



TOURIST LANDINGS IN ANTARCTICA AND THE ENVIRONMENTAL IMPACT ASSESSMENT PROCESS ACCORDING TO THE MADRID PROTOCOL: THE CASE OF HALFMOON (MEDIA LUNA) ISLAND*

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Abstract

Although tourism is one of the most intensive activities in the area of the Antarctic Treaty, it is mostly carried out without previous environmental impact assessments. The few assessments made so far do not comply with the basic requirements of Annex I of the Protocol on Environmental Protection. On the basis of four seasons of systematic observations at one of the most frequently visited sites, Halfmoon Island in the South Shetlands, it was found that the numbers of ships and tourists were considerably high. Moreover, tourist distribution on the small island was irregular both in time and numbers, brought by a number of operators of different nationalities, often on ships flying flags of third parties. In these conditions the mooring and landing areas, and the sites visited on land, become areas especially exposed to the environmental impacts of commercial tourism. In order to apply the EIA process according to Annex I of the Protocol to tourist activities such as those observed, some relevant practical requirements are found to be necessary. Such conditions are: coordination between operators and parties, the need for the timely collection of all logistic information, the need for scientific information on the local environment, the special consideration of the spatial aspects of tourism and of its impacts, the need for special consideration to be given also to its temporal and quantitative aspects, the consideration of possible cumulative and second-order effects, and the likely need for monitoring the local environmental conditions in the future. These basic requirements, at least, need to be considered by tourist operators and by the Parties if tourism in the Antarctic is to be effectively evaluated for its environmental consequences according to the Treaty's provisions.

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INTRODUCTION

In inhabited lands the Environmental Impact Assessment is an apt procedural aid to the decision-making process about the use of territory. Indeed EIAs are sophisticated procedural tools of a predictive nature. Many national and regional laws and regulations, and ample scientific literature have established firm points of EIA processes, which have been designed to ensure the compatibility of any new project of land use with the survival of some primary physical and biological conditions of the environment affected¹.

However, the concept of 'environment' in the populated areas is a concept of the human environment. Man's activities can transform the geographic space profoundly, affecting many important natural aspects of this space such as the conservation of natural physiography, natural water drainage, or original vegetation. This happens in urban areas, in intensive farming lands, or in mining areas. Only the most basic natural conditions, such as firm ground or breathable air, are not subject to severe alteration. Sometimes it is of fundamental social or economic importance to carry out projects in certain territories, severely affecting their natural environmental features, and at times even human health is put at risk. In such cases the EIA process may be devised mainly to limit, and not to avoid, damage to the natural environment.

In natural reserves the primary value to be protected is the natural environment in its pristine conditions. Human activities are banned or restricted accordingly in such areas and are permitted only if the natural conditions are not changed.

Most EIA procedures deal with the first kind of environment. They are used to limit the risks of practices that may not be destructive of the natural environmental elements *per se*, but which may be dangerous to man's welfare in a tamed space. Instead, the management of natural reserves fulfills specific aims of conservation by following its own specific principles. Therefore, the EIA processes developed for certain human uses of the territory may not be directly applicable to natural reserves. EIAs conceived for natural reserves differ both in their aims and in their scope. The value to be primarily preserved is the conservation of the pristine state through the protection of the

1. E.g., to quote an early and classic study, MUNN, *Environmental Impact Assessment Procedures*, 1975; MALCEVSKI, *Qualità ed impatto ambientale*, 1991; WATHER, *Environmental Impact Assessment: theory and practice*, 1988.



natural equilibria and of the natural dynamic processes. Their scope is also wider, as the dimensions of the protected values and the technologies that may be applied are greater. In natural reserves nature is not expendable.

