

TOURISM IN POLAR ENVIRONMENTS
- WITH SPECIAL REFERENCE TO GREENLAND AND ANTARCTICA

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DECLARATION

In accordance with University of Cambridge regulations, *I do hereby declare that:*

This thesis represents my own original work and conforms to accepted standards of citation in those instances in which I have availed myself of the work of others.

This thesis is not now being submitted nor has not been submitted in the past for any other degree, diploma, or any similar qualification at any university or similar institution.

This thesis does not exceed the maximum allowable length of 20,000 words, excluding: footnotes, tables, appendices, and references.



Cambridge, June 1990

ABSTRACT

This thesis is concerned with the impact and the management of tourism in polar environments. A perspective is given on the environmental hazards that may arise from tourist activities in polar regions, through documented examples from the impact on alpine and similar environments in other parts of the world. General management theories for controlling such impact are described and adapted for polar regions. The thesis then describes the current state of tourism and assesses its environmental impact in Greenland and Antarctica and its likely future development there. Finally the present status of environmental management as practised in the two studied areas is evaluated. It is concluded that the level of tourism and its present environmental impact in Greenland and Antarctica remain minor. However, the concentration of increasing numbers of visitors is inevitable, and calls for attention to the general management procedures described. Tourism can develop in harmony with the natural environment if the suggested measures for management are applied. In Greenland an advisory forum for the development of tourism has been established but unfortunately this seems, so far, only concerned with marketing. At present Antarctica's most urgent need is a convention on tourism that considers management theories and a board with competence to enforce conditions for entry to the area covered by the Antarctic Treaty.

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1. INTRODUCTION.

Though their exploration is now mostly over, no other places on earth have kept the image of inaccessibility so much alive as the polar regions. Whilst in the past, participation on polar expeditions was confined mostly to small groups of chosen explorers, and later scientists, today there is the possibility for anyone to go there as visitors.

Why should the polar experience be confined to the chosen few? As Lord Shackleton has pointed out (Milton, 1989):

The great majority of men who visit the Arctic do so because they want to, a large number do so for publicity, while it is possible that one or two have gone there for purely scientific purposes.

The objective of this thesis is, however, not to discuss the question of which purposes give people the right to visit polar regions. It is in general to consider the possible environmental impacts from tourism in polar environments and to suggest methods for managing this impact. In particular two areas, Greenland and Antarctica, are studied, the number of visitors is estimated, the future development predicted and the present state of management described and evaluated.

1.1. Definitions.

In this thesis I define polar environments to include only the biophysical environment. The polar regions are understood as areas of higher latitude than 60°, but relevant examples are taken from environments of high altitude all over the world.

"Tourist" as used in this thesis is based on definitions of visitors, tourists and excursionists suggested by the United Nations (U.N.) in 1963 and later adopted by the World Tourism Organisation (1978). A "visitor" is defined as:

...any person visiting a country other than that in which he has his usual place of residence, for any reason other than following an occupation remunerated from within the country visited.

The definition covers two types of visitors, "tourists" and "excursionists", as follows:

Tourists: temporary visitors staying at least 24 hours (or one night) in the country visited and the purpose of whose journey can be classified under one of the following headings: recreation, health, study, religion and sport.

Excursionists: temporary visitors staying less than 24 hours (or one night) in the country visited (including travellers on cruises).

In this thesis the use of the term "visitor" does not include scientists and family (unlike the U.N. definition). Similarly these categories were not included by Thalund (1988), the only source of data on the number of visitors to Greenland. The term "tourism" is used conceptually as a heading for all the activities of visitors as defined above.

Included under the heading "tourism" are "non-scientific" expeditions, which in Greenland are defined as sporting expeditions with the purpose of climbing mountains or glaciers, crossing the ice sheet, walking tours or sailing in remote parts of the country, and similar activities (Danish Polar Center, 1989). In Antarctica a similar definition is adopted for "non-governmental" expeditions even though these normally are distinguished from other tourist expeditions by being heavily dependent on sponsorship (Heap, 1989).

Greenland is defined as covering Greenlandic territory, and Antarctica, the area covered by the Antarctic Treaty i.e. south of 60°S.

The "Antarctic Treaty System" (ATS) is used to describe the range of agreements, centred upon the Antarctic Treaty, which was signed by 12 governments in 1959 and

came into effect in 1961.

1.2. Factors determining the scale of polar tourism.

With increasing infrastructure and logistical facilities available, the development of tourism in the polar regions must be considered as inevitable. Using the term "travel" to indicate the presence of adequate logistics a Norwegian remarked: "Before travel there was exploration, after travel there is tourism" (Jacobsen, 1989).

Today it is becoming increasingly difficult to embark on a unique journey anywhere in the world. The polar regions, however, still present rare opportunities to give modern tourism some flavour of exploration and expedition life, and also give people the opportunity to see something "new" and different.

In general terms world tourism has experienced a "phenomenal explosion" (Tyler, 1989) since the 1970s. Furthermore, within this "explosion" there is a "greening" of world tourism (Millman, 1989). People are seeking the last "pristine" areas of the world, including the polar regions.

Development of tourism in the polar regions, then, can for these reasons be considered in a way an historic inevitability.

1.3. The relationship between tourism and the environment.

Does tourism confer any significant environmental dangers compared with other more heavily polluting industrial developments? I argue that it does. Chapter 2 outlines arguments for serious environmental considerations to be made before tourism is developed in polar regions. An additional argument for studying the relationship between tourism and the environment is that it represents a reflection not only of a given authority's ability to cope with independent industrial activity, but also of the environmental awareness of the individual.

Visitors come to polar regions from a wide range of countries, and many countries are involved in the management of polar regions for tourism. Thus tourism is an interesting subject for studies in management, liability and enforcement of regulations and laws at both national and international levels.

It is not difficult to see why the polar regions are currently environmentally interesting. They are believed to be of paramount importance in monitoring such problems as global warming, ozone depletion and airborne aerosol pollution. When, at the same time, they offer experiences of unique unspoiled nature for the visitor, these regions may be able to foster a better individual understanding of the ecosystem in which humans live. However, such fine ideals might be lost, to say the least, if the development of tourism in polar regions is not carefully managed.

To sum up: the objectives of this study are to highlight the potential problems introduced by tourism upon the natural environment, to suggest methods for the environmental management of the development of tourism in polar regions in general, and Greenland and Antarctica in particular.

1.4. Greenland and Antarctica as special areas.

I regard these as areas for special study firstly because in both, tourism is at an embryonic stage and increasing, presenting perfect situations for management strategies to be considered and introduced. The industry is at a stage of development where it is possible to perceive future trends, and to induce regulations without getting into conflict with too well-established industrial arrangements.

Secondly, Greenland and Antarctica are both true polar regions with some similar physical features. Each has a large ice sheet surrounded by a small fringe of ice free land. One important difference is that Greenland has an indigenous human population, now in the process of becoming self-governing; Antarctica in contrast has only transient populations and no indigenous government. A

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comprehensive study of the implications of such a difference lies far beyond the scope of this thesis. Nevertheless, comparisons are possible, and lessons drawn from these will be touched upon in the conclusions.

A third and final reason is to take advantage of my personal background of involvement in Greenlandic tourism, and the resources of the Scott Polar Research Institute, where Antarctic tourism has previously been studied (Reich, 1979; 1980) and is currently being studied by Dr Bernard Stonehouse.

1.4. Outline.

Chapter 2 aims at providing a general picture of the potential hazards arising from tourism in polar regions by means of looking on relevant experiences all over the world. It must be kept in mind while reading this chapter that the environmental impact of tourism at its present state in the two case study areas is very limited compared to the areas used as examples. Chapter 3 deals with the theories that have been developed to deal with this impact and an attempt is made to adapt the theories to polar regions where this has not been done already. Chapters 2 and 3 are meant to give an introduction to what the environmental aspect of tourism in polar regions is about and to introduce general theories for environmental management of tourism.

Chapter 4 introduces the factual situation of tourism in Greenland and Antarctica. Chapter 5 predicts the likely development and chapter 6 examines the present state of management. Chapters 4-6 deal, so to say, with the reality, and in the concluding chapter 7, theory and practice are brought together, the general theories being applied to the two case-study areas and evaluated.

2. IMPACTS OF TOURISM ON POLAR ENVIRONMENTS.

2.1. Active physical pursuits.

Active pursuits relevant to polar regions are mainly skiing, and dogsledging, climbing and hiking. Before examining the problems that such activities have caused in other parts of the world it should be emphasised that the number and concentration of visitors will be shown to have a crucial role in the creation of tourism related environmental problems. This means that the examples in this chapter, though relevant to consider, not necessarily all apply equally to the present situation in polar regions where the number of visitors are much lower than in the areas from which the examples are taken (section 2.5.).

2.1.1. Skiing.

Cross-country skiing is distinguished from alpine skiing. Cross-country skiing (and dogsledging) does not normally have any great effect on the environment. It alters the natural environment little, and is normally practised in areas with smooth slopes less threatened by mud-slides and erosion. However, if the number of visitors to a particular area results in crowding, cross-country skiing can bring undesirable side effects.

Development of facilities for alpine ("downhill") skiing have caused serious environmental problems in the Alps (Diem, 1988; Simons, 1988). Mud-slides and floods in Tyrol, in the space of three weeks in July 1987, left more than 60 people dead, 7,000 homeless and 50 towns, villages and holiday centres wrecked (Simons, 1988). Deforestation, and the subsequent physical pressure from skiing, is directly linked to such events.

In alpine areas above the treeline, where conditions are more similar to polar regions, skiing developments have caused similar problems. Rough tracks for vehicles to service ski areas have started irreversible erosion, and the installation of ski lifts makes sheet erosion a common feature (Diem, 1988). Lack of snow - which also characterise some polar regions - has led to the use in

developed ski resorts of snow cannons. Drawing from local lakes to serve the water requirements of such machines has caused damage to large areas of freshwater in the French Alps (Smith and Jenner, 1989).

Whether an area is threatened by lack of snow or not, the development of facilities for alpine skiing in polar regions will need carefully planning, and initiation of environmental impact assessments beforehand (chapter 3).

2.1.2. Climbing.

Climbing and mountaineering pose other potential environmental problems. Polar and alpine plant species are occasionally restricted in distribution to the steep rock surfaces. This association makes them potentially vulnerable to damage by climbers. Damage may be caused accidentally or as a result of "gardening" climbs to increase the availability of holds. Snowdon in North Wales is area with such conflicting interests. (Edington and Edington, 1986).

Crowding at particularly popular climbing sites creates litter and sanitary problems. Growing numbers of climbers on North America's tallest peak, Mount McKinley, have caused officials to consider climbing restriction due to such problems (Alaska, 1990). The authorities in Nepal now insist that extra sherpas must accompany every Everest expedition to carry back discarded equipment, etc. (Cullen, 1986). Present plans for development of climbing in South Greenland (section 5.1.2.) would need to consider ways of avoiding problems like this beforehand.

Problems with crowding are, of course, not confined to climbing, but apply equally to all physical pursuits where it might occur.

2.1.3. Hiking.

Hiking, like cross-country skiing, is generally a harmless activity involving few environmental risks. However, where large concentrations of hikers occur, so do environmental problems. At high altitudes in the Alps a widening of a popular footpath resulted in it spreading

over 30 metres in only two years (Diem, 1988). Soil erosion arising from hiking is a well known problem all over the British national parks (Patmore, 1983). The Himalayas provide an illuminating example of the potential consequences of hiking growth in an area environmentally fragile (Singh and Kaur, 1983). After the alpine meadows of the Rocky Mountain National Park were made accessible by road, the subsequent trampling resulted in as much as 95% of the vegetation cover in areas near the road being destroyed (Edington and Edington, 1986).

These examples do not necessarily represent threats to polar environments in the near future. However, increasing numbers of hikers in, for example, Greenland makes the examples important to bear in mind. Particularly important is that they reflect the number and concentration of visitors having a crucial role to play in determining the environmental effect of a given activity. This raises the question of whether it is desirable to concentrate the tourists on established paths. With a relatively small number it might be feasible not to direct the hikers, because by thus spreading out in the landscape, such impacts as soil erosion are less likely to occur. However, with increasing numbers impact will begin, and concentration is probably desirable. The zoning of tourist activities and national park strategies will be discussed in chapter 3.

2.1.4. Disturbance of wildlife.

So far the only aspects of physical pursuits that have been considered are those of direct physical damage. The disturbance of wildlife is a feature potentially shared by all the above mentioned activities.

Studying blanket bog areas in the Peak District, England, Yalden and Yalden (1988) expressed concern about the impact from recreational pursuits on breeding birds, especially golden plovers (*Pluvialis apricarius*). An example of more indirect disturbance is the impact of ski developments on birds and mammals in the Scottish hills. Watson (1979) observed an influx of scavenging bird species attracted by human waste at the ski

grounds. Alien species like crows (*Corvus corone*) have a damaging impact by robbing the nests of ptarmigan (*Lagopus mutus*) and red grouse (*Lagopus lagopus scoticus*).

On Svalbard, studies of reindeer (*Rangifer tarandus*) and polar bears (*Ursus maritimus*) have shown that disturbance has a significant problematic impact because it makes the animals run. Firstly, an increased energy consumption can prove fatal when the stored energy becomes of crucial importance during the long winter; an increase in running by reindeer of 2% throughout the winter involves waste of energy corresponding to 16 days total consumption under normal activity (Persen, 1989). Secondly, these animals have problems in getting rid of the surplus heat. This can lead to "heat stress" under which the energy consumption also is far higher than the normal. In particular, young polar bear cubs are endangered. Swimming in cold water following running has been shown to result in the cubs drowning due to freezing because their thermo regulating mechanisms have not fully developed (Persen, 1989).

In some areas of Western Europe the development of sea-cliff climbing as a recreational pursuit has become a threat to some species of seabirds (Edington and Edington, 1986). This is a reminder to initiators of climbing facilities in polar regions where not only seabirds but also such inland cliff breeding birds as the peregrine falcon (*Falco peregrinus*) in the Arctic could be disturbed.

