

# PROTECTION OF THE ANTARCTIC ENVIRONMENT

## Introductory note

Considerations of impact on the Antarctic environment need to come to terms with problems of scale. On the one hand, there are the vastnesses of the Antarctic ice sheet and the Southern Ocean, both with an enormous buffering capacity to absorb the impacts of human activities. On the other hand, there are small, coastal, ice-free areas, homes of birds, seals, plants and other forms of life down to the microscopic, where the impact of human activities can be considerable. In their approach to the question of environmental protection Parties have approached the issue from both ends related to general conceptual objectives and specific activities. Most of the earlier Recommendations were hortatory. Following the negotiation of the Convention on the Regulation of Antarctic Mineral Resource Activities (CRAMRA), it was recognized that many mechanisms of environmental protection which had been included in that Convention in mandatory terms had drawn their inspiration from earlier, hortatory Recommendations. It was recognized that it could be helpful to codify and extend the existing system of measures to protect the environment, as embodied in Recommendations adopted over the years. The Protocol on Environmental Protection was drafted. It draws in large part from Recommendations adopted earlier. The Protocol was adopted in Madrid on 4 October 1991. It entered into force on 14 January 1998. The text of the Protocol is included at the beginning of the Handbook, just after the text of the Treaty.

## Final Report of the Eleventh Antarctic Treaty Special Consultative Meeting, 1991

1. The Eleventh Antarctic Treaty Special Consultative Meeting was held in accordance with the provisions of Recommendation XV-1 adopted by all the Antarctic Treaty Consultative Parties in Paris in October 1989, in order to explore and discuss proposals relating to the comprehensive environmental protection of Antarctica and its dependent and associated ecosystems.
2. The Special Consultative Meeting opened at Viña del Mar from November 19 to December 6, 1990 and was attended by representatives of the Antarctic Treaty Consultative Parties namely, Argentina, Australia, Belgium, Brazil, Chile, China, Ecuador, Finland, France, Germany, India, Italy, Japan, The Netherlands, New Zealand, Norway, Peru, Poland, the Republic of Korea, South Africa, Spain, Sweden, the Union of Soviet Socialist Republics, the United Kingdom, the United States of America and Uruguay. Mr Oscar Pinochet de la Barra, Head of the Delegation of Chile, acted as Chairman for this first session.
3. At Viña del Mar two Working Groups were established by the plenary:

- Working Group I under the Chairmanship of Mr Dietrich Graanow, Head of the Delegation of Germany, and
- Working Group II under the Chairmanship of Mr Roberto Puceiro Ripoll, from the Delegation of Uruguay.

4. The second session took place in Madrid from April 22 to 30, from June 17 to 22 and from October 3 to 4, 1991. The Madrid Session was chaired by Mr Carlos Blasco Villa, Head of the Delegation of Spain. The Closure of the Session was chaired by Mr Francisco Fernández Ordoñez, the Minister of Foreign Affairs of Spain.

5. Representatives from all the Consultative Parties took part in the Madrid Session, namely Argentina, Australia, Belgium, Brazil, Chile, China, Ecuador, Finland, France, Germany, India, Italy, Japan, the Republic of Korea, The Netherlands, New Zealand, Norway, Peru, Poland, South Africa, Spain, Sweden, the Union of Soviet Socialist Republics, the United Kingdom, the United States of America and Uruguay. At the invitation of the Consultative Parties to the Antarctic Treaty, representatives from all of the Contracting Parties which are not Consultative Parties also attended, namely, Austria, Bulgaria, Canada, Colombia, Czechoslovakia, Cuba, Denmark, Greece, Guatemala, Hungary, the Democratic People's Republic of Korea, Papua New Guinea, Romania and Switzerland. The chairman welcomed Guatemala taking part for the first time in an Antarctic Treaty Meeting.

6. The following organisations and institutions were invited to take part in the sessions of the Special Consultative Meeting:

- the Antarctic and Southern Ocean Coalition (ASOC)
- the Commission of the European Communities (CEC)
- the Commission for the Conservation of Antarctic Marine Living Resources (CCAMLR)
- the International Union for the Conservation of Nature and Natural Resources (IUCN)
- the Intergovernmental Oceanographic Commission (IOC)
- the Scientific Committee on Antarctic Research (SCAR)
- the World Meteorological Organisation (WMO)

7. The work of the Madrid Session was greatly facilitated by a draft Protocol on Environmental Protection to the Antarctic Treaty, presented by Ambassador Rolf Trolle Andersen of Norway, the first draft of which was tabled during the Viña del Mar Session.

8. A Legal Drafting Committee was constituted, chaired by Mr Pieter Verbeek from The Netherlands and met from April 25 to 27 and from June 10 to 14, 1991, with the participation of 23 Consultative Parties to the Antarctic Treaty.

9. A Linguistic Group was constituted, chaired by Ferdinand von der Assen, from The Netherlands, to establish the concordance of the text in the official languages of the Antarctic Treaty. The Group met from June 17 to 22 and from September 30 to October 3, 1991.

10. At the conclusion of the Madrid Session, the Representatives of the Consultative Parties adopted by consensus, in the four official languages of the Antarctic Treaty, the Protocol on Environmental Protection to the Antarctic Treaty, of which four Annexes form an integral part, concerning environmental impact assessment, conservation of Antarctic fauna and flora, waste disposal and management and prevention of marine pollution. The Representatives of the Consultative Parties together with those of the non-Consultative Parties participating in the Madrid Session, signed the Final Act of the Eleventh Special Consultative meeting on Antarctic Environmental Protection, to which the aforementioned Protocol is attached.

11. In accordance with the provisions of the Final Report of the XV Antarctic Treaty Consultative Meeting, the Meeting proceeded to initiate a study on tourism, and the Representatives agreed that their study of this subject would be carried out in the XVI Consultative Meeting.

12. Declarations and statements circulated by representatives upon the adoption of the Protocol are annexed to this Final Report. [not reproduced here]

13. The Representatives expressed their thanks to the Governments of Chile and Spain, the hosts of the Special Consultative meeting, as well as to their Chairmen, Ambassador Oscar Pinochet de la Barra and Mr Carlos Blasco Villa, and to the Secretariat for its dedicated contribution to the work of the Sessions, which made the conclusion of the Protocol possible.

## **Final Act of the Eleventh Antarctic Treaty Special Consultative Meeting, Madrid, October 1991**

[1] The final session of the XIth Antarctic Treaty Special Consultative Meeting, convened in accordance with the Recommendation XV-I, was held at Madrid on the 3rd and 4th of October, 1991. The Meeting was attended by representatives of the Antarctic Treaty Consultative Parties (Argentina, Australia, Belgium, Brazil, Chile, China, Ecuador, Finland, France, Germany, India, Italy, Japan, The Netherlands, New Zealand, Norway, Peru, Poland, the Republic of Korea, South Africa, Spain, Sweden, the Union of Soviet Socialist Republics, the United Kingdom, the United States of America and Uruguay). The Meeting was also attended by delegations from Contracting Parties to the Antarctic Treaty which are not Consultative Parties (Austria, Bulgaria, Canada, Colombia, Cuba, Czechoslovakia, Denmark, Greece, Hungary, the Democratic People's Republic of Korea, Romania and Switzerland). Representatives of international governmental and non-governmental organisations attended the Meeting as Observers (Antarctic and Southern Ocean Coalition, Scientific Committee on Antarctic Research, Commission for the Conservation of Antarctic Marine Living Resources, Commission of the European Communities, Intergovernmental Oceanographic Commission, World Meteorological Organisation, International Union for the Conservation of Nature and Natural Resources).

[2] As a result of the deliberations, summarised in the Final Report of the XIth Antarctic Treaty Special Consultative Meeting, the Antarctic Treaty Consultative Parties adopted in the official languages of the Antarctic Treaty the 'Protocol on Environmental Protection to the Antarctic Treaty' and four Annexes to the Protocol, which form an integral part thereof, namely: Annex I on Environmental Impact Assessment, Annex II on Conservation of Antarctic Fauna and Flora, Annex III on Waste Disposal and Waste Management, Annex IV on Prevention of Marine Pollution. The text of the Protocol and the four Annexes is attached to this Final Act. The Protocol provides for the possibility of adopting additional Annexes.

[3] The Protocol provides that it will be opened for signature in Madrid on the 4th of October, 1991, and thereafter in Washington D.C. until the 3rd of October, 1992.

[4] In the Protocol the Parties commit themselves to the comprehensive protection of the Antarctic environment and dependent and associated ecosystems, and designate Antarctica as a natural reserve devoted to peace and science.

[5] In this context, the Meeting agreed that, pending entry into force of the protocol, which would take place as soon as possible, current constraints on Antarctic mineral resource activity should continue.

[6] The Meeting noted that the harvesting of ice was not considered to be an Antarctic mineral resource activity; it was therefore agreed that if the harvesting of ice were to become possible in the future, it was understood that the provisions of the Protocol, other than Article 7, would apply.

[7] The meeting noted that nothing in the Protocol shall derogate from the right and obligations of Parties under the Convention on the Conservation of Antarctic Marine Living Resources, the Convention for the Conservation of Antarctic Seals and the International Convention for the Regulation of Whaling.

[8] With respect to the activities referred to in Article 8, the Meeting noted that it was not intended that those activities should include activities undertaken in the Antarctic Treaty area pursuant to the Convention on the Conservation of Antarctic Marine Living Resources or the Convention for the Conservation of Antarctic Seals.

[9] The Meeting underlined the commitment of the Parties to the Protocol in its Article 16 to elaborate rules and procedures relating to liability for damage arising from activities taking place in the Antarctic Treaty area and covered by the Protocol, with a view to their inclusion in one or more Annexes and expressed the wish that work on their elaboration could begin at an early stage. In this context, it was understood that liability for damage to the Antarctic environment should be included in such an elaboration.

[10] The Meeting noted that, with regard to the competence of the Arbitral Tribunal under Articles 19 and 20 of the Protocol to make an award upon any matter, it was understood that the Tribunal would not make determinations as to damages until a binding legal regime had entered into force through an Annex or Annexes pursuant to Article 16.

[11] With reference to Article 18, the Meeting agreed that an inquiry procedure should be elaborated to facilitate resolution of disputes concerning the interpretation or application of Article 3 with respect to activities undertaken or proposed to be undertaken in the Antarctic Treaty area.

[12] The Meeting acknowledged that, while reservations to the Protocol would not be permitted, this did not preclude a State, when signing, ratifying, accepting or approving the Protocol, or when acceding to it, from making declarations or statements, however, phrased or named, with a view, *inter alia*, to the harmonisation of its laws and regulations with the Protocol, provided that such declarations or statements do not purport to exclude or to modify the legal effect of the Protocol in its application to that State.

[13] The Meeting agreed that the contents of this Final Act are without prejudice to the legal position of any Party under Article IV of the Antarctic Treaty.

[14] The Meeting agreed that it was desirable to ensure the effective implementation at an early date of the provisions of the Protocol. Pending the entry into force of the Protocol it was agreed that it was desirable for all Contracting Parties to the Antarctic Treaty to apply Annexes I–IV, in accordance with their legal systems and to the extent practicable, and to take individually such steps to enable it to occur as soon as possible.

[15] Done in Madrid, this fourth day of October, 1991, in a single original copy in the four languages of the Antarctic Treaty to be deposited in the Archives of the Government of the United States of America, which will transmit a certified copy thereof to all Contracting Parties to the Antarctic Treaty.

## **Antarctic Treaty Recommendations**

### **ATCM XXIV: Decision 3 (2001): [Liability]**

The Representatives,

*Taking into account* Decision 3 (1998), which called on Working Group I to elaborate draft texts for an annex or annexes on liability for environmental damage;

*Encouraged by* the progress made in the meetings of Working Group I and in informal consultations on a liability annex to the Environment Protocol;

*Conscious of* the need to continue the negotiations on this issue, which were mandated in Article 16 of the Environment Protocol;

*Decide:*

1. To invite the Chairman of Working Group I to elaborate a draft text of an annex on the liability aspects of environmental emergencies, as a step in the establishment of a liability regime in accordance with Article 16 of the Protocol, on the basis of the draft text proposed by the United States (ATCM XXIV/WP6) and his own draft text (ATCM XXIV/WP17), taking into account the paper produced by SCAR and COMNAP in

response to Resolution 5 (1999) (ATCM XXIV/WP14), the informal consultations and the discussions in Working Group I on this topic, and the papers produced during these discussions.

2. To further invite the Chairman of Working Group I to explore the possibility of holding intersessional consultations in 2002, under the same conditions as normal meetings of the ATCM, in order to develop a consensus on the draft text, and to encourage all Antarctic Treaty Parties to participate in any such intersessional consultations.
3. To continue and conclude the negotiations on a draft annex on the liability aspects of environmental emergencies as soon as possible and to undertake these negotiations in Working Group I of the ATCM.

### **XXIII: Resolution 4(1999)**

#### **Cooperation among Parties in Accordance with Article 6 of the Protocol on Environmental Protection to the Antarctic Treaty**

The Representatives,

*Recalling* that, at the XVI Antarctic Treaty Consultative Meeting, held in Bonn, Germany, on 7-28 October 1991, and the XVII Antarctic Treaty Consultative Meeting, held in Venice, Italy, on 11-20 November 1992, the Consultative Parties examined in detail international cooperation in scientific research and associated logistic activities;

*Noting* that Article 6 of the Protocol on Environmental Protection to the Antarctic Treaty calls on the Parties to cooperate in the planning and conduct of activities in the Antarctic Treaty area;

*Noting* further that Article 6 (a-d) highlights the need to cooperate to ensure environmental protection in Antarctica;

*Aware* of the usefulness of examining past experiences of cooperation on environmental matters in Antarctica so as to identify the potential for expansion and development of further cooperation;

*Recommend* that:

1. ATCM XXIV discuss the potential for enhanced cooperation on environmental protection in Antarctica in light of past experience and particularly since the XVI Antarctic Treaty Consultative Meeting.
2. Peru coordinate preparation for discussion of this issue prior to ATCM XXIV.

Peru should seek relevant information from SCAR and COMNAP, including their environmental subgroups, and invited experts as appropriate, as well as directly from other Antarctic Treaty Parties and share such information through electronic means.

### **XXIII: Resolution 6 (1999)**

#### **Adherence to the Environmental Protocol by Non-Consultative Parties**

The Representatives,

*Considering* the entry into force of the Protocol on Environmental Protection to the Antarctic Treaty;

*Noting* that certain non-Consultative Parties are not yet Parties to the Protocol and are therefore not bound by its provisions;

*Aware* that vessels carrying significant numbers of tourists are operating, or planning to operate, in Antarctic waters, and that some of these vessels are chartered by tourist companies organizing their expeditions in the territory of non-Consultative Parties;

*Conscious* of the potential for cumulative environmental impacts as a result of large numbers of tourists visiting sites in Antarctica;

*Concerned* that the presence of such vessels in Antarctic waters may result, in the event of a major maritime accident, in a serious risk to the safety of the crew and passengers involved, and significant adverse impact on the Antarctic environment and dependent and associated ecosystems, as well as major implications for search and rescue resources in Antarctica;

*Urge:*

Those non-Consultative Parties which have not yet become Parties to the Protocol on Environmental Protection to the Antarctic Treaty, particularly those with Antarctic tourist activities organised in their territory, to adhere to the Protocol as soon as possible.

### **XXII: Decision 3 (1998)**

#### **Liability**

The Representatives,

*Recalling* the obligation in Article 16 of the Protocol;

*Determined* to advance the process leading to full and effective implementation of that Article;

*Welcoming* the report by the Group of Legal Experts on Liability;

*Decide:*

1. That the Group of Legal Experts on Liability, by submitting its report, has fulfilled its task and its work is now completed;
2. That the further negotiation of an annex or annexes on liability be undertaken in Working Group I of the ATCM;
3. To this end, deliberations shall continue at ATCM XXIII, taking into account *inter alia*:

- a) the Report of the Group of Legal Experts (XXII ATCM/WPI ),
- b) the emergency response work undertaken on the basis of Resolution 6 ( 1998),
- c) inputs from SCAR, COMNAP and others on risk assessments, concentrating on facts, data and evaluations with regard to circumstances leading to and types of environmental damage, the financial magnitude of potential damages and the probable costs of response actions and remedial measures under the circumstances of Antarctica,
- d) other pertinent inputs;

That Working Group I of the ATCM shall seek to elaborate draft texts, based on submission by Parties, for further consideration at ATCM XXIV.

### **XIX: Resolution 4(1995)**

#### **Fuel Storage and Handling**

The Representatives:

*Noting* advice in inspection reports that fuel storage facilities and fuel transfer practices are the components of station activities with the greatest potential for causing significant adverse impacts;

*Recalling* that pending its entry into force the Parties have committed themselves to implement the Protocol on Environmental Protection to the Antarctic Treaty to the extent practicable; and,

*Acknowledging* that Article 3 of the Protocol provides that activities in the Antarctic Treaty area shall be planned and conducted so as to limit adverse impacts on the Antarctic environment and dependent and associated ecosystems.

Recommend that:

The Consultative Parties ask COMNAP, through their members, to identify steps that could be taken to improve fuel storage and handling and that this item be included on the Agenda for the next ATCM.

### **XVII-1: Environmental Monitoring and Data Management**

The Representatives,

*Recalling* Recommendations XV-5, XV-16, XVI-12 and paragraphs 106-109 of the Report of the XVIth ATCM;

*Noting* the report and the valuable work of the First Meeting of Experts on Environmental Monitoring in Antarctica (XVII ATCM/INFO 9) and the recommendation set forth in the afore mentioned report;

*Noting* that better data management can improve the quality of Antarctic Environmental Monitoring, operations and science;



*Noting* additionally the report by SCAR-COMNAP (XVII ATCM/WP 5) describing actions that could be taken to develop a coordinated data management system with the intent to improve the comparability and accessibility of both scientific and environmental data being collected by national programmes, as called for by ATCM Recommendations XIII-5 and XV-16.

*Recognizing* that, in the Final Act of the Protocol on Environmental Protection to the Antarctic Treaty, it was agreed that it was desirable to ensure effective implementation at an early date; and that paragraph 69 of the Report of the XVIth ATCM exhorts the Consultative Parties to ratify the Protocol as soon as possible, and that meanwhile efforts also should be made to implement the provisions of the Annexes as rapidly and completely as possible.

*Acknowledging* that in order to meet the requirements of the Protocol on Environmental Protection to the Antarctic Treaty that calls, under Articles 3.2 (d) and 3.2 (e), for regular and effective monitoring, to allow assessment of the adverse impacts of human activities, it is necessary to focus environment impact monitoring particularly on anthropogenic effects at a local level;

*Aware* that once established, the Committee for Environmental Protection may offer its advice on these measures, consistent with its terms of reference as provided for in the Protocol;

*Aware* that applied monitoring can be expensive and may require long term commitment and that any environmental monitoring should be scientifically defensible, practicable and cost-effective;

*Recommend* to their Governments that they:

1. Through their SCAR National Committees request SCAR to consider and provide advice on:
  - i) The types of long-term programmes, if any, necessary to verify that human activities (such as tourism, scientific research or other activities) do not have significant adverse effects on birds, seals and plants; and
  - ii) emission standards that should be established to ensure that the combustion of fossil fuels and incineration of waste do not contaminate the Antarctic atmosphere, terrestrial, ice, aquatic or marine environments in a way that would compromise their scientific values;
2. Ask their COMNAP Representatives in consultation with SCAR to establish research programmes at a representative subset of facilities in Antarctica to determine how different types and sizes of facilities in different localities (e.g. coastal and inland stations on rocks and on ice shelves) affect the Antarctic environment;
3. Provide a list of the Antarctic data sets being compiled and archived by their nationals and make this list available to other Parties, SCAR and COMNAP, as soon as possible, to form the basis for the development of an Antarctic Data Directory;

4. Establish, as appropriate, national arrangements for obtaining expert advice on the types of data products and data access mechanisms which would best meet both the basic scientific requirements and long-term environmental monitoring requirements.