1. *Environmental Impact Evaluation in Antarctica*

According to the Madrid Protocol the whole Antarctic area is a natural reserve (Art. 2), and according to the environmental principles set out in Art. 3, among other environmental provisions "... activities shall be planned and conducted on the basis of information sufficient to allow prior assessments of, or informed judgements about, their possible impacts on the Antarctic environment ..." (Art. 3.2c). Therefore Art. 8.2 establishes that "... procedures set out in Annex I are applied in the planning process leading to decisions about any activities ... pursuant to scientific research programmes, tourism, and all other ... activities ... for which advance notice is required under Art. VII.5 of the Antarctic Treaty, including associated logistic activities". The parties are responsible for the implementation and application of EIAs in Antarctica for those activities which are subject to exchange of communication and to inspections pursuant to Art. VII of the Treaty. Annex I of the Protocol establishes that the EIA process must be completed before any activities are conducted, and designs an EIA process in which three stages of increasing complexity are established, namely a Preliminary Stage (PS), an Initial Environmental Evaluation (IEE), or a Comprehensive Environmental Evaluation (CEE). Each stage calls for increasingly high requirements, following preliminary value-judgements about the scale or 'significance' of the possible impacts, namely: less than, equal to, or more than, 'minor and transitory' impacts. The review of the Antarctic EIAs is made by the Committee for Environmental Protection (CEP), and, ultimately, by the Antarctic Treaty Consultative Meetings (ATCMs).

Many analyses have been conducted on the legal, procedural, and practical aspects of the EIA process envisaged in the Protocol². These will not be examined here, save to remark the main differences between the Antarctic EIA

2. Among many others: PINESCHI, *La protezione dell'ambiente in Antartide*, chapt. VI and IX, 1993; MANZONI, *Environmental hazards in Antarctica and man's impact on the Antarctic environment*, in FRANCONI (ed.) *International environmental law for Antarctica*, 1993, p. 53-92.



and other established and well-tested EIA regulations which are in force elsewhere in the world. These differences may be seen, first, in the impact evaluation phase, second, in the review phase, and third, in the decision making.

i *The impact evaluation phase.*

— The EIA is based on 'possible impacts', while elsewhere it is based on the nature or type of the activity.

— No quantitative definition of the scale of impacts establishes which of the three stages of the EIA is applicable.

— The criteria for objective evaluations of impacts are not given, and are referred to the national procedures of the Parties.

— The term 'activity' seems to mean 'overall program', otherwise separate EIAs might be required for the different phases of an activity.

— Some Parties, e. g. those with national EIA processes based on activities classifications, may be more strictly bound than others in their Antarctic activities. The 'case by case' criterion based on a preliminary assessment of likely impacts may give rise to all sorts of exceptions and inconsistencies.

— The environmental parameters in Antarctica are different, and may require different tolerances or thresholds. For instance, the thresholds may be lower because of the relatively unknown responses of the natural elements or because of the higher level of protection afforded.

— Environmental risk is not adequately taken into account.

ii *The review phase.*

— No objective criteria are given for differentiating between EIA stages.

— IEEs are not submitted to external review or to circulation among Parties.

— CEEs or IEEs on any activity are conducted on the Parties' discretion.

— The review process is not binding, and EIAs are subject to 'comments' in the CEP and to 'consideration' in the ATCMs.

— Procedures of comparison should be very precise for assessing the performances of methods by different Parties.

— There are no provisions of acceptance of CEEs.



iii *Decision-making*

- Acceptance is not bound by objective evaluations of impacts.
- Several discretionary clauses allow for subjective evaluations, not only of emergency cases, but also of the value of (scientific) activities, equipment and facilities.
 - A general overriding clause on CEEs is provided in Annex I, Art. 4: 'any decision on whether a proposed activity ... should proceed... shall be based on the CEE as well as other relevant considerations'.
 - In cases of inconsistency between domestic provisions and those of the Madrid Protocol, it is not stated which would prevail.

The possible environmental impact of tourism in Antarctica has been dealt with in several papers and in some regulatory proposals presented at the Consultative Meetings of the Antarctic Treaty in recent years. However, estimates based only on one or a few of the various characteristics of tourism are not reliable. For instance, Headland³ compared the time spent on land by tourists with the time spent by the personnel of the national activities, and calculated the impact of tourism to be 0.52% of the total human impact in Antarctica. Such statements are based on scientifically unsound assumptions, such as that all activities involve equal impacts, and that all environments suffer impacts in the same way. The figures, like all estimates similarly based on single-issue reasonings, can be changed dramatically at will. For instance, tourists would account for about 60% of the total impact in terms of the number of people, for about 35% in terms of the number of ships, and for 70% in terms for the number of journeys, etc. Instead, scientific considerations on the possible overall impact of tourism on the whole Antarctic area should take into account all the complex conditions of the activity. It may be simpler to identify and assess the possible impacts of tourism in the areas where that activity actually takes place.

In order to apply the EIA process of the Protocol to tourism some relevant aspects should be considered.