Problems arising from people just being present in an area, and interfering by this presence with wildlife, are dealt with in the next section.

2.2. Observing wildlife.

Different from physical pursuits are the recreational activities where the involvement of wildlife is central and intentional rather than accidental.

Extensive television coverage of the natural history of polar regions is reflecting an increased popularity of these interests. Attention given to polar wildlife plays an important role in protecting animals. However,

even this mutually supportive relationship between wildlife and observers must not obscure the fact that wildlife-based recreation may have adverse side effects.

The classic example on this is when bird-watchers gather in thousands to see a particular rare bird. As Edington and Edington (1986) remark: "Frequently on these occasions little attention is given to the welfare of the animal itself or to the damage which might be caused to the habitat." This is probably again not the most likely scenario for bird watchers in polar regions because they are unlikely to appear in such large numbers. However, special bird-watching cruises are at present being arranged (Society Expeditions, 1989a) and even though these involve at most 130 enthusiastic bird-watchers, landings of such parties have to be taken into consideration when establishing environmental plans for the development of tourism.

When visitors start to arrive in large numbers at places where "fearless" animals, perhaps with no natural enemies, are seen, problems with artificial feeding might occur. In the Antarctic, penguins are easy to approach and in the Arctic it is sometimes possible almost to domesticate arctic fox (*Alopex lagopus*) and arctic hare (*Lepus arcticus*). Visitors need a "code of conduct" that will help them resist temptation to feed these animals; wildlife living on hand-outs represents a serious disturbance of local ecosystems.

A serious hazard associated with tourism arises when visitors unwittingly make certain species more vulnerable to competition from other species, or to attacks from natural enemies. At Punto Tombo, a Nature Reserve in northern Patagonia, Chile, the entry of visitors into the breeding colonies of king shags (*Phalacrocorax albiventer*) and magellanic penguins (*Spheniscus magellanicus*) increases significantly loss of eggs to predatory gulls (Kury and Gochfield, 1975). As visitors move into the shag colony the parent birds start to leave their nests; the gulls, which are constantly patrolling the colony edge, move in to steal the eggs. The gulls seem to recognise the fact that the presence of human visi-

tors creates an opportunity to attack the nests.

Visitors can also unwittingly disrupt the bonds between parents and their offspring. "Whale-watching" has formed the basis for a rapidly expanding tourist industry; given the abundance of whales in the Arctic in particular, this kind of tourism has a great potential. Whale-watching along the west coast of North America has become a major industry. It is mainly based on the migrations of the gray whale (*Eschrichtius robustus*) which moves annually between summer feeding regions in the Arctic seas to calving areas along the Mexican coast. The calves of the grey whale normally maintain constant body contact with their mothers, but when separated are likely to transfer their attachment to a nearby ship (Norris et al., 1977). This fact has given rise to speculations that disturbance by whale-watching boats could result in an irreversible separation between the calves and their mothers (Edington and Edington, 1986).

The general disturbance of whales sound-communication by the noise from boats is well documented (Baker et al., 1984; Richardson, 1985) and a factor that needs consideration as well before initiating whale-watching activities.

Another form of disturbance stems from overflights or even landing with helicopters at interesting sites. An example is mentioned in section 4.2.4., where helicopter flights to an adélie penguin (*Pygoscelis adeliae*) rookery had an serious impact on the population.

2.3. Recreational hunting and fishing.

Sports hunting and fishing involve ecological and ethical problems. Those who oppose hunting on ethic grounds have a very strong public influence, which has to be considered by planners when, for example, possibilities for gamehunting of polar bears (*Ursus maritimus*) in Greenland, are raised (section 5.1.1.).

It can be argued that there have been no problems with the special licence (sport) hunting of polar bears that has been carried out in the Northwest Territories since 1970, because it is managed carefully (Stirling and

Calvert, 1985). This suggests that it is possible to exploit game animals on a sustained-yield basis.

A notion prevalent amongst recreational (and some native) hunters is that they are competing for quarry species with natural predators. Therefore by reducing these predators it should be possible to increase the yield to the hunter. Edington and Edington (1986) discuss why this idea gains only limited support from modern ecological studies. There seem to be only two circumstances with relevance to the polar regions where game animals become so vulnerable to predators that control measures might be reasonable. The first concerns the reintroduction of species which initially might need some level of protection before a natural balance is reestablished. The second applies where severe winter conditions or over-exploitation have depleted herbivore populations without having a commensurate effect on their predators.

Any kind of recreational hunting and fishing needs to be carefully controlled in order not to exceed the sustained yield, requiring efficient systems of licensing and monitoring. Equipped with suitable biological data, it is possible to exploit game-animal populations without destabilize them. There are rare circumstances where predator control could be considered and it should be judged strictly on its merits in a proper ecological context. Generally the need for careful environmental planning and monitoring of recreational hunting and fishing must be emphasised.

The introduction of new species to polar regions by accident is not a problem confined to tourist activities. However, new species have been introduced for recreational hunting all over the world, including polar regions. Norwegian whalers early in this century introduced reindeers (*Rangifer tarandus*) to provide South Georgia with a sporting amenity and alternative source of meat that required no husbandry or management (Leader-Williams, 1988). The herds have since expanded, offering possibility of unique studies in population dynamics, reproduction changes, changes in diet and the

general ecology of reindeers. However, dramatic local effects on vegetation have also been measured. Any introduction of free-living species to polar environments for recreational purposes is today considered unacceptable and is generally illegal. The possibility is covered by both Greenlandic law and the Antarctic Treaty.

2.4. Tourist support facilities.

The environmental implications of roads and general logistic facilities falls beyond the scope of this thesis because the development of such items of infrastructure is seldom confined totally to recreational uses.

One of the most serious environmental problems occurring at tourist resorts is management of waste disposal and sewage. Implications can range from eutrophication (excessive algal growth) of freshwater habitats to sanitary problems resulting in health risks for human beings.

Tourist establishments close to population centres often meet waste disposal requirements by discharging into existing municipal treatment systems. If these systems are themselves environmentally sound, and have sufficient spare capacity to accommodate the extra load, this is an ideal solution. Difficulties arise at isolated localities where independent arrangements for waste disposal have to be made. This will be the case for many initiatives in polar regions, where the problems are aggravated by seasonal fluctuations in visitor numbers and the difficulties of arranging for adequate supervision. Nonetheless failure to make adequate provisions carries with it a risk of producing environmental changes directly detrimental to the enjoyment of visitors.

Just as the nutrients in sewage effluents can be utilised by certain aquatic algae, so also can the edible components of refuse be exploited by scavenging animals. Because of the absence of large predatory landliving mammals in the Antarctic this is a problem confined to the Arctic. The classic area with problems of this kind is Churchill in Manitoba, Canada, on the coast of Hudson Bay. Fleming (1988) in a popular account of Churchill

noted:

As summer food sources are scarce for the [polar] bears, they are driven by a hunger that often leads them into the town of Churchill itself, looking for the easy pickings afforded by the town dump just 10 kilometres (6 miles) from the outskirts of town. In fact this local garbage dump is where tourists still go to see bears, so it's likely the most visited dump in the world.

It is certainly a minor ecological problem but it has to be considered when new tourist resorts in bear exposed areas are planned.

More serious is the general question of how to manage the refuse from isolated tourist resorts. It is impossible to conceal garbage on the tundra, and it cannot be buried in permafrost or rock. Therefore settlements all over the polar regions share similar problems in how to deal with refuse. In tourist resorts this is particularly important since failure to make proper arrangements can be directly detrimental to the tourist "value" of the place.

In a general review of waste-disposal needs of tourist sites, Christiansen (1977) concluded that the most satisfactory arrangements was to transport waste out of tourist areas for disposal at existing municipal facilities. In the Antarctic detailed guidelines for waste management have been developed for the scientific stations, which could easily be applied to tourist resorts as well (Heap, 1989).

Finally, problems with cruise ships in polar waters should be mentioned. Consideration of potential problems with discharge of waste disposal from these ships and a serious oil spill following a wreck, is necessary before encouraging more cruises to polar regions. The importance of this was emphasised by the incident near Svalbard in June 1989 when the cruiser *Maksim Gor'kiy*, carrying 575 tourists and 378 crew members, struck an ice floe and was quite seriously damaged, although fortunately

without loss of life (Times, 1989).

2.5. Applications to polar regions.

What has been presented in this chapter might seem a very negative picture of tourism in mountainous and polar environments. It describes a "worst scenario", and not all of the examples apply equally to different polar regions. It is, however, necessary as a part of any planning for tourism to examine all the potential dangers from a given proposed activity. This is an integrated part of any environmental impact assessment (see next chapter and appendix A).

However, the awareness of a "worst scenario" should not become a substitute for rational enquiry into the actual scale of impact to be expected from given activities nor an excuse to turn down well thought out and planned activities.

3. ENVIRONMENTAL PLANNING FOR TOURISM.

3.1. General theories for planning.

During the past two decades it has increasingly been recognised that tourism and the environment are closely related. A considerable amount of literature written by people with different academic backgrounds dealing with this relationship is now available. A general conclusion in the literature is that careful environmental planning is essential when tourism is developed (OECD, 1980; Pearce, 1985; Farrel and McLellan, 1987; Inskeep, 1987; Romeril, 1989a).

Several authors have suggested planning processes for managing the environmental impact of tourism. Inskeep (1987) divides the process into a macro level for regional planning and micro level for resorts, hotels, related attractions, and their associated infrastructure. Other authors incorporate both these levels in models of varying complexity for the management process (see figure 3.1. and 3.2.) (Pigram, 1983; Hammitt and Cole, 1987).

However, the key stages highlighted in the planning process are generally the same throughout the literature and can be summarised in the three central boxes in figure 3.2.. The following description of a management procedure is based on Pigram (1983), Inskeep (1987) and Hammitt and Cole (1987) but adapted with reference to polar regions.

A set of objectives is delineated first with reference to constraints of the resource base. Information on resources should indicate which activities are physically possible as well as some of the resource constraints on recreation opportunities.

Institutional constraints have obvious implications for management and set limits on the range of recreational opportunities possible. It is important to note here that consideration of what level of impact that will be

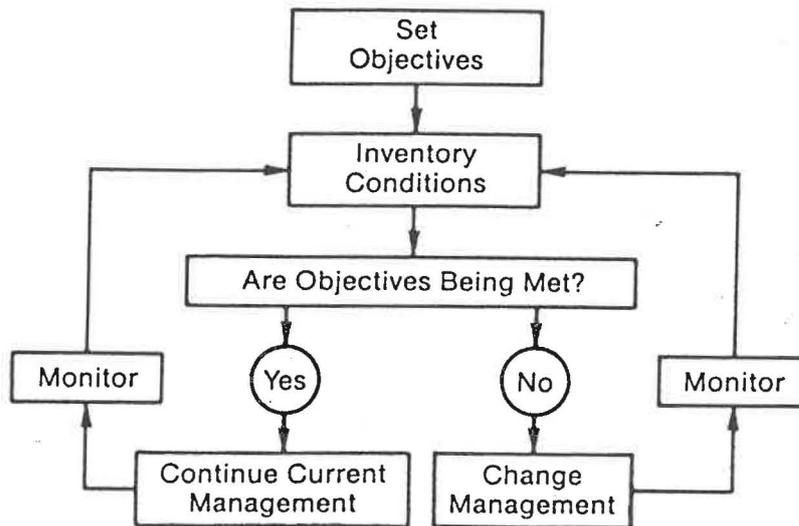


Figure 3.1. A simple management process (Hammitt and Cole, 1987).

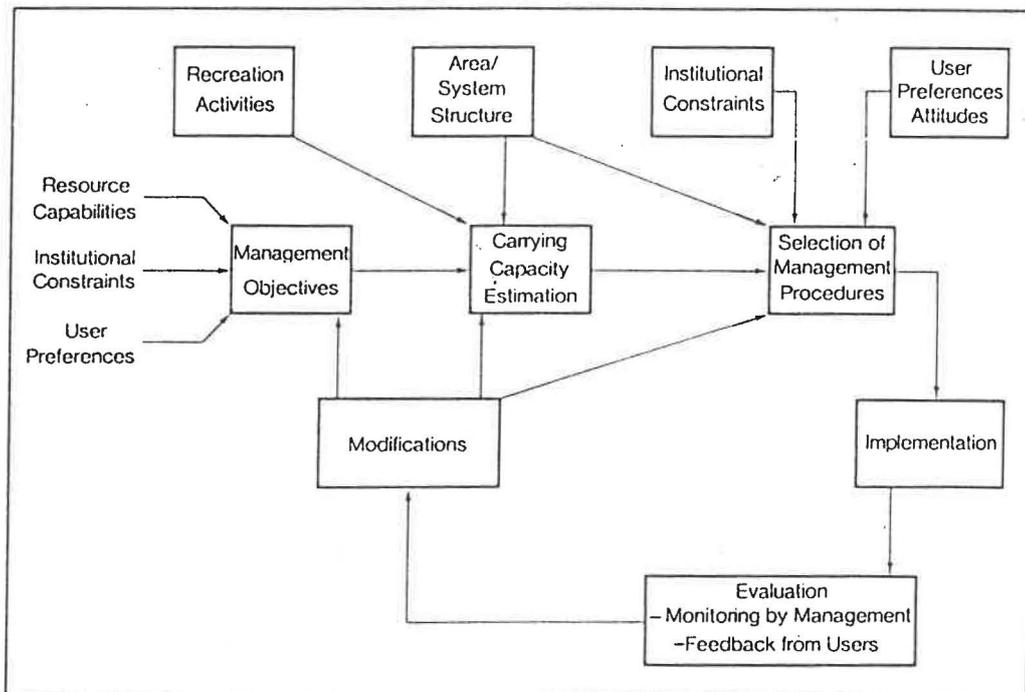


Figure 3.2. A more complex recreation management model. The three central boxes i.e. "Management Objectives", "Carrying Capacity Estimation" and "Selection of Management Procedures" also represent the stages used for describing the management procedure outlined in the text (Pigram, 1983).

accepted (cost/benefit analysis) must be made as early as possible in the planning process. This is in order to produce guidelines and agreed measures/standards unbiased with regard to specific circumstances in connection with a particular project. Legal restrictions and consideration of other industrial developments will also influence the selection of realistic management objectives.