**XV-1: Comprehensive measures for the protection of the Antarctic environment and dependent and associated ecosystems**

The Representatives,

*Convinced* of the need to preserve the Antarctic Treaty system so as to ensure that Antarctica does not become the scene or object of international discord;

*Bearing in mind* the special legal and political status of Antarctica and the special responsibility of the Antarctic Treaty Consultative Parties to ensure that all activities in Antarctica are consistent with the purposes and principles of the Antarctic Treaty;

*Recalling* the designation of Antarctica as a Special Conservation Area;

*Recognizing* the vulnerability to human interference of the Antarctic environment and its dependent and associated ecosystems;

*Recognizing further* the unique opportunities Antarctica offers for scientific research on processes of global as well as regional importance;

*Taking into account* international concern for the environment and the importance of Antarctica for the global environment;

*Bearing in mind* the substantial body of measures adopted by the Antarctic Treaty Consultative Parties in recognition of their special responsibilities for the protection of the Antarctic environment and its dependent and associated ecosystems;

*Recalling* in this context Articles V and IX (1) (f) of the Antarctic Treaty and Recommendations setting out general principles for the protection of the Antarctic environment;

*Recalling also:*

- a) the Agreed Measures for the Conservation of Antarctic Fauna and Flora and associated Recommendations;
- b) the Convention for the Conservation of Antarctic Seals (which entered into force on 11 March 1978)
- c) the convention on the Conservation of Antarctic Marine Living Resources which entered into force on 7 April 1982);
- d) the Convention on the Regulation of Antarctic Mineral Resource Activities which has not yet entered into force);
- e) Recommendations relating to:
  - i) the Antarctic Protected Area system concerning Specially Protected Areas, Sites of Special Scientific Interest and Historic Sites and monuments;
  - ii) the Code of Conduct for Antarctic expeditions and station activities;
  - iii) the effects of Antarctic tourism and non-governmental expeditions;

- iv) the use of radio-isotopes;
- v) oil contamination;
- vi) the prohibition on the disposal of nuclear waste; and
- vii) environmental impact assessment procedures;

as well as work undertaken in relation to the uses of Antarctic ice;

*Taking note* of proposals made at XVth Consultative Meeting by France and Australia for a comprehensive Convention for the Protection of the Antarctic Environment which would establish Antarctica as a natural reserve, land of science; by the United States for comprehensive measures building on the components of the Antarctic Treaty system; by Chile on comprehensive measures, which include the development of the concept of Antarctica as a Special Conservation Area; by New Zealand for comprehensive measures constituting an integrated and binding environmental protection regime; and by Sweden relating to common elements for environmental protection;

*Welcoming* the further substantial progress made on the protection of the Antarctic environment and its dependent and associated ecosystems through the work of this Consultative Meeting including the adoption of Recommendation XV-3 on Waste Disposal; Recommendation XV-4 on the Prevention, Control and Response to Marine Pollution; Recommendation XV-5 on Environmental Monitoring in Antarctica; Recommendation XV-6 on New Sites of Special Scientific Interest; Recommendation XV-8 amending Article VIII of the Agreed Measures to provide for Management Plans for SPAs; Recommendation XV-9 on development of improved descriptions and management plans for Specially Protected Areas (SPAs); Recommendation XV-10 on Establishment of Specially Reserved Areas; Recommendation XV-11 on Establishment of Multiple-use Planning Areas; Recommendation XV-14 and XV-15 on promotion of the international scientific cooperation; Recommendation XV-17 on the Siting of Stations; Recommendation XV-19 on Charting of Antarctic waters; Recommendation XV-21 on Antarctic Ice and the Declaration on the Ozone Layer and Climate Change;

*Acknowledging* the need, in the light of the unique qualities of Antarctica and increasing human activities there, to ensure the effective implementation, coordination and further elaboration of the system of protection of the Antarctic environment and its dependent and associated ecosystems;

*Recommend* to their Governments that:

1. They undertake as a priority objective the further elaboration, maintenance and effective implementation of a comprehensive system for the protection of the Antarctic environment and its dependent and associated ecosystems aimed at ensuring that human activity does not have adverse impacts on the Antarctic environment or its dependent or associated ecosystems or compromise the scientific, aesthetic or wilderness values of Antarctica.
2. To contribute to this objective, a Special Antarctic Treaty Consultative Meeting be held in 1990 to explore and discuss all proposals relating to the comprehensive protection of the Antarctic environment and its dependent and associated ecosystems.

3. In addressing the requirements of such a comprehensive system, they:
- a) have regard to the principles for the protection of the Antarctic environment and its dependent and associated ecosystems already established under the Antarctic Treaty system and shall consider the need to elaborate further, expand and supplement those principles;
  - b) review the existing body of measures for the protection of the Antarctic environment and its dependent and associated ecosystems in order, *inter alia*, to:
    - i) identify those measures which should be updated, strengthened or otherwise improved;
    - ii) identify areas where the existing measures should be supplemented;
    - iii) consider the nature of the legal obligations contained in existing measures and the need, as necessary, to state those obligations with greater precision;
    - iv) make provision for the promotion of research related to environmental management decisions;
    - v) promote the establishment of procedures for assessing the possible impact of human activities on the Antarctic environment and its dependent and associated ecosystems in order to provide for informed decision-making as to their acceptability;
    - vi) promote the establishment of procedures to monitor the effectiveness and adequacy of environmental protection measures;
    - vii) consider the role of an information and data base for the effective implementation, revision and extension of environmental protection measures;
  - c) consider if and to what extent institutional arrangements may be necessary and the form or forms of the legal or other measures needed to ensure the maintenance, integration, consistency and comprehensiveness of the system of protection of the Antarctic environment and its dependent and associated ecosystems.

#### **XV-5: Human Impact on the Antarctic Environment: Environmental Monitoring in Antarctica**

The Representatives,

*Recognizing* that, because of its relatively pristine state, Antarctica provides an important natural laboratory to obtain baseline information on Antarctic environments and for detecting and monitoring some of the effects of human activities on the global environments and ecosystems upon which the welfare and survival of the human species depend;

*Recognizing* also that scientific research, related logistic support activities, tourism, natural resources exploration and development, and other human activities in Antarctica could have local, regional or global environmental effects, or compromise the scientific value of Antarctica;

*Recalling* the Scientific Committee on Antarctic Research (SCAR) response to Recommendation XII-3 and Recommendation XIV-2, which call upon the Antarctic Treaty

Consultative Parties to establish programmes for detecting and monitoring the effects of human activities on key components of Antarctic ecosystems;

*Conscious* that determining cause-effect relationships between certain human activities and observed changes in Antarctic environments will require knowledge of natural variation in Antarctic environments and accurate records of such things as the types and quantities of fuels used to supply heat and light to Antarctic stations and to operate aircraft and land vehicles in Antarctica;

*Aware* of the ecosystem monitoring programme being developed to help meet the objectives of the Convention on the Conservation of Antarctic Marine Living Resources;

*Desiring* to identify and initiate cooperative, long-term monitoring programmes necessary to verify the predicted effects and to detect and quantify the possible unforeseen effects of human activities on the Antarctic environment; and

*Recognizing* that the design and implementation of integrated, comprehensive, and cost-effective environmental monitoring programmes in Antarctica serve both scientific and environmental protection purposes;

*Recommend* to their Governments that:

1. They encourage their national Antarctic programmes, individually and collectively, to continue and, as appropriate, expand programmes in Antarctica aimed at detecting and monitoring global environmental change, including its effects on the ozone layer over Antarctica, effects on Antarctic terrestrial, marine, and atmospheric environments and dependent and associated ecosystems as well as effects on Antarctic living resources.
2. They undertake, individually and collectively, to establish environmental monitoring programmes to verify the predicted effects and to detect the possible unforeseen effects on Antarctic environments and living resources of activities in the Antarctic Treaty area, including:
  - a) waste disposal;
  - b) contamination by oil or other hazardous or toxic substances;
  - c) construction and operation of stations, field camps, and related ship, aircraft and other logistic support facilities;
  - d) conduct of science programmes;
  - e) recreational activities, and
  - f) those affecting the purposes of designated protected areas.
3. They take such steps as necessary to maintain accurate records of the activities of their national programmes in Antarctica, including, among other things, maintaining accurate records of the types and quantities of fuels and other materials transported to and used to support their national programmes in Antarctica, the types and quantities of materials subsequently removed from Antarctica, and the types and quantities of materials disposed of in Antarctica by various means, bearing in mind Recommendation XV-3.
4. They convene, in accordance with Recommendation IV-24, a meeting of experts to consider and provide advice on:

- a) The types of cooperative, long-term monitoring programmes that would be useful for detecting, quantifying, monitoring, and determining the likely causes of observed changes in air quality, snow and water quality, and other key features of Antarctic environments and living resources;
- b) on the methods that should be used to collect, report, store, exchange, and analyze needed data; and
- c) on where and how frequently various environmental parameters should be measured.

To this end, they invite SCAR through their national committees, to consider and provide advice on the above matters.

5. They exchange information and establish cooperative working relations with those Specialized Agencies of the United Nations and other international organizations having a scientific or technical interest in Antarctica that are engaged in the planning and implementation of related scientific research and environmental monitoring programmes.

#### **IX-5: Man's impact on the Antarctic environment**

The Representatives,

*Recommend* to their Governments that they approve the following declaration on the Protection of the Antarctic Environment:

The Governments participating in the Ninth Antarctic Treaty Consultative Meeting,

*Deeply aware* that the Antarctic environment is unique and vulnerable to contamination and disturbance;

*Determined* to protect the Antarctic environment from harmful interference;

*Having particular regard* to the conservation principles developed by the Scientific Committee on Antarctic Research (SCAR) of the International Council of Scientific Unions;

*Recalling* their obligation to exert appropriate efforts, consistent with the Charter of the United Nations, to the end that no one engages in any activity in Antarctica contrary to the principles or purposes of the Antarctic Treaty;

*Declare* as follows:

1. The Consultative Parties recognize their prime responsibility for the protection of the Antarctic environment from all forms of harmful human interference;
2. They will ensure in planning future activities that the question of environmental effects and of the possible impact of such activities on the relevant ecosystems are duly considered;
3. They will refrain from activities having an inherent tendency to modify the Antarctic environment unless appropriate steps have been taken to foresee the probable

modifications and to exercise appropriate controls with respect to harmful environmental effects;

4. They will continue to monitor the Antarctic environment and to exercise their responsibility for informing the world community of any significant changes in the Antarctic Treaty Area caused by man's activities.

### **VIII-11: Man's impact on the Antarctic environment**

The Representatives,

*Recalling* Recommendations VI-4 and VII-1;

*Desiring* to minimize the impact of man on the Antarctic environment;

*Noting* with appreciation the response of the Scientific Committee on Antarctic Research (SCAR) to Recommendation VI-4;

*Recommend* to their Governments that:

1. To the greatest extent feasible they observe the code of conduct annexed to this Recommendation at their stations and for their activities within the Antarctic Treaty Area;
2. Through their National Antarctic Committees they invite SCAR, in cooperation with the Scientific Committee on Problems of the Environment (SCOPE) of the International Council of Scientific Unions, to continue its interest in the development of scientific programmes for detecting and assessing changes occurring in the Antarctic environment.

#### ***Annex***

##### *Code of Conduct for Antarctic Expeditions and Station Activities*

#### 1. Waste disposal

The following are recommended procedures:

- a) Solid waste
  - i) *Non-combustible, including chemicals (except batteries)*. These materials may be disposed of at sea either in deep water or, if this is not possible, at specified sites in shallow water.
  - ii) *Batteries* should be removed from the Antarctic Treaty Area.
  - iii) *Combustibles*
    - Wood, wood products and paper should be incinerated, the ash being disposed of at sea.
    - Lubricating oils may be burnt except those containing harmful additives which should be removed from the Antarctic Treaty Area.
    - Carcasses and materials associated with imported experimental animals should be incinerated.

- All plastics and rubber products should be removed from the Antarctic Treaty Area.
- b) Liquid waste
    - i) Human waste, garbage and laundry effluents should, where possible, be macerated and be flushed into the sea.
    - ii) Large quantities of photographic liquids should be treated for the recovery of silver and the residue should be flushed into the sea.
  - c) The above procedures are recommended for coastal stations. Field sites supported from coastal stations should, where feasible, use the facilities of their supporting station. Inland stations should concentrate all waste in deep pits. Except as stated for inland stations, waste should not be buried.
  - d) Waste containing radio-isotopes should be removed from the Antarctic Treaty Area.
  - e) Every effort should be made to reduce the plastic packaging of products imported into the Antarctic Treaty Area.
  - f) If possible the use of leaded fuels or fuels containing ethylene bromide and ethylene chloride should be avoided.
  - g) When incinerators are used it is desirable to monitor the effluents.

## 2. *Introduction of alien species*

Procedures to safeguard against the introduction of alien species are covered by Article IX of the Agreed Measures for the Conservation of Antarctic Fauna and Flora.

## 3. *Disturbance of breeding colonies and concentration of birds and mammals*

Procedures to minimise such disturbances are covered by Article VII of the Agreed Measures for the Conservation of Antarctic Fauna and Flora.

## 4. *Guidelines for Antarctic operating organizations planning major Antarctic Projects*

- a) In the planning of major operations in the Antarctic Treaty Area an evaluation of the environmental impact of the proposed activity should be carried out by the Antarctic operating organizations concerned. Such an evaluation should include:
  - i) A description of the proposed action and an assessment of its potential benefits and its possible impact on the relevant ecosystems.
  - ii) A consideration of alternative actions which might alter the pattern of benefits versus adverse environmental effects expected to result from the action.
- b) These evaluations may be circulated for information through SCAR channels to all the states engaged in Antarctic activities.

## **VIII-13: The Antarctic environment**

The Representatives,

*Recognizing* that prime responsibility for Antarctic matters, including protection of the Antarctic environment, lies with the States active in the area which are parties to the Antarctic Treaty;



*Noting* the vulnerability of the Antarctic environment to human interference and that the consequences of major alterations would be of global significance;

*Noting* the distance of the Antarctic from the main sources of environmental pollution and hence its value for global baseline monitoring purposes;

*Considering* the role of the Antarctic as a global climatic regulator of major importance;

*Noting* that in seeking to fulfil these responsibilities Antarctic Treaty States have;

- a) negotiated the Agreed Measures for the Conservation of Antarctic Fauna and Flora;
- b) negotiated the Convention for the Conservation of Antarctic Seals (London 1972);
- c) invited the Scientific Committee on Antarctic Research (SCAR) of the International Council of Scientific Unions (ICSU):
  - i) to identify the types and assess the extent of human interference which has occurred in the Treaty Area as a result of man's activities;
  - ii) to propose measures which might be taken to minimize harmful interference;
  - iii) to consider and recommend scientific programmes which will detect and measure changes occurring in the Antarctic environment;

*Noting* that a Code of Conduct for stations and activities within the Antarctic Treaty Area to minimize their harmful environmental effects has been adopted;

*Noting* that the Antarctic Treaty calls upon Contracting Parties to encourage co-operative working relations with those specialized agencies of the United Nations and other international organizations having a scientific or technical interest in the Antarctic;

*Noting* the cable to the Chairman of the Consultative Meeting from the Executive Director of the United Nations Environment Program (UNEP), circulated to the meeting on 10 June 1975;

*Recommend* to their Governments that:

1. In exercising their responsibility for the wise use and protection of the Antarctic environment they shall have regard to the following:
  - a) that in considering measures for the wise use and protection of the Antarctic environment they shall act in accordance with their responsibility for ensuring that such measures are consistent with the interests of all mankind;
  - b) that no act or activity having an inherent tendency to modify the environment over wide areas within the Antarctic Treaty Area should be undertaken unless appropriate steps have been taken to foresee the probable modifications and to exercise appropriate controls with respect to the harmful environmental effects such uses of the Antarctic Treaty Area may have;
  - c) that in co-operation with SCAR and other relevant agencies they continue, within the capabilities of their Antarctic scientific programmes, to monitor changes in the environment, irrespective of their cause, and to exercise their responsibility for

informing the world community of any significant changes caused by man's activities outside the Antarctic Treaty Area;

2. They welcome the offer made by UNEP of cooperation in questions of scientific and technical interest relating to the Antarctic environment and invite SCAR, through their National Antarctic Committees, to continue its participation in the development of the relevant parts of the programme under consideration by the Scientific Committee on Problems of the Environment (SCOPE).

### **VII-1: Man's impact on the Antarctic Environment**

The Representatives,

*Recalling* Recommendations III-VIII and VI-4;

*Noting* the information provided by the Consultative Parties about the implementation of the Agreed Measures on the Conservation of Antarctic Fauna and Flora;

*Considering* that there is a need to strengthen the protection of the Antarctic environment;

*Recommend* to their Governments that:

1. They take note of the responses by SCAR (Scientific Committee on Antarctic Research) to paragraph 1 of Recommendation VI-4 and that they discuss these responses in detail at the Eighth Consultative Meeting;
2. They consider adopting as far as feasible and practicable, and subject to other international arrangements and advice, these responses of SCAR as voluntary guidelines for the conduct of their expeditions and stations;

### **VI-4: Man's impact on the Antarctic environment**

The Representatives,

*Considering and recognizing* that:

1. in the Antarctic Treaty Area the ecosystem is particularly vulnerable to human interference;
2. the Antarctic derives much of its scientific importance from its uncontaminated and undisturbed condition;
3. there is an increasingly urgent need to protect the environment from human interference;
4. the Consultative Parties should assume responsibility for the protection of the environment and the wise use of the Treaty Area;

*Recommend* to their Governments that:

1. They invite the Scientific Committee on Antarctic Research through their National Antarctic Committees:

- a) to identify the types and assess the extent of human interference which has occurred in the Treaty Area as a result of man's activities;
  - b) to propose measures which might be taken to minimize harmful interference;
  - c) to consider and recommend scientific programmes which will detect and measure changes occurring in the Antarctic environment;
2. They encourage research on the impact of man on the Antarctic ecosystem;
  3. They take interim measures to reduce known causes of harmful environmental interference;
  4. They consider including on the agenda for the Seventh Antarctic Treaty Consultative Meeting an examination of this matter in the light of any further available information.

# ENVIRONMENTAL IMPACT ASSESSMENT

## *Introductory note*

Concepts of environmental impact analysis have been the subject of steady development since the early 1970s and have been applied in the Antarctic by some expeditions on a national basis, notably by the United States, since then. The fourth part of Recommendation VIII-11 paved the way for further consideration of the issue by Consultative Parties. At the Canberra meeting in 1983 a proposal was made for the provisional adoption of environmental impact assessment procedures based on the Principles and Procedures volume published by the ICSU Scientific Committee on Problems of the Environment (SCOPE 5, 1979). The outcome was Recommendation XII-3 and a decision to refer the matter to SCAR for consideration. Shortly before the Brussels meeting in 1985 SCAR published their response: “Man’s Impact on the Antarctic Environment: Procedure for Evaluating the Effects of Scientific and Logistic Activities”, by W. S. Benninghoff and W. N. Bonner. There was insufficient time at Brussels to proceed further with this matter and full consideration of the SCAR response was deferred until the Rio meeting in 1987. Environmental Impact Assessment procedures for Antarctica have been codified in Annex I to the Protocol on Environmental Protection to the Antarctic Treaty.

## **Antarctic Treaty Recommendations**

### **XXIII: Resolution 1(1999)**

#### **Guidelines for EIA in Antarctica**

The Representatives,

*Noting* the requirements under Article 8 and Annex I of the Environmental Protocol to prepare Environmental Impact Assessments (EIAs) for proposed activities in the Antarctic Treaty Area;

*Recognizing* that all EIAs need to conform to the requirements of Annex I of the Protocol;

*Recognizing* also that Parties should already have in place national legislation which includes procedures and guidelines for the preparation of EIAs in Antarctica;

*Conscious* of the need for general guidance for the preparation of EIAs to achieve effectiveness in fulfilling the obligations of the Protocol;

*Recommend* that:

The Guidelines for Environmental Impact Assessment in Antarctica appended to this Resolution be made available to be used by those engaged in the preparation of Environmental Impact Assessments for proposed activities in Antarctica, to the extent that such use does not conflict with the national legislative regime and other obligations of the Party or Parties concerned.

## **GUIDELINES FOR ENVIRONMENTAL IMPACT ASSESSMENT IN ANTARCTICA**

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## 1. Introduction

The Madrid Protocol, in Article 3, establishes a number of environmental principles which can be considered a guide to environmental protection in Antarctica and its dependent and associated ecosystems. Among such principles, those stated under paragraph C express the necessity of collecting sufficient information "to allow prior assessments of, and informed judgements about, their possible impacts on the Antarctic environment and dependent and associated ecosystems and on the value of Antarctica for the conduct of scientific research". In addition, it states that "such judgements shall take account of:

- i) the scope of the activity, including its area, duration and intensity;
- ii) the cumulative impacts of the activity, both by itself and in combination with other activities in the Antarctic Treaty Area;
- iii) whether the activity will detrimentally affect any other activity in the Antarctic Treaty Area;
- iv) whether technology and procedures are available to provide for environmentally safe operations;
- v) whether there exists the capacity to monitor key environmental parameters and ecosystem components so as to identify and provide early warning of any adverse effects of the activity and to provide for such modification of operating procedures as may be necessary in the light of the results of monitoring or increased knowledge of the Antarctic environment and dependent and associated ecosystems; and
- vi) whether there exists the capacity to respond promptly and effectively to accidents, particularly those with potential environmental effects"

Article 8 of the Protocol introduces the term Environmental Impact Assessment and provides three categories of environmental impacts (less than, equal to and more than

minor or transitory), according to their significance. The Article also requires that assessment of planned activities to be undertaken in Antarctica, subject to the procedures set out in Annex I.

Annex I of the Protocol provides a more comprehensive explanation of the different impact categories and establishes a set of basic principles to conduct an EIA for planned activities in Antarctica.

In addition, it sets up a preliminary stage for assessing the environmental impact of Antarctic activities, which is intended to determine if an impact produced by a certain activity is less than minor or transitory or not. Such determination must be accomplished through the appropriate national procedures.

According to the results of the preliminary stage, the activity can either:

- proceed (if the predicted impacts of the activity are likely to be less than minor or transitory), or
- be preceded by an Initial Environmental Evaluation (IEE), if predicted impacts are likely to be minor or transitory; or
- be preceded by a Comprehensive Environmental Evaluation (CEE), if the predicted impacts are to be more than minor or transitory.