Before beginning an activity, a preliminary, initial, or comprehensive environmental evaluation must be carried out, according to the scale and the nature of the impacts that may be expected from that activity.

3. HEADLAND, *Historical Development of Antarctic Tourism*, *Annals of Tourism Research* 21 (2), 1994, p. 269-280.



This EIA process is designed for any activity, whether of logistic, scientific or recreational nature, carried out by one or more operators, and viewed as a single independent activity whose environmental assessment is prepared under the responsibility of a single (or common) subject.

However, Antarctic tourism is complex insofar as its programs can vary each year according to the operators' programs. The activity does not generally rely on national authorities charged with carrying out EIAs, and the burden may be left to single operators.

Some authors have found potential problems of applicability of the EIA to tourist activities on the basis of the text of the Protocol and Annex I⁴. Among these authors Manheim, for instance, concluded: "It is clear that significant gaps in the Protocol exist and, in absence of efforts to address such problems, they will impede implementation of an effective program for the management of tourism in Antarctica".

On the basis of direct observations of tourist activities concrete questions on applicability may also arise, set forth in a report submitted to ATCM XIX by Argentina and Italy⁵.

This study deals with some concrete aspects of tourist visits on land which are deemed relevant to tourist management. These aspects are tackled on the basis of direct observations carried out from 1991 to 1995 by Argentinian teams on the frequently visited Halfmoon Island. This paper aims to show which practical conditions of the conduct of tourist activities need to be known in order to carry out EIAs as envisaged by the Madrid Protocol.

4. MANHEIM, *Gaps in management of Antarctic sea borne tourism under the Protocol*, 1993; PINESCHI, *ibid.*; VIDAS, *Antarctic tourism: a challenge to the legitimacy of the Antarctic Treaty System*, 1993.

5. ATCM XIX, *Observaciones sobre las Actividad Turistica en la Isla Media Luna, Shetland del Sur, Antartida y los Procedimientos de Evaluacion de Impacto Ambiental*, Information Paper 48, Argentina and Italy, 1995.



2. *The specific characteristics of Antarctic tourism*

Tourism is an activity normally permitted in natural reserves and parks according to specific regulations which consist of spatial, temporal, and quantitative restrictions, (e.g. assigned itineraries, timings of visits, number of tourists), and behavioral prescriptions (what tourists can or cannot do).

During the last decade, since the issue of Antarctic tourism has been debated at the Treaty's Consultative Meetings, several authors have published data and studies on Antarctic tourism⁶. Several studies deal with concrete aspects of tourist activities. The National Science Foundation and the Antarctic Program of the United States have sent observers on board tourist ships and have started an inventory of the sites visited by tourists⁷. Some attempts have also been made to monitor tourist activities. Argentina and the United Kingdom have started programs to monitor tourism in the Antarctic, while the delegations of Australia, Chile, and other parties have reported their observations on tourist activities to Treaty Meetings⁸.

The young literature on Antarctic tourism exceeds now 130 titles. Such ample literature will not be reviewed here, as this work deals specifically with the practical questions of the applicability of the EIA procedures of the Protocol to tourism.

From a geographer's point of view Antarctic tourism is very different from the other activities traditionally carried out by the countries engaged in scientific research in the area in terms of its spatial quality. In Antarctica, the most important long-term operations by national operators have been traditionally concentrated at few points, namely scientific stations and research camps. From these points, itineraries stem out toward other sites of interest, such as ice-free grounds, faunal concentrations, drilling sites, etc. Thus a sec-

6. Among many examples: HALL, *Tourism in Antarctica: activities, impacts and management*, J. Travel Res. 30, (4), 1992, p. 2-9; CESSFORD & DINGWALL, *Tourism on New Zealand's sub-Antarctic Islands*, Annals of Tourism Research 21 (2), 1994, p. 318-332; ATCM XIX, *Recent Developments in Antarctic Tourism*, Information Paper 13, United Kingdom, 1995.

7. ATCM XIX, *Pilot study to assess the potential utility of an Antarctic site inventory*, Information Paper 47, United States of America, 1995.

8. STONEHOUSE, *Monitoring shipborne visitors in Antarctica: a preliminary field study*, Polar Record 28 (166), 1992, p. 213-218; STONEHOUSE, *Shipborne tourism in Antarctica: project Antarctic conservation studies 1992/93*. Polar Record 29 (117), 1993, p. 330-332; ATCM XIX, Information Paper 48, 1995, *ibidem*.



ondary, wider and diffused spatial pattern of shorter-term activities is created around the permanent stations.