In addition, consideration should be given to the basic question of what kind of tourism should be developed. Is mass tourism or "quality tourism", implying limited, highly controlled development and selective marketing, preferred? It is documented that "quality tourism", implying a strong dependence on quality natural resources, makes their enduring and sustainable use an economic necessity as much as a desired ideal (see figure 3.3.) (Romeril, 1985).

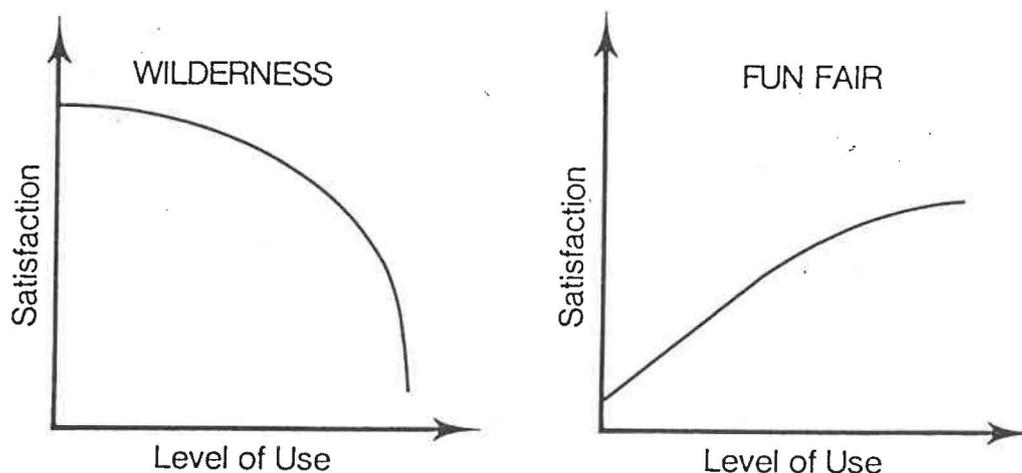


Figure 3.3. The effect of crowding and its subsequent impact on the environment upon recreational satisfaction. The figure reflects also why marketing of "wilderness" needs other considerations than the ones for more conventional tourist resorts i.e. "fun fair" (section 5.1.3.) (Pigram, 1983).

Finally, there is also the question about how management objectives reflect the preferences of the potential user. What is it the tourists want or do not want? Market surveys must be made to answer this question. In some situations tourist preferences might be far less sophisticated and demanding than initially suspected by planners. In the polar regions in particular, the satisfaction gained by just being present is often paramount.

The second stage in the management process is that of setting appropriate carrying capacities consistent with the management objectives adopted. The concept of carrying capacity as a threshold level beyond which overcrowding, congestion and deleterious environmental impacts will occur is an attractive one not difficult to perceive in theory. However, the reality is far more difficult to rationalise and quantify. Romeril (1989b) in reviewing the concept, points out how it attracts a plethora of definitions. Mitchell (1979) discusses the concept under two headings: biophysical and behavioural; Pearce and Kirk (1986) identify three types: environmental, physical (facilities) and perceptual/social; and Shelby and Heberlein (1987) define four types: ecological, physical (space), facility and social capacities. Romeril (1989b) points out how these capacities can be varied if other management parameters alter the relationship, if management objectives are changed, or if user preferences change radically.

The relationship between trampling and vegetation provides the most frequently used expression of ecological carrying capacity with relevance to polar regions. Generally, excessive trampling leads to adverse effects ranging widely from total loss of vegetation cover to physiological and morphological changes. The nature of trampling impact will be critical and in polar regions there is the need to evaluate the winter versus the summer use of the mountain slopes. Clearly the carrying capacity will vary depending on the type of impact and the biological system. Methods for estimating ecological carrying capacities is described by e.g. Patmore (1983) and Lindsay (1986).

However, the different carrying capacities are - and should be - closely interrelated. The physical capacity (facilities) should not be developed to an extent exceeding the ecological capacity of a particular area, thereby making their operation economical only if the ecological carrying capacity is exceeded. On the other hand the present situation regarding facilities in the polar regions often shows a lower carrying capacity than the ecosystems potential capacity.

Once objectives have been formulated and estimates made of carrying capacities, the primary task of environmental management emerges - that of selection, implementation and modification of on-site management procedures.

The selection of sites involves various safety and socioeconomic factors as reviewed by Pigram (1983). With special reference to polar regions, the concept of zoning should be mentioned. It is a difficult term to define since it ranges from limiting movement on land to established paths, to directing tourists towards established resorts. National parks are, in the latter sense, a form of zoning and the designation of certain areas within parks for special purposes is often practised. Special management plans for zones such as these are normally implemented.

However, the designating of national parks is a controversial issue that comes down to the discussion about whether a unique untouched area should be protected from visitors or whether the area should serve as a recreational source for the public. In Canada, national parks have the dual purpose of enjoyment and protecting the country's natural heritage. Despite the best intentions, however, there remains in some cases an inherent conflict between parks for people and parks to preserve untouched areas, as argued, for example, by England (1983) and Donnelly (1987). Generally, the objectives of zoning have to be very clear and local (native or scientific) interests involved have to be considered carefully before implementation.

Controversy over the concept of zoning is not confined to the question of national parks. Zoning is frequently mentioned as a desirable way of controlling and limiting environmental impact (Inskeep, 1987; Hammitt and Cole, 1987). However, counter-arguments against the very nature of zoning have also emerged: "A line on a map defining a zone becomes the boundary between 'good' and 'bad', and subsequent decisions on policy or actions in the areas on either side of the line are unjustifiably influenced" (Codling, 1982b). Similarly Yapp and Barrow (1979) draw attention to the fact that zones are not "objectively determined realities...zonation is an operational concept".

A basic problem with zoning in polar environments is the remoteness of the areas and thereby the problems in ensuring that visitors coming with different means of transport actually respond to the zones in the desired way. In practice establishment and maintenance of fences and markers of zones are problematic in polar regions but a method for standardisation of marking has been advised (Fleming and Keage, 1987).

This problem leads to the question of implementation and enforcement, i.e. how to ensure in practice that visitors are adequately informed (concerning regulations etc.) and supervised. Measures should be taken to make sure that all tour operators employ experienced guides who are aware of all regulations (such as zoning). Furthermore, "codes of conduct" should be provided for all visitors setting down guidelines for behaviour in the particular area visited. It should not be left to the initiative of private companies to produce these.

In order to implement the same standards when dealing with tourists coming to polar regions on their own, advantage should be taken first of all of the relatively small number of gateways. The main airports involved in transporting tourists to polar regions act as bottlenecks and should, through their information services, make the "codes of conduct" available. Furthermore, it should be possible to obtain these from travel agencies

in all parts of the world involved in polar tourism.

Finally the management procedure should ideally involve frequent monitoring of the impact. An important feature of the system is that it is flexible and easy to modify management objectives if required.

In addition to this general management procedure, a detailed environmental impact assessment (EIA) should be made of specific major projects. The procedure for this is described in the next section.

3.2. Environmental impact assessment procedure.

Environmental impact assessments (EIAs) have during the last few decades, become a frequently used method of controlling and monitoring the environmental impact of various industrial activities. Most of the quite substantial amount of literature on the subject describes procedures in general terms and includes, and emphasises the importance of, all the aspects of environmental impact, not just the biophysical environment (e.g. Roberts and Roberts, 1984; Ortolano, 1984; Westman, 1985). However, the procedure for an EIA outlined in appendix A is one that has quite legitimately been developed without consideration of any aspects other than those relating to the biophysical environment. It was designed to be used in Antarctica and it is in this sense of crucial relevance to this thesis. However, certain socioeconomic and human health aspects should be added for use in inhabited areas.

The EIA model outlined in appendix A was part of a report by the Scientific Committee on Antarctic Research (SCAR), *Man's impact on the Antarctic environment* (Benninghoff and Bonner, 1985), and was proposed to be adopted as a recommendation at the XIV Antarctic Treaty Consultative Meeting in October 1987. This model was, however, changed slightly by the negotiators before being adopted as Recommendation XIV-2 on the use of EIA with direct reference to activities associated with science and its logistic support (Bonner, 1989). The use of the rejected model here is just to emphasise its general application rather than specifically Antarctic.

An EIA as the one suggested in appendix A does not apply to all tourist activities. It can be very useful in a large area as a whole, if a specific development plan for tourism is enforced. This was done in the Falkland Islands as part of a comprehensive tourist development plan (Romeril, 1989b). EIAs are also relevant to sites, like a zone designated to be used for tourism, or to the establishment of a tourist field camp, both of which are examples of present plans in polar regions as will be described in chapter 5 and 6.

4. PRESENT STATE OF TOURISM.

4.1. Greenland.

4.1.1. Amount and categories of tourists.

Organised tourism in Greenland is a relatively new phenomenon. It started with group tours to South Greenland in the 1960s and has since developed as the country's infrastructure has also developed.

It is difficult to give any precise figures for the extent of this development because no actual statistics have been kept on the number of visitors in Greenland in the past. The first to try estimating the extent of tourism was Thalund (1988), who used airline tickets as his data. Based on a market survey, aimed at estimating the relative proportions of the different categories of passengers for each type of ticket, he estimated figures for 1987 (Table 4.1.) to which are added comparable figures for 1988 (Thalund, pers. comm.). Excursionists are derived directly from the numbers and capacities of one day flights and cruise ships.

	<u>South Greenland</u>	<u>East</u>	<u>Rest</u>	<u>Total</u>
<u>Tourists</u>				
Summer	1,980 (2,140)	330 (580)	990 (1,280)	3,300
Winter	- (-)	- (80)	- (120)	-
<u>Excursionists</u>				
All year	2,100 (400)	1,300 (1,230)	- (-)	3,400

Table 4.1. Number of tourists and excursionists visiting Greenland 1987 and 1988. 1988 figures in brackets.

Of the total number of 3,300 tourists staying overnight in the summer of 1987, 75% were estimated by Thalund (1988) to have been based in hotels, taking part in arranged tours varying between 3 and 14 days in duration. Hiking/activity tourism (i.e. on tours arranged by travel agencies, length of stay normally varying between

7 and 28 days) accounts for the remaining 25%.

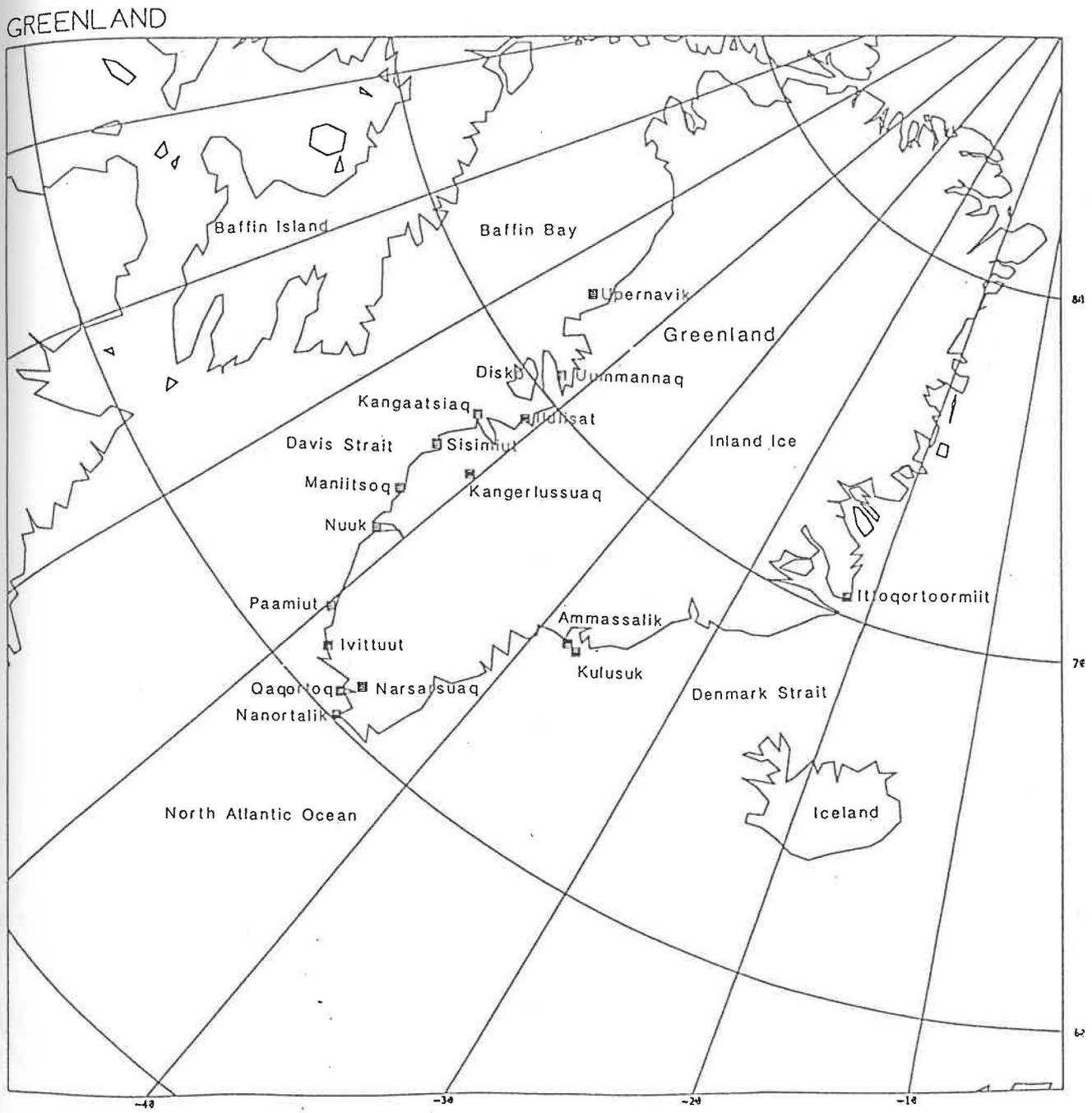


Figure 4.1. Greenland. Only the place names mentioned in the text are included.

