experience, and in what areas. Note that this should include all activities and not only science.
- ii) *Bibliography.* An annotated bibliography of all published and unpublished works relating to a particular geographical location.
- iii) *Visitation.* Information on patterns of visitor use and behaviour, in particular relating to specific sites within the Antarctic, to predict future potential impacts on protected areas.
- iv) *Catchments.* Information on activities within catchment areas of protected areas, where these are outside the site.

### 3. Environmental monitoring

SCAR and COMNAP have drafted a discussion document on *Environmental Monitoring in Antarctica* (May 1992), which deals with both scientific and operational aspects of monitoring programmes as well as information management. It is important that strong links are forged between any process developed for information management on protected areas, and for information derived from monitoring programmes (a number of which are likely to be conducted in protected areas).

### 4. International designations

Holdgate (this volume) identifies a number of the elements involved in the process of "obtaining" international designations. A number of the steps involve the transfer of information, nomination (or proposal), evaluation, and audit (monitoring). If the Treaty Parties are to set up a parallel system, similar steps would be involved, with similar information management requirements.

### 5. Information management

In order to manage information effectively it is necessary to define an information management strategy which clearly identifies the information needs, the process for satisfying those needs (information capture, management and dissemination), and the resources required to carry out the work.

Submission of much of the information identified in the previous section is required by the Articles of Annex V which cover management plans, permit documentation, visit reports and other "auditing" information. In some ways this would make the situation in the Antarctic much better

than in most other parts of the world. The importance, firstly, is to ensure compliance with the provisions specified, and secondly to ensure that guidelines on completion of the management plans, permits and reports are followed (see below). For other types of information, while its capture is less straightforward, it is achievable where the information exists. In both cases the problem is not acquiring the information (providing the resources are there to do the job), it is whether the information exists.

**(a) Standardization**

Standardization is greatly facilitated by a uniform format and content for management plans, permit requests and reports. However, it should go beyond this, as certain information needs to be arranged in categories to facilitate analysis, comparison and evaluation. For example, incorporation of information in the management plans on how the site relates to the SCAR matrices on ecosystem classification. Such classification could be done later, but is better done by those who complete the original document.

It is important to lend support to the SCAR recommendation that there should be standard format permits and reports, and encourage the preparation of guidelines for completing permits, reports and management plans. This process should include identification of categories for information to be managed in a comparative manner.

**(b) User and user needs**

The discussions during this meeting suggest that users of information on Antarctic Protected Areas are likely to include the following categories of people whose information needs are likely to vary:

- Treaty Parties
- Treaty committees and meetings
- National Antarctic programme managers
- scientists and support personnel
- ships' officers and crews
- tour operators
- tourists
- other interested parties
- general public

These different groups need information in order to carry out a wide range of tasks, including:

- facilitating the workings of the Treaty
- evaluation of proposed activities
- briefing
- identifying locations for particular activities
- carrying out analyses and comparisons
- satisfying curiosity

And these users require a wide range of types of information, including:

- lists of sites (including those meeting certain criteria)

- maps (both location maps and site maps)
- summaries of information describing sites
- lists of original documents (including permits, reports and management plans, as well as published work)
- copies of original documents
- summaries of information contained in original documents (permits, reports, management plans)
- analysis and comparisons, based on information in original documents, overlay of information from a range of sources
- bibliography
- list of contacts

And may wish to access this information, as it becomes available, by a range of means, including:

- being provided with copies of documents
- having access to a library/archive
- having access to an information request service
- having access to a computer database
- being provided with summaries and analysis of the information

Quite clearly these lists are incomplete, and items within the lists are not mutually exclusive, but they perhaps indicate the extent of support that could be required.

## 6. Principles for an information management service

Finally, before planning what process needs to be established, it is necessary to identify what might be regarded as key features of an information management system. The following criteria are suggested as being important:

- supporting actual need
- using technology appropriate to need
- being independent of national and sectoral issues
- making information accessible
- working in a transparent way
- ensuring continuity
- ensuring information is up-to-date and accurate
- supplying information in the required format in a timely manner

Given the potential size of the task of information management on Antarctic Protected Areas, and the need to put clear boundaries around what is trying to be achieved, it is recommended that an information management strategy be developed. This could take the form of a discussion document, along the lines of the paper on environmental monitoring prepared by SCAR and COMNAP. This could be an objective of the new SCAR-COMNAP *ad hoc* Planning Group on Antarctic Data Management, whose terms of reference include planning for the coordination and management of Antarctic data.