The major environmental impacts caused by the activities of the Antarctic national operators have been experienced and are expected around the stations or other fixed installations. The relevant provisions of the Antarctic Treaty System for environmental protection have been therefore devised in response to the traditional pattern of the geographic distribution of the national activities, where scientific and logistic bases are central points of environmental impacts, surrounded by distant secondary sites of lesser and specific impact. The only national activities of a comparable spatial nature to the pattern of tourism are the cruises of research ships and, perhaps, the long crossings on the icecap. Are the provisions on Environmental Impact Assessment of the Madrid Protocol adequate to cover activities of a different spatial nature from those carried out over the last five decades, when almost all human presence on the continent was brought in by the national research programmes of the consultative states?

In the Antarctic system there are no binding provisions specifically designed to protect the environment from the impacts of tourist activities. The parties did not agree on a separate instrument, such as a Convention as proposed by some delegations at the XI Special Consultative Meeting or on a specific Annex to the Protocol. Tourism in Antarctica, however, should be subject to the prerequisite of not causing significant environmental impacts, whose evaluations will be carried out according to Annex I of the Protocol, when in force. Tourist activities should not be conducted, as they are now, before EIAs have been made.

Regardless of the existence of sovereignty claims which are not formally prejudiced by the provisions of the Antarctic Treaty, tourism is carried out in that region in the following conditions.

— International law is applicable to tourist ship activities. However, on land, only 'soft law' provisions of environmental protection apply.

— Several parties have issued environmental provisions for their nationals in Antarctica. These provisions are considerably softer and less complete than the analogous regulations in force on their national territories, either because of simplified procedural requirements, or because objective information and methods practicable on the Antarctic environment are as yet insufficient. Some states have not issued specific environmental provisions at all.



— Tourist operators and ships of third parties are not effectively bound by the provisions of the Antarctic Treaty System.

— No territorial, temporal, or quantitative restrictions are applied to tourism, with the exception of the spatial restrictions on the few and small protected areas, where violations, however, are not subject to sanctions. In the scientific stations restrictions are enforced on the interiors of the buildings, which are properties. In fact all Antarctica is indiscriminately open to unmanaged tourism.

— Visiting pristine sites 'where no one ever set foot before' is one important attraction of Antarctic tourism. In the early '90s about 70% of tourist landings were unwitnessed, on landing sites which were located far away from any station and which had often not previously explored by scientists⁹.

— Till 1995 no large infrastructures for tourist activities had been installed in the Antarctic, presumably not because of self-restraint by operators, but because of their economic burden.

If the characteristics of a typical important activity by a national operator, such as the installation of a base, are compared to those of tourism as it is conducted today in Antarctica, some major differences are evident.

— A base is planned at established sites (and therefore known areas of impacts), with scheduled timings and a known scale of the operations (and therefore known intensity or the scale of impacts). The authorities responsible for implementation and enforcement, i.e. the national operators, are easily identified. The overall and long-term program (and therefore the cumulative impacts) is also established and known.

— Tourism affects various areas (by visiting different places on a case by case basis), with varying timings (routes are planned each year, while the overall activity may be prolonged for an indefinite number of years), and on different scales (the numbers of tourists also vary according to the programs of different operators and to the response of the market). In any area of the Antarctic the overall tourist activity lacks common planning. The scale of impacts is unknown and may be expected to be extremely variable. This fact poses *per se* obvious difficulties in selecting which EIA stage is applicable to each tourist operation.

9. ENZENBACHER, *Tourism at Faraday Station: an Antarctic case of study*, *Annals of Tourism Research* 21 (2), p. 303-317, 1994.



Three main types of Antarctic tourism can be identified.

i) Adventure tourism, of individual nature, which is spontaneous and non-commercial, or at times commercial for limited numbers. This tourism is either in yachts, mostly in the Peninsula area, or with sledges on foot across the icecap. The itineraries are often totally unscheduled.

ii) Aerial tourism, now about 10% of tourism in terms of numbers, is conducted in the following ways: i) by commercial flights landing at some bases; ii) by commercial overflights (this kind of tourism is scheduled and controlled by independent observers); iii) by commercial flights landing on the icecap; iv) by helicopters from ships. This latter kind of commercial tourism is uncontrolled and often unscheduled or unplanned. Helicopters land anywhere within flight radius from ships. They penetrate inland, at times laying fuel and equipment deposits in pristine areas, and endangering irreplaceable values such as the purity of uncontaminated areas.

iii) Tourism by ship. Commercial cruises use ships whose capacity varies between 30 and 500 tourists. This kind of tourism accounts for about 90% of total tourist numbers in the Antarctic, and in the last decade it has outnumbered any other activity.