These cruises normally visit only South and Southwest Greenland but a few sail up the west coast. The empty spaces in the row for excursionists under the final category in table 1 (i.e. "rest") might therefore not be quite true. The exceptional high figure of 2,100 excursionist in South Greenland for 1987 was due to a coincidence where three big cruise ships, carrying around 600 passengers each, visited the area in the same year (*Maksim Gor'kiy* being one of these, see section 2.4.). These ships normally visit Greenland only once every four years.

4.1.2. Problems in estimating numbers.

The above figures, the best that exist for Greenland, are not perfect by any means. The ratio between hiking/activity and hotel tourists is based on very sporadic information from Danish travel agencies with emphasis on different types of tourist. The agencies, for reasons like business secrecy, have little interest in giving out accurate information. Furthermore, an increasing number of passengers, especially hiking/activity tourists, on flights to Greenland arrange their own tours. My conclusion is that the 25% for hiking/activity tourists is an underestimation.

The total figure for tourists that arrive on normal flights to Greenland is based on a market analysis done in 1985 by an opinion-survey institute, AIM. This revealed that 88% of the passengers with group tickets (IT/GIT tickets) and 20% of the passengers with time-restricted tickets (APEX tickets) are tourists. These percentages could have changed since 1985. For example, increasing numbers of conferences and fairs are now held in Greenland - for example, in 1988 there was a major fishing fair in Nuuk (Thalund, pers. comm.). Participants in these are not defined as tourists but they travel on IT/GIT tickets. This may have altered the figures considerably.

There is, however, no doubt that the above figures give a correct indication of the order of magnitude of tourism in Greenland.

4.1.3. Visitor activities.

Greenland can be divided in four main tourist areas: South Greenland, Disko Bay, East Greenland and West Greenland. South Greenland attracts more than half of the total number of tourists. Of the remaining areas, Disko Bay is probably the biggest attraction, but again is it impossible to give exact figures because there is no central registration.

Recreational activities of tourists based in hotels are normally restricted to arrangements made by the particular hotel or travel agency (Thalund, 1988). In the main they are tours by boat to spectacular glaciers, historic remains of the Norse settlements or earlier Inuit populations, or modern "picturesque" villages. Guided, easy hiking tours are also offered. For example at Hotel Narsarsuaq, guided tours are arranged along the only marked path in Greenland, which leads to a glacier 3 hours walk from Narsarsuaq: those that make it can, with some justification, say they have touched the Inland Ice. Most city hotels offer guided tours to the immediate environment, and more expensive helicopter flights to interesting areas further afield.

Less restricted in scope of activities are the hiking tourists. Outdoor pursuits provide the possibilities for many different kinds of activity ranging from specific interests like bird-watching, botany or fishing, to sport. Hikers are free to walk anywhere on their own but most participate in hiking tours arranged by travel agencies, tending to make use of the same areas. Some hiking tours are based on use of cabins which, in the most popular hiking areas of South Greenland, are provided by sheep-farmers. Their routes are even more restricted. High costs of transportation help to keep activities in the vicinity of the airports.

More adventurous hikers, skiers and mountaineers are generally willing to pay for getting to more remote areas of the country. The National Park in North and East Greenland is a popular destination (fig. 6.1.). Crossing the Inland Ice is becoming increasingly popular

too (Jensen, 1988).

Less demanding activity holidays include fishing and hunting tours. Fishing plays varying roles in many different categories of Greenland tourism. Reindeer (*Rangifer tarandus*) hunting in West Greenland is allowed under certain restrictions and arranged trophy hunting has been established on an introduced population of reindeer in South Greenland.

The last of the major land-based activities at present is dogsledging in East, West and Northwest Greenland. These are normally tours of one week's duration and most of them are based rather comfortably in hotels. The season for this is early spring.

Cruise ships that come to Greenland make landings in towns and villages or at historic sites. Landings in towns are normally accompanied by a guided round trip in the town and/or a helicopter flight to view the area from above, or to see attractions of specific interest. Each ship makes between three and eight landings, depending on the structure of the cruise. The average length of stay ashore is approximately four hours.

4.1.4. Present environmental impact.

Tourist vessels in Greenlandic waters add to existing potential dangers such as accidents and oil spills. This is particularly significant in the light of the *Maksim Gor'kiy* accident mentioned in section 2.4.. This ship has, as mentioned, visited Greenland. However, major oil spills in Greenlandic waters have so far only involved non-tourist vessels such as supply ships.

The increased human presence during the tourist season has also the result of increasing the volume of local waste disposal and sewage. An extreme example of this is the village of Narsarsuaq which, as the main gateway to South Greenland with its airport and sizeable hotel, occasionally more than doubles its population during the summer months. However, such influence, which could induce local waste problems, is far from typical. Tourism at its present level never adds more than approximately 5% (normally much less) to the total population

in the larger towns at the same time (excluding excursionists). This means that the waste problem should be handled within the normal safety margins.

Tourist facilities have not, to any large extent, yet been established in non-urban areas. However, there are plans for this (see section 5.1.2.) and such initiatives might have a significant impact.

So far, the only reported impacts on the environment arising exclusively from tourist activities are associated with hiking/activity holidays. During debates about tourism in the Greenlandic parliament in 1977 and 1984 (see section 5.1.1.), it was postulated that hiking had caused detrimental impact on reindeer breeding cycles in the areas of Maniitsoq and Sisimiut in West Greenland. Tourists were also believed responsible for having overfished the rivers around Narsarsuaq (Thalund, 1988).

The extent of such impact has not yet been documented. However, among the citizens of Sisimiut, a strong opinion was that increasing numbers of hikers, on the route between Kangerlussuaq and Sisimiut, were having a detrimental impact on reindeer and arctic char (*Salvelinus alpinus*) populations. Initiatives were therefore taken to concentrate the hikers on a single route, including the establishment of cabins along the route that was thought to involve least harm (Thalund, 1988). Later accounts seem to indicate that the cabins were built there to actually encourage hiking in the area (Sermitiak, 1990a). If the motive for establishing these huts was purely to restrict hiking, then it represents the only case so far in Greenland where facilities for tourism in the field have been introduced in order to protect the environment.

It can generally be concluded that the present impact of tourism on the Greenlandic environment is limited. The impact on the state of historic remains is probably another story but it does not need to be considered here because it is not defined as part of the biophysical environment.

4.2. Antarctica.

4.2.1. Amount and categories.

When trying to give an accurate figure of the number of tourists and excursionists visiting Antarctica, the same problem arises as with Greenland: no central registration exists.

Little has been done to follow Reich's (1979; 1980) pioneering work, in describing the development of Antarctic tourism. Recent development in airborne tourism has been dealt with by Boswall (1986) and Swithinbank (1989), and Headland's (1989) chronological list give accounts of most activities to the end of 1988. However, in none of these later works is there any indication of the total number of tourists and excursionists visiting Antarctica.

Manheim (1990) gives a figure of 2,863 visitors aboard cruise ships in 1988, based on reports from the operators. Headland lists five Argentine and Chilean supply ship cruises carrying an average of 50 excursionists (my estimate) in 1987-88 giving a total of 250. Headland also lists seven yacht cruises which with an average of 7 on board gives the total of 49 visitors (this is an absolute minimum estimate since there might be several yachts not registered by Headland). The land-based activities are, in numbers, most significant on King George Island and a figure of 300 is estimated (Headland, pers. comm.). Finally, an average of 100 crew members aboard 30 cruises in the 1988-89 season brings the estimate for the crew visits to 3,000 (Manheim, 1990). This brings about a total rough estimate of 6,400 tourism related visitors a year at present.

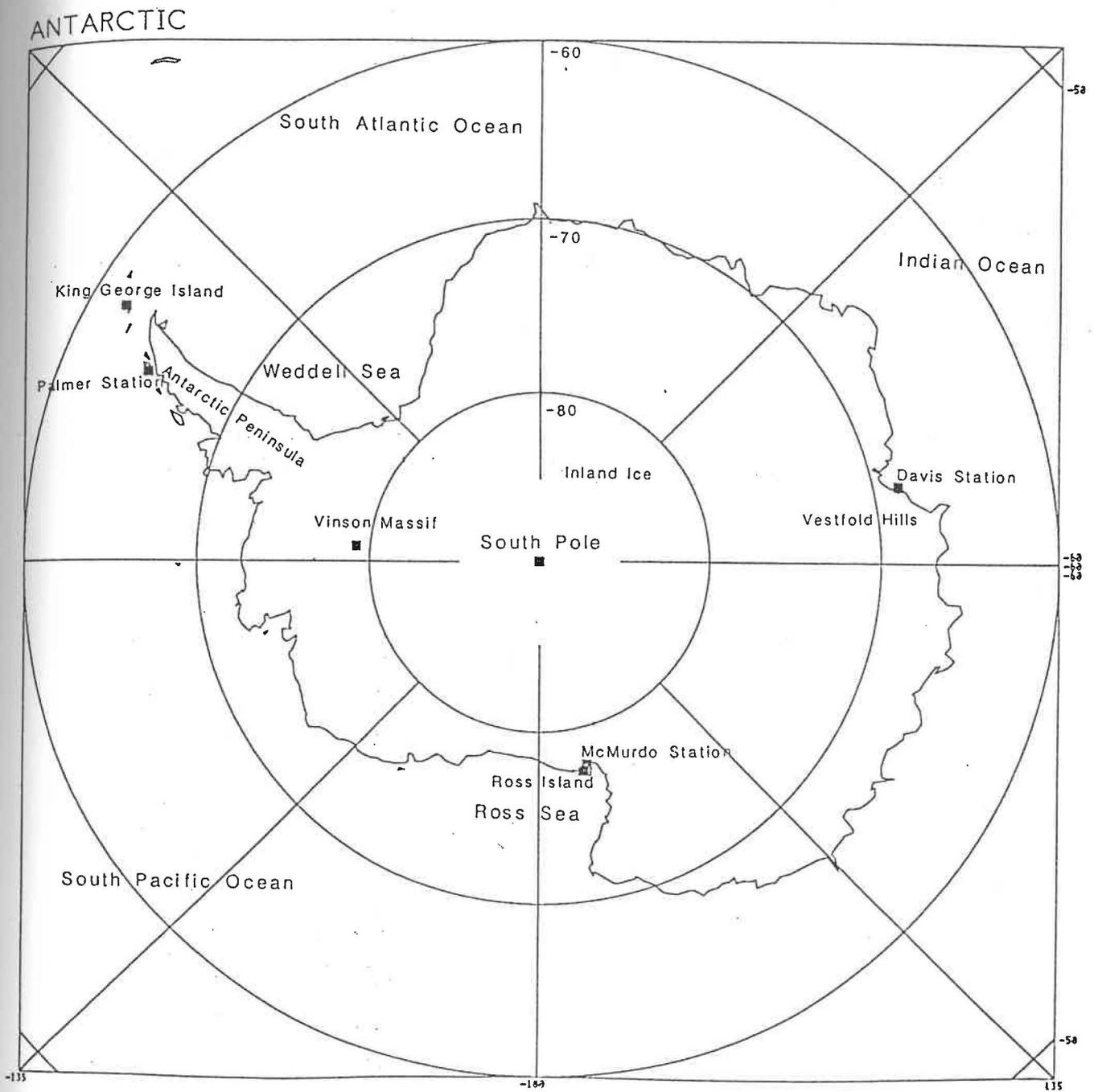


Figure 4.3. Antarctica. Only the place names mentioned in the text are shown.

<u>Cruisers</u>	<u>Supply ships</u>	<u>Yachts</u>	<u>Land-based</u>	<u>Crews</u>	<u>Total</u>
2,800	250	50	300	3,000	6,400

Table 4.2. Estimated annual numbers of tourism-related visitors in the Antarctic in five categories. Figures are based on data from the 1987-88 and 1988-89 austral summers.

These figures are in accordance with general estimates appearing in the literature (e.g. Tangley, 1988; Milton, 1989).

The two ships that have most consistently brought excursionists to the Antarctic on cruises are the *World Discoverer* and *Society Explorer*. They are relatively small ice-strengthened vessels with capacities of 100-130 passengers. Another similar cruise ship, although not ice-strengthened, *Illiria*, has been operating in the Antarctic since 1987. These cruises are normally round trips, e.g. Chile - Antarctic Peninsula - South Shetland Islands - South Orkney Islands - South Georgia - Falkland Islands - Chile, or one way trips, e.g. Tasmania - Macquarie Island - Antarctica - Balleny Islands - Campbell Islands - Auckland Islands - New Zealand.

As mentioned above, excursionists are brought also to Antarctica on board Chilean and Argentine supply vessels. The Chilean *Capitan Luis Alcazar* and especially the Argentine *Bahia Paraiso* have been used for this. This kind of cruise has, however, seemingly come to an end because of the grounding and sinking of *Bahia Paraiso* in January-February 1989 off Antarctic Peninsula (see below and 6.2.2.). The ship was at the time of the grounding on a cruise exclusively for excursionists, and carried around 80 passengers (Antarctic Journal of the US, 1989a).

4.2.2. Problems in estimating numbers.

Antarctic Treaty Recommendation VIII-6 provides a standardised form of reporting, by which tour operators can submit data about their visits to Antarctica. However, the actual use of this form is limited and it is thus impossible to give a precise picture on how many visitors went where. In the case of the 1988-89 season one company simply indicated that it visited the Antarctic Peninsula, while another identified sites visited, numbers of passengers off-loaded and duration of stay (Manheim, 1990).

To relate tourist and excursionist activities to environmental factors would be much easier if each operator fulfilled requirements to provide annual information about the number of visitors, guides and crew landed on all sites and the specific length and time of such visits.

4.2.3. Visitor activities.

The figures give a very abstract picture of the potential impact from tourism. To present a more precise idea we have to look on the actual activities of the visitors.