Although the key to decide whether an activity shall be preceded by an IEE or a CEE is the concept of "*minor or transitory impact*", no agreement on this term has so far been reached (contributions to this subject can be found in XX ATCM/IP 2, New Zealand; XXI ATCM/WP 35, New Zealand; XXI ATCM/IP 55, Argentina, XXII ATCM/IP 66 , Russia and XXII ATCM/WP 19, Australia, among others). The difficulty with defining "*minor and transitory impact*" thus far appear to be due to the dependence of a number of variables associated with each activity and each environmental context. Therefore the interpretation of this term will need to be made on a case by case site specific basis. As a consequence, this document does not focus on seeking a clear definition of "*minor or transitory impact*", but rather is an attempt to provide basic elements for the development of the EIA *process*.

Article 8 and Annex I of the Protocol on Environmental Protection to the Antarctic Treaty set out the requirements for Environmental Impact Assessments (EIAs) for proposed activities in Antarctica. These Guidelines to EIA in Antarctica do not amend, modify or interpret the requirements set out in Article 8 and Annex I of the Environmental Protocol, or the requirements of national legislation which may include procedures and guidelines for the preparation of EIAs in Antarctica. These Guidelines have been produced to assist those preparing EIAs for proposed activities in Antarctica.

## **2. Objectives**

The general objective of these guidelines is to achieve transparency and effectiveness in assessing environmental impacts during the planning stages of possible activities in Antarctica, as well as consistency of approach in fulfilling the obligations of the Protocol.

Specifically, the guidelines aim to

- assist proponents of activities who may have little experience of EIA in Antarctica;
- assist in determining the proper level of EIA document (according to the Protocol) to be prepared;
- facilitate co-operation and co-ordination in EIA for joint activities ;
- facilitate comparison of EIAs for similar activities and/or environmental conditions;
- provide advice to operators other than ATCPs;
- assist in the retrospective analysis of cumulative impacts for specific sites;
- initiate a process of continuous improvement of EIA.

### 3. The EIA Process

The EIA is a process having the ultimate objective of providing decision makers with an indication of the likely environmental consequences of a proposed activity (figure 1).

The *process* of predicting the environmental impacts of an activity and assessing their significance is the same regardless of the apparent magnitude of the activity. Some activities require no more than a cursory examination to determine impacts, although it must be remembered that the level of assessment is relative to the significance of the environmental impacts, not to the scale or complexity of the activity. Thus, the picture that emerges with respect to the impacts of the activity will determine how much further the EIA process needs to be taken, and how complex it should be.

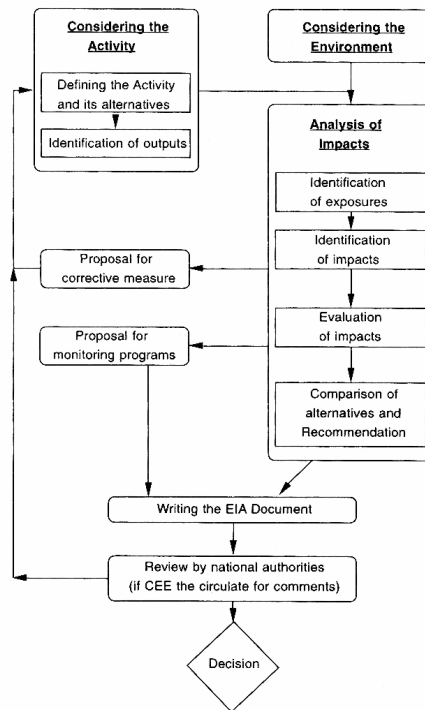


Figure 1: Steps of the EIA process for Antarctic activities



Those persons responsible for an Environmental Impact Assessment Process need to ensure that they consult as widely as is reasonably necessary and possible in order that the best available information and professional advice contribute to the outcome. A number of different participants may be involved throughout this process, ranging from those who are involved in the details of nearly all parts of the process (e.g. environmental officer, proponent of the activity) to those who are the technical experts who provide input in particular subjects of the process (e.g. researchers, logistic personnel, others with experience at the location or in a particular activity). In addition, EIAs undertaken in Antarctica for planned activities may represent a valuable source of information. At this respect, it should be pointed out that an updated list of EIAs is presented every ATCM, according to Resolution XIX-6. The Antarctic Data Directory System (ADDS) can also represent an helpful source of metadata.

### **3.1. Considering the activity**

#### *3.1.1. Defining the activity*

An activity is an event or process resulting from (or associated with) the presence of humans in the Antarctic, and/or which may lead to the presence of humans in Antarctica.

An activity may consist of several actions, e.g. an ice drilling activity may require actions such as the transport of equipment, establishment of a field camp, power generation for drilling, fuel management, drilling operation, waste management, etc. An activity should be analysed by considering all phases involved (e.g. construction, operation and potential dismantling or decommissioning phases).

The activity and the individual actions should be defined through a planning process which considers the physical, technical and economic aspects of the proposed project and its alternatives. Consultation with relevant experts to identify all these aspects is an important part of this initial scoping process. It is important to accurately define all aspects of the activity which could have environmental impacts. The rest of the EIA process relies on this initial description, which should occur during the planning process. The following aspects of the proposed activity and its alternatives should be clearly identified:

- the purpose of and the need for the activity;
- the principal characteristics of the activity that might cause impact on the environment; for instance: design characteristics; construction requirements (types of material, technologies, energy, size of any installation, personnel, temporary constructions, etc.); transportation requirements (e.g. types, numbers and frequency of use of vehicles, fuel types); type (according to Annex III of the Protocol) and volume of wastes generated through different phases of the activity and their final disposition; dismantling of temporary constructions; decommissioning the activity if necessary; as well as those aspects that will result from the operational phase of the activity.
- the relationship of the proposed activity to relevant previous or current activities;

- a description of the activity's location and geographical area, indicating access roads, etc. Using maps will ease the evaluation process and, therefore, will be useful in the EIA documentation.
- timing of the activity (including range of calendar dates for construction time, as well as overall duration, periods of operation of the activity and decommissioning. This may be significant with respect to wildlife breeding cycles, for example.);
- location of the activity with regard to areas with special management requirements (SPA, SSSI, HSM, CCAMLR CEMP sites, already proposed ASPAs and/or ASMAs, etc.).
- precautionary measures that are integral to the project including during the construction, operational and decommissioning phases.

Careful consideration is required to determine the full scope of the activity so that the impacts can be properly assessed. This is necessary to avoid preparing a number of separate EIAs on actions which indicate an apparent low impact, when in fact, taken in its entirety, the activity actually has potential for impacts of much greater significance. This is particularly common where a number of activities take place at the same site either spatially and/or temporally.

When defining an Antarctic activity, experience gained in similar projects undertaken within and outside the Antarctic Treaty System Area (e.g. the Arctic) may be an additional and valuable source of information. Once the activity is defined, any subsequent changes to the activity must be clearly identified and addressed according to when they occur in the EIA process (e.g. if the change occurs once the EIA document is completed, then an amendment to the EIA or a rewrite of the document may be necessary depending on how significant the change is). In every case it is important that the change and its implications (in terms of impacts) is assessed in the same manner as other impacts previously identified in the EIA process.

### *3.1.2 Alternatives to the activity*

Both the proposed activity and possible alternatives should be examined in concert so that a decision maker can more easily compare the potential impacts. Both the environmental and scientific consequences should be considered during the evaluation.

Examples of alternatives for consideration include:

- use of different locations or sites for the activity,
- use of different technologies, in order to reduce the outputs (or the intensity of the outputs) of the activity.
- use of pre-existing facilities, and
- different timing for the activity.

The alternative of not proceeding with the proposed activity (i.e. the "no-action" alternative) should always be included in any analysis of environmental impacts of the proposed activity.

### 3.1.3. Identification of outputs of the activity

An *output* is a physical change (e.g. movement of sediments by vehicle passage, noise) or an entity (e.g. emissions, an introduced species) imposed on or released to the environment as the result of an *action* or an *activity*. Outputs can also be defined as by-products of the activity (or action) and can include emissions, dust, mechanical action on substrate, fuel spills, noise, light, electromagnetic radiation, wastes, heat, introductions of alien species, etc.

Note that a single action may generate several different outputs (for example the use of vehicles may cause soil compaction, emissions, noise, visual interference etc.) and that the same type of output may be generated by different actions of a single activity, (for example in an ice drilling activity emissions may come from the use of vehicles, drilling operations, power generation, etc.).

Output levels may play a relevant role especially if several activities take place at the same time. Therefore, potential for additive, synergistic or antagonistic interactions between outputs (thus resulting in possible significant environmental impacts) has to be considered.

Systematising outputs and actions in a matrix format may be helpful in this process. The example below, taken from "*Monitoring of Environmental Impacts from Science and Operations in Antarctica*"(SCAR/COMNAP, 1996), illustrates a potential situation (e.g. actions and outputs associated with a station complex).

ACTIONS	OUTPUTS					
	Air emissions (incl. Dust)	Wastes	Noise	Fuel spills	Mechanical action	Heat
Vehicles	X	-	X	X	X	X
Power generation	X	-	X	X	-	X
Building	X	X	X	X	X	-
Fuel storage	-	-	-	X	-	-

Outputs may vary across different alternatives. That is there may not be a single set of outputs, but rather multiple sets if the alternatives are significantly different from one another.

The geographical spread of an output has to be accurately estimated in order to determine to what extent the environment is exposed.

### 3.2. Considering the environment

Consideration of the environment requires the characterisation of all relevant physical, biological, chemical and anthropic elements or values in a given area, where and when an

activity is proposed. Relevant means all those aspects of the environment that the proposed activity might influence or which might influence the activity.

Such information should be quantitative (e.g., heavy metal concentration on organisms or on river flows, a bird population size) where available and appropriate. In many cases qualitative descriptions (e.g., aesthetic value of a landscape) may have to be used. Maps, publications, research results and researchers are different sources of information to be identified and taken into account.

Consideration of the existing environment should include:

- recognition of the special status accorded to Antarctica by the ATS, including its status as a natural reserve devoted to peace and science
- the physical and biological features that could be affected directly or indirectly, including:
  - o the physical characteristics (topography, bathymetry, geology, geomorphology, soils, hydrology, meteorology, glaciology etc.)
  - o the biota (e.g. inventories of plant and animal species, populations and communities, and other important features such as the presence of breeding grounds.) and
  - o any dependent and related populations (e.g. bird nesting areas related to feeding areas);
- natural variations in environmental conditions that could occur on a diurnal, seasonal, annual and/or interannual timescale;
- information about the spatial and temporal variability of the environmental sensitivity (e.g. differences in impacts when an area is snow covered compared to when it is not);
- current trends in natural processes such as population growth or spread of particular species, geological or hydrological phenomena;
- the reliability of the data (e.g. anecdotal, historical, scientific, etc.);
- aspects of the environment which have been changed, or may be changing as the result of other current or previous activities;
- special values of the area (if previously identified);
- the existence of areas potentially subject to indirect and cumulative impacts;
- the influence that the activity may exert on dependent and associated ecosystems;
- existing activities being carried out in the area or at the site, particularly scientific activities, given their intrinsic importance as a value to be protected in Antarctica
- specific parameters against which predicted changes are to be monitored, including:
- A thorough consideration of the environment before starting the activity (baseline information) is essential to ensure a valid prediction of impacts and to define monitoring parameters, if required. If such a baseline information is not available, field research may be necessary to obtain reliable data about the state of the environment before beginning the activity.

It is also important to clearly identify gaps in knowledge and uncertainties encountered in compiling the information.

### 3.3. Analysis of Impacts

#### 3.3.1. Identification of exposures

Exposure is the process of interaction between an identified potential output and an environmental element or value. Identifying exposure means determining which component of the environment is susceptible to be affected by the outputs of an activity or action. Overlaying spatial information (e.g. use of a GIS) is a valuable tool to assist in this determination.

Determination of exposures may be summarised using a matrix of outputs and environmental elements or values, taking into account that matrices can only give information about the existence of exposures but not on their intensity .

The table below provides an example of the interaction of various outputs with environmental elements to identify relevant exposures resulting from the activity.

OUTPUTS	ENVIRONMENTAL ELEMENTS OR VALUES				
	Flora	Fauna	Freshwater/ Seawater	Soil	Air
Emissions	X	X	X	X	X
Noise		X			
Fuel spills	X	X	X	X	
Wastes	X	X	X	X	
Introduced species	X	X			

When the box is crossed (X) it means that the environmental element is exposed to the considered output. This is a random example for a given environment and may, therefore, vary in another context. For example, a noise may occur when a breeding site is unoccupied, or a breeding site may be protected from noise by a topographic feature. From the examples above it can be inferred that the occurrence of an output does not necessarily lead to exposure of environmental element or value and hence potential for environmental effects.

Correct identification of the intensity of exposure is a crucial step in making a reliable prediction of impacts. Some elements contributing to that identification are:

- Temporal variation. The exposure of an environmental element or value may change with the season in which the activity takes place, as climate cycles, breeding patterns, etc. may change over time.
- Cause-effect relationships between outputs and environmental elements or values must be determined, especially in cases where the relationships are indirect, or an element or value is exposed to outputs from numerous sources, or repeatedly from the same source.

### 3.3.2. Impact identification

An **impact** (synonym: **effect**) is a change in the values or resources attributable to a human activity. It is the consequence (e.g. reduced plant cover) of an agent of change, not the agent itself (e.g. increase of trampling). Impact may also be defined as the result of the interaction between an output and an environmental value or resource.

The identification of environmental impacts consists of the characterisation of all changes in environmental elements or values exposed to the outputs of a given set of activities. The identification task requires that evaluators are able to determine the important cause-effect relationships between the activities and the environmental elements or values. Only when the impact is identified can an evaluation be made of its **significance**.

An impact may be identified by its nature, spatial extent, intensity, duration, reversibility and lag time.

- **Nature:** type of change imposed on the environment due to the activity (e.g. contamination, erosion, mortality).
- **Spatial extent:** area or volume where changes are likely to be detectable.
- **Intensity:** a measure of the amount of change imposed on the environment due to the activity. (it can be measured, or estimated, through, e.g. number of species or individuals effected, concentration of a given pollutant in a waterbody, rates of erosion, rates of mortality, etc.)
- **Duration:** period of time during which changes in the environment are likely to occur.
- **Reversibility:** possibility of the system to return to its initial environmental conditions once an impact is produced.
- **Lag time:** time span between the moment outputs are released to or imposed on the environment and the moment impacts occur.

In addition, a proper impact identification should also enable a distinction between direct, indirect and cumulative impacts.

A **direct impact** is a change in environmental components that results from direct cause-effect consequences of interaction between the exposed environment and outputs (e.g. decrease of a limpet population due to an oil spill). An **indirect impact** is a change in environmental components that results from interactions between the environment and other impacts -direct or indirect- (e.g. alteration in seagull population due to a decrease in limpet population which, in turn, was caused by an oil spill).

A **cumulative impact** is the combined impact of past, present, and reasonably foreseeable activities. These activities may occur over time and space and can be additive or interactive/synergistic (e.g. decrease of limpet population due to the combined effect of oil discharges by base and ship operations). Cumulative impacts can often be one of the hardest impact categories to adequately identify in the EIA process. When attempting to identify cumulative impacts it is important to consider both spatial and temporal aspects

and to identify other activities which have and could occur at the same site or within the same area.

Several methods exist to identify impacts such as: overlay maps, checklists, matrices, etc. The choice of the methodology will depend on the character of the activity and the environment that is likely to be affected.

### 3.3.3. Impact Evaluation

The purpose of impact evaluation is to assign relative significance to predicted impacts associated with an activity (and the various identified alternatives).

**Significance:** *It is a value judgement about the severity and importance of a change in a given environment or environmental value.*

According to the Madrid Protocol, impacts shall be evaluated by taking into account three levels of significance:

- less than minor or transitory impact;
- minor or transitory impact; or
- more than minor or transitory impact.

The interpretation of these terms should be made on a case by case site specific basis. However it may be useful to consider how similar impacts have been judged in earlier EIAs at similar sites and/or for similar types of activities.

An inherent consideration to judging significance is that it may have a rather subjective component and this fact should be acknowledged. Where an impact has the possibility of being significant, several experts should be consulted to achieve a view as objective as possible. This is particularly important either if there is a reliance on incomplete data or if there are gaps in the knowledge.

Judging significance should not be based solely on direct impacts, but must also take account of possible indirect and cumulative impacts.

The significance of the unavoidable impacts (those impacts for which no further mitigation is possible) represents an important consideration for the decision maker in deciding whether, on balance, an activity is justified.

Some problems can arise when evaluating impacts, due to misunderstanding or overlooking some aspects of the process of evaluating impacts. These can include for example:

- confusing duration of the impact with duration of the activity;
- confusing outputs of activities with impacts;
- limiting the analysis to direct impacts, without consideration of indirect and cumulative impacts.

### *3.4. Comparison of impacts*

When the project has been assessed with respect to environmental impacts it is necessary to summarise and aggregate the significant impacts for the various alternatives in a form suitable for communication to the decision makers. From such an aggregation of information a comparison among alternatives can be easily made.

### *3.5. Proposal for corrective measures*

Corrective measures are composed of all steps conducted to decrease, avoid, or eliminate any of the components of an impact. It can be considered a process of feedback, and should occur throughout the EIA process, not simply as a final step. Corrective measures include mitigation and remediation actions.

**Mitigation** is the use of practice, procedure or technology to minimise or to prevent impacts associated with proposed activities. The modification of any aspect of the activity (and hence the consideration of outputs and the environmental exposure) as well as the establishment of supervision procedures represent effective ways of mitigation.

Mitigation measures will vary according to the activity and the characteristics of the environment, and may include:

- developing on site control procedures (e.g. recommended methods for waste disposal)
- establishing the best time for the activity (e.g. to avoid the breeding season of penguins)
- providing environmental education and training to personnel, or contractors, involved in the activity.
- ensuring adequate on site supervision of the activity by senior project staff or environmental specialists.

**Remediation** consists of the steps taken after impacts have occurred to promote, as much as possible, the return of the environment to its original condition.

The final version of the activity to be assessed must incorporate all corrective measures, including those associated with mitigation and remediation actions. Impact avoidance, as a form of mitigation, may contribute to minimising monitoring, reducing remediation costs and generally contribute also to maintaining the existing state of the environment.

When considering mitigation and remediation measures, the following issues should be addressed:

- making a clear distinction between mitigation and remediation measures;
- clearly defining the state of the environment that is being aimed for through such measures;
- considering that new, unforeseen impacts may appear as a result of inadequate implementation of proposed mitigation measures;
- noting that the environment may not always be capable of returning to its original condition, even when remediation actions are implemented;



- considering that a given corrective measure may interact antagonistically or synergically with other corrective measures.

### *3.6. Proposal for Monitoring Programs*

Monitoring consists of standardised measurements or observations of key parameters (outputs and environmental variables) over time, their statistical evaluation and reporting on the state of the environment in order to define quality and trends. For the EIA process, monitoring should be oriented towards confirming the accuracy of predictions about environmental impacts of the activity, and to detect unforeseen impacts or impacts more significant than expected. Given this, it may be useful to set environmental thresholds or standards for an activity that monitoring results are assessed against. If these thresholds are exceeded, then a review or re-analysis would be required of assumptions made regarding the environmental impacts or of management systems related to the activity.

Monitoring may also include any other procedures that can be used to assess and verify the predicted impacts of the activity. Where measurement of specific parameters is not necessary or appropriate, assessment and verification procedures could include maintaining a log of the activity that actually occurred, and of changes in the nature of the activity where they were significantly different from those described in the EIA. This information can be useful for further minimising or mitigating impacts, and, where appropriate, for modifying, suspending or even cancelling all or part of the activity.

Monitoring is not about the measurement of everything in a haphazard approach to detect change but about precise measurement of a few target species, processes, or other indicators, carefully selected on the basis of scientifically sound predetermined criteria.

The process of selecting key indicators should be accomplished during the activity's planning stage, once outputs have been identified, the environment has been considered and associated impacts have been assessed, while monitoring environmental parameters generally should start before the commencement of the activity if adequate baseline information is not available.

Planning or undertaking monitoring activities may be hindered by a number of situations:

- leaving the planning of monitoring programs until the activity is in progress;
- monitoring activities can be costly, especially for multi-year projects and activities;
- some assumptions about the environmental impacts of an activity cannot be tested;
- failure to follow through with monitoring;
- failure to distinguish between natural and human-induced variability in environmental parameters.

## **4. Writing the EIA Document**

The outcome of an EIA is a formal document, which presents all the relevant information about the EIA process. The EIA document represents a fundamental link between the

EIA process and decision makers seeing that conclusions stemming from the EIA process will assist decision makers to consider the environmental aspects of the proposed activity.

Four bodies of information arise from an EIA process: *methodology*, *data*, *results* and *conclusions* derived from them. Since *results* and *conclusions* are of particular interest for decision makers, these chapters should be written in an accessible language, avoiding very technical terms. The use of graphical information, such as maps, tables and graphs, is an effective way of improving communication.