According to the programs proposed by tour operators and some published reviews of their operations, ship tourism follows common temporal and spatial patterns¹⁰. Tour operators carry out cruises of one to three weeks, visiting 4 or 5 to 8 or 10 selected sites during each journey. Each ship makes several cruises per season, up to 10 in all. Specialists with some Antarctic experience are employed on board as guides or lecturers on Antarctica and its natural characteristics, and they illustrate codes of conduct that tourists are asked to follow.

Inflatable boats are used to approach icebergs, whales and seals. Tourists are taken ashore for short landings to visit scientific stations, historical remains, penguin rookeries, and beaches with faunal concentrations. Some sites are visited frequently or even routinely.

10. National Science Foundation, *6th Antarctic tour operators meeting. Agenda/Handouts*, 1994.



3. *Monitoring tourist visits at Halfmoon Island*

The small Halfmoon Island (62° 36' S; 59° 54' W, about 2.5 km across; fig. 1), South Shetlands, is frequently visited by tourist cruises. Indeed it was one of the sites most visited by tourists during the last five seasons (Table 1):

Table 1

Tourists landing at Halfmoon Island during five seasons, 1989-1994

Season	Tourists	Rank
1989-90	1191	3rd
1990-91	1011	7th
1991-92	2984	1st
1992-93	1585 (1959)*	7th (2nd)
1993-94	2961	7th

* Halfmoon Is. is ranked among the most visited sites by tourists in the Antarctic. The data was collected by NSF (United States) from information supplied by Antarctic tour operators. Data in brackets for the 1992-93 season was gathered from direct observation by the Argentinian research team between Dec. 15th 1992 and Feb. 1st 1993.

Tourists do not only visit Halfmoon Island to admire the beauty of its landscape, surrounded by the glaciers and mountains of the Greenwich and Livingston Islands. They also come to observe a variety of wildlife.

One of the outstanding tourist attractions is a Chinstrap Penguin rookery in the southernmost part of the island. In 1991, 1747 pairs of penguins were breeding on an area of 0,1 km². Other breeding birds such as Storm Wilson's Petrel (60 pairs), Blue-eyed Cormorant (40 pairs), Skuas (26 pairs), Greater Sheathbill (8 pairs), Kelp Gulls (57 pairs) and Antarctic Tern (122 pairs) have been observed there¹¹. From January on, many groups of Fur Seals settle on island's shores. A vegetation cover of prevailing mosses and lichens is abundant on all high ground.

11. FAVERO & SILVA, *The Status of the Breeding Birds in Halfmoon Island, (Isla Media Luna), South Shetland Islands, Antarctica*, Contribucion del Instituto Antartico Argentino 407, 1991.



Camara Station has been manned as an Argentinian summer station for four decades. From that station, since 1991 the Instituto Antartico Argentino has been carrying out a tourist monitoring project according to the methods described in Acero & Aguirre¹². All data obtained under this project are the result of direct field observations. Tourists and guides were counted at landings, and since the habitual behaviour of tourists was to be monitored, no recommendations were given, apart from the request to keep away from a penguin breeding group selected for reference. Ship names, the dates of the visits, arrival and departure times, time spent ashore, and guide numbers were recorded. Research teams were not however present on the island in the early and late weeks of the tourist seasons, and so only about three quarters of the yearly activities could be monitored.

During the four Austral Summers 1991-1995, 75 landings from 17 ships were observed, and 9222 tourists were counted. Tourist numbers varied between 26 and 520 per visit and the timing of visits was quite irregular. Details with yearly and weekly occurrences are given in ATCM XIX Info Paper 48.

As an example of the tourist activity at Halfmoon Island, Table 2 reports the visits monitored during the 1992-93 season. In addition to data on tourist and guide numbers and length of stays, the table lists the names and registries of the ships and the nationalities of the operators.