Sea-based activities, whether on board cruise ships, supply ships or yachts, have little impact (as long as they avoid getting wrecked), while passengers remain at sea. Cruise ships provide lectures on aspects of Antarctic science and politics and, of course, sailing in Antarctic waters provides possibilities for everyone on board to watch scenery, birds and marine mammals. Sailing a yacht in Antarctic waters attracts tourists seeking adventure, navigating a sailing boat in Antarctic waters being a challenge in itself.

Landings are normally made at sites with either interesting wildlife, historic remains (or a combination of these two) or modern research stations and due to limited numbers of areas suitable for landings these tends to be at the same sites. Cruise ships normally do not stay at one site for more than 2-3 hours.

Land-based activities are somewhat different from this. *Adventure Networks* basecamps attracts sports-orientated adventure-type tourists. From these basecamps, the highest peak in Antarctica in the Vinson Massif has been climbed and the polar plateau has been skied across by very small numbers of tourists. Tours to the South Pole by plane are open to others too, their activity being limited merely to a return trip.

The visitors flown to King George Island by the Chilean airforce have the opportunity to walk around and experience the atmosphere in the "modern" Antarctic. Three research stations are within walking distance and there is furthermore a significant wildlife in the vicinity of Teniente Rodolfo Marsh. Some of these visitors are flown back to Chile on the same day, but, as mentioned, there is the possibility of staying on.

4.2.4. Present environmental impact.

The groups of visitors that have visited natural areas in Antarctica have for the most part behaved with care and responsibility. The present cruise operators take steps to make sure that their activities cause the least possible damage. Guides-lecturers in a high ratio to the number of passengers (one for each 20 passengers) are hired for directing and controlling the excursionists on shore, and also to provide them with the basic knowledge about Antarctic wildlife that allows them to display an enlightened and respectful attitude towards it.

Complications from this kind of activity have, however, appeared. Ships crews that have not been carefully briefed, and are maybe not as motivated in their respect for nature as the passengers, have reportedly been chasing and picking up penguins, and walking into penguin and seal breeding colonies (Wikander, 1986).

Little is known about the yacht passengers habits on shore but they are still so limited in numbers that their environmental impact must be considered negligible.

The human presence in Antarctica connected with tourism is very limited compared with the presence related to scientific purposes. A rough estimate is that on a yearly basis human presence on Antarctic land for scientific purposes accounts for 375,000 man-days while this figure for purposes of relation to tourism is only roughly 16,000 man-days (including crews) spent on land. The impact of land-based activities connected with scientific stations is therefore difficult to determine. The impact of visitors at the actual research stations is not on nature, but on the life and work done at such stations, and does not need to be considered here. The activities connected with tourism might, however, have an additional impact on the environment to that presented by the station. An ultimate example of this was the dramatic decline in adélie penguin (*Pygoscelis adeliae*) breeding pairs at Cape Royds on Ross Island in the period after the establishment of the American McMurdo Station in 1956. Stonehouse (1965) reported that:

...to an observer on the spot one cause was almost certain: from 1956 Shackleton's hut and the small groups of adélie penguins had become star attractions to congressmen, parliamentarians, journalists, diplomats, soldiers, sailors, and scientists visiting Antarctica as guests of the United States and New Zealand governments. A steady flow of visiting VIP's is one phenomenon which nature discounted in fitting Antarctic penguins for their environment, and the Cape Royds adélies were unable to cope.

This example represents the only reported serious impact from land-based tourist-like activities to date. It can generally be assumed that the present impact of tourism on land is negligible.

The reason for this is probably partly that the bulk of visitors stay most of the time aboard the ships (on a 15 day cruise a maximum 60 hours is spend on land (Stonehouse, pers. comm.)) and the ships themselves seems at

present to be the biggest problem for the Antarctic environment arising from tourism. It was, after a visit to Palmer Station, purely for reasons related with tourism, the Argentine *Bahia Paraiso* ran aground leading to one of the most significant oil spill in Antarctic waters, so far. Before this, proof existed of seven tourism related ships having been involved in incidents, including three ships which ran aground and one which suffered damage (Reich, 1979; Levich and Fal'kovich, 1987).

In the case of the *Bahia Paraiso* incident it was, however, also cruise ships that helped to evacuate stranded passengers and crew (Antarctic Journal of the U.S., 1989a). The presence in Antarctic waters of sensibly operating cruise ships can therefore also be considered an improvement of the safety margins in Antarctic shipping.

Waste disposal from the ships imposes another problem. While at least one tour vessel does not dump certain wastes at sea (*Society Explorer*) and another apparently incinerates combustible wastes (*World Discoverer*), other ships have reportedly discharged garbage in plastic bags into Antarctic waters. These include the *Illiria* and the *Bahia Paraiso* (Manheim, 1990).

Generally it can be concluded that the impact of tourism on the Antarctic environment has been minimal, so far. However, it should not be taken for granted that tourism - by its own initiative - will continue to be managed along the conscientious lines that at least the cruise ships seem to be operated at present.

5. POSSIBLE DEVELOPMENT OF TOURISM.

5.1. Greenland.

5.1.1. Political initiatives.

Throughout the 1970s the Greenland authorities discussed the possibility for developing tourism. No clear picture emerged until 1977, when a policy was defined on the issue. This policy was confirmed in 1984, and very recently in June 1990, when the Greenlandic parliament again discussed the development of tourism (Christensen, pers. comm.).

The policy is to encourage tourism based on local plans. The reason for such encouragement is to create jobs and provide another source of income for the local economies in Greenland. Five basic principles for the development was agreed upon in 1984 (cited by Thalund, 1988 - my translation):

1. That tourism is developed upon the basis of judgments made by local communities.
2. That organised tourism based on existing possibilities is concentrated upon.
3. That tourism must not be in conflict with the primary industries (fishing, hunting).
4. That tourism is recognised as an industry in Greenland.
5. That stress is put upon the creation of local jobs and revenue for the communities.

At the local level the interest in encouraging tourism is determined by the location of the community. Most communities say that they would like to develop tourism but the real possibility for doing this is dependent upon the accessibility of the area. This means that communities logistically far from the three main gateways to Greenland, the airports in Kangerlussuaq/Søndre Strømfjord (West), Narsarsuaq (South), and Kulusuk (East), are currently of little interest since it is simply too expensive to get there. Local transportation is a high cost business in Greenland and for the typical tourist coming from Europe or the U.S. there is little

difference between the more easily accessible areas and the logistically remote ones.

The subsequent difference in the potential for development of tourism was reflected by an official survey made in 1985. This aimed at determining the community opinion to the development of tourism (Thalund, 1988). Five communities found little or no interest in answering the questions asked by the survey. These were Ittoqortoormiit, Upernavik, Kangaatsiaq, Paamiut and Ivittuut - communities that logistically are relatively far from the above mentioned three airports.

Because of these reasons the areas around the three mentioned gateways and areas in good logistical contact with these (e.g. Ilulissat (Disko Bay)) account for the bulk of tourists coming to Greenland. However, not all visitors come by air. Cruise liners are independent of the airports; Paamiut, for example, is a town frequently visited by cruisers (*Frederikshaab* on figure 4.2.).

Recent statements by Home Rule politicians indicate that the remote areas could have a tourist potential as well. Member of the Government Kaj Egede says: "It is not mass-tourism we want. It is directing experiences towards relatively few tourists who are willing to pay a high price for their tour..." (Sermitsiak, 1990a).

He emphasises the need for the right way of marketing and presenting Greenland. He mentions the possibility for attracting pilgrims to the remains of the oldest church on the American continent in South Greenland. He also mentions the potential for trophy hunting of polar bears (*Ursus maritimus*) in addition to the already existing trophy hunting of reindeers (*Rangifer tarandus*). The National Park in North and East Greenland is the world's biggest of its kind and is also mentioned as an attraction. Finally, he draws up the possibility for developing further dogsledging tours together with the potential for all-year skiing (Sermitsiak, 1990a). The overall goal is 35,000 tourists annually by the year 2005 but no specific plan for how this goal is to be achieved and how the development will be managed was suggested by the parliament at their debate about tou-

rism in May-June 1990.

5.1.2. Initiatives in the tourist industry.

Greenland is often in the situation where politicians have interesting ideas and perspectives, but industry has to take a more careful look at the reality behind the ideas. However, ideas mentioned by Kaj Egede above have already been realised to a limited extent.

Dogsledging in Northwest, West and East Greenland is an increasing business. Facilities for skiing are being established in East Greenland and there was recently built a ski lift in Maniitsoq. A further plan for a skiing centre exists in Nuuk.

Nuuk in particular has become the centre for many ideas and initiatives in the industry. There has been a substantial expansion of hotel accommodation in Nuuk and charter tours were introduced there in 1989. Hotels all over Greenland are now cooperating with the flight companies and from 1990 it will be possible to get low-budget charter flights with nights spent at hotels in Qaqortoq, Nuuk, Sisimiut, Ilulissat, Uummannaq or Ammassalik (Sermitsiak, 1990a).

In Nuuk there are further plans for establishing a large comfortable basecamp inland and not too far from the city. This will provide the possibility for some of the more comfort demanding tourists to get a firsthand impression of the real "wilderness". Facilities for 30 guests at a time, with a helicopter pad and a small harbour, are included in this plan. The plan still needs to be approved by the local authorities (Sermitsiak, 1990b).

Even though Greenland has the same potential for "whale-watching" as in many areas of North America where this is an important business, few initiatives in this direction exist in Greenland. Only the hotel in Uummannaq is providing this as an option for its guests.

The southernmost part of Greenland, in Nanortalik municipality, is a very rough and mountainous area of alpine character. Hundreds of unclimbed peaks present a challenge to those mountaineers who know of their exis-

tence and have the necessary resources. This group is thought by the municipality to have considerable potential if the area is presented in the right way to climbing clubs and communities all over the world. The local initiators expect to build up a substantial know-how on Greenlandic climbing and equipment (Sermitsiak, 1990a).

5.1.3. The future.

There is no doubt that a political desire to develop tourism in Greenland exists. There is, however, no comprehensive development plan and there seems to be an inconsistency between political statements and actual development in the industry.

While politicians apparently want to sell Greenland as an exclusive area to visit, the industry is doing what it can to make the tours cheaper and introduce arrangements that tend to be more like mass-tourism.

There is a natural limit to the growth determined by the inevitably more expensive travel to Greenland compared to areas closer to the world population centres. Even if it was possible to exceed this limit it might not be desirable because Greenland thereby might lose some of the image of being pristine. This is the image that to a large extent sells Greenland today (figure 3.3.).

However, to give an estimate of the future for tourism in Greenland, is it clear that with all the political support behind a tourist industry that is expanding its facilities all over Greenland, there is a substantial opportunity for an increase in the numbers of visitors coming to Greenland. The mentioned goal of 35,000 tourists by the year 2005 must, however, be considered unrealistic since this represents more than a 10 fold increase of the 3,300 annually today (Table 4.1.).

The crucial issue determining the scale of development will probably be to present Greenland in the right way. However, this should not be the only subject for attention, as will be discussed in the conclusions.

5.2. Antarctica.

5.2.1. Treaty policy.

The question of actual management of tourism by the Treaty will be dealt with later. This section only considers attitudes towards the development of tourism. Treaty policy towards the development has generally been neutral. In Treaty recommendations on the regulation of tourism appearing during the years, the introductory remarks on the increasing tourism have always used the terms "Noting" or "Recognising" the increase (Heap, 1989). The furthest the Treaty recommendations have gone in expressing an opinion on the general development is in Recommendation VIII-9 where it is "acknowledged that tourism is a natural development in the area and that it requires regulation" (Heap, 1989).

This very neutral position is probably because the Treaty encompasses some quite substantial differences in national policies towards the development of tourism in Antarctica.

5.2.2. National policies.

Argentina and Chile have for a long time brought excursionists to the Antarctic on board government ships and more recently also on aircraft. This reflects a positive attitude to the use of the area for tourism purposes as well as for science.

The U.S. has, however, been very sceptical towards this combined use of the Antarctic. Their rather negative attitude has been reflected by the way the excursionists have been "welcomed" on the scientific bases. American citizens visiting American bases in the Antarctic have complained about the reception they received. Paradoxically these American visitors have pointed towards the Polish base personnel as being much more welcoming in their attitude (Tangley, 1988; Stonehouse, pers. comm.).

U.K. scientists hold, in general, a view similar to the Americans. This negative attitude towards the development is mostly based on fear of and irritation over

scientific experiments being disturbed, either directly on bases and scientific sites, or through possible search and rescue operations. Concern about impact of visitors on research stations is felt by all of the Treaty nations and has resulted in a range of recommendations for minimising this impact.

A different view from that of the British and U.S. was presented in a report by the Australian House of Representatives Standing Committee on Environment, Recreation and the Arts reviewing the present situation of tourism in Antarctica (Milton, 1989):

The Committee does not accept that the Antarctic experience should be reserved for the privileged few who are involved in Antarctic research and the establishment and maintenance of support facilities or others because of their distinguished visitor status or their positions in administration. The Committee supports tourism to the Antarctic provided it is conducted within a regime which ensures proper protection of the wilderness values of the continent.

5.2.3. Initiatives in the tourist industry.

The Australian Committee report contained a list of all the plans in the Australian industry and also some media reports. These included (Milton, 1989):

- a Sydney group proposing an Antarctic visitors' centre and convention centre near Davis (Australian research station), based on an airstrip in the Vestfold Hills;
- a private Melbourne based consortium interested in developing a tourist facility and cruising operation based on an airstrip in the Davis region;
- another Sydney company investigating 'adventure' cruises for groups of up to 30 passengers to and from Antarctica and sub-Antarctic islands, combined possibly with a cargo operation;
- media reports of the possibility of a floating hotel in Antarctica, along the lines of the development on the Great Barrier Reef, had been raised;

- a study by another group into the feasibility of spring and autumn cruises to sub-Antarctic islands and the Antarctic ice edge in an ice-strengthened supply vessel.
- press reports about a Sydney businessman who was apparently seeking to resume the chartered overflights of Antarctica from Australia.

In the U.S. tourist industry, one tour operator apparently plans to charter a 400 passenger vessel while another has reportedly commissioned construction of two additional ships each capable of carrying 180 excursionists. A third company will operate a new 165 passenger vessel in Antarctica beginning late 1990 (Manheim, 1990).