The size and level of detail in the document will depend on the significance of the environmental impacts that have been identified throughout the EIA process. Thus, Annex I to the Protocol establishes two formats to document it: Initial Environmental Evaluation (IEE) and Comprehensive Environmental Evaluation (CEE), for which the Protocol requires the presentation of different volumes of information (Annex I, Articles 2 and 3).

Unless it has been determined that an activity will have less than a minor or transitory impact or it has already been determined that a Comprehensive Environmental Evaluation is needed, an Initial Environmental Evaluation (IEE) shall be prepared. If the EIA process indicates that a proposed activity is likely to have more than a minor or transitory impact a Comprehensive Environmental Evaluation must be prepared.

According to Annex I requirements a draft CEE shall be prepared first, which shall be circulated to all Parties as well as to CEP for comments. Once comments and suggestions have been incorporated, a final CEE is circulated to all Parties.

The following table summarises the steps to be considered throughout the EIA process (which are explained in Section 3 of the present guidelines). It also lists the requirements stemming from Annex I that should be included in an EIA document. In the case of IEE, some of the marked items are not specifically mentioned in Annex I, Article 2. However, their inclusion in the IEE document is often useful to communicate the results of the process in a transparent manner. These items were distinguished in the table with an X.

EIA Contents and Annex I Requirements	IEE	CEE
Description of the purpose and need of the activity	✓	✓
Description of the proposed activity and possible alternatives and the consequences of those alternatives	✓	✓
Alternative of not proceeding with the activity	x	✓
Description of the initial environmental reference state and prediction of the environmental state in absence of the activity	✓	✓
Description of methods and data used to forecast the impacts	x	✓
Estimation of nature, extent, duration and intensity of direct impacts	✓	✓
Consideration of cumulative impacts	✓	✓
Consideration of possible indirect impacts	x	✓
Monitoring programs	x	✓

Mitigation and remediation measures	x	✓
Identification of unavoidable impacts	x	✓
Effects of the activity on scientific research and other uses or values	x	✓
Identification of gaps in the knowledge	x	✓
Preparers and advisors	x	✓
References	x	x
Non-technical summary	x	✓
Index	x	x
Glossary		x
Cover sheet		x

✓ required by Annex I

x often useful

The following text focuses briefly on how the items listed above should be referred to in the text of any EIA. Further technical information is already described in previous chapters.

#### *Description of the Purpose and Need for the Proposed Activity*

This section should include a brief description of the proposed activity and an explanation of the intent of the activity. It should include sufficient detail to make it clear why the activity is being proposed including the need for the activity to proceed. It should also provide details on the process by which the scope of the activity was defined. This will help ensure that the full scope of the activity has been included so that impacts can be properly assessed. If a formal process was used to accomplish this (a formal meeting or solicitation of input from the public or other groups), that process and its results should be discussed here.

#### *Description of the proposed activity and possible alternatives and the consequences of those alternatives*

This section should include a detailed description of the proposed activity as well as reasonable alternatives. The first alternative to be described would be the proposed activity. The description should be as comprehensive and detailed as possible (see section 3.1). It may be useful to provide a comparison of alternatives in this section. For instance, for a new research station, alternatives might include differences in the size of the station and the number of persons that could be accommodated. These differences would mean different quantities of materials required, fuels consumed and emissions or wastes generated. Tables showing appropriate comparisons can be very helpful to the reader of the document.

#### *Alternative of not proceeding with the activity*

The alternative of not proceeding with the proposed activity (i.e. the "no-action" alternative) should be described to highlight the pros and cons of not conducting the

activity. Although the Protocol only requires its inclusion in CEEs, it is useful to also include the "no-action" alternative in the text of IEEs in order to better justify the need for proceeding with the activity.

*Description of the initial environmental reference state and prediction of the environmental state in absence of the activity*

Such a description should not be limited to a characterisation of the relevant physical, biological, chemical and anthropic elements of the environment, but should also take into account the existence and behaviour of dynamic trends and processes in order to predict the state of the environment in absence of the activity. A proper description of the initial environmental reference state provides elements against which changes are to be compared.

*Description of methods and data used to forecast the impacts*

The purpose of this section is to explain and, if necessary, defend the design of the assessment and then provide enough detail that a further evaluator can understand and reproduce the procedure. Careful writing of the methodology is critically important because it determines that results can be reproducible and/or comparable.

*Estimation of nature, extent, duration and intensity of impacts (including consideration of possible indirect and cumulative impacts).*

This section contains the results of analyses of impacts, which includes a clear description of identified exposures as well as the identification of impact aspects, in terms of their nature, spatial extent, intensity, duration, reversibility and lag time. It must clearly establish the significance assigned to each impact and the justification for such assignment. In addition, and to summarise this section, the inclusion of a table showing the environmental impacts on each environmental component can be very helpful.

Special attention must be paid to the consideration of possible indirect and cumulative impacts, since cause-effect relationship determining the existence of such impacts usually exhibit a higher degree of complexity.

*Monitoring programs*

When necessary, this section should clearly define monitoring objectives, set testable hypotheses, choose key parameters to be monitored, assess data collection methods, design statistical sampling program, and decide on frequency and timing of data collection/recording. Implementation of such monitoring programs is a further step that may begin after the planning of the activity has been completed, even though the activity has not actually been initiated.

*Mitigation and remediation measures*

Since mitigation and remediation measures usually aim to correct some aspects of the activity, communication of these measures must be concrete, pointing out the proposed actions and their timing, as well as the benefits associated to each individual measure. It is often useful to include this section in the text of IEEs.

### *Identification of unavoidable impacts*

Recognition of the existence of unavoidable impacts should be included within any impact analysis. Consideration of such impacts is of great importance given that the occurrence of unavoidable impacts may affect the decision on whether to proceed with the proposed activity.

### *Effects of the activity on scientific research and other uses or values*

Taking into account that the Protocol designates Antarctica as an area devoted to peace and science, the effects of the proposed activity on ongoing scientific research, or on the potential of a site to future scientific research, must be a fundamental consideration when the impact analysis is carried out.

### *Identification of gaps in the knowledge*

Existing bodies of knowledge (i.e., empirical, theoretical, or anecdotal data and information) are used to support the assessment process. Nonetheless, these bodies of knowledge may be incomplete or may be surrounded by varying degrees of uncertainty. It is critical to identify explicitly in the assessment where such incompleteness or uncertainty exists; and how this has been factored into the assessment process. This disclosure can be useful in assessment by clearly identifying where more knowledge is needed.

### *Preparers and Advisors*

This section provides a list of those experts who were consulted in preparing the assessment, their areas of expertise, and appropriate contact information. It should also list the persons who were responsible for the actual preparation of the document. This information is useful to reviewers and decision makers to ensure that the appropriate expertise was brought to bear on the analyses needed to assess the type and degree of impact from the proposed activity. It is also useful information for future assessments on similar activities or issues.

### *References*

This section should list any references used in preparing the evaluation. They may include research or other scientific papers used in the analysis of impacts or monitoring data used to establish baseline conditions in the area where the activity is proposed. They may also include other environmental assessments of similar activities at other or similar locations.

### *Index*

As an EIA document may be fairly large, an index is a very helpful aid to the reader.

### *Glossary*

This section provides a list of terms and definitions as well as abbreviations that are helpful to the reader, especially if the terms are not commonly understood.

### *Cover Sheet*

The CEE should contain a title page or cover sheet that lists the name and address of the person or organization who prepared the CEE and the address to which comments should be sent (for the draft document only).

### *Non-Technical Summary*

The CEE must contain a non-technical summary of the contents of the document. This summary should be written in an accessible language and include pertinent information on the purpose and need for the proposed activity, the issues and alternatives considered, the existing environment, and the impacts associated with each alternative. A non-technical summary might also be useful for an IEE.

Finally, in either case (IEE or CEE) a number of considerations about writing the EIA document should be taken into account, such as:

- avoidance of including irrelevant descriptive information;
- documenting all relevant steps of the process;
- clearly describing the impact identification methodology;
- clearly distinguishing between results (identification of impacts, mitigation measures, etc.) and final value judgement of significance;
- properly connecting results and conclusions.

## **5. Annex I Requirements for Circulation**

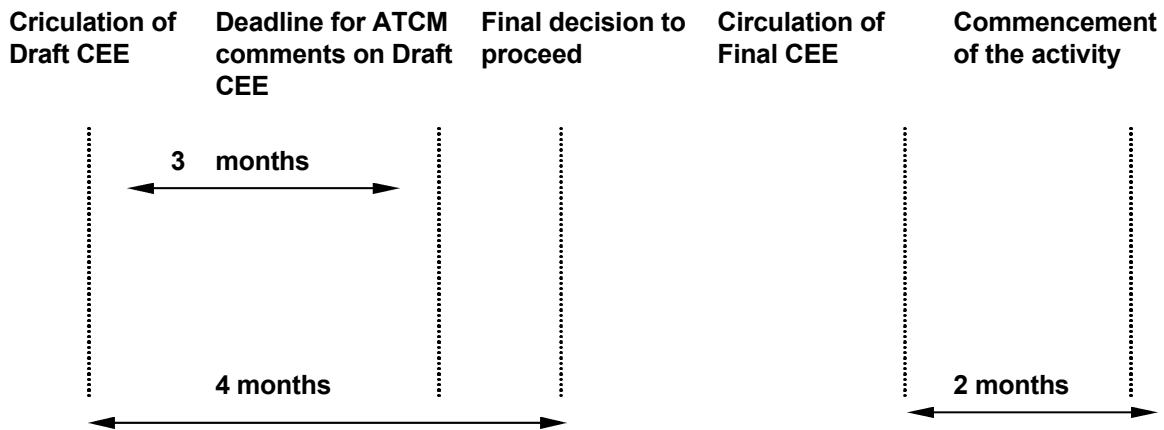
### *5.1. Public circulation of an EIA*

Under Annex I, public circulation is only required for CEEs. The draft CEE shall be made publicly available and shall be circulated to all Parties, which shall also make it publicly available, for comment. A period of 90 days shall be allowed for the receipt of comments. It shall be forwarded to the CEP at the same time as it is circulated to the Parties, and at least 120 days before the next ATCM, for consideration as appropriate.

### *5.2. Receipt and incorporation of comments*

No final decision shall be taken to proceed with the proposed activity in the Antarctic Treaty area unless there has been an opportunity for consideration of the draft CEE by the ATCM on the advice of the CEP, provided that no decision to proceed with a proposed activity shall be delayed for longer than fifteen months from the day of circulation of the draft CEE. A final CEE shall address and shall include or summarise comments received on the draft CEE. The final CEE, notice of any decision relating thereto, and any evaluation of the significance of the predicted impacts in relation to the advantages of the proposed activity, shall be circulated to all Parties, which shall also make them publicly available, at least sixty days before the commencement of the proposed activity in the Antarctic Treaty area.

The following diagram illustrates this schedule for CEEs, as defined in Annex I:



## 6. Definition of terms in the EIA process

**Action:** any step taken as a part of an activity.

**Activity:** an event or process resulting from (or associated with) the presence of humans in the Antarctic, and/or which may lead to the presence of humans in Antarctica. (adapted from *SCAR/COMNAP Monitoring Workshop*)

**Comprehensive Environmental Evaluation (CEE):** an environmental impact document required for proposed activities that may have more than a minor or transitory impact on the Antarctic environment (from *Madrid Protocol, Annex I, Article 3*).

**Cumulative Impact:** the combined impact of past, present, and reasonably foreseeable activities. These activities may occur over time and space and can be additive or interactive/synergistic (adapted from *IUCN Cumulative Impacts Workshop*).

**Direct Impact:** a change in environmental components that results from direct cause-effect consequences of interaction between the exposed environment and outputs. (from *Guidelines for EIA in the Arctic*)

**Environmental Impact Assessment (EIA):** a process for identifying, predicting, evaluating and mitigating the biophysical, social and other relevant effects of proposed projects and physical activities prior to major decisions and commitments being made (from *Guidelines EIA in the Arctic*)

**Exposure:** the process of interaction between an identified potential output and an environmental element or value. (adapted from *SCAR/COMNAP Monitoring Workshop*)

**Impact:** a change in the values or resources attributable to a human activity. It is the consequence (e.g. reduced plant cover) of an agent of change, not the agent itself (e.g. increase of trampling). Synonym: effect. (from *SCAR/COMNAP Monitoring Workshop*).

**Indirect Impact:** a change in environmental components that results from interactions between the environment and other impacts (direct or indirect). (from *Guidelines for EIA in the Arctic*)

**Initial Environmental Evaluation (IEE):** an environmental impact document required for proposed activities that may have a minor or transitory impact on the Antarctic environment (from *Madrid Protocol, Annex I, Article 2*).

**Mitigation:** the use of practice, procedure or technology to minimise or to prevent impacts associated with proposed activities. (*COMNAP Practical Guidelines*)

**Monitoring:** consists of standardised measurements or observations of key parameters (outputs and environmental variables) over time, their statistical evaluation and reporting on the state of the environment in order to define quality and trends. (adapted from *SCAR/COMNAP Monitoring Workshop*)

**Output:** a physical change (e.g. movement of sediments by vehicle passage, noise) or an entity (e.g. emissions, an introduced species) imposed on or released to the environment as the result of an action or an activity. (*SCAR/COMNAP Monitoring Workshop*)

**Preliminary Stage (PS):** a process that considers the level of environmental impacts of proposed activities - before their commencement - referred to in Article 8 of the Protocol, in accordance with appropriate national procedures. (from *Madrid Protocol, Annex I, Article 1*)

**Remediation:** consists of the steps taken after impacts have occurred to promote, as much as possible, the return of the environment to its original condition.

**Unavoidable Impact:** an impact for which no further mitigation is possible.

## 7. References

ARCTIC ENVIRONMENTAL PROTECTION STRATEGY. 1997. *Guidelines for Environmental Impacts Assessment (EIA) in the Arctic. Sustainable Development and Utilisation*. Finnish Ministry of the Environment, Finland, 50 pp.

ATCPs. 1991. *Protocol on Environmental Protection to the Antarctic Treaty (plus annexes)*. 11<sup>th</sup> Antarctic Treaty Special Consultative Meeting. Madrid, 22-30 April, 17-23 June 1991.

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FOREIGN AND COMMONWEALTH OFFICE. 1995. *Guide to Environmental Impact Assessment of Activities in Antarctica*. Polar Regions Section, South Atlantic and Antarctic Department, London.



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MINISTRY OF FOREIGN AFFAIRS AND TRADE. 1997. *Guidelines and Procedures for Visitors to the Ross Sea Region*. Ministry of Foreign Affairs and Trade. New Zealand.

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XX ATCM/IP 2, “Developing and Understanding of Minor or Transitory”, submitted by New Zealand.

XXI ATCM/IP 55, “Elementos para la Interpretación de los Procedimientos de Evaluación de Impacto Ambiental contenidos en el Anexo I del Protocolo de Madrid”, submitted by Argentina.

XXI ATCM/WP 35, “Further understanding of the term Minor or Transitory”, submitted by New Zealand.

XXII ATCM/IP 66, “Application of the ‘minor or transitory impacts’ criterion of EIA in different regions of Antarctica”, submitted by Russian Federation.

XXII ATCM/WP 19, “Environmental Impact Assessment: The role of EIA Guidelines in understanding ‘Minor or Transitory’”, submitted by Australia.

## **8. Acronyms**

ASMA: Antarctic Specially Managed Area

ASP: Antarctic Specially Protected Area

ASOC: Antarctic and Southern Ocean Coalition

ATCM: Antarctic Treaty Consultative Meeting

ATCP: Antarctic Treaty Consultative Party

ATS: Antarctic Treaty System

CCAMLR: Commission for the Conservation of Antarctic Marine Living Resources

CEE: Comprehensive Environmental Evaluation

CEMP: CCAMLR Ecosystem Monitoring Program

CEP: Committee of Environmental Protection

COMNAP: Council of Managers of National Antarctic Programmes

EIA: Environmental Impact Assessment

GIS: Geographical Information System

GOSEAC: SCAR Group of Specialists on Environmental Affairs and Conservation

HSM: Historic Sites and Monuments

IEE: Initial Environmental Evaluation

IUCN: International Union for the Conservation of Nature (World Conservation Union)  
SCAR: Scientific Committee of Antarctic Research  
SPA: Specially Protected Area  
SSSI: Site of Special Scientific Interest

### **XXI: Resolution 2 (1997)**

#### **Comprehensive Environmental Evaluation (CEE): Methodology for Reviewing Activities for which a CEE has been Prepared**

The Representatives,

*Recalling* Annex I, Article 3 of the Protocol on Environmental Protection to the Antarctic Treaty;

*Noting* that further guidance is desirable for following up on the implementation of activities for which CEEs have been prepared under Annex I of the Protocol on Environmental Protection to the Antarctic Treaty;

*Encourage* Consultative Parties to:

1. Include in their procedures for assessing the environmental impacts of their activities in Antarctica, provision for review of the activities undertaken following the completion of a CEE.
2. Adopt the following process for CEE follow-up:
  - a) Review activities carried out following completion of CEE, including analysis of whether the activities were conducted as proposed, whether applicable mitigation measures were implemented, and whether the impacts of the activity were as predicted in the assessment;
  - b) Record any changes to the activities described in the CEE, the reasons for the changes, and the environmental consequences of those changes; and
  - c) Report to the Parties on the outcomes of (a) and (b) above.

### **XIX: Resolution 6(1995)**

#### **Environmental Impact Assessment: Circulation of Information**

The Representatives of the Consultative Parties,

*Recalling* Articles III and VII of the Antarctic Treaty and Articles 3.6(2) and 17 of the Protocol on Environmental Protection to the Antarctic Treaty;

*Noting* that numerous Recommendations of Consultative Meetings have established requirements for exchange of information between Governments;

*Noting* also that Annex I of the Protocol creates further obligations to exchange information annually, including information on Initial Environmental Evaluations and Comprehensive Environmental Evaluations;

*Desirous* that such information should be easily accessible and in a comprehensive and uniform format so that the scale and trend of activities and developments in Antarctic can be readily monitored;

*Recommend* that:

1. The Governments of the Consultative Parties should provide, through diplomatic channels, a list of the Initial Environmental Evaluations and Comprehensive Environmental Evaluations prepared by or submitted to them during the preceding calendar year.
2. The list, as a separate document, should be transmitted to the host Government of the next ATCM not later than 1 March.
3. The list should, at a minimum, contain the following information: a short description of the development or activity; the type of environmental impact statement undertaken (IEE or CEE); the location (name, latitude, and longitude) of the activity; the organisation responsible for the EIA; and any decision taken following consideration of the environmental impact assessment.
4. The lists should be collated by the host Government of the ATCM and circulated as an information paper to the ATCM and thereafter, if the ATCM so agrees, be published as an Annex to the final Report of the ATCM.
5. The above procedures should be reviewed following the establishment of a permanent Secretariat.

#### **XIV-2: Man's Impact on the Antarctic environment: Environmental Impact Assessment**

The Representatives,

*Recalling:*

- i) Article II of the Antarctic Treaty, Recommendations VI-4, VIII-11, VIII-13, IX-5 and XII-3;
- ii) the work of SCAR with respect to the elaboration of procedures for evaluating impacts from scientific and logistic activities;
- iii) the United Nations Environment Program (UNEP) 'Goals and Principles on Environmental Impact Assessment' adopted by the UNEP Governing Council at its Fourteenth Session (June 1987);

*Reaffirming* that, before decisions are taken by their respective national organizations responsible for Antarctic activities to undertake scientific research or associated logistic activities that are likely significantly to affect the Antarctic environment, the environmental effects of such activities should be identified so that such effects may be

carefully weighed against the advantages that are expected to be derived from the activity in question;

*Desiring:*

- i) to promote the implementation by Consultative Parties of appropriate procedures consistent with national laws and decision-making processes, through which the foregoing goal may be realized;
- ii) to encourage the development of reciprocal procedures for information exchange and comment between Parties when proposed activities are likely to have significant effects on the Antarctic environment;
- iii) to introduce a measure of comparability between environmental impact assessment procedures for use with respect to the scientific research and associated logistic activities of Consultative Parties;
- iv) to ensure that in the implementation of such procedures due account is taken of, inter alia, the cumulative impact such activities may have in the Antarctic environment and of their possible impact on other uses of Antarctica and on dependent and related ecosystems;

*Recommend* to their Governments that:

1. In the planning process leading to decisions about scientific research programmes and their associated logistic support facilities, their respective national Antarctic organizations responsible for Antarctic activities evaluate the environmental impact of such activities in accordance with the procedural guidelines set out below:

*Guidelines*

- i) The proposed activity should be defined and described, such description to include information on the needs to be met by the proposed activity and features of the activity that might cause impacts on the environment;
- ii) a first evaluation, termed an 'Initial Environmental Evaluation', should be performed to determine whether the activity might reasonably be expected to have a significant impact;
- iii) if this Initial Environmental Evaluation indicates that the proposed activity is likely to have no more than a minor or transitory effect on the environment, the activity may proceed, with the proviso that appropriate monitoring of the actual impact should take place;
- iv) otherwise, a 'Comprehensive Environmental Evaluation' should be prepared;
- v) such a Comprehensive Environmental Evaluation should include:
  - a) descriptions of the proposed activity and feasible alternatives, including the alternative of not proceeding, and their respective consequences on Antarctic research;
  - b) a description of the initial environmental reference state with which predicted changes are to be compared and a prediction of the future environmental state in the absence of the proposed activity;
  - c) estimation of the nature, extent, duration and intensity of the likely direct environmental effects resulting from the proposed activity;
  - d) consideration of possible indirect or second order effects;

- e) consideration of cumulative impacts of the proposed activity in the light of existing activities and other known planned activities;
  - f) identification of measures, including monitoring programmes, that could be taken to minimize or mitigate impacts and detect possible unforeseen effects;
  - g) identification of unavoidable impacts;
  - h) evaluation of the significance of the predicted environmental effects in relation to the advantages of the proposed activity.
- vi) on the basis of the Comprehensive Environmental Evaluation, a decision would be made by the appropriate national authority whether the activity should proceed and, if so, in its original or in a modified form;
  - vii) key indicators of the environmental effects of the activity should be monitored and, where possible, environmental impacts should, as in all Antarctic activities, be minimized or mitigated.
2. In the process of preparing a Comprehensive Environmental Evaluation, Parties concerned shall be informed, and be given the opportunity to comment, either directly or through their national contact points.
  3. Final Comprehensive Environmental Evaluations shall be transmitted as part of the annual exchange of information provided for under the Antarctic Treaty.