## **7. Afterword**

Finally, it will be noted that two significant issues are missing from this paper: identification of who does the bulk of the work of information management, and what resources are required. Clearly, the answer would be—first draft your strategy ...

WCMC would be very willing to work with the Treaty System and co-operate with its various committees and expert groups, as well as with national Antarctic programmes, provided the resources are available.

## 6.4 Summary and Conclusions

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A centralised database is required for all Antarctic Protected Areas. However, the collection of scientific information for protected areas will involve resource costs both in the field and with the development and maintenance of the database. In the field, funding would normally lie with national operators. Responsibility for the database would rest with the ATCPs, although this responsibility could devolve on WCMC, SCAR or IUCN by agreement, if and when the AT develops an acceptable strategy and provides adequate resources. It is important that the scientific data are properly used either for basic scientific research or for the management of the site. For example, data could be used to revise management plans or to direct or focus new scientific studies.

Five conclusions were reached:

- (a) The scientific information required for the development of a management plan will be different for ASPAs and ASMAs, the latter including data on patterns of human activity, station operations, fuel depots, waste disposal, etc. A minimal requirement for any site would be sufficient information to place a site within the SCAR matrix, to secure its acceptance as a reasonable nomination, and to provide a basis for management. More detail will be needed for sites subject to active management than for those where the need is to define constraints for potentially damaging human activities;
- (b) sites should not be rejected because they are not the subject of full scientific description, or deferred from consideration while elaborate dossiers are compiled. Management plans need not be long or intricate (a 10-12 page document should generally suffice);
- (c) additional information should be gathered after designation of a site in an incremental, evolutionary way. It is important to avoid scientific activities that may reduce the value of a protected area (for example through disturbance). Such supplementary information should be referred to in an annex to the Management Plan, or held in a separate database;
- (d) monitoring is essential, but it must also avoid disrupting the site. The parameters to be monitored should be specified and justified in the Management Plan. The aim of monitoring should be to ensure that the Management Plan is working and to measure any changes occurring in the site.

There is ample evidence to show that many people who travel to Antarctica do not have direct or easy access to information on protected areas, yet everyone who visits the Antarctic needs this basic information.

Improved information flow is required. Whilst it was suggested that national contact points be established, and that the ATS develop a database of sites which will be available to the public, it has to be recognised that there are cost implications in this. A fund overseen by the ATCPs, or the CEP, contributed to by tour companies and other user groups was suggested.

The meeting emphasised that the final recipients of any information supply system have to be specified before effective action can be undertaken. Unless the information activities under the

Environmental Protocol and its Annexes are very clearly defined, and streamlined, the process will be cumbersome, wasteful and unusable. The meeting recommended that:

- (a) ATCPs should discuss urgently the system required for information exchange and the categories of information to be exchanged within it;
- (b) a clear distinction be drawn between the information exchange needed between the Parties and other groups within the Treaty System, and the information needed for a wider public. The former is codified within the ATS and the Protocol, but the latter is not;
- (c) visitors to Antarctica need information in order to secure their support for Antarctic conservation. The information must be in lay terms, in the most useful languages and should also be available at points of departure of tour and private vessels. Videos should be used as well as written text. Tour operators are one of the best channels to distribute such information packages;
- (d) crews of ships (including military and chartered vessels) are an important target. Charterers of ships crewed by nationals of non-Party states should ensure that an obligation to observe conservation measures is imposed on captains, officers and crew members under the terms of the charter;
- (e) the wider media also needed information about Antarctic environmental issues and a focal point might be established for them.

To manage information on protected areas effectively an information strategy is required. This would involve issues of information capture, standardization and the establishment of user needs. One way to develop this would be through the form of a discussion document from SCAR/COMNAP.