A recent development in aviation techniques, wheeled landings on hard ice (as opposed to skis on snow) has opened perspectives for an easy way of using larger passenger aircraft for bringing visitors to the continent. The technique is already in use, and it is the plan that very large American aircraft used for transport, of the Galaxy type, shall operate on a regular basis using hard ice runways (Antarctic Journal of the US, 1989b).

5.2.4. The future.

The different plans mentioned above are, of course, not all equally realistic within the near future. However, they give a picture of an industry aware of a significant potential for tourism in the Antarctic and willing to take a chance.

There is at present nothing in the Treaty recommendations, requiring approval of new projects. In this unrestricted setting it is likely that tourism will increase, largely uncontrolled.

Erize (1987) is of the opinion that no dramatic increase in the level of visitors will happen in the near future. He gives three arguments for this, the first being economic considerations by the cruise operators. He outlines all the problems and costs in operating cruises in the Antarctic and says this will prevent the

tour operators from expanding. I think the documented plans in Australia and especially among the existing operators in the U.S. prove him wrong in assuming this.

Secondly, he mentions the risk of passengers' dissatisfaction resulting from bad weather or discomfort. There are, of course, always cases of disappointment but the general image the cruises have build up through the years is something different and the general conclusion of observers that has been on board the cruise ships does not support Erize's argument either (Codling, 1982a; Hart, 1988).

The last point he raises is the economic situation in the South American countries which is unlikely to support any expansion in tourism. In fact the Chileans, have now expanded their activities by bringing airborne visitors to Antarctica (see section 4.2.1.). This seems to be a way of injecting money into its straitened economy, since the national tourist board is heavily involved in the activities (Sernatur, 1988).

Finally, the actual figures for the development of Antarctic cruise tourism recently speak for themselves: an increase of almost 350% in a five year period, rising from 822 in 1983 to 2,863 in 1988 (Manheim, 1990).

This brings about the conclusion that the Antarctic presumably is facing an increase in the number of visitors and possibly later in the range of activities. Assuming that the mentioned present plans in the industry for operating additional cruise ships is successful, but no further airborne nor land-based activities are established, this increase is estimated to number 6,000 excursionists within the next five years. Accommodating these is 6,000 crew members which brings about a total estimate of 18,000 tourist related visitors the Antarctic annually in the year 1995. This is an increase for which there exists today no comprehensive management plan.

It is, however, also a very rough guess, and limitation of development, through the costs involved in travelling to the Antarctic, must be kept in mind.

6. PRESENT WAYS OF MANAGING ENVIRONMENTAL IMPACT.

6.1. Greenland.

6.1.1. General environmental legislation.

In comparison to Antarctica (see below), Greenland has a simple system of jurisdiction in the sense that it is only national law that is enforced; any part of Greenlandic law applying equally to visitors, visiting organisations/operators and actual inhabitants. Greenland did not have its own environmental law until 1 January 1989 when the Greenland Home Rule Authorities assumed full jurisdiction over environmental matters. At the same time they implemented *Landstingsforordning nr. 12 af 22. december 1988 om beskyttelse af miljøet* ("parliamentary law on protection of the environment") (Statsministeriet, 1988). Previously, Greenland's environmental protection had been enshrined partly in other laws and partly under Danish law.

The new law provides the framework for the local municipalities to inspect and supervise new industrial establishments in order to minimise environmental impact. So far, the law has not been applied to activities of tourism-related enterprises, but some of the present plans in the industry, mentioned in section 5.1.2. above, would seem to be of a character that demand such an application. Among other things, the law provides the possibility for the authorities to lay down rules about defray of expenses. For example, in the case of the establishment of a major tourist field camp, such expenses could aim at (my translation of "parliamentary law no. 12", Chapter 3, Paragraph 7, Section 1, 2, 3, 9, 12; Statsministeriet (1988)):

- 1) limitation of pollution from plants, construction, tools, furnace establishments and logistics...
- 2) gaining of freshwater for consumption etc.,
- 3) limitation of pollution from the sewage discharge, incineration, dumps etc., and to establishment and maintenance of such constructions.
- 9) protection of freshwater resources, air and earth..

12) repairing and restoration of damage done to landscape formations, vegetation cover etc.

There is no doubt that this law could be applied to tourist activities. However, the question is whether it will be enforced. As will be seen later, is the main concern of the Greenlandic Authorities at the moment the potential economic benefit from tourism, and the law has a section stating that any environmental consideration must be weighted against the potential benefit to the Greenlandic society from the proposed activity. This is a principle that has been withdrawn from the Danish environmental law on which the Greenlandic is modelled (Ettrup, 1989).

In addition to the general law, the Greenland Home Rule Authorities have laid down specific regulations for public access to the National Park in North and East Greenland and for expeditions to enter Greenland. These will be dealt with in the next section, but here it should be mentioned that similar regulations have been laid down for an area in Northwest Greenland. There are also a number of local conservation rules concerning areas of scenic interest and for plants, birds, fish and mammals. In addition 11 sites all over Greenland have been laid out as international wetlands according to the "Ramsar" Convention on Wetlands of International Importance (Greenland Home Rule, n.d.).

Furthermore the Greenland Home Rule Authorities have produced guidelines relating to encounters with wildlife. The guidelines are aimed at making visitors remember *inter alia* (Danish Polar Center, 1989):

- not to disturb birds at their nesting sites
- not to disturb flightless moulting ducks and geese
- not to disturb mammals accompanied by juveniles
- not to harass birds or mammals with low-flying aircraft.

The guidelines gives also advice on how to deal with each of the large mammals in Greenland.

Enforcement of these measures, and the general legislation, however, is difficult because of the remoteness of most of Greenland. An example of this is presently,

in South Greenland, an extremely small proportion of the visitors that fish for arctic char (*Salvelinus alpinus*) in freshwater areas buy the required fishing licence (Thalund, pers. comm.).

This underlines the case for controlled organised tourism where visitors are under careful supervision when they encounter the Greenlandic environment. This has been discussed in the Greenlandic parliament with regards to hunting and fishing holidays where, for environmental and safety reasons, a system with local experienced guides has been considered (Grønlands Hjemmestyre, 1989).

Considering that the majority of tourists coming to Greenland already take part in organised tours, the problem of enforcement could be solved by producing a "code of conduct". Under this, existing tour operators (ergo the guides on the spot) would be obliged to ensure the participants enforced the rules. This could be modelled upon measures already existing to control the impact of expeditions in Greenland.

Expeditions of both sport and scientific character must submit an application to the Danish Polar Center for admission to enter Greenland. Approval may be granted on a range of operational conditions which include environmental considerations. These conditions (appendix B) provide comprehensive measures to minimise the detrimental impact of expeditions on the Greenlandic environment as well as society. This model for protection might also be of relevance to Antarctica (see below).

6.1.2. The National Park In North and East Greenland.

The world's largest national park is found in North and East Greenland (Figure 6.1.). Regulations covering public access are in an Order dated 1987 made by the Greenland Home Rule Authorities.

This Order imposes vigorous restrictions on behaviour in the area of which the following examples are taken (Danish Polar Center, 1989):

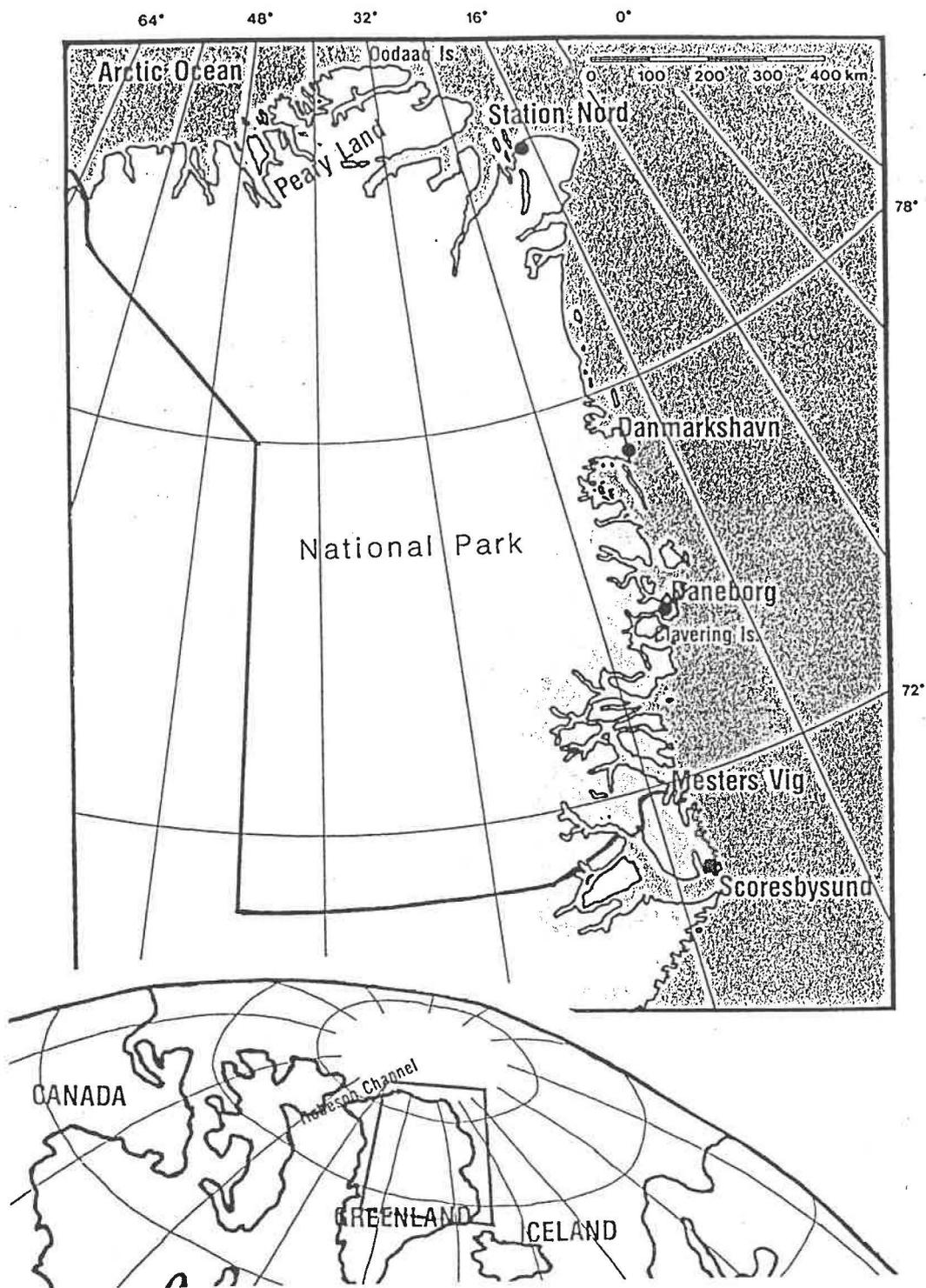


Figure 6.1. The National Park in North and East Greenland. Scoresbysund = Ittoqortoormiit.

- All larger animals are totally protected from any kind of hunting and disturbance. Fish can be caught with rod or jig.
- Use of off-road motor vehicles on bare ground is illegal.
- Streams must not be altered.
- A zoning system is in force under which specially demarcated areas are established; any kind of activity in these areas must be in accordance with further restrictions.
- Waste or contaminating products must be brought back to the stations or ships.
- Low flying and landing in the area must be previously arranged with the Home Rule Authorities.
- General access can only be permitted to parties approved by the National Park Board under the Home Rule Authorities. Application is sent to Danish Polar Center.

Suggestions that have been put forward about opening the national park for organised tourism are controversial. On the one hand it might be directly against the aims of protecting the area (scientists working there will probably take this opinion), but on the other hand is it the best protected area in the whole of Greenland and might therefore, with the right enforcement, be a "safe" area to direct the tourists towards.

This opens the general discussion about the national park strategy for protecting natural environments and the subsequent increase in visitors and was discussed in chapter 3.

6.1.3. Grønlands Turistforum.

Tourism in Greenland is officially organised by *Grønlands Turistforum* (Greenland Tourist Forum), a forum recognised by the Home Rule Authorities as the official advisory body when the £230,000 (approximately) that has been allocated to tourism related initiatives in 1990 comes to be spent (Hesseldahl, 1989). *Grønlands Turistforum* has 11 members. Representatives of: SAS, Greenlandair, Home Rule Authorities, the association of tra-

desmen, the hotel and restaurant industry, Greenland Travel, the association of municipalities, the fishermen and hunters association, the sheep-farmers association, the association of municipal tourist boards and the Greenland Trade Department.

According to a press release following the foundation of the Forum on 13 November 1989, representatives of fishermen, hunters, sheep-farmers and tradesmen were included to make sure that development of tourism is not detrimental to environmental interests (Hesseldahl, 1989). Whether this is enough of a guarantee can be questioned since these representatives all have commercial interests to one degree or another and some of them are already heavily involved in the tourist industry (e.g. the sheep-farmers, see section 4.1.3.).

The forum has recently proposed to support research into tourism in Greenland and furthermore that matters concerning tourism is transferred from the Home Rule department of traffic and trade to the department of industry (Thalund, pers. comm.). This indicates that tourism certainly is emphasised as an industry but in practice what seems to be the Forum's only concern, so far, is how and where to present Greenland as a tourist goal (Grønlands Turistforum, 1989 and 1990; Lind, pers. comm.).

6.1.4. Proposals for environmental management.

When looking for management plans for the development of tourism in Greenland, very few are to be found. The Greenland Home Rule Authorities seem, as mentioned above, to be concerned most with marketing plans, for the time being. No comprehensive management plans that take environmental aspects into account seem to be considered in connection with the allocation of £230,000 to tourist initiatives this year. Development seems in reality to be in the hands of the industry, with no protective environmental measures apart from what the law provides (see above).