#### **XIV-3: Man's impact on the Antarctic environment: Safeguards for scientific drilling**

The Representatives,

*Recalling* Article II of the Antarctic Treaty and Recommendations VIII-13, IX-5, X-7 and XII-3;

*Recognizing* the knowledge of the tectonic, geochemical and climatic evolution of the Antarctic region that can be obtained from Scientific Drilling;

*Bearing in mind* the potential risk to the Antarctic environment in cases where such drilling could result in hydrocarbons being released into the Antarctic environment;

*Conscious* of the need for adequate preparation and planning of such drilling to ensure the best possible scientific results and protection of the Antarctic environment;

*Conscious* also that planning such drilling will require preparation of a Comprehensive Environmental Impact Evaluation as provided for in Recommendation XIV-2.

*Recommend* to their Governments that they adopt and use the following Guidelines to assist in evaluating and avoiding the potential risk for significant adverse environmental impacts resulting from such drilling.

##### *Guidelines for scientific drilling in the Antarctic Treaty Area*

1. Before undertaking any scientific drilling that may have significant adverse environmental effects, adequately detailed geophysical surveys shall be performed of the

sites in question to enable any potential hazard associated with any specific drill site within the area of interest to be evaluated along with any other information available about that particular site.

2. All feasible precautions shall be taken to locate such drill sites offstructure to reduce the possibility of encountering hydrocarbons.
3. Such planned drill sites and operational drilling plans, including the geophysical survey results and other information, shall be reviewed by a body of appropriate experts to identify potential hazards and to assess the potential risk to the environment resulting from the proposed drilling and how those risks can be minimized.
4. If any significant potential hazard is identified which cannot be avoided by modifying the planned drilling procedure or equipment, the location of the proposed drill site shall be abandoned and any recommendations of the reviewing body shall be considered in connection with the choice of an alternative site.
5. Contingency plans shall be prepared to deal with any problems that may develop during the drilling process.
6. The drilling process shall be continuously monitored for potential hazards and necessary action shall be taken if problems occur.
7. Notification shall be provided to the responsible national agency by those conducting drilling operations of all hazards encountered, including the location of the site at which they were identified, and a description of the actions taken.

### **XII-3: Man's impact on the Antarctic environment**

The Representatives,

*Recalling* Article II of the Antarctic Treaty, Recommendations VI-4, VIII-13 and IX-5;

*Noting* that in these recommendations, which have become effective in accordance with Article IX, Paragraph 4 of the Antarctic Treaty, certain principles were elaborated and adopted, namely that:

- i) The ecosystem of the Antarctic Treaty Area is vulnerable to human interference;
- ii) the Antarctic derives much of its scientific importance from its uncontaminated and relatively undisturbed conditions;
- iii) in considering measures for the wise use and protection of the Antarctic environment their Governments shall act in accordance with their responsibility for ensuring that such measures are consistent with the interests of all mankind; and
- iv) no act or activity having an inherent tendency to modify the environment over wide areas within the Antarctic Treaty Area should be undertaken unless appropriate steps have been taken to foresee the probable modifications and to

exercise appropriate controls with respect to the harmful effects such uses of the Antarctic Treaty Area may have;

*Recalling* that in accordance with these principles there has been established for the Antarctic a substantial series of measures for the protection, conservation and wise use of Antarctic fauna and flora consisting of the Agreed Measures for the Conservation of Antarctic Fauna and Flora, the Convention for the Conservation of Antarctic Seals and the Convention for the Conservation of Antarctic Marine Living Resources;

*Noting* that the States involved in Antarctic research activities are in the best position to assess potential environmental impacts of such activities and to develop assessment procedures which might, with benefit, be applied to determining whether the activities they plan to conduct are likely to have significant impacts;

*Considering* that a measure of comparability between such procedures might, in the future, become desirable;

*Affirming* that environmental assessment procedures should not prejudice one of the fundamental principles of the Antarctic Treaty providing for freedom of scientific investigation as set out in Article II of the Antarctic Treaty and that such procedures should not encroach upon nor prejudice provisions for the protection of the environment and the conservation of living resources contained in instruments that have been or may, in the future, be negotiated as part of the Antarctic Treaty system;

*Recommend* to their Governments that:

1. In relation to any scientific activity they plan to conduct, including the planned provision of logistic facilities to support such activity, they urge their respective national organizations responsible for Antarctic activities to continue to scrutinize the plans for such research and logistic activities, in accordance with procedures they have developed or may develop, to determine whether the planned activities are likely to have significant impacts;
2. If a preliminary determination indicates that a planned research or logistic activity could have potentially significant impacts on the environment, their relevant agencies undertake a detailed environmental assessment, in accordance with procedures they have developed or may develop, with a view to determining the factors likely to cause such impacts and, if the seriousness of such impacts so indicates, to elaborate feasible research and logistic alternatives aimed at minimizing the harmful effects on the environment. In the event that such an assessment is completed they notify other Consultative Parties;
3. Through their National Committees, they invite the Scientific Committee on Antarctic Research (SCAR) to offer:
  - i) scientific advice regarding the definition of categories of research and logistic activity in Antarctica which might reasonably be expected to have a significant impact on the environment; and
  - ii) bearing in mind, *inter alia*, the discussion at this Meeting as reflected in paragraphs 17 to 19 of its Report, such advice as seems to SCAR to be relevant to the elaboration of assessment procedures which may be applied by

the relevant agencies of the Consultative Parties, on an experimental basis, with regard to research and logistic activity; and

4. The question of Man's impact on the Antarctic Environment should be considered further at the next Consultative Meeting.

**VIII-11: Man's impact on the Antarctic environment: Annex: Code of conduct for Antarctic expeditions and station activities, paragraph 4;**

[Paragraph 4 only, see section above for full text of Recommendation]

4. Guidelines for Antarctic operating organizations planning major Antarctic Projects
  - a) In the planning of major operations in the Antarctic Treaty Area an evaluation of the environmental impact of the proposed activity should be carried out by the Antarctic operating organizations concerned. Such an evaluation should include:
    - i) A description of the proposed action and an assessment of its potential benefits and its possible impact on the relevant ecosystems.
    - ii) A consideration of alternative actions which might alter the pattern of benefits versus adverse environmental effects expected to result from the action.
  - b) These evaluations may be circulated for information through SCAR channels to all the states engaged in Antarctic activities.



# CONSERVATION OF FAUNA AND FLORA

## Introductory note

With the increase in the number of stations during the International Geophysical Year (1957-58) scientists became aware of the need to regulate interactions between humans and animals. At a meeting of the Scientific Committee on Antarctic Research (SCAR) in August 1960 scientists developed “General rules of conduct for the preservation and conservation of living resources in Antarctica”. At the first Antarctic Treaty Consultative Meeting in 1961 it was agreed (Recommendation I-VIII) to consider the matter further and, as an interim measure, to recommend that the general rules SCAR had developed should be issued to Antarctic expeditions. These ideas were further discussed at the second ATCM (Recommendation II-II) and were developed into the Agreed Measures for the Conservation of Antarctic Fauna and Flora that were annexed to Recommendation III-VIII. The Agreed Measures have been superceded by Annexes II and V of the Protocol on Environmental Protection to the Antarctic Treaty.

## Antarctic Treaty Recommendations

### XXIII: Resolution 2(1999)

#### List of Specially Protected Species: Annex II To The Environmental Protocol

The Representatives,

*Noting* that the provisions of Article 8 of the Annex II to the Environmental Protocol require that the Consultative Parties keep under continuing review measures for the conservation of Antarctic fauna and flora, taking into account any recommendations from the Committee for Environmental Protection;

*Aware* that there has been no review of the list of Specially Protected Species in Appendix A to Annex II since the list was originally adopted by the consultative Parties in the 1964 Agreed Measures (Recommendation III-8);

*Aware* also that consideration needs to be given to including other species of fauna and flora on the list of Specially Protected Species as appropriate;

*Recommend* that:

1. SCAR be requested, in consultation with Consultative Parties, CCAMLR and other expert bodies as appropriate, to review the list of Specially Protected Species referred to in Article 3(4) of Annex II and listed in Appendix A to the Environmental Protocol.
2. The following Terms of Reference should be used by SCAR:

- i) Examine the status of those species which:
  - are native to the Antarctic Treaty Area or occur there seasonally through natural migration; and
  - whose status might be of concern.
- ii) With the assistance of IUCN, use the information contained in the IUCN Red Lists to help determine the conservation status of native Antarctic fauna and flora;
- iii) Provide expert scientific advice to the Committee on Environmental Protection as to which species should remain, or be designated as Specially Protected Species.

The review should be completed by 2001, and submitted to the Committee for Environmental Protection for discussion at its next meeting thereafter.

#### **VII-5: Importation of Laboratory Animals and Plants**

The Representatives,

*Considering:*

1. that harmful interference with the natural ecological system may be caused by micro-organisms introduced by man for experimental purposes;
2. Article IX of the Agreed Measures for the Conservation of Antarctic Fauna and Flora;

*Recommend* to their Governments that the following be added to the end of paragraph (c) of Annex C, Importation of Animals and Plants, of the Agreed Measures for the Conservation of Antarctic Fauna and Flora;

“including viruses, bacteria, yeasts and fungi”.

#### **VI-9: Data on the Conservation of Fauna and Flora**

The Representatives,

*Recalling* Recommendations III-10 and IV-19;

*Noting* that:

1. information is already being exchanged in accordance with the interim guidelines contained in Recommendation IV-20;
2. this information may be freely published and it is desirable that it should be amalgamated in the form most useful for scientific analysis;

*Recommend* to their Governments that:

1. They transmit the information exchanged under Recommendation IV-19 to their National Antarctic Committees;

2. They invite the Scientific Committee on Antarctic Research, through their National Committees, to assemble the information exchanged under Article XII of the Agreed Measures for the Conservation of Antarctic Fauna and Flora, to arrange for its publication and, in accordance with Recommendation IV-19, to prepare reports from time to time on the status of species.

#### **V-6: Modification of the Agreed Measures Adopted under Recommendation III-VIII for the Conservation of Fauna and Flora**

The Representatives recommend to their governments that:

1. in paragraph (d) of Article II after the words “Agreed Measures” they add the following:

“The functions of an authorised person will be carried out within the framework of the Antarctic Treaty. They will be carried out exclusively in accordance with scientific principles and will have as their sole purpose the effective protection of Antarctic fauna and flora in accordance with these Agreed Measures”.

2. in paragraph (e) of Article II, after the words “appropriate authority”, they add the following:

“as defined at paragraph (d) above”.

#### **IV-16: Specially Protected Species: Fur Seals**

The Representatives recommend to their Governments that the following be inserted in Annex A, Specially Protected Species, of the Agreed Measures for the Conservation of Antarctic Fauna and Flora:

“All species of the genus *Arctocephalus*, Fur Seals.”

#### **IV-17: Specially Protected Species: Ross Seals**

The Representatives recommend to their Governments that the following be inserted in Annex A, Specially Protected Species, of the Agreed Measures for the Conservation of Antarctic Fauna and Flora:

“*Ommatophoca rossi*, Ross Seal.”

#### **IV-18: Co-operation in implementing Article VI of the Agreed Measures for the Conservation of Antarctic Fauna and Flora (Recommendation III-8)**

The Representatives, taking into consideration Article VI of the Agreed Measures for the Conservation of Antarctic Fauna and Flora (Recommendation III-8), recommend to their Governments that in cases where expeditions of more than one Participating Government may be working in the same region of the Treaty Area, the Governments involved should arrange to cooperate as far as practicable in limiting the issuance of permits in accordance

with Article VI to ensure that the total number of native mammals and birds killed or captured accords with the requirements of paragraphs 4 and 7(b) of Article VI and paragraph 4(b) of Article VIII of the Agreed Measures.

#### **IV-19: Implementation of Article XII(1)(d) of the Agreed Measures**

The Representatives recommend to their Governments that for the effective implementation of the provision of Article XII of the Agreed Measures for the Conservation of Antarctic Fauna and Flora, documents exchanged annually by Participating Governments on the matters set down in paragraph 1(a) of that Article should follow the pattern of the form annexed hereto [see following page]. Recognizing the role of the Scientific Committee on Antarctic Research (SCAR), as defined in Recommendation I-IV, the Representatives further welcome the decision of SCAR to study the status of species, their need for protection and numbers of each species which might be harvested for food, study or other uses, as outlined in paragraph 1(b) and (c) of Article XII of the Agreed Measures.

## Antarctic Treaty Area

ANNUAL RETURN OF SPECIES KILLED OR CAPTURED (1 JULY \_\_\_\_ TO 30 JUNE \_\_\_\_)  
year year

BY \_\_\_\_\_ (country)

*Use a separate form for each locality*

LOCALITY (1) \_\_\_\_\_ LAT. \_\_\_\_\_ LONG. \_\_\_\_\_  
(site name)

<i>Species</i> (2)	<i>Sex</i> (3)	<i>Age</i> (4)	<i>Number killed for</i>			<i>Number captured and removed (5) for</i>		<i>Number captured and released</i> (6)
			Food	Scientific purposes	Museums, etc.	Scientific purposes	Zoos, etc.	

- NOTES: (1) Define as precisely as possible. Analysis will not be possible if the localities are too large.  
 (2) Use scientific name.  
 (3) Enter "M" for male, "F" for female or "U" if sex is unknown.  
 (4) Enter year class, if known, otherwise "A" for adult, or "J" for juvenile.  
 (5) Removed from the Treaty Area.  
 (6) Enter in this column the numbers of species removed from one locality and released elsewhere in the Treaty Area.

#### **IV-20: Interim Guide Lines for the Conservation of Fauna and Flora**

The Representatives recommend to their Governments that, until such time as the Agreed Measures on the Conservation of Antarctic Fauna and Flora may become effective in accordance with Article IX of the Antarctic Treaty, the following Recommendations as far as feasible be considered as guide lines in the interim period. Recommendations IV-1 to IV-19 inclusive.

#### **III-VIII: Agreed Measures for the Conservation of Antarctic Fauna and Flora**

The Representatives, taking into consideration Article IX of the Antarctic Treaty, and recalling Recommendation I-VIII of the First Consultative Meeting and Recommendation II-II of the Second Consultative Meeting, recommend to their Governments that they approve as soon as possible and implement without delay the annexed 'Agreed Measures for the Conservation of Antarctic Fauna and Flora'.

#### **Agreed Measures for the Conservation of Antarctic Fauna and Flora.**

##### *Preamble*

The Governments participating in the Third Consultative Meeting under Article IX of the Antarctic Treaty,

*Desiring* to implement the principles and purposes of the Antarctic Treaty;

*Recognizing* the scientific importance of the study of Antarctic fauna and flora, their adaptation to their rigorous environment, and their inter-relationship with that environment;

*Considering* the unique nature of these fauna and flora, their circumpolar range, and particularly their defencelessness and susceptibility to extermination;

*Desiring* by further international collaboration within the framework of the Antarctic Treaty to promote and achieve the objectives of protection, scientific study, and rational use of these fauna and flora; and

*Having particular regard* to the conservation principles developed by the Scientific Committee on Antarctic Research (SCAR) of the International Council of Scientific Unions;

Hereby consider the Treaty Area as a Special Conservation Area and have agreed on the following measures:

*Article I: [Area of application]*

1. These Agreed Measures shall apply to the same area to which the Antarctic Treaty is applicable (hereinafter referred to as the Treaty Area) namely the area south of 60° South Latitude, including all ice shelves.
2. However, nothing in these Agreed Measures shall prejudice or in any way affect the rights, or the exercise of the rights, of any State under international law with regard to the high seas within the Treaty Area, or restrict the implementation of the provisions of the Antarctic Treaty with respect to inspection.
3. The Annexes to these Agreed Measures shall form an integral part thereof, and all references to the Agreed Measures shall be considered to include the Annexes.

*Article II: [Definitions]*

For the purposes of these Agreed Measures:

- a) 'Native mammal' means any member, at any stage of its life cycle, of any species belonging to the Class Mammalia indigenous to the Antarctic or occurring there through natural agencies of dispersal, excepting whales.
- b) 'Native bird' means any member, at any stage of its life cycle (including eggs), of any species of the Class Aves indigenous to the Antarctic or occurring there through natural agencies of dispersal.
- c) 'Native plant' means any kind of vegetation at any stage of its life cycle (including seeds), indigenous to the Antarctic or occurring there through natural agencies of dispersal.
- d) 'Appropriate authority' means any person authorized by a Participating Government to issue permits under these Agreed Measures. The functions of an authorised person will be carried out within the framework of the Antarctic Treaty. They will be carried out exclusively in accordance with scientific principles and will have as their sole purpose the effective protection of Antarctic fauna and flora in accordance with these Agreed Measures.
- e) 'Permit' means a formal permission in writing issued by an appropriate authority as defined at paragraph (d) above.
- f) 'Participating Government' means any Government for which these Agreed Measures have become effective in accordance with Article XIII of these Agreed Measures.

*Article III: [Implementation]*

Each Participating Government shall take appropriate action to carry out these Agreed Measures.

*Article IV: [Publicity]*

The Participating Governments shall prepare and circulate to members of expeditions and stations information to ensure understanding and observance of the provisions of these

Agreed Measures, setting forth in particular prohibited activities, and providing lists of specially protected species and specially protected areas.

*Article V: [Cases of extreme emergency]*

The provisions of these Agreed Measures shall not apply in cases of extreme emergency involving possible loss of human life or involving the safety of ships or aircraft.

*Article VI [Protection of native fauna]*

1. Each Participating Government shall prohibit within the Treaty Area the killing, wounding, capturing or molesting of any native mammal or native bird, or any attempt at any such act, except in accordance with a permit.
2. Such permits shall be drawn in terms as specific as possible and issued only for the following purposes:
  - a) to provide indispensable food for men or dogs in the Treaty Area in limited quantities, and in conformity with the purposes and principles of these Agreed Measures;
  - b) to provide specimens for scientific study or scientific information;
  - c) to provide specimens for museums, zoological gardens, or other educational or cultural institutions or uses.
3. Permits for Specially Protected Areas shall be issued only in accordance with the provisions of Article VIII.
4. Participating Governments shall limit the issue of such permits so as to ensure as far as possible that:
  - a) no more native mammals or birds are killed or taken in any year than can normally be replaced by natural reproduction in the following breeding season;
  - b) the variety of species and the balance of the natural ecological systems existing within the Treaty Area are maintained.
5. The species of native mammals and birds listed in Annex A of these Measures shall be designated 'Specially Protected Species', and shall be accorded special protection by Participating Governments.
6. A Participating Government shall not authorize an appropriate authority to issue a permit with respect to a Specially Protected Species except in accordance with paragraph 7 of this Article.
7. A permit may be issued under this Article with respect to a Specially Protected Species, provided that:
  - a) it is issued for a compelling scientific purpose, and
  - b) the actions permitted thereunder will not jeopardize the existing natural ecological system or the survival of that species.



*Article VII: [Harmful interference]*

1. Each Participating Government shall take appropriate measures to minimize harmful interference within the Treaty Area with the normal living conditions of any native mammal or bird, or any attempt at such harmful interference, except as permitted under Article VI.
2. The following acts and activities shall be considered harmful interference:
  - a) allowing dogs to run free,
  - b) flying helicopters or other aircraft in a manner which would unnecessarily disturb bird and seal concentrations, or landing close to such concentrations (eg within 200 m),
  - c) driving vehicles unnecessarily close to concentrations of birds and seals (eg within 200 m),
  - d) use of explosives close to concentrations of birds and seals,
  - e) discharge of firearms close to bird and seal concentrations (eg within 300 m),
  - f) any disturbance of bird and seal colonies during the breeding period by persistent attention from persons on foot.