12. ACERO & AGUIRRE, *A monitoring research plan for tourism in Antarctica*, Annals of Tourism Res. 21 (2), p. 295-302, 1994.



Table 2

Tourist landings at Halfmoon Island, Dec. 15th 1992 to Feb. 1st, 1993.

date	ship	flag	operator	time	nt	ng	t/g
15-12	World Discoverer	Liberia	USA	170	80	7	11
25-12	World Discoverer	Liberia	USA	100	93	7	13
27-12	A. S. Vavilov	Russia	USA	270	53	5	11
05-01	A. S. Vavilov	Russia	USA	255	43	3	14
09-01	Illiria	Liberia	USA	125	97	6	16
17-01	A. S. Vavilov	Russia	USA	210	53	5	11
18-01	Illiria	Liberia	USA	120	109	7	16
19-01	Northern Ranger	Canada	Canada	150	71	—	—
20-01	Ocean Princess	Bahamas	France	210	320*	6	17
22-01	Vistamar	Panama	Germany	155	290	3	97
26-01	Explorer	Liberia	USA	100	70	4	17
30-01	A. S. Vavilov	Russia	USA	185	65	4	16
31-01	Ocean Princess	Bahamas	France	215	325*	6	17
01-02	Vistamar	Panama	Germany	185	290	2	145

time spent on land, in minutes; nt = number of landed tourists, ng = number of guides; t/g = tourists-per-guide ratio. * tourists landed in groups of 100 at a time.

Some common characteristics of the activities were observed.

- i) All ships moored in about the same position in the bay.
- ii) Arrivals did not follow a regular schedule. The weekly distribution of data shows that the activity was not planned in view of a uniform time-distribution of the visits. Intervals when no visits were reported were followed by periods when hundreds of visitors, up to over 600, visited the island in one day. At times landings were daily. In one case two large ships moored on the bay in the same day. The close arrivals of ships observed by one operator were in contrast with the regularity of schedules claimed by its 'IEE'.
- iii) The movements of the tourist groups on the island varied according to the operator's program. All groups visited the half-hectare penguin rookery.



On some occasions groups stayed only at the rookery area, while in other cases groups walked across to Camara Station (Fig. 1). Tourist itineraries were dependent on weather or topographic conditions rather than on any control exerted on them. Tourists were never seen behaving aggressively to fauna or flora. No scattered waste was ever left.

iv) Tourist numbers per guide varied widely between 10 and 100. The tourist/guide ratios varied mostly between 10 and 20, with four cases of ratios higher than 30 and two cases of ratios of 97 and 145 tourists per guide.

v) Tourist numbers per each landing varied widely between 26 and 480, according to the ship's carrying capacity. Only two operators of large ships disembarked tourists in groups of 100 at a time.

vi) Tourist numbers per ship also varied widely. One single operator contributed about 40% of the total activity in only two visits of a large ship in one season, while several operators of small ships together contributed about 10% of the overall activity.

All in all, on the frequently visited Halfmoon Island the overall tourist activity is carried out by a number of operators of different nationalities on ships flying various flags, including those of states not parties to the Antarctic Treaty. In the example of Table 2 the tour operators involved in the 1992-93 tourist season at Halfmoon Island belonged to 9 nationalities and the ships flags were 5, only two of which were of parties to the Treaty. During the last decade several other states were involved in tourist operations throughout the Antarctic region. Potential environmental impacts of varying nature can be expected by such intense activities carried out by a number of un-coordinated operators over a single small area.

4. *Practical requirements for the EIA process at frequently visited sites*

Until 1995 very few tour operators had prepared environmental assessments or reviews of their activities. The few available documents usually report the seasonal activity planned by each operator and produce commentaries on some environmental aspects of their cruises including the stops at the sites to be visited. Some such reviews are named 'audits', others are named 'Initial Environmental Evaluation'. Nevertheless their contents do not conform to the requirements for IEEs set by the Protocol.



In these documents the possible impacts which are taken into account are mainly those associated with navigation such as ship's safety, oil spills, management of ship's wastes etc.. Environmental consequences are thus defined by extending the existing measures of environmental management and safety of navigation to the tourist activity, as may be logical - and, above all, feasible - from an operator's point of view. However, the requirements established in Art. 8 and Annex I have been grounded neither on any characterization nor on any categorization of activities, but instead on the possibility of consequent 'likely impacts' whose identification, definition, and quantitative assessment require expert scientific knowledge. In fact the evaluation of the impacts is not dealt with adequately in the documents prepared by tour operators and presented to ATCM XVIII and XIX, and the conditions for possible impacts at the landing sites are neither described nor analyzed.