The meeting agreed that clear information management procedures need to be established, with standard formats. To progress this the meeting recommended that:

- (a) The CEP should advise on the system for the collection, evaluation and storage of information before the Protocol enters into force;
- (b) in this work, the CEP should draw upon the information management strategy prepared by SCAR/COMNAP;
- (c) the specification should begin with the information essential to fulfil the requirements of the Treaty and Protocol;
- (d) it should extend further to cover the information essential to meet priority scientific needs, as defined by key operators ("critical users of information");
- (e) case studies should be undertaken in order to provide practical guidelines on the value and cost-effectiveness of different information systems.

# ACRONYMS

<b>ASMA</b>	<b>Antarctic Specially Managed Area</b>
<b>ASPA</b>	<b>Antarctic Specially Protected Area</b>
<b>ASTI</b>	<b>Antarctic Site of Tourist Interest</b>
<b>AT</b>	<b>Antarctic Treaty</b>
<b>ATCM</b>	<b>Antarctic Treaty Consultative Meeting</b>
<b>ATCP</b>	<b>Antarctic Treaty Consultative Party</b>
<b>ATS</b>	<b>Antarctic Treaty System</b>
<b>ASTI</b>	<b>Antarctic Site of Tourist Interest</b>
<b>CCAMLR</b>	<b>Convention for the Conservation of Antarctic Marine Living Resources</b>
<b>CCAS</b>	<b>Convention for the Conservation of Antarctic Seals</b>
<b>CEMP</b>	<b>CCAMLR Ecosystem Monitoring Programme</b>
<b>CEP</b>	<b>Committee on Environmental Protection</b>
<b>COMNAP</b>	<b>Council of Managers of National Antarctic Programmes</b>
<b>GIS</b>	<b>Geographic Information System</b>
<b>GOSEAC</b>	<b>Group of Specialists on Environmental Affairs and Conservation</b>
<b>GPS</b>	<b>Global Positioning System</b>
<b>ICOMOS</b>	<b>International Council on Monuments and Sites</b>
<b>ICSU</b>	<b>International Council of Scientific Unions</b>
<b>IUCN</b>	<b>International Union for the Conservation of Nature and Natural Resources</b>
<b>MPA</b>	<b>Multiple-use Planning Area</b>
<b>NGO</b>	<b>Non-Governmental Organisation</b>
<b>SCALOP</b>	<b>Standing Committee on Antarctic Logistics and Operations</b>
<b>SCAR</b>	<b>Scientific Committee on Antarctic Research</b>
<b>SES</b>	<b>Satellite Earth Station</b>
<b>SPA</b>	<b>Specially Protected Area</b>
<b>SRA</b>	<b>Specially Reserved Area</b>
<b>SSSI</b>	<b>Site of Special Scientific Interest</b>
<b>UN</b>	<b>United Nations</b>
<b>UNESCO</b>	<b>United Nations Educational, Scientific and Cultural Organisation</b>
<b>WCMC</b>	<b>World Conservation Monitoring Centre</b>





## IUCN – The World Conservation Union

Founded in 1948, The World Conservation Union brings together States, government agencies and a diverse range of non-governmental organizations in a unique world partnership: over 800 members in all, spread across some 125 countries.

As a Union, IUCN seeks to influence, encourage and assist societies throughout the world to conserve the integrity and diversity of nature and to ensure that any use of natural resources is equitable and ecologically sustainable. A central secretariat coordinates the IUCN Programme and serves the Union membership, representing their views on the world stage and providing them with the strategies, services, scientific knowledge and technical support they need to achieve their goals. Through its six Commissions, IUCN draws together over 6,000 expert volunteers in project teams and action groups, focusing in particular on species and biodiversity conservation and the management of habitats and natural resources. The Union has helped many countries to prepare National Conservation Strategies, and demonstrates the application of its knowledge through the field projects it supervises. Operations are increasingly decentralized and are carried forward by an expanding network of regional and country offices, located principally in developing countries.

The World Conservation Union builds on the strengths of its members, networks and partners to enhance their capacity and to support global alliances to safeguard natural resources at local, regional and global levels.

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