However, the above activities, with the exception of those mentioned in (a) and (e) may be permitted to the minimum extent necessary for the establishment, supply and operation of stations.

3. Each Participating Government shall take all reasonable steps towards the alleviation of pollution of the waters adjacent to the coast and ice shelves.

*Article VIII: [Specially Protected Areas]*

1. The areas of outstanding scientific interest listed in Annex B shall be designated 'Specially Protected Area' and shall be accorded special protection by the Participating Governments in order to preserve their unique natural ecological system.
2. In addition to the prohibitions and measures of protection dealt with in other Articles of these Agreed Measures, the Participating Governments shall in Specially Protected Areas further prohibit:
  - g) the collection of any native plant, except in accordance with a permit;
  - h) the driving of any vehicle.
  - i) entry by their nationals, except in accordance with a permit issued under Article VI or under paragraph 2(a) of the present Article or in accordance with a permit issued for some other compelling scientific purpose;
3. A permit issued under Article IV shall not have effect within a Specially Protected Area except in accordance with paragraph 4 of the present Article.
4. A permit shall have effect within a Specially Protected Area provided that:
  - a) it was issued for a compelling scientific purpose which cannot be served elsewhere; and
  - b) the actions permitted thereunder will not jeopardize the natural ecological system existing in that Area.

*Article IX [Introduction of non-indigenous species, parasites and diseases]*

1. Each Participating Government shall prohibit the bringing into the Treaty Area of any species of animal or plant not indigenous to that Area, except in accordance with a permit.
2. Permits under paragraph 1 of this Article shall be drawn in terms as specific as possible and shall be issued to allow the importation only of the animals and plants listed in Annex C. When any such animal or plant might cause harmful interference with the natural system if left unsupervised within the Treaty Area, such permits shall require that it be kept under controlled conditions and, after it has served its purpose, it shall be removed from the Treaty Area or destroyed.
3. Nothing in paragraphs 1 and 2 of this Article shall apply to the importation of food into the Treaty Area so long as animals and plants used for this purpose are kept under controlled conditions.
4. Each Participating Government undertakes to ensure that all reasonable precautions shall be taken to prevent the accidental introduction of parasites and diseases into the Treaty Area. In particular, the precautions listed in Annex D shall be taken.

*Article X: [Activities contrary to the principles and purposes of these Measures]*

Each Participating Government undertakes to exert appropriate efforts, consistent with the Charter of the United Nations, to the end that no one engages in any activity in the Treaty Area contrary to the principles or purposes of these Agreed Measures.

*Article XI: [Ships' crews]*

Each Participating Government whose expeditions use ships sailing under flags of nationalities other than its own shall, as far as feasible, arrange with the owners of such ships that the crews of these ships observe these Agreed Measures.

*Article XII: [Exchange of information]*

1. The Participating Governments may make such arrangements as may be necessary for the discussion of such matters as:
  - a) the collection and exchange of records (including records of permits) and statistics concerning the numbers of each species of native mammal and bird killed or captured annually in the Treaty Area;
  - b) the obtaining and exchange of information as to the status of native mammals and birds in the Treaty Area, and the extent to which any species needs protection;
  - c) the number of native mammals or birds which should be permitted to be harvested for food, scientific study, or other uses in the various regions;
  - d) the establishment of a common form in which this information shall be submitted by Participating Governments in accordance with paragraph 2 of this Article.
2. Each Participating Government shall inform the other Governments in writing before the end of November each year of the steps taken and information collected in the preceding period of 1st July to 30th June relating to the implementation of these Agreed

Measures. Governments exchanging information under paragraph 5 of Article VII of the Antarctic Treaty may at the same time transmit the information relating to the implementation of these Agreed Measures.

*Article XIII: [Formal provisions]*

1. After the receipt by the Government designated in Recommendation I-XIV(5) of notification of approval by all Governments whose representatives are entitled to participate in meetings provided for under Article IX of the Antarctic Treaty, these Agreed Measures shall become effective for those Governments.
2. Thereafter any other Contracting Party to the Antarctic Treaty may, in consonance with the purposes of Recommendation III-VII, accept these Agreed Measures by notifying the designated Government of its intention to apply the Agreed Measures and to be bound by them. The Agreed Measures shall become effective with regard to such Governments on the date of receipt of such notification.
3. The designated Government shall inform the Governments referred to in paragraph 1 of this Article of each notification of approval, the effective date of these Agreed Measures and of each notification of acceptance. The designated Government shall also inform any Government which has accepted these Agreed Measures of each subsequent notification of acceptance.

*Article XIV: [Amendment]*

1. These Agreed Measures may be amended at any time by unanimous agreement of the Governments whose Representatives are entitled to participate in meetings under Article IX of the Antarctic Treaty.
2. The Annexes, in particular, may be amended as necessary through diplomatic channels.
3. An amendment proposed through diplomatic channels shall be submitted in writing to the designated Government which shall communicate it to the Governments referred to in paragraph 1 of the present Article for approval; at the same time, it shall be communicated to the other Participating Governments.
4. Any amendment shall become effective on the date on which notifications of approval have been received by the designated Government and from all of the Governments referred to in paragraph 1 of this Article.
5. The designated Government shall notify those same Governments of the date of receipt of each approval communicated to it and the date on which the amendment will become effective for them.
6. Such amendment shall become effective on that same date for all other Participating Governments, except those which before the expiry of two months after that date notify the designated Government that they do not accept it.

*ANNEXES TO THESE AGREED MEASURES*

*ANNEX A: Specially Protected Species*

All species of the genus *Arctocephalus*, Fur Seals.

*Ommatophoca rossii*, Ross Seal.

*ANNEX B: Specially Protected Areas*

**[Annex B consisted of an updated list of Specially Protected Areas (SPAs). The current list may be found the section on SPAs.]**

*ANNEX C: Importation of animals and plants*

The following animals and plants may be imported into the Treaty Area in accordance with permits issued under Article IX(2) of these Agreed Measures:

- a) sledge dogs
- b) animals and plants
- c) laboratory animals and plants including viruses, bacteria, yeasts and fungi.

*ANNEX D: Precautions to prevent accidental introduction of parasites and diseases into the Treaty Area*

The following precautions shall be taken:

1. *Dogs*. All dogs imported into the Treaty Area shall be inoculated against the following diseases:

- a) distemper
- b) contagious canine hepatitis
- c) rabies
- d) leptospirosis (*L. canicola* and *L. icterohaemorrhagicae*)

Each dog shall be inoculated at least two months before the time of its arrival in the Treaty Area

2. *Poultry*. Notwithstanding the provisions of Article IX(3) of these Agreed Measures, no living poultry shall be brought into the Treaty Area after 1st July 1966.

**III-IX: Interim Guide Lines for the Conservation of Fauna and Flora**

The Representatives recommend to their Governments that until such time as the Agreed Measures on the Conservation of Antarctic Fauna and Flora may become effective in accordance with Article IX of the Antarctic Treaty, these Agreed Measures as far as feasible be considered as guide lines in this interim period.

### **III-X: Interest of SCAR in the conservation of Antarctic fauna and flora**

Recognizing the initiative already taken by the Scientific Committee on Antarctic Research (SCAR) on matters relating to the conservation of Antarctic fauna and flora, and considering its role as defined in Recommendation I-IV, the Representatives recommend to their Governments that they encourage SCAR to continue its interest in those matters and to prepare reports from time to time on this subject, and especially at this time on the matters that it considers should be listed in the Annexes of the Agreed Measures for the Conservation of Antarctic Fauna and Flora.

### **II-II: Conservation of Antarctic fauna and flora**

Recalling and reaffirming Recommendation I-VIII of the First Consultative Meeting, and expressing their conviction that the general rules attached to that Recommendation should be scrupulously observed,

The Representatives recommend to their Governments that:

- a) they collect and exchange information on the measures which they have adopted for the protection of living resources in Antarctica;
- b) they promote the further exchange and evaluation of information about the existing state of living resources in the Antarctic;
- c) they consult together with a view to the establishment, in an appropriate form and at an early date, of effective and internationally agreed measures on this subject;
- d) these consultations should take into account the rules attached to Recommendation I-VIII of the First Consultative Meeting, the recommendations made on this subject by SCAR, the proposal submitted by the Delegation of the United Kingdom in Document P.3 to the Second Consultative Meeting, and the views expressed by Delegations in the discussion of this item;
- e) in the course of the meetings held to prepare the Third Consultative Meeting they undertake the task of formulating, on the basis of the principles enunciated above, the draft text of measures on this subject to be submitted to that Consultative Meeting with a view to its approval and recommendation to Governments.

### **I-VIII: Conservation of Antarctic fauna and flora**

The Representatives recommend to their Governments that:

- i) they recognize the urgent need for measures to conserve the living resources of the Treaty area and to protect them from uncontrolled destruction or interference by man;
- ii) they encourage the interchange of information and international co operation with a view to promoting scientific studies of Antarctic life as the essential basis for long-term conservation measures.
- iii) they bring to the attention of all persons entering the area the need for the protection of living resources;
- iv) they consult on the form in which it would be most suitable to establish in due course internationally agreed measures for the preservation and conservation of

- the living resources of the Antarctic, taking into account the discussion at and documents submitted to the first Consultative Meeting;
- v) as an interim measure, and to the extent possible under national legislation and binding international conventions, they issue general rules of conduct on the lines of the attached statement extracted from the recommendations of SCAR as contained in the report of the meeting held in Cambridge in August, 1960;
  - vi) they exchange information on any major steps taken in accordance with this recommendation with respect to the next Antarctic season;
  - vii) this question be included in the agenda of the next Consultative Meeting.

*General rules of conduct for preservation and conservation of living resources in Antarctica*

1. Animals and plants indigenous to Antarctica shall not be unnecessarily disturbed and shall not be destroyed or injured. Exceptions shall be permitted on a strictly controlled scale which will not deplete the local stock and only for the following purposes:

- a) collections and studies for scientific purposes;
- b) food (eg meat, eggs) for men and dogs;
- c) living specimens for zoological gardens;
- d) taking a strictly limited number of specimens, especially natural casualties, for private purposes.

Exceptions (c) and (d) shall not apply for the time being to Fur Seals.

2. Alien forms of flora and fauna should not be deliberately introduced except when rigidly controlled having regard to their chances of survival, capacity of reproduction and utilization by man.

3. The following activities should be regulated with a view to preventing serious harm to wild life:

- a) allowing dogs to run free,
- b) flying helicopters or other aircraft in a manner which would unnecessarily disturb bird and seal colonies, or landing near (eg within 200 yards) such colonies,
- c) driving vehicles unnecessarily close to breeding colonies of birds and seals,
- d) use of explosives or discharge of firearms close to breeding colonies of birds and seals,
- e) disturbance of bird and seal colonies by persistent attention from people on foot,
- f) the discharge of oil from ships in a manner harmful to animals and plants indigenous to Antarctica.

# WASTE DISPOSAL AND WASTE MANAGEMENT

## Introductory note

The Antarctic is often described as 'pristine'; it projects an image of cleanliness. But wherever humans go they generate waste which must be managed. Waste disposal and waste management procedures for Antarctica have been codified in Annex III to the Protocol on Environmental Protection to the Antarctic Treaty.

## Antarctic Treaty Recommendations

### XIX: Resolution 2(1995): Nuclear Waste Disposal

The Representatives:

*Recalling* the provisions of Article V of the Antarctic Treaty;

*Recalling* Recommendation VII-12:

*Aware* that Article 4.6 of the Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and their Disposal prohibits the export of hazardous wastes or other wastes for disposal within the area south of 60° South latitude, whether or not such wastes are subject to transboundary movement;

*Noting* that in September 1994 the International Atomic Energy Agency's General Conference adopted a resolution inviting the Board of Governors and the Director General to commence preparations for a convention on the safety of radioactive waste management;

*Urge* their Governments to:

Coordinate their positions in any negotiations relating to the disposal of nuclear waste in which they participate, with the objective of the inclusion of provision prohibiting the transfer of nuclear waste to, and the disposal of nuclear waste in, the Antarctic Treaty Area.

### XV-3: Human Impact on the Antarctic Environment: Waste Disposal

The Representatives,

*Recalling* Article II of the Antarctic Treaty and Recommendations VI-4, VIII-11, XII-4, and XIII-4;

*Reaffirming* the commitment of Consultative Parties to take measures to reduce the amount of wastes generated in Antarctica and to minimize the impact of wastes on the

Antarctic environment, giving due consideration to the need to avoid detrimental effects on dependent or associated ecosystems outside the Antarctic Treaty Area;

*Recognizing* that the Antarctic derives much of its scientific importance from its uncontaminated condition;

*Recognizing* further that the support of science has an impact on the Antarctic environment which it is impractical to eliminate completely, but which, by good management can be limited;

*Noting* that the increasing level and complexity of Antarctic operations have increased the quantity and variety of wastes produced, but that improvements in logistics and technology have increased the capacity to minimize wastes and their environmental impacts;

*Recognizing* further that different environments, scales of operation, and logistic infrastructures will require different approaches to waste management, and that further technical developments can be expected to provide new solutions to waste management problems;

*Noting* with appreciation the work of the Scientific Committee on Antarctic Research (SCAR) in response to Recommendation XIII-4, which invited National Antarctic Committees to undertake a comprehensive review of the waste disposal aspects of the Annex to Recommendation VIII-11, and to offer scientific advice regarding waste disposal procedures and standards that it is desirable and practical to achieve at coastal and inland stations and field camps;

*Desiring* to revise the waste disposal aspects of the Code of Conduct annexed to Recommendation VIII-11 to take account of the recommendations of SCAR;

*Recommend* to their Governments that they adopt the following practices and take measures within their competence necessary to ensure compliance with them;

#### *General obligation*

1. The amount of wastes produced, or disposed of, in Antarctica shall be reduced to the maximum extent possible so as to minimize impact on the Antarctic environment and minimize interference with scientific research, or other legitimate uses of the Antarctic.

#### *Waste management planning*

2. Each Government carrying out Antarctic activities shall establish a waste disposal classification as a basis for recording wastes and to facilitate studies aimed at evaluating the environmental impacts of operational and scientific activity. Wastes produced may be classified as sewage and domestic liquid wastes (Group 1); other liquid wastes and chemicals, including fuels and lubricants (Group 2); solids to be combusted (Group 3); other solid wastes (Group 4); and radioactive materials (Group 5). Source classification codes, which represent individual processes or functions logically associated with points of waste creation, may be used in auditing studies.



3. Each Government carrying out Antarctic activities shall, in respect of those activities, prepare and annually update:
  - a) plans for waste management (including waste reduction, storage and disposal, specifying for each fixed site, for field camps generally, and for each vessel (other than small boats that are part of the operations of fixed sites or of vessels);
    - i) programmes for cleaning up existing waste disposal sites and abandoned work sites;
    - ii) current and planned waste management arrangements;
    - iii) current and planned arrangements for analyzing the environmental effects of Antarctic waste and waste management systems; and
    - iv) other efforts to minimize any environmental effects of wastes and waste management.
  - b) an inventory of locations of past activities (such as traverses, fuel depots, field bases, crashed aircraft) as far as is practicable, before the information is lost, so that such locations can be taken into account in planning future scientific programmes (e.g. snow chemistry, pollutants in lichens, ice core drilling etc.).
4. Each Government carrying out Antarctic activities shall include the waste management plans referred to in paragraph 3 (a) above in the annual exchanges of information in accordance with Articles III and VII of the Antarctic Treaty and related Recommendations under Article IX of the Treaty. The formats of such exchanges shall be determined by each Government pending development of standardized formats. They shall also exchange the inventories referred to in paragraph 3 (b) above.
5. Each Government carrying out Antarctic activities shall ensure that its national Antarctic operators designate a waste management official to develop and monitor waste management plans. In the field, this responsibility shall be delegated to an appropriate person at each site.
6. Those carrying out activities in Antarctica shall ensure that members of their expeditions receive training designed to limit the impact of their operations on the Antarctic environment and to inform them of required practices.
7. Pesticides, polychlorinated biphenols (PCBs), non-sterile soil or polystyrene beads, chips or similar forms of packaging shall not be sent to the Antarctic. The use of polyvinyl chloride (PVC) products in packaging shall be discouraged.
8. Those carrying out activities in Antarctica shall ensure that their expeditions to Antarctica are advised of any PVC products being provided.
9. Each Government shall establish a long-term programme to remove existing abandoned fuel drums and fuel, where such removal is practical. Such programmes shall identify for clean up at the first opportunity those drum sites where the transport equipment which delivered the drums is no longer available in the same area.
10. Waste compaction, storage and incineration facilities shall be incorporated in the design and construction of ships engaged in or supporting Antarctic programmes.

*Waste disposal*

11. The following wastes shall be removed from the Antarctic Treaty area:
  - a) radio-active materials;
  - b) electrical batteries (including lead/acid, dry cell and other types);
  - c) fuel, both liquid and solid; and
  - d) wastes containing high levels of heavy metals or harmful persistent compounds.
12. The following wastes shall be removed from the Antarctic Treaty area unless they are incinerated in equipment which neutralizes the harmful emissions that would otherwise be produced:
  - a) polyvinyl chloride (PVC), polyurethane foam, polystyrene foam, rubber and lubricating oils which contain additives that are widely recognized as products that could produce harmful emissions;
  - b) all other plastic wastes, including those of unknown composition.
13. The following wastes shall be removed from the Antarctic Treaty Area to the maximum extent practicable:
  - a) liquid wastes, other than sewage and domestic liquid wastes;
  - b) solid, non-combustible wastes; and
  - c) fuel drums.
14. The following wastes shall be removed from Antarctic Treaty area unless incinerated, autoclaved or otherwise treated to be made sterile:
  - a) residues of introduced animal carcasses;
  - b) culture of micro-organisms; and
  - c) introduced avian products.
15. Combustible wastes, not removed from the Antarctic Treaty area, shall be burnt in incinerators designed to reduce harmful emissions to the maximum extent practicable.
16. All open burning of wastes shall be phased out. Pending the completion of such phase out, when it is necessary to dispose of wastes by open burning:
  - a) allowance shall be made for the wind and the type of wastes to be burnt to limit, as far as practicable, particulate deposition on land and to avoid such deposition over sensitive areas; and
  - b) wastes to be burnt shall be stored in such as way as to prevent their dispersal by wind, or access and dispersal by scavengers.
17. All wastes to be removed from the Antarctic Treaty area, or otherwise disposed of, shall be stored in such a way as to prevent their dispersal by wind or access and dispersal by scavengers.
18. Solid non-combustible wastes, which cannot be removed to land disposal sites outside the Antarctic Treaty area and which are to be disposed of at sea, shall only be disposed of at selected dump sites in deep waters, within or outside the Antarctic Treaty area and only in accordance with the international Convention for the Prevention of Marine Pollution by the Dumping of Wastes and other Matter (London Dumping Convention), as well as any other relevant international agreements.

19. Dumping of any other wastes at sea shall be carried out in accordance with the London Dumping Convention.
20. Sewage, chemical wastes and, to the maximum extent practicable, domestic liquid wastes shall not be disposed of onto ice free land. Sewage and domestic liquid wastes may be discharged directly into the ocean, provided that:
- a) such discharge be located, wherever practicable, where conditions exist for rapid dispersal;
  - b) large quantities of such wastes (generated by approximately 30 individuals or more), receive at least primary treatment, such as maceration; and
  - c) consideration be given to the advantages of treating very large quantities through systems, such as Rotating Biological Contactor Systems, to reduce biological oxygen demand (BOD) and suspended solids.
21. Vessels engaged in supporting Antarctic activities that are not fitted with incinerator facilities shall, to the maximum extent practicable, stockpile waste, excluding untreated sewage and domestic effluents, for appropriate disposal at stations, bases, deep waters sites or outside of the Antarctic Treaty area, provided that such wastes may be disposed of at stations or bases in Antarctica only in accordance with these practices, and at sea only in accordance with relevant Antarctic Treaty recommendations, the London Dumping Convention and any other relevant international agreements. Any incineration of shipboard wastes in the Antarctic Treaty area shall be conducted in incinerators of the type which are designed to reduce harmful emissions to the maximum extent practicable.
22. Those carrying out activities in Antarctica shall to the maximum extent practicable clean up the waste disposal sites and abandoned work sites of their Antarctic activities.
23. Wastes generated at inland stations shall be removed from the area of such stations to the maximum extent practicable for disposal in accordance with the practices set out in this Recommendation. Where this is not practicable, such wastes shall be concentrated in deep ice pits. In planning the location of inland stations where deep ice pits are the only practicable alternative, sites on known ice flow lines which terminate at ice-free areas or in areas of high ablation shall be avoided.
24. Wherever practicable, wastes generated at field camps shall be removed to their supporting stations, bases or ships for disposal in accordance with the practices set out in this Recommendation.

#### *Procedures*

25. These practices shall be kept under continuing review so as to ensure that they are updated as necessary to reflect improvements in waste disposal technology and procedures and to ensure maximum protection of the Antarctic environment. To this end it would be desirable for SCAR and the Managers of National Antarctic Programmes to continue to consider problems, prospects and opportunities for cooperation in Antarctic waste management and to provide advice on appropriate steps that may be taken.
26. Governments should ensure that their nationals and vessels are subject to measures governing waste disposal in Antarctica that are no less effective in affording protection of

the environment than those applicable to their nationals and vessels outside Antarctica. Further, nothing in these practices shall be interpreted as replacing national environmental standards applicable to Antarctic activities, where such standards are stricter than those contained in these practices; nor shall any provision in these practices be interpreted as limiting governments from adopting stricter standards.