It is evident that the likely environmental consequences of tourist navigation are small, and dispersed along long routes. However, when accidents occur, severe local impacts may be localized at and around the sites of accidents. The management of accidents under the EIA provisions of the Protocol is hampered by the fact that the concept of environmental risk is not adequately dealt with in the Protocol itself.

It would seem obvious that probabilities of impacts are higher, and impacts are more likely to occur on a major scale at the landing sites, where tourist activities are specific, more intense, concentrated and repeated. From a practical point of view the probability of larger-scale impacts is higher because of the ships' prolonged-moorings in the same stretch of sea (a small bay in the case of Halfmoon Island), the localized boat traffic, the wandering of visitors on land in the small areas where natural and human attractions are located. Furthermore, the lack of coordination of landing timings means that the intensity of the possible impacts may vary considerably according to how many ships are anchored in the same place in a short period of time.

In addition to considering the higher probability of impacts at the landing sites, the EIA process for sites repeatedly visited should take into account the cumulative impacts of all activities in the area.

Indeed, while the impacts of one or few groups of tourists landing for a short time might well be less than 'minor or transitory', the cumulative environmental effects of many visits repeated year after year may well become 'more than minor or transitory', and may require Comprehensive Environmental Evaluations by the operators or by the parties responsible for the



activities. Finally, when an environmental evaluation cannot exclude that cumulative effects are possible, subsequent monitoring of the latter is required pursuant to Art. 8, and the operators or parties responsible should plan a program of future visits by experts to observe and measure the 'second-order and cumulative effects'. Many of the documents prepared up until 1995 by tour operators did not mention cumulative impacts. When they did, however, they maintained that baseline data was insufficient for evaluation, in spite of the fact that most operators keep visiting the same sites year after year. None of the documents has mentioned plans for the future monitoring of the effects.

The natural elements subject to impacts to be considered in environmental assessments at tourist landing sites are the following.

i) On land: terrestrial flora (trampled upon or taken); upper fauna (especially disturbed during the reproduction cycle); soils (physically disturbed, contaminated by chemicals or by alien microorganisms); a-biotic components such as rocks, stones, fossils, ice (taken, altered, defaced, contaminated, often irreversibly).

ii) At sea: water quality (polluted by repeated ship moorings); marine fauna (disturbed by noise or vibrations, or affected by pollutants at the seabottom, mammals and birds disturbed during reproductive cycles).

The interference of tourist visits on other human activities has also been well-documented. The disturbance of scientific activities at the stations and the taking of 'souvenirs' at unguarded installations have been increasingly reported. Impacts by tourists on sites of historical interest may be less known but in some cases have been dramatic. For instance, the taking of whale bones or handicrafts from the abandoned whaling stations at Deception Island has been so systematic as to have defaced forever its unique historical landscape of 'whale graveyard' in just a few years. These kinds of impacts are not conditional or 'expected'. They have actually occurred and have already caused the irreversible loss of the historical and aesthetic value of the sites. In these cases the localized and truly cumulative effects of repeated visits conducted by various operators, without any prior assessment and without any subsequent control, have had severe consequences.

Within the framework of the present conduct of tourism in Antarctica, adequate EIA processes need to be carried out on tourist activities at frequently



visited sites. To do so it is necessary to set some minimum requirements. These are the following.

i) To coordinate all operators active in the same area for the common planning of the activities (in particular their intensity and time distribution) and for the consideration of possible cumulative effects.

ii) To explore the applicability of Art. 8.4 to tourist activities: "Where activities are planned jointly by more than one Party, the Parties involved shall nominate one of their number to coordinate the implementation of environmental impact assessment procedures set out in Annex I". Indeed, tour operators of several parties may be present at any frequently visited site, but only a very extensive interpretation of Art. 8.4 could establish that such activities should be viewed as 'planned jointly'. If Art. 8.4 is not applicable, parties can avoid the responsibility of assessing cumulative impacts.

iii) To carry out monitoring programs by coordinated operators or by appointed parties in order to assess possible long-term effects. The question of the costs of monitoring programs is an important issue to be addressed.