The Home Rule Authorities established in 1989 a data bank with information about living resources all over Greenland (Jervin, 1989). Although the objectives of this data bank do not have much directly to do with the development of tourism, it does make reference to tourist resources and it will be an important part of a possible environmental assessment (appendix A) and therefore also hopefully apply to major tourism developments. The data bank initiative is closely related to the Inuit Circumpolar Conference's conservation strategy that as its main objectives has (Jervin, 1989):

- 1) to secure the Inuit's fundamental rights to habitual land and water areas and to self-determination, and to secure the living resources needed to maintain a high degree of self-sufficiency;
- 2) to preserve and protect the living resources, their heterogeneity/diversity and the ecological processes on which the Inuit depend, culturally as well as economically.

Furthermore the Home Rule Authorities have started an information campaign about larger animals and environmental conditions in general (see above).

No comprehensive "code of conduct" in the Greenlandic environment has been developed, and the guidelines for expeditions to Greenland provide the only initiative of such kind produced by the Authorities. Unfortunately these protective measures apply only to expeditions.

6.2. Antarctica.

6.2.1. Treaty regulations and management approach.

Although the original text of the Antarctic Treaty does not make any specific reference to tourism, several recommendations relating to tourism and non-governmental expeditions have been adopted since 1966 (see appendix C for full list and Heap's (1989) comments). The relevant recommendations of the Consultative Parties concern the following topics:

- a) information about tourist and non-governmental expeditions is provided in advance (IV-27);
- b) conditions for visits to stations may be made known (IV-27, VI-7 and VIII-9);
- c) scientific research activities must not be prejudiced (IV-27 and VI-7);
- d) visitors to the Antarctic not sponsored by a Consultative party are aware of the relevant provisions of the Treaty, Recommendations and accepted practices (VII-4, VIII-9 and X-8);
- e) the environmental effect of tourism can be monitored (VII-4 and VIII-9);
- f) provision exists to concentrate the impact of tourism if this should be considered environmentally prudent (ASTIs see below) (VII-4 and VIII-9);
- g) tour operators are encouraged to carry experienced guides (X-8);
- h) Consultative Parties consult each other about non-governmental expeditions organised in one country and requesting assistance from another (X-8);
- i) non-governmental expeditions are encouraged to be self-sufficient and to carry adequate insurance (X-8).

Recommendation VII-4 refers to the 1964 *Agreed Measures for the Conservation of Antarctic Fauna and Flora*. That agreement requires each Party to prohibit its nationals from "killing, wounding, capturing or molesting" any "native mammal or native bird" unless so authorised. In addition it calls upon each government to "take appropriate measures to minimise harmful interference

within the Treaty Area with the normal living conditions of any native mammal or bird". Harmful interference is defined to include "flying helicopters or other aircraft in a manner which would unnecessarily disturb bird and seal concentrations, or landing close to such concentrations (e.g. within 200 m). Finally, interference includes "any disturbance of bird and seal colonies during the breeding period by persistent attention from persons on foot". Each Party must ensure that these provisions are observed by ships' crews even if their nationality is different (Heap, 1989).

Zoning has been adopted by the Treaty to protect particular areas from human interference. Such areas are designated as "Specially Protected Areas" (SPAs) to "preserve their unique natural ecological system" or as "Sites of Special Scientific Interest" (SSSIs) where there is a "demonstrable risk of interference" with scientific research or the site is of "exceptional scientific interest" (Heap, 1989).

When the Treaty Parties agreed in 1975 that tourism in the Antarctic is a "natural development" (see section 5.2.1.) they also requested each commercial operator to land only within designated "Areas of Special Tourist Interest" (ASTI) - f) above. However, no ASTI has been designated yet.

Instead, in response to Recommendation XIII-5 about additional protective arrangements, which the Treaty Parties adopted in 1985, the Scientific Committee on Antarctic Research (SCAR) produced a report evaluating the system of protected areas and the need for a different kind of protection. This recommended that, among other things, the parties establish extensive multi-purpose areas where sites would be zoned for different levels of protection and use (e.g. scientific research, tourism, commercial fisheries, etc.) and SCAR suggested such areas should be designated as "Antarctic Protected Areas". Management plans for specific areas, for example Ross Island, to fit into such a system, were prepared by New Zealand, U.K. and the U.S.. SCAR concluded that with the present system there was no provision for protecting

areas of recreational, cultural, aesthetic, scenic or wilderness value in Antarctica.

To address these findings, however, the Treaty Parties took a slightly different approach from that suggested by SCAR. They created two additional categories of protected areas at the XV Antarctic Treaty Consultative Meeting (ATCM) in 1989: "Multi-use Planning Areas" (MPAs) and "Specially Reserved Areas" (SRAs). The extent to which tourism activities will be permitted within such areas will depend on specific management plans drawn up for each site (SCAR, 1990).

With regards to waste disposal from (tourist-) ships at sea the Treaty has recently recommended (Recommendation XV-3) that this should be in accordance with the international Convention for the Prevention of Marine Pollution by the Dumping of Wastes and other Matter (London Dumping Convention) (SCAR, 1990).

Overall, the picture of Treaty regulations on tourism is complex. It would be useful to improve the existing situation by integrating all the rules and regulations into one convention.

What remains is the question of enforcement of these rules and regulations. While individual Consultative Parties are legally obligated to ensure compliance with the environmental rules by visitors who are their nationals, phrases such as to "inform, in so as far as they are able"; "use their best efforts to ensure"; "to the extent practicable they encourage" (see Recommendations VI-7, VII-4 and X-8 in appendix C) imply that in relation to visitors who are not nationals the Recommendations are only "hortatory, 'soft' law" (Boczek, 1988).

Enforcement is left to the Consultative Parties' national legislations and will be dealt with in the next section. However, the Treaty does leave some serious jurisdictional uncertainties behind as pictured by Nicholson (1986):

...what is the responsible flag state in the case of an incident involving, say, a Panamanian registered vessel, with a Greek captain, a Philippine crew, carrying an international party of tourists on a charter tour organised by a travel agent in the United States under a joint arrangement with travel agents in Britain, France and Germany and departing from New Zealand for the Ross Sea and the Antarctic Peninsula?.

6.2.2. National regulations.

As mentioned, the Consultative Parties are obliged to implement the Treaty Recommendations, regulations and declarations of protected areas in their national legislations. The following examples show that practice varies.

Australia adopts a territorial basis of environmental jurisdiction which applies not only to Australian citizens, but also to "any persons and property, including foreign persons and property" in the Australian Antarctic Territory (Antarctic Treaty (Environment Protection) Act 1980, S.4(1)(a)). France adopts a similar territorial jurisdiction in relation to Adélie Land (Triggs, 1986) broader than that adopted by New Zealand which does not assert jurisdiction on nationals of other Treaty nations (The Antarctica (Fauna and Flora) Regulations, 1971). The United Kingdom legislation implementing the *Agreed Measures* from 1964 (see above) applies to the whole of Antarctica, rather than just to the British Antarctic Territory, but it applies only to British nationals (figure 6.2.) (Antarctic Treaty Act, 1967).

The U.S. *Antarctic Conservation Act of 1978* applies to any United States citizen in the Antarctic. The term "United States citizen" is defined as "any individual who is a citizen or national of the United States; [and] any corporation, partnership, trust, association, or other legal entity existing or organised under the laws of any of the United States" (Antarctic Conservation Act of 1978, S.3(16)). This is of significance to the que-

stion of jurisdiction over tourism activities because all of the principal Antarctic tour operators at present are incorporated in the United States. The Chilean and Argentine operators and the Canadian company *Adventure Network* (see section 4.2.1.) are in association with American travel agencies and the present cruise operators, *Society Expeditions* and *Salen Lindblad Cruising*, are both American based. It has therefore been argued that, with the present situation of tourism, "unilateral action by the U.S. could reduce harassment of Antarctic wildlife and increase protection of particularly vulnerable sites.." (Manheim, 1990).

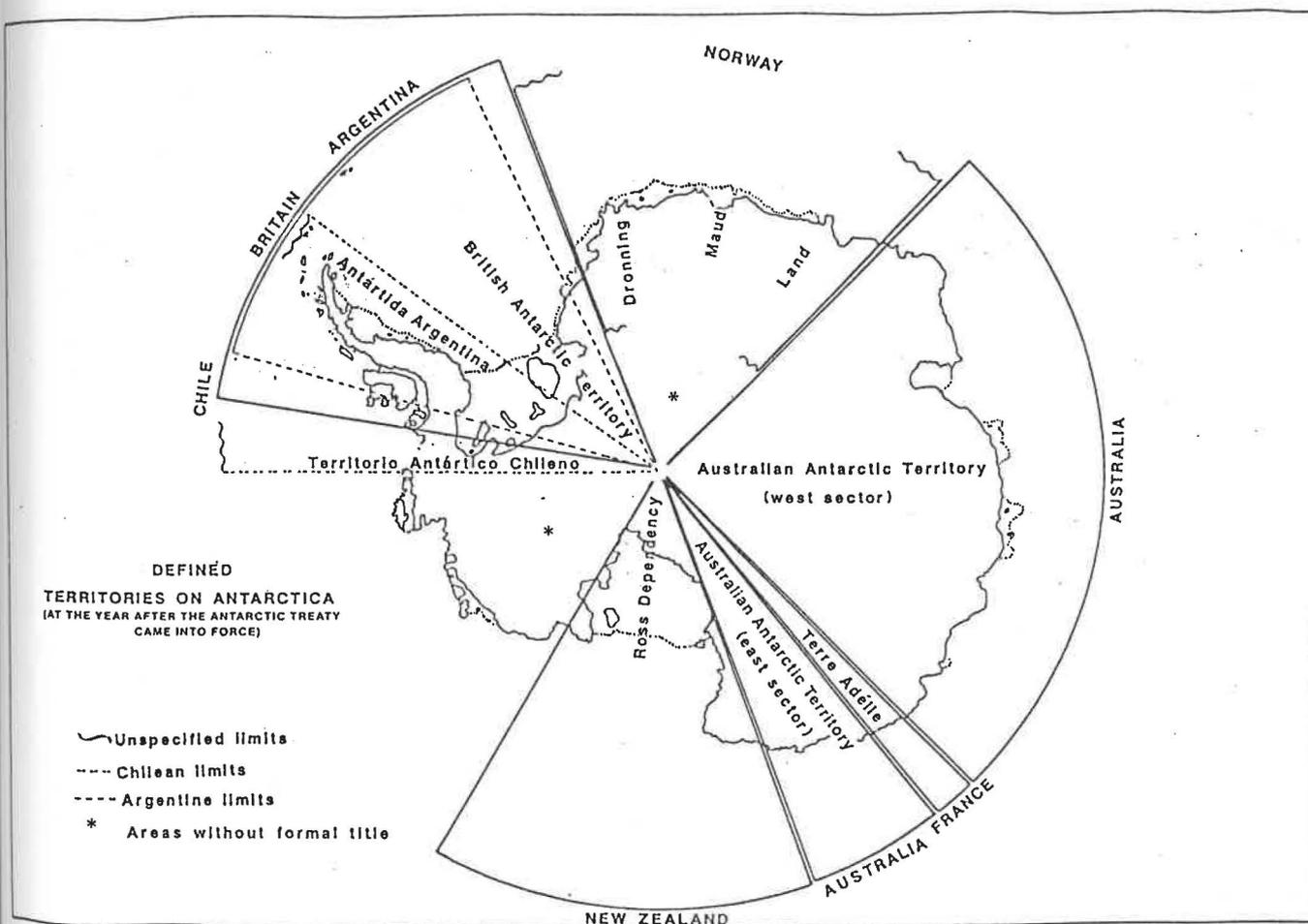


Figure 6.2. The seven territorial claims to the Antarctic (Headland, 1989).

The conclusion presented in section 4.2.4. is that, at present, there is no significant impact on the Antarctic environment but if the development predicted in section 5.2.4. becomes reality this might not continue to be so. There exists no post-Treaty record of any criminal law

case inside the Antarctic Treaty area (the first and only was in 1953) (Headland, 1989), so no evidence exists as to how the present juridical system can cope with a possible incident causing serious environmental damage. One fears that the complexity of the jurisdiction could prevent such a case from being brought to court.

When the Argentine ship *Bahia Paraiso* ran aground near Palmer Station on the Antarctic Peninsula in January 1989, a spill of more than 250,000 gallons of diesel fuel followed (Manheim, 1990). The clean-up after this was largely done by the U.S. Coast Guard. In any other place in the world this would probably have resulted in an international law case for recovery of costs. The U.S. have, however, avoided this, most likely due to the difficult legal situation.

However, it can be concluded that whatever scenario might follow a serious environmental impact arising from tourism activity, the present legal system to resolve this is extremely complex, particularly if the incident involves a "third party".

6.2.3. Proposals for environmental management.

Tourism is already present as a commercial activity in the Antarctic Treaty area and is most likely to increase in the near future (section 5.2.4.). During the last eight years' battle about a convention on possible future exploitation of minerals in the Antarctic the argument has regularly been raised that it might be more relevant to discuss a convention on regulation of tourism.

Such a convention is probably desirable. Recognising this, the earlier mentioned report to the Australian House of Representatives recommended that discussions at the Consultative meetings for the development of a tourism convention for Antarctica be initiated (Milton, 1989). However, the discussions relating to minerals development have resulted in Australia and France rejecting the proposed Convention on Regulation of Antarctic Mineral Resource Activities (CRAMRA) and instead propo-

sing a convention on "comprehensive measures for the protection of the Antarctic environment and dependent and associated ecosystems" (Australian, 1989). This proposal covers also the question of regulation of tourism and represents a so called "top down" approach which means it seeks to provide comprehensive measures that apply to all parts of the Treaty System; this is in contrast to a "bottom up" approach which deals with the specific problems as they appear and characterise the way the Treaty System has operated thus far.

The presently unresolved situation with CRAMRA versus "comprehensive measures" prevents any further discussion within the Treaty System about a comprehensive management plan for tourism in the Antarctic; even so such a plan would take several years to negotiate. At a national level the Australian House Committee expects within a shorter time scale that any land-based tourism initiatives in the Australian Antarctic Territory would be rejected by the Australian Government until a comprehensive management plan for tourism has been agreed (Milton, 1989).