27. These practices shall not be interpreted or implemented in such fashion as to endanger human life.

#### **XIII-4: Man's Impact on the Antarctic Environment: Code of Conduct for Antarctic Expeditions and Station Activities: Waste Disposal**

The Representatives,

*Recalling* Recommendations VI-4, VIII-11 and XII-4;

*Recognizing* that Antarctica derives much of its scientific importance from its uncontaminated condition and the consequent need to reduce to the minimum level practicable the spread of all potential contaminants introduced into the Antarctic Treaty Area by man;

*Noting* that changes have occurred in the perception of what constitutes pollution and in analytical techniques since Recommendation VIII-11 was approved;

*Noting* with appreciation the preliminary review by the Scientific Committee on Antarctic Research (SCAR) of the waste disposal aspects of the Annex to Recommendation VIII-11;

*Recommend* to their respective Governments that:

through their National Antarctic Committees they invite SCAR, using all resources available to it, to undertake a comprehensive review of the waste disposal aspects of the Annex to Recommendations VIII-11 and, giving due consideration to the need to avoid detrimental effects on neighbouring or associated ecosystems outside the Antarctic Treaty Area and to considerations of cost-effectiveness, to offer

- i) scientific advice regarding waste disposal procedures and standards that it is desirable to achieve at coastal and inland stations and field camps;
- ii) advice regarding the logistic feasibility of such procedures, bearing in mind Antarctic operational circumstances, including variation in the numbers of personnel between stations, operational and logistic difficulties, and local circumstances and
- iii) such other advice as seems to SCAR to be relevant to waste disposal procedures.

#### **XII-4: Man's Impact on the Antarctic Environment: Code of Conduct for Antarctic Expeditions and Station Activities**

The Representatives,

*Recalling* Recommendation VIII-11;

*Noting* a general increase in awareness amongst Consultative Parties of the potential environmental impacts of the disposal of waste in the Antarctic region;

*Noting* that the increasing level and degree of complexity of Antarctic operations is likely to introduce into the Antarctic a wider range of potentially environmentally damaging substances than previously;

*Noting* that improvements in logistics and technology increase the feasibility of on-site treatment of human and other waste, and of the removal of solid waste, residues and noxious substances from the Treaty area;

*Recommend* to their Governments that they seek the advice of their respective Antarctic operating agencies as to:

- i) any problems which have been experienced in implementing the Code of Conduct for Antarctic Expeditions and Station Activities contained in the Annex to Recommendation VIII-11; and
- ii) the desirability and feasibility of revising the Code of Conduct in the light of the points noted above, particularly the increased potential for on-site treatment and removal of waste from the Treaty Area.

### **VIII-11: Man's Impact on the Antarctic Environment: Annex: Code of Conduct for Antarctic Expeditions and Station Activities**

[Paragraph 1 only, see section above for full text of Recommendation]

#### *1. Waste disposal*

The following are recommended procedures:

- a) Solid waste
  - i) *Non-combustible, including chemicals (except batteries)*. These materials may be disposed of at sea either in deep water or, if this is not possible, at specified sites in shallow water.
  - ii) *Batteries* should be removed from the Antarctic Treaty Area.
  - iii) *Combustibles*
    - Wood, wood products and paper should be incinerated, the ash being disposed of at sea.
    - Lubricating oils may be burnt except those containing harmful additives which should be removed from the Antarctic Treaty Area.
    - Carcasses and materials associated with imported experimental animals should be incinerated.
    - All plastics and rubber products should be removed from the Antarctic Treaty Area.
- b) Liquid waste
  - i) Human waste, garbage and laundry effluents should, where possible, be macerated and be flushed into the sea.

- ii) Large quantities of photographic liquids should be treated for the recovery of silver and the residue should be flushed into the sea.
  - c) The above procedures are recommended for coastal stations. Field sites supported from coastal stations should, where feasible, use the facilities of their supporting station. Inland stations should concentrate all waste in deep pits. Except as stated for inland stations, waste should not be buried.
  - d) Waste containing radio-isotopes should be removed from the Antarctic Treaty Area.
  - e) Every effort should be made to reduce the plastic packaging of products imported into the Antarctic Treaty Area.
  - f) If possible the use of leaded fuels or fuels containing ethylene bromide and ethylene chloride should be avoided.
- When incinerators are used it is desirable to monitor the effluents.

### **VIII-12: Disposal of Nuclear Waste**

The Representatives,

*Recalling* Article V of the Antarctic Treaty;

*Noting* that the increasing production of nuclear materials and the growing concern about the disposal of nuclear waste;

*Bearing in mind* the undertaking of Contracting Parties in Article X of the Antarctic Treaty to exert appropriate efforts, consistent with the Charter of the United Nations, to the end that no one engages in any activity in Antarctica contrary to the principles or purposes of the Treaty;

*Desiring* to preserve the unique quality of the Antarctic environment;

*Recommend* to their Governments that they continue to exert appropriate efforts to the end that no one disposes of nuclear waste in the Antarctic Treaty Area.

# PREVENTION OF MARINE POLLUTION

## Introductory note

The question of the extent to which the Antarctic environment, and more particularly the marine component, was contaminated by oil was first raised at the Ninth ATCM. The reports prepared for the Tenth ATCM showed that the levels of oil in the marine environment were so low as to be barely detectable and pointed to uncertainties of interpretation as to whether the source of these very low levels was biogenic or anthropogenic. The Tenth Meeting recognized the need to pursue the question as to how very low levels of contamination could be detected and their source be attributed. At the Tenth ATCM the question was raised as to the adequacy of ship design and construction to counter oil pollution from ships. At the Eleventh Meeting this matter was further considered and it was concluded that the effect of international agreements relating to the prevention of oil contamination of the marine environment from ships, together with the maritime insurance arrangements for ships used in ice-bound waters, was probably sufficient safeguard at the present level of shipping activity in the Antarctic. Having adopted Recommendation XV-3, setting out rules relating to the disposal of waste at land based facilities, the Consultative Parties, at the same meeting, also addressed the question of pollution of the marine environment from ships operating in the Antarctic Treaty area. Recommendation XV-4 was adopted. This Recommendation takes account of rules relating to marine pollution that have been generated in other fora (primarily the IMO) and integrates them with specific reference to Antarctica. This Recommendation was a basis for Annex IV to the Protocol on Environmental Protection to the Antarctic Treaty that codifies rules for the prevention of marine pollution. At the XXIIInd ATCM, Parties noted work underway in the International Maritime Organization to develop a draft “Code of Safety for Ships in Polar Waters”. At the XXIIIrd ATCM, it was decided to convene a meeting of experts to develop guidelines for Antarctic shipping. This meeting of experts was held in London in April 2000.

## Antarctic Treaty Recommendations

### Extract from Report of XXIVth ATCM

(83) The United Kingdom presented Working Paper (XXIV ATCM/WP26) covering the Final Report of the Antarctic Treaty Meeting of Experts convened in April 2000 under the terms of Decision 2 (1999). The Meeting of Experts had been convened to begin the development of Guidelines for Antarctic Shipping and Related Activities. The Meeting of Experts was held in London and was hosted by the UK Government.

(84) The UK reported that the Meeting of Experts had made good progress in beginning to develop guidelines for Antarctic shipping and related activities. A number of key principles for the guidelines had been considered. A Framework Document had been

developed as a possible basis for further elaboration of the guidelines, and certain elements of the Framework Document had been considered in greater detail. The Meeting of Experts had also developed seven recommendations for ATCM XXIV to consider.

(85) The Meeting expressed its gratitude to the United Kingdom for their valuable contributions on this issue and for hosting the Meeting of Experts.

(86) The Meeting agreed that it was important to continue to make progress with the development of the Antarctic shipping guidelines. The Meeting examined the Framework Document that had been prepared by the Meeting of Experts and agreed that it provided a useful basis for development of the issue. Several delegations also expressed support for the Meeting of Experts proposal to develop the shipping guidelines in the form of a “Handbook of Information”.

(87) The Meeting also recognized the importance of building on, as appropriate, the Arctic Shipping Guidelines, currently under development within the IMO, particularly with regard to those elements related to vessel construction and equipment.

(88) The Meeting discussed whether or not to await the outcome of IMO’s deliberations on the Arctic shipping guidelines before undertaking any further work on Antarctic guidelines.

(89) Some delegations expressed the view that it would be preferable to postpone on the Antarctic shipping guidelines until IMO had completed its work on the Arctic guidelines. At that time the Arctic document would have been through significant scrutiny by various IMO technical committees, and could provide a firm basis for development of the Antarctic guidelines.

(90) Other delegations considered that it would be more appropriate to continue working on the Antarctic guidelines, building on the work of the Meeting of Experts, and recognizing that ATCM had already decided separately to develop guidelines for Antarctic shipping. This work should focus on Antarctic specific aspects of the guidelines and not duplicate work being carried out by the IMO.

(91) The UK noted the requirements of Article 10 of Annex IV of the Environmental Protocol on the design, construction, manning and equipment of ships engaged in, or supporting Antarctic activities. With that in mind, and in order to assist the process, the UK offered to consult intersessionally with interested Parties, COMNAP, IAATO and others as appropriate, to see how the issue of Antarctic shipping guidelines might be further progressed.

(92) The Meeting thanked the UK for its offer and looked forward to further considering the matter at ATCM XXV.

(93) Russia introduced Working Paper (XXIV ATCM/WP 30) regarding the zonation of the Southern Ocean based on ice navigation conditions. The proposed zonation and



classification reflected the results of almost half a century of experience of the Russian Antarctic Expedition operating its ships over the entire Southern Ocean. Russia requested comments from Parties on their Working Paper and several Parties with experience of ice navigation offered to provide Russia with their comments after studying the document in more detail.

(94) Several delegations commented on the valuable information contained in this Working Paper and suggested that the concept might be incorporated into the proposed Guidelines for Antarctic shipping as a mechanism for providing information on ice-conditions to Antarctic mariners.

### **XXIII: Decision 2 (1999):**

#### **Guidelines for Antarctic Shipping and Related Activities**

The Representatives,

*Recalling* Resolution 3(1998) on the draft Polar Shipping Code;

*Noting* the outcome of the 71st session of the International Maritime Organisation's Maritime Safety Committee regarding the development of a Polar Shipping Code in the form of non-mandatory guidelines, and the intention to exclude Antarctica from the application of these guidelines unless Antarctic Treaty Consultative Parties decide otherwise;

*Recalling* the provisions of Article 10 of Annex IV of the Protocol on Environmental Protection to the Antarctic Treaty;

*Recognizing* the importance of maximising the safety of vessels operating in Antarctic waters;

*Decide:*

1. To give priority to the development of guidelines for Antarctic shipping and related activities pursuant to Article 10 of Annex IV to the Protocol;
2. To seek subsequent adoption of these guidelines by the International Maritime Organisation (IMO) as a means of extending their applicability to members of the IMO that are not Antarctic Treaty Consultative Parties;
3. To convene a Meeting of Experts under the provisions of Recommendation IV-24, with the aim of developing draft guidelines for Antarctic shipping and related activities;
4. To notify the IMO, through Peru as host Government of ATCM XXIII, of the provisions of paragraphs 1, 2 and 3 above;
5. Pursuant to paragraph 3 above, to request the Meeting of Experts :
  - i) to examine the most recent version of the draft Polar Shipping guidelines being developed for the Arctic by the IMO, and decide which elements of those draft Arctic guidelines should form the basis of the Antarctic guidelines;

- ii) to consider other aspects of the design, construction, manning and equipment of vessels operating in Antarctic waters that might require elaboration in the Antarctic guidelines;
  - iii) to take into account existing international instruments regulating shipping activities in Antarctica, including for example MARPOL, SOLAS, UNCLOS and the Environmental Protocol to the Antarctic Treaty;
  - iv) to take into account existing guidelines adopted under the Antarctic Treaty, and in particular those adopted under Resolution 6 (1998);
  - v) to ensure the guidelines adequately take account of the nature of Antarctic shipping, the environmental conditions of Antarctica and the system of international governance applying to the Antarctic Treaty area;
  - vi) to report back to ATCM XXIV.
6. To encourage attendance at the Meeting by representatives from Consultative Parties, particularly their Antarctic and marine safety experts, and to invite experts from, Non-Consultative Parties, the Council of Managers of National Antarctic Programmes (COMNAP) and the Scientific Committee on Antarctic Research (SCAR).
  7. To also invite experts from the following bodies: International Hydrographic Organisation (IHO), International Maritime Organisation (IMO), World Meteorological Organisation (WMO), International Association of Classification Societies (IACS), International Association of Protection and Indemnity Clubs (P&I Clubs), International Association of Antarctic Tour Operators (IAATO) and the Antarctic and Southern Ocean Coalition (ASOC).
  8. To accept the offer of the United Kingdom Government to host the Meeting of Experts in London, which should, as far as possible, be held in conjunction with a meeting of the appropriate IMO expert body.
  9. That in accordance with Recommendation IV-24, the United Kingdom should submit a report of the Meeting of Experts to ATCM XXIV for consideration.

## **XXII: Resolution 3 (1998)**

### **International Code of Safety for Ships in Polar Waters**

The Representatives,

*Noting* the draft International Code of Safety for Ships in Polar Waters (Polar Code), being developed by the International Maritime Organisation (IMO);

*Recognizing* the benefits of having a Code of Practice for Ship Safety for vessels operating in Antarctic waters;

*Noting* also that a Polar Code should meet the requirements of Article 10 of Annex IV to the Protocol on Environmental Protection to the Antarctic Treaty;

*Recommend* that:

Consultative Parties provide input to IMO, via their national maritime authorities, on the draft Polar Shipping Code as it relates to shipping operations within the Antarctic Treaty area.

### **XIX: Resolution 1(1995)**

#### **Strengthening Cooperation in Hydrographic Surveying and Charting of Antarctic Waters**

The Representatives of the Consultative Parties,

*Having* noted that as an implementation of the Recommendation XV-19 the International Hydrographic Organization has established within its Member States a Permanent Working Group on Cooperation in Antarctica with the aim of coordinating hydrographic surveys and producing international nautical charts along the standards of the IHO;

*Recognizing* the significant step forward made by the IHO Permanent Working Group for Cooperation in Antarctica (PWGCA) which has established a scheme of international charts to ensure safe navigation in Antarctic waters;

*Considering* that the INT chart scheme for Antarctica has been agreed by IHO Member States and that a number of them volunteered for chart production;

*Considering* that the PWGCA permanently liaises with SCAR for supporting scientific research which needs hydrographic products;

*Noting* that the IHO INT chart scheme for the Antarctic region has the support of COMNAP;

*Considering* that the Antarctic waters require a considerable effort in manpower and equipment to carry out hydrographic surveys adequate for nautical chart production,

*Recommend* that:

1. All Consultative Parties with a hydrographic surveying and charting capability in Antarctica are encouraged to stress nationally that their surveying and charting activities in Antarctica are being coordinated through the IHO's PWG on Cooperation in Antarctica. In particular, they should emphasize the INT chart scheme initiative and their national contribution to it, with international cooperation through the IHO implements Recommendation XV-19 of the XVth Antarctic Treaty Consultative Meeting, and emphasizes the international commitment and nature of their Antarctic activities particularly when seeking national support for hydrographic surveying and charting priorities and budget.
2. That the IHO PWG on Antarctic should continue its endeavours to achieve comprehensive, up-dated, coverage of Hydrographic charting, as envisaged by Recommendation XV-19, through the INT chart scheme.

#### **XV-4. Human impact on the Antarctic environment. Prevention, control and response to marine pollution**

The Representatives,

*Recalling* Recommendations IX-6 and X-7 on oil contamination of the Antarctic marine environment;

*Recognizing* the special characteristics of the Antarctic Treaty area and the particularly hazardous nature of the area for vessel operations;

*Recognizing* further that the Antarctic derives much of its scientific importance from its uncontaminated condition;

*Reaffirming* their commitment to the avoidance and reduction of the contamination of the sea by oil and other pollutants;

*Noting* the framework provided by the 1982 United Nations convention on the Law of the Sea in its Part XII and other relevant international agreements for the protection and preservation of the marine environment;

*Bearing in mind* the need to take measures relating to the design, construction, manning, and equipment of vessels engaged in or supporting Antarctic operations to avoid marine pollution from vessels;

*Recognizing* further the importance of the expeditious exchange of information on weather and ice conditions in the Antarctic Treaty area and with respect to accidents and emergency response efforts;

*Mindful* of the need for accurate and up-to-date charting of the Antarctic Treaty area; and

*Acknowledging* the value of cooperation directly and through appropriate international organizations in efforts to avoid and respond to marine pollution incidents;

*Recommend* to their Governments that:

1. They approve and take measures within their competence necessary to ensure compliance with:
  - a) a prohibition within the Antarctic Treaty area on all intentional discharges from vessels into the marine environment which include oil;
  - b) a prohibition within the Antarctic Treaty area on disposal from vessels into the marine environment of all plastics and garbage other than food wastes, provided that disposal of food wastes should be made as far as practicable from land, but in no event within 12 nautical miles of land or ice shelves; and
  - c) a prohibition within the Antarctic Treaty area on discharge of sewage from vessels within 12 nautical miles of land or ice shelves.

In implementing these provisions, they give due consideration to the need to avoid detrimental effects on dependent or associated ecosystems outside the Antarctic Treaty area.

2. They take measures within their competence necessary to ensure compliance by all their vessels engaged in or supporting Antarctic operations with the relevant provisions of the following conventions:
  - a) the Convention on the Prevention of Marine Pollution by Dumping of Wastes and Other Matter, 1972 (the London Dumping Convention);
  - b) the International Convention for the Prevention of Pollution from Ships, 1973, and the Protocol of 1978 relating thereto, with Annexes I, II, III, and V (MARPOL 73/78);
  - c) the International Convention on Standards of Training, Certification and Watchkeeping for Seafarers with Annex, 1978, (the STCW Convention);
  - d) the International Convention for the Safety of Life at Sea, 1974, and the Protocol of 1978 relating thereto (SOLAS);
  - e) the International Convention on Load Lines, 1966 (the Load Lines Convention); and
  - f) the Convention on the International Regulations for Preventing Collisions at Sea, 1972 (COLREGS).
3. When such vessels are warships, naval auxiliaries or other state-owned or state-operated vessels used, for the time being, only on government non-commercial service, they shall take appropriate measures not impairing operations or operational capabilities of such vessels to ensure that they act in a manner consistent so far as is reasonable and practicable with these provisions.
4. If they are not parties, they become parties to the conventions listed in paragraph 2 (a) - (f).
5. Those that are parties to MARPOL 73/78 consider taking actions within the International Maritime Organization (IMO) to secure designation of the waters south of 60° South Latitude as a special area under Annexes I and V of that Convention, provided that the establishment of reception facilities otherwise called for in these Annexes not be considered either necessary or desirable in the Antarctic Treaty area.
6. They establish contingency plans for marine pollution response in Antarctica, including contingency plans for vessels operating in the Antarctic Treaty area, particularly vessels carrying oil. To this end they shall:
  - a) cooperate in the formulation and implementation of such plans and in responding to pollution emergencies in Antarctica; and
  - b) draw on the advice of the IMO and other international organizations, as appropriate.
7. They convene, in accordance with Recommendation IV-24, a meeting of experts to consider and provide advice on the establishment of contingency plans for marine pollution response and additional requirements to reduce and prevent pollution of the Antarctic marine environment, giving due consideration to the need to avoid detrimental effects on dependent and associated ecosystems outside the Antarctic Treaty area.

8. They keep under continuing review measures to reduce and prevent pollution of the Antarctic marine environment.

### **XV-19: Cooperation in the hydrographic charting of Antarctic waters**

The Representatives,

*Recognizing* the importance and historical values of activities carried out by the countries who developed the present knowledge of Antarctic hydrography;

*Aware* that there have been significant increases in both the number and size of vessels operating in Antarctic waters in recent years;

*Recognizing* that severe environmental conditions in the Antarctic give rise to particular risks for shipping and hydrographic activities;

*Recognizing* that the sea ice conditions can lead to the diversion of shipping from acknowledged routes, thus requiring the extension of charting into waters contiguous to such routes;

*Conscious* that the safety of life at sea and the protection of the Antarctic marine environment and dependent and associated ecosystems requires that the Consultative Parties should take all possible steps open to them, by improving the charting of Antarctic waters to ensure the safety of navigation so that maritime accidents are reduced to a minimum;

*Recognizing* that the resources available to devote to hydrographic surveys and the accurate positioning and depiction of the Antarctic coastline are scarce;

*Conscious* of the benefits to be gained by making provision for international cooperation between those countries which undertake hydrographic surveys and nautical charting of Antarctic waters and of utilizing to the maximum extent cooperative arrangements which already exist routinely between hydrographic offices and, therefore, of the need to avoid the establishment of a parallel system;

*Aware* of the role traditionally played by the International Hydrographic Organization (IHO) in contributing to cooperation between hydrographic offices, and by the Scientific Committee on Antarctic Research (SCAR) in all cartographic and other scientific activities in Antarctica;

*Recommend* to their Governments that :

1. They increase their mutual cooperation in the hydrographic survey and charting of Antarctic waters in order to contribute to the safety of navigation, the protection of the Antarctic environment and dependent and associated ecosystems, and for scientific purposes.
2. For the purposes of hydrographic survey and charting and associated terrestrial surveys and mapping, they coordinate their activities within the frameworks of IHO and SCAR, as appropriate.