The fact that some operators have already presented their own IEEs although the Protocol is not yet in force can be regarded as a positive aspect of the operators' environmental consciousness. Any single operator or party is responsible for the impacts of its own activity along the route and on land. But the cumulative effects on the sites should be regarded as a common responsibility of all the operators and parties involved.

In order to implement the environmental principles and the EIA requirements of the Protocol with respect of tourist activities in Antarctica, the seasonal 'activity' whose impacts should be assessed, should be defined as the sum of all visits of that seasons at any visited site.

The geographic-environmental aspect of tourist activities management was addressed in the past during the negotiations of ATSCM XIth. Some delegations considered the obvious fact that tourist activities in Antarctica would have a more severe impact on some areas, especially the sites preferred by tourism. They proposed that tourist activities should be carried out in selected areas (Antarctic Special Tourist Areas) to be managed according to the specific characteristics and needs of tourism. Aware of the spatial aspects of the EIA question, the Netherlands suggested a viable solution called 'area-wide environmental assessment procedure' which would be applicable to the areas visited by tourists. Three major practical advantages of the area-wide approach



were identified: i) to gather the subjects involved in tourist activities into the same area; ii) to obtain information and expertise in order to assess possible cumulative effects; and, iii) to save times and costs by optimizing the resources needed to carry out the required EIA procedures in common. In a different context, the geographic-environmental 'area-wide' approach has been already applied in Antarctica to the protection of marine mammals at Palmer Station.

But in the end these proposals were not agreed upon.

Now, in the absence of specific regulations on tourism, the legal and practical difficulties for managing international tourism in the Antarctic should not be overlooked.

A practical issue is the logistic knowledge necessary for carrying out environmental assessment procedures on tourist sites. A mechanism should be established for collecting the information on the programs of all the operators who plan to visit repeatedly certain sites, which become subject to possible cumulative impacts. An inventory of the tourist sites in the Antarctic was started by the U. S. National Science Foundation, and it may provide the necessary database for environmental management. However, an international initiative would be more suitable to address the issue.

The last ATCM recommendation on tourism, Racc. XVIII-1, deals mainly with the information required from operators; the two annexed codes of conduct can be considered insufficient and one-sided. Indeed, they may respond to the perspective of managing the activity under the tourists' behavioral aspect, but neglect completely the other three fundamental conditions imposed upon tourism in natural reserves anywhere in the world, i.e. the spatial, temporal and quantitative restrictions.

Among the spatial aspects of tourism management, an important default is that no solution has been offered for limiting access to the pristine areas. The value of these areas is grounded on the absolute absence of any local anthropic interference, and it is seriously threatened by the 'adventure' tourism of spot-landings of planes or helicopters. Arguing that landings of short duration by a few visitors in a pristine area do not carry significant environmental effects is hazardous. The parameters for environmental purity can be extremely strict, while the scientific importance of the areas is irreplaceable, and their cultural and ethical value is also extremely high.

A possible problem of applicability stems from the reference made by the Protocol to Art. VII of the Treaty, which was taken as a basis for establishing which subjects should carry out EIA procedures. The states are



required to inform the other parties of their expeditions (including tourist journeys), as well of expeditions of others leaving their territories to Antarctica, in advance. But are tourist activities planned so in advance as to be included in the national exchanges of information for the next austral Summer? And how could information obligations be satisfied when tour operators or ship flags belong to third parties, or when ships leave for Antarctica from the ports of third parties? In such cases, if a party cannot satisfy the obligations on information exchange required by Art. VII of the Treaty, might that party also deem itself to be exempt from complying to those provisions in the Protocol which make reference to that Article?

The observed and possible environmental effects of the itinerant Antarctic tourism as it has developed in recent years and as it is conducted now can be detrimental to the environment. Were the Protocol now in force - and enforced - no such activity would have access to Antarctica as no adequate environmental impact assessments have yet been carried out.

The minimum requirements for carrying out adequate EIAs on tourist activities at frequently visited sites should be:

- i) coordination between subjects (operators and parties);
- ii) logistic information on the overall activity;
- iii) scientific information on the local environment;
- iv) special consideration of the spatial aspect of the activity;
- v) consideration of the temporal and quantitative aspects;
- vi) consideration of the possible cumulative and second-order effects;
- vii) monitoring plans.

Without prior consideration of these requirements and in the absence of specific regulations for tourist management it will be difficult to implement effectively the provisions of the Madrid Protocol.