#### **XIV-10: Marine meteorological and sea ice information services for navigation in the Treaty area of the Southern Ocean**

*Recalling* Article II of the Antarctic Treaty and Recommendations relating to cooperation with regard to Antarctic logistics (II-V, III-3, IV-25) and Antarctic meteorology and telecommunication (I-II, II-3, III-5, IV-26, V-2, VI-1, VI-3, VII-7, IX-3, X-3, XII-1, XII-2);

*Aware* of numerous cases when ships have been lost or beset in Antarctic sea ice for long periods;

*Aware* :

- i) of increasing interest in the science and operational relevance of Antarctic meteorology and sea ice studies on the part of the WMO, SCAR, and IOC as indicated by existing research projects of these international bodies;
- ii) of advances in satellite monitoring of marine meteorological and sea ice conditions and of the consequent improvement in the quality, reliability and content of their assessment and prediction;
- iii) of the strides that have been made in predicting optimal ship routings with respect to marine meteorological and sea ice conditions;
- iv) of existing marine meteorological and sea ice services;

*Considering* advances in telecommunication and the exchange of marine meteorological and sea ice information;

*Desiring* to apply the benefits of these developments to the improvement of real time data utilization and prediction of weather, sea ice, currents and sea-state conditions (particularly in the sea ice zone) with a view to increasing further the efficiency and the safety of navigation;

*Recommend* to their Governments that:

1. They invite WMO and SCAR (through their Permanent Representatives and their National Committees, respectively) to consider ways of improving or developing operational marine meteorological and sea ice information services in the Treaty Area of the Southern Ocean;
2. Any such consideration should take into account the Implementation Programme for the Antarctic described in Annex I of the Final Report of the Fourth Session of the EC Working Group on Antarctic Meteorology (September 1986) and subsequent pertinent decisions of the Tenth WMO Congress (May 1987).
3. Such considerations be coordinated with the IOC;
4. After receiving a response from the WMO and SCAR, they convene, if necessary, in accordance with Recommendation IV-24, a Meeting of Experts to consider how an improved approach to marine meteorological and sea ice information services in the Treaty Area of the Southern Ocean could be implemented.

### **Extract from Report of XIth ATCM**

Recommendation X-7 and some other suggestions [relating to oil contamination of the marine environment] were considered by the Plenary. With respect to Recommendation X-7, the work of SCAR was noted; in response to part I of X-7 it was agreed that SCAR should be encouraged, through its appropriate Working Groups and Groups of Specialists, to develop guidelines for a program of hydrocarbon baseline measurements, and in response to Part II, to consider operating techniques and other pertinent information as part of a Logistics Symposium which will take place in Leningrad (USSR) in 1982. With respect to part II of X-7, there was an exchange of views concerning applicable existing international conventions for prevention of pollution of the sea by oil, and concerning remedial measures which might be taken in the event of a major oil spill in Antarctica. The following conclusions were drawn:

- a) In view of the nature of present ship operations in the Treaty Area, the application of the provisions contained in existing International Conventions for prevention of oil pollution of the sea provide for the time being an adequate and sufficient basis for minimizing risks of pollution.
- b) Ship operations, especially those of tankers, always create some risk of pollution and this question should remain under continuing review by the Consultative Parties to ensure the adoption of the most appropriate prevention measures.
- c) Prevention of pollution of Antarctic waters by oil, and the best remedial measures if oil spills should occur, would be facilitated by future studies in the Antarctic and by the results of studies and experience available from elsewhere.

#### **X-7: Oil contamination of the Antarctic marine environment**

The Representatives,

*Recalling* that paragraph 4 of Recommendation IX-6 called for such reports as might have been prepared on the matters set out in the first three paragraphs of that Recommendation to be considered at the Meeting of Experts recommended in paragraph 3 of Recommendation IX-1;

*Noting* that three reports were submitted to that meeting (Washington, June 1979) which, between them:

- i) outlined the probable pathways by which oil might reach the Antarctic marine environment;
- ii) concentrated on the question of baseline measurements of the hydrocarbon content of the Antarctic marine environment and on programs for further study of this question;
- iii) devoted less attention to proposals relating to practicable means by which oil contamination of the Antarctic marine environment might be reduced;
- iv) noted the need for further studies relating to the problem of oil contamination of the Antarctic marine environment;



*Recognizing* that methods for analyzing dissolved hydrocarbons have not yet reached the stage where they can be used on a routine basis and that the results of such measurements have given rise to differing interpretations as to their environmental significance, especially regarding very low levels of hydrocarbon content in water samples from the open ocean;

*Recognizing* that determination of baseline measurements of the hydrocarbon content in representative components of the Antarctic marine ecosystem (including birds and mammals) would probably, in the medium term, provide a more cost-effective insight into levels of oil contamination of the Antarctic marine environment;

*Noting* that up to now the most significant introduction of oil in the Antarctic marine environment has appeared to be from the operation of ships and that there are international agreements aimed at reducing the levels of oil contamination of the marine environment generally;

*Recognizing* that the presence of ice in Antarctic waters gives rise to particular hazards for the operation of ships; and

*Noting* that in many instances it may not be feasible to adapt existing ships to more stringent standards for the prevention of the contamination of the sea by oil than those which existed at the time these ships were built;

*Recommend* to their Governments that:

1. They take note of Section III of the Report of Ecological, Technological, and other Related Experts on Mineral Exploration and Exploitation in Antarctica (Washington, 1979), annexed to the Final Report of the Tenth Consultative Meeting;

*I. Baseline levels of hydrocarbon content*

2. While co-ordinating programs through their National Committees and the Scientific Committee on Antarctic Research (SCAR), they encourage studies of:

- a) baseline measurements of hydrocarbon content in representative components of the Antarctic marine ecosystem (including birds and mammals);
- b) the effects of various kinds and concentrations of hydrocarbons (and other pollutants) on key components of the Antarctic marine ecosystem;
- c) the methodology of analyzing low levels of dissolved hydrocarbon content of the marine environment and the development of this methodology for purposes of routine measurements;

3. Through their National Committees, they invite SCAR in consultation with other appropriate international organizations, to keep under review the possibility of developing a program for the determination of baseline measurements of hydrocarbon content relevant to the needs for such determinations in the Antarctic marine environment.

*II. Reduction of the risk of contamination*

4. They review their respective obligations under existing international agreements to which they are parties which relate to the reduction of contamination of the sea by oil and, in the light of the particularly hazardous nature of the Antarctic for ship operations, consider whether their compliance with these obligations adequately minimizes the risk of oil contamination of the Antarctic marine environment;
5. They be prepared to discuss this matter further at the Eleventh Consultative Meeting.

#### **IX-6: Oil contamination of the Antarctic marine environment**

The Representatives,

*Recommend* to their Governments that:

1. They consider the possibility of preparing reports concerning the pathways by which oil may reach the Antarctic marine environment as a result of man's maritime activities in the Antarctic;
2. They include in these reports proposals relating to practicable means, if any, by which such oil contamination might be reduced;
3. They consider the possibility of instituting, in association with appropriate organisations, a programme for the determination of baseline levels of contamination of the Antarctic marine environment by oil;
4. They provide such reports as they may have prepared to, and further consider this matter at, the Meeting of Experts recommended in paragraph 3 of Recommendation IX-1, with a view to making proposals concerning these matters for consideration at the next Consultative Meeting.

# AREA PROTECTION AND MANAGEMENT

## Introductory note

The practice of setting aside areas subject to different management regimes was first introduced into the Antarctic Treaty system under Article VIII of the Agreed Measures for the Conservation of Antarctic Fauna and Flora (1964). Prior to adoption of the Protocol in 1991 the categories of sites and areas had proliferated so that there was provision for Specially Protected Areas, Sites of Special Scientific Interest, Marine Sites of Special Scientific Interest, Historic Sites and Monuments, Specially Reserved Areas, Multiple Use Planning Areas, and CEMP (CCAMLR Environmental Monitoring Program) Sites.

This situation came about over the years from 1964 to 1990 because:

- b) Specially Protected Areas designated under Article VIII of the Agreed Measures provided only for the protection of fauna and flora;
- c) the Specially Protected Area mechanism was first used to protect scientific investigations going on in them rather than just the fauna and flora: thus came about the concept of Sites of Special Scientific Interest (SSSIs) (see Recommendations VII-3 and VIII-3);
- d) there was thought to be a need to be able to designate areas for the protection of other values, thus the concept of Specially Reserved Areas (SRAs, see Recommendation XV-10) was explored, though this Recommendation never entered into force and was subsequently superseded by provisions of the Protocol on Environmental Protection, specifically those found in Annex V;
- e) there was no mechanism for the protection of areas in the vicinity of scientific stations, thus came about the concept of Multiple Use Planning Areas (MUPAs, see Recommendation XV-11), though this Recommendation also never entered into force and was superseded by provisions of the Protocol on Environmental Protection, specifically those found in Annex V.

During the negotiation of Annex II (Conservation of Antarctic Fauna and Flora) to the Protocol, the question arose as to how best to deal with Article VIII (the Area Protection Article) of the Agreed Measures. The opportunity was seized to review and, if possible rationalise, the proliferation of area categories referred to above.

In the debate that followed, the overriding issue was whether to rationalise the existing categories of area in accordance with the values it was intended to protect (fauna and flora, geological, scientific, wilderness etc) or in accordance with the methodology by which they were to be protected. Amongst factors which influenced the outcome were:

- a) that there was a crucial difference between areas for which a hands-on management structure could be envisaged and areas where it could not;

- b) recognition that in order to regulate access to protected areas by the increasing number of visitors to the Antarctic who were not under the direct control of Consultative Parties, it was necessary that the designation of areas should carry the clearest possible message about the regulatory method which was applicable to them;
- c) that in areas in the vicinity of scientific stations, the government or governments responsible for the station or stations in question knew best how to manage activity within such an area;
- d) that management of areas in the vicinity of scientific stations was not to be seen as according any sort of proprietorial rights to the area in question, and must not interfere in any way with the exercise of rights of on-site inspection in accordance with Article VII of the Antarctic Treaty;
- e) that all Consultative Parties which had approved the Agreed Measures had experience of operating a permit system for the purpose of implementing Article VIII, and that some Consultative Parties had instituted a permit system for the purpose of regulating access to Sites of Special Scientific Interest.

The outcome of the debate was Annex V to the Protocol which provides for two sorts of Antarctic Protected Area, namely Antarctic Specially Protected Areas (ASPAs) and Antarctic Specially Managed Areas (ASMAs). Access to ASPAs requires a permit; access to ASMAs does not. The first paragraphs of Articles 3 and 4 set out the purposes for which, respectively, ASPAs and ASMAs may be designated. The main difference between them is that ASPAs may be designated to protect values, 'environmental, scientific, historic, aesthetic or wilderness', while ASMAs are to protect activities.

At the heart of the protection mechanism for both ASPAs and ASMAs is the Management Plan. Article 5 sets out the matters that are to be covered in Management Plans for both ASPAs and ASMAs. In the case of ASPAs, any permit must be accompanied by 'the relevant sections of the Management Plan'; anyone in an ASPA without a permit or with a permit which does not have the relevant elements of the Management Plan attached to it will, in either event, be *ultra vires*. In the case of ASMAs, the Management Plan is to be drafted in the form of a 'Code of Conduct'. There is no requirement that a visitor should be aware of such a code of conduct, but it is implicit that any visitor who had his or her attention drawn to a code of conduct would be under an obligation to comply with it. Annex V entered into force on 24 May 2002.

#### New Islands

In 1969 a volcanic eruption in Port Foster, Deception Island, brought into existence a small island. Volcanic activity in the Antarctic is rare and biological scientists recognized the valuable opportunities that were offered by the birth of a new piece of land for research into the sequence and rates of colonization by flora and fauna. Recommendation VI-11 provides for special protection to be accorded to such islands and notes the need to avoid human interference until such protection can be provided. The small island in Port Foster, Deception Island, together with other areas of the shores of Port Foster, was designated as Site of Special Scientific Interest No. 21 by Recommendation XIII-8.

## Historic Sites and Monuments

A need to take steps to protect historic sites and monuments was recognized at the first meeting and led to the adoption of Recommendation I-IX. There had been a marked increase in the number of expeditions in the Antarctic prior to the International Geophysical Year. Some of these expeditions established stations in areas where the huts and remnants of earlier expeditions of Antarctic exploration (1895-1916) still existed. At the Fifth Consultative Meeting it was agreed that Consultative Parties would draw up lists of historic sites and monuments. At the Seventh Consultative Meeting these lists were consolidated into one list. Historic Sites and Monuments are included in the 'List of Historic Monuments Identified and Described by the Proposing Government or Governments' annexed to Recommendation VII-9. All, strictly speaking, are 'Monuments', that is to say human artifacts, rather than 'Sites' or areas. Many of them are in close proximity to scientific stations. Provision for their protection is contained in Annex V, Article 8, on the grounds that the ASPA permit system may be the best means of ensuring protection of historic monuments where direct oversight management is not possible. Where such management is possible, Article 8 provides for the possibility of designation as ASMAs.

## Seal Reserves and Sealing Zones

The following is an extract from the Annex to the Convention for the Conservation of Antarctic Seals.

### *4. Sealing Zones*

Each of the sealing zones listed in this paragraph shall be closed in numerical sequence to all sealing operations for the seal species listed in paragraph 1 of this Annex for the period 1 September to the last day of February inclusive. Such closures shall begin with the same zone as is closed under paragraph 2 of Annex B to Annex 1 of the Report of the Fifth Antarctic Treaty Consultative Meeting at the moment the Convention enters into force. Upon the expiration of each closed period, the affected zone shall reopen:

Zone 1 — between 60° and 120° West Longitude

Zone 2 — between 0° and 60° West Longitude, together with that part of the Weddell Sea lying westward of 60° West Longitude

Zone 3 — between 0° and 70° East Longitude

Zone 4 — between 70° and 130° East Longitude

Zone 5 — between 130° East Longitude and 170° West Longitude

Zone 6 — between 120° and 170° West Longitude.

### *5. Seal Reserves*

It is forbidden to kill or capture seals in the following reserves, which are seal breeding areas or the site of long-term scientific research:

- a) The area around the South Orkney Islands between 60°20' and 60°56' South Latitude and 44°05' and 46°25' West Longitude.
- b) The area of the southwestern Ross Sea south of 76° South Latitude and west of 170° East Longitude.
- c) The area of Edisto Inlet south and west of a line drawn between Cape Hallett at 72°19' South Latitude, 170°18' East Longitude, and Helm Point, at 72°11'South Latitude, 170°00'East Longitude.'

**Table 1. Listed SPAs and SSSIs and relevant Recommendations**

**SPECIALLY PROTECTED AREAS (SPAs)**

NOTE: SXII refers to Antarctic Treaty Special Consultative Meeting XII (The Hague, 2000)

	SPA: Short name	Annex B insertion	Amended description	Annex B termination	Origination as SSSI	Management Plan	Annex V Management Plan
1	Taylor Rookery	IV-1	-	-	-	-	XVII-2
2	Rookery Islands	IV-2	-	-	-	-	XVII-2
3	Ardey and Odbert	IV-3	-	-	-	-	XVII-2
4	Sabrina Island	IV-4	-	-	-	-	-
5	Beaufort Island	IV-5	-	-	-	-	XXI-1
6	Cape Crozier	IV-6	-	VIII-2	VIII-4/No 4	-	-
7	Cape Hallett	IV-7	XIII-13	-	-	-	-
8	Dion Islands	IV-8	XVI-6	-	-	XVI-6	-
9	Green Island	IV-9	XVI-6	-	-	XVI-6	-
10	Byers Peninsula	IV-10	-	VIII-2	VIII-4/No 6	-	-
11	Cape Shirreff	IV-11	-	XV-7	XV-7/No 32	-	-
12	Fildes Peninsula	IV-12	V-5	VIII-2	VIII-4/No 5	-	-
13	Moe Island	IV-13	XVI-6	-	-	XVI-6	XIX-1
14	Lynch Island	IV-14	XVI-6	-	-	XVI-6	SXII-1
15	Powell Island	IV-15	XVI-6	-	-	XVI-6	XIX-1
16	Coppermine Peninsula	VI-10	XVI-6	-	-	XVI-6	-
17	Litchfield Island	VIII-1	-	-	-	-	-
18	Coronation Island	XIII-10	XVI-6	-	-	XVI-6	-
19	Lagotellerie Island	XIII-11	XVI-6	-	-	XVI-6	SXII-1
20	New College Valley	XIII-12	-	-	-	XVII-2	SXII-1
21	Avian Island	XVI-4	-	-	XV-6/No 30	XVI-4	-
22	Cryptogam Ridge	XVI-8	-	-	-	XVI-8	-
23		Fortidas Pond	XVI-9	-	-	-	XVI-9
24	Pointe-Geologie Archipelago	XIX-3					XIX-3
25	Cape Evans Historic Site	XXI-2					XXI-2
26	Lewis Bay Tomb	XXI-2					XXI-2
27	Cape Royds Historic Site	XXII-1					XXII-1
28	Hut Point Historic	XXII-1					XXII-1

	SPA: Short name	Annex B insertion	Amended description	Annex B termination	Origination as SSSI	Management Plan	Annex V Management Plan
	Site						
29	Cape Adare Historic Site	XXII-1					XXII-1

#### SITES OF SPECIAL SCIENTIFIC INTEREST (SSSIs)

	SSSI: Short name	First designation	Expiry year	Annex V management	Amended plan	Termination as SSSI	Designation as SPA
1	Cape Royds	VIII-4	2005	-	XIII-9	-	-
2	Arrival Heights	VIII-4	2005	-	-	-	-
3	Barwick Valley	VIII-4	2005	-	-	-	-
4	Cape Crozier	VIII-4	2005	-	-	-	-
5	Fildes Peninsula	VIII-4	2005	-	-	-	-
6	Byers Peninsula	VIII-4	2005	-	XVI-5	-	-
7	Haswell Island	VIII-4	2005	-	-	-	-
8	Admiralty Bay	X-5	indefinite	-	SXII-1	-	-
9	Rothera Point	XIII-8	indefinite	-	XX-1	-	-
10	Caughley Beach	XIII-8	2001	-	-	-	-
11	Tramway Ridge	XIII-8	indefinite	-	XXI-3, XIX-2	-	-
12	Canada Glacier	XIII-8	indefinite	-	XXI-3	-	-
13	Potter Peninsula	XIII-8	indefinite	-	XXI-3	-	-
14	Harmony Point	XIII-8	indefinite	-	XXI-3	-	-
15	Cierva Point	XIII-8	indefinite	-	XXI-3	-	-
16	Bailey Peninsula	XIII-8	2005	-	-	-	-
17	Clark Peninsula	XIII-8	indefinite	-	SXII-1-	-	-
18	White Island	XIII-8	2005	-	XVI-6	-	-
19	Linnaeus Terrace	XIII-8	indefinite	-	XX-1-	-	-
20	Biscoe Point	XIII-8	2005	-	-	-	-
21	Deception Island	XIII-8	2005	-	-	-	-
22	Yukidori Valley	XIV-5	indefinite	-	SXII-1	-	-
23	Svarthamaren	XIV-5	indefinite	-	XXIII-1	-	-
24	Mount Melbourne	XIV-5	2005	-	-	-	-
25	Marine Plain	XIV-5	2005	-	XVIII-AnnexF	-	-
26	Chile Bay	XIV-5	2005	-	-	-	-
27	Port Foster	XIV-5	2005	-	-	-	-
28	South Bay	XIV-5	2005	-	-	-	-
29	Ablation Point	XV-6	2005	-	-	-	-
30	Avian Island	XV-6	1999	-	-	XVI-4	XVI-4/No 21
31	Mount Flora	XV-6	2005	-	-	-	-
32	Cape Shirreff	XV-7	2005	-	-	-	-
33	Ardley Island	XVI-2	2005	-	-	-	-
34	Lions Rump	XVI-2	indefinite	-	SXII-1	-	-
35	Bransfield Strait	XVI-3	2005	-	-	-	-

	<b>SSSI: Short name</b>	<b>First designation</b>	<b>Expiry year</b>	<b>Annex V management</b>	<b>Amended plan</b>	<b>Termination as SSSI</b>	<b>Designation as SPA</b>
36	Dallmann Bay	XVI-3	2005	-	-	-	-
37	Botany Bay	XXI-3	indefinite	-	-	-	-

It should be noted that:

- a. SPA Nos 6, 10, 11 and 12 have been redesignated, respectively, as SSSI Nos 4, 6, 32 and 5;
- b. SSSI No 30 has been redesignated as SPA No 21.