Realising further, that at present the major part of Antarctic visitors come by ship, the Committee recommend that a system requiring approval before entry to the Treaty area be implemented. In considering such approvals it would be necessary to take account of the nature of the vessels, qualification of tour leaders, education programmes for passengers and sites to be visited.

Such a system of approval would demand some sort of an institution under the ATS to function as a secretariat for the consideration of the applications by a competent body. The case for a secretariat for the ATS as a whole is often raised and the arguments for it expands into most areas of the Treaty System. South American countries; notably Argentina, fear that such a secretariat might diminish their role in the ATS and have, so far, managed to prevent it from being established (Heap, pers. comm.). However, the secretariat suggested here could be concerned only with serving the possible convention on tourism as the Convention on the Conservation

of Antarctic Marine Living Resources (CCAMLR) under the ATS has its own secretariat in Australia. A board with official representatives from the Consultative Parties could once a year consider applications for entry to the Treaty area and the secretariat could function as the place where applications is send forward to and from where information on conditions for entry could be obtained. Such a system would be in line with the management of entry for expeditions to Greenland as described above.

Site management has been the subject of proposals for improvement. Partly with regards to the increasing pressure from tourism on the Antarctic protected areas Keage et al. (1989) suggest a:

Register embracing (a) environmental sensitive areas, (b) historic and cultural sites, (c) protected site activities and the names of relevant contact specialists and (d) registered site specimen collections. The Register could be maintained on a desk-top computing system accessible to Antarctic Treaty Parties and interested non-governmental parties [e.g. tour operators], thus contributing to environmental assessments of existing and proposed activities.

This is very much in line with the general theories for development described in chapter 3.

Quite a few practical "codes of conduct" in the Antarctic have been prepared. SCAR provided *A visitor's introduction to the Antarctic and its environment* (SCAR, 1980) which is very general in its approach with e.g. no up to date information on protected areas. An independent attempt to provide a more detailed *Antarctic traveller's code* was reviewed by Stonehouse (1990) and described as "a practical starting point - a kerb-drill for all who visit Antarctica". However, probably the best "code of conduct", so far, has been produced by the industry itself (Society Expeditions et al., 1989b).

In addition to the codes that apply to the Antarctic, several others have been produced for some of the peri-Antarctic islands north of 60°S. These fall outside this thesis' definition of the Antarctic but it should be noted that much of the environmental management experience and existing proposals there is highly relevant to polar regions in general (Dingwall et al., 1985; Keage, 1987; Cooper and Condry, 1988).

Finally, the opinion of environmental groups should be heard. These, like the Treaty Parties, have generally accepted that tourism is a natural development. However, they argue strongly against any land-based facilities and recommend that permission for tourists and excursionists to enter the Treaty area be considered on a case by case basis (Rigg, pers. comm.; ASOC, 1989). The American Environmental Defense Fund have pointed out in a comprehensive report the possibilities for the U.S. Government to protect the Antarctic environment against hazards resulting from tourism activities through the enforcement of national law and regulations (Manheim, 1990).

7. CONCLUSIONS.

This study has raised a number of questions to which I have attempted to find answers. Here the more important findings are summarised and conclusions drawn.

What is the current scale of tourism in the studied polar environments?

Tourism in the two case study areas is still minor. 6,700 tourism-related visitors come to Greenland annually; the equivalent figure for Antarctica is 6,400. These figures are minor compared with those for most other tourist areas of comparable size in the world, and minor too in the sense that they fall well below the potential of the two areas.

What is the likely development?

It can generally be concluded that tourism will continue in the polar regions. With increasing infrastructure and logistical facilities tourism in the polar regions must be considered a historic inevitability (section 1.2; 5.1.3.; 5.2.4.). However, it is also concluded that there are limits to development; important here are costs involved in travel to the polar regions. Tourism in polar regions will never be able to compete in price with areas like the Himalaya and the Alps which are closer to the main centres of world population (section 5.1.3.). Mass tourism in polar regions may be self-inflicting since what makes people pay the higher price is the exclusiveness that still characterise tourism there.

In Greenland, politicians in the parliament have a goal of 35,000 tourists annually by the year 2005 (section 5.1.1.). The tourist industry is expanding facilities in suitable areas of Greenland, so the 35,000 might be logistically possible to accommodate. However, since the politicians' ideal is to cater for the more exclusive end of the tourist market, the goal actually represents more than a 10-fold increase within 15 years (section 5.1.3.). This is considered unrealistic but should

it be realised, certainly will call for careful environmental planning.

It has been pointed out how national attitudes to tourism in the Antarctic vary from American scientists giving American citizens a very cold "welcome" at U.S. research bases, to Chilean and Argentine use of government supply ships as excursionist cruises. The Antarctic Treaty System is unable, at the moment, to issue permits to tourist operators, and its only means of controlling the activities is through the recommendations on tourism (section 6.2.1.).

The tourist industry is expanding: new cruise ships are being built and plans for land-based activities are being prepared. Combined with evidence for an increase in visitor numbers during the last decade, this indicates that tourism is increasing in the Antarctic as well as in Greenland. Within the next five years, assuming the present plans of the industry are successful, this increase is estimated to be in the scale of 12,000 tourism related visitors in the Antarctic leading to an annual figure of around 18,000 (section 5.2.4.).

What environmental problems may rise from the development?

Chapter 2 outlines the environmental hazards rising from tourism and is very much a "worst scenario". However, the predicted developments in Greenland and Antarctica call for an awareness of the problems outlined in chapter 2.

The concentration of visitors in relative small areas and in limited seasons makes the environmental effect more profound. For example, with the present population in Greenland of 55,000 the politicians goal of 35,000 tourists annually would be the equivalent of 35 million tourists in England, concentrated in three rather small areas and in two seasons of approximately two months each. This example might say more about the cultural impact, but it does reflect the general effect of concentration.

Erosion, wildlife disturbance and eutrophication following sewage discharge are all problems that come from the concentration of visitors and are all likely to appear with the predicted development in Greenland and Antarctica. In Greenland the tourists are concentrated in areas around, and logistically close to, the three main gateways because of the costs of local transportation. A limited number areas in the Antarctic tends to be used for landings of excursionists on board cruise ships.

However, concentration of visitors is at the same time an important tool in managing the environmental impact of tourism.

Is there justification for comprehensive management plans?

My conclusion is yes - not only because of the case of the environment in itself and the interaction between general environmental awareness and tourism (section 1.3.), but also for the simple reason that any of the problems pictured in chapter 2 will prove directly detrimental to the tourist industry. Visitors in polar regions are generally highly concerned about the environment; for operators to stay in business, the environmental damage must be minimised.

Is current environmental management in Greenland and Antarctica sufficient?

In Greenland there is no application of general environmental management plans at the moment (section 6.1.). *Grønlands Turistforum* has been established to give advice and recommend on the development of tourism in Greenland. However, it is unfortunate that this forum, which could be concerned with managing, is concerned only with marketing and pays no attention to modern management strategies.

The management of the National Park in North and East Greenland and the regulations on expeditions provides a useful example for Antarctica (see below). The environmental law in Greenland and the Inuit Circumpolar Confe-

rence's conservation strategy mentioned in section 6.1. provide very good "baselines" for environmental management in Greenland, though the opportunity to use these for comprehensive planning has not been taken at present.

Application of general theories for planning in Antarctica is somewhat different from Greenland. Certainly there is awareness of the need for comprehensive planning (section 6.2.3.), but in the case of tourism, still largely limited to site management. However, through the adopted recommendations (section 6.2.1. and appendix C) the Antarctic Treaty System has taken some initial steps to control tourism. It remains to bring them together in a convention to which the general theory described in section 3.1. could be applied. Environmental impact assessments have already been applied to Antarctica (section 3.2. and appendix A).

However, a general problem for Antarctica, i.e. the enforcement of recommendations, also applies to tourism. A general solution to this problem is the establishment of some kind of institution with the power to approve and reject projects in the Antarctic. This leads to an examination of what can be learned from Greenland and Antarctica and particularly what the two areas can learn from each other.

How can the management in Greenland and Antarctica be improved - what can they learn from each other?

Greenland provides, as mentioned above, an example on how evident opportunities for management can be missed. However, the system that controls the National Park in North and East Greenland and the entry of expeditions to Greenland in general might be worth considering as a model for Antarctica. The Danish Polar Center acts here as a secretariat for competent boards that evaluates a series of operational conditions for approval of projects (section 6.1., appendix B). A similar system could be adopted for Antarctica (and has been suggested already, section 6.2.3.) once a secretariat has been established. This is, however, a controversial issue

within the Treaty System (section 6.2.3.).

However, this secretariat do not need to cover the whole of the ATS but could be concerned only with tourism (section 6.2.3.). A convention on the management of tourism, and a secretariat to receive applications for entry to the Treaty area which is to be considered by a competent board with enforcement power (as far as Treaty institutions have the power to enforce (section 6.2.1.)), is concluded to be the ultimate solution for Antarctica.

What then can be learned in the Arctic from the development of tourism in the Antarctic so far?

At a recent symposium on the development of tourism on Svalbard, Emmelin (1989), reviewing international experiences with relevance to Svalbard, concluded that "little is to be learned from Antarctica". I think this is a wrong assumption. Practically speaking, there exist "codes of conduct" of which some are worth consulting when similar guidelines are to be produced in the Arctic. So far, the best such guidelines have been produced by the industry itself (Society Expeditions et al., 1989b; section 6.2.3.).

Furthermore, Antarctica provides an interesting, almost philosophical, general reflection on how we as humans would manage our own environment in the case that humans were not present. Matching this perspective with the actual situation in today's industrialised world allows us to see just how much damage we actually accept in our own environment. This is probably the reason a somehow irrational term, "wilderness", becomes specific in its meaning.

This pure environmental view of Antarctica, however useful, also reflects the narrow perspective of this thesis when it comes to inhabited areas like Greenland. In any such area the reality is that the environmental aspect has to be counter-balanced to a certain extent by the benefits from the activity in question. Inherent in such a cost/benefit analysis is an acknowledgement of the fact that any tourist activity will have a certain impact. The question is then, how much impact will be

accepted (section 3.1.). The application of cost/benefit analysis also indicates the fact that no development of tourism can be seen in isolation from other areas of a given society. Planning of tourism has to be in accordance with development in other sectors so that, for example, a major hydropower project is not situated in the same area that has been designated to the development of tourism with emphasis on activities in "unspoiled" nature (section 3.1.).

However, as mentioned above, the present situation in Greenland is that the authorities seem almost exclusively to be interested in the potential benefits from tourism and pay little attention to what costs that will be incurred. A political statement saying that "tourism must not be in conflict with the primary industries" (section 5.1.1.) reflects again only concern about financial costs and does not in any case carry much of a guarantee. Here the general management theory becomes relevant again to help defining exactly what will be accepted as reasonable costs and what will not.

The general conclusion in this thesis, that comprehensive management schemes are essential when developing tourism in polar regions, is supported by recent reviews of development of tourism in the Falkland Islands and Svalbard. In the case of the Falkland Islands *Fielder Green Associates*, the marketing and management consultants with responsibility for developing tourism in those Islands, have shown a particularly enlightened approach in including, in their brief, the necessity to undertake after five years an environmental impact assessment of the impact of tourism on the Islands as a whole (Romeril, 1989b).

The mentioned symposium on the future development of tourism on Svalbard, which was attended by representatives of Svalbard inhabitants, local authorities, academics, environmental organisations and the Norwegian ministries of jurisdiction, environment and trade, concluded similarly that established environmental management procedures for tourism should be applied and fur-

thermore they stressed the need for a superior development strategy (Emmelin and Lien, 1989).

The seriousness of the view of environmental planning in these two examples is striking considering the actual number of visitors here are lower than in Greenland and Antarctica. The main conclusion of this thesis is that environmental aspects of tourism in polar regions are not a "storm in a teacup". There is no reason that the development of tourism should not be in harmony with the environment but it need careful attention and planning based on sound ecological principles.

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APPENDIX A

The key stages that should be taken in any Environmental impact assessment, as suggested by Benninghoff and Bonner (1985), are:

- 1) *Documentation and description of proposed activity.*
Information on location and design features. Background information describing the needs to be met by the proposed project. Which impacts are likely to result from the activity?
- 2) *Preparation of an environmental assessment (EA).* An independent reviewer or advisory group is to decide whether the proposed activity will have a significant impact on the environment. If it is considered that it will not, then it should be implemented under the proviso that it is monitored by means of the execution of:
 - a) A review analysis of the pertinent institutional information (laws, regulations...).
 - b) The identification of possible impacts from any activities associated with the project. Possible hazards should be recognised through literature studies and other sources of experience with similar projects.
 - c) The preparation of a description of the environment where the project is to be carried out. This should be quantitative for certain environmental factors and qualitative for others. Historical trend records can extend the baseline. Published material from the site and its similar environments is useful.
 - d) Prediction of impacts. Qualitative and quantitative information is needed on the types of impacts and on factors causing impacts. Information on predictive techniques and their input information is also necessary.
 - e) An assessment of the predicted impacts. This necessitates the assembly of information from appropriate standards and criteria, a knowledge of qualitative regulatory requirements and similar

previous project. This stage requires the exercise of considerable professional knowledge.

- 3) *Preparation of an Environmental impact statement (EIS)*. If the proposed activity is believed to have potentially significant impacts on the environment, an EIS should be prepared. This should include:
 - a) A description of the proposed project and feasible alternatives.
 - b) A description of the initial environmental reference state with which predicted changes can be compared. Likewise a prediction of the future without the activity.
 - c) An estimate of the nature, extent, duration and intensity of the changes resulting and the identification of key indicators.
 - d) An estimate of the significance of the predicted environmental changes, that is, the acceptability of the proposed activity.
 - e) Identification and evaluation of alternative options. Identification and description of possible measures to mitigate the predicted undesirable impacts.
- 4) *Preparation of a judgement on mounting the proposed project*. On the basis of the EIS, a decision should be made as to whether or not to proceed with the proposed activity. Conclusions should be reported and this document should be completed by the (government) agency responsible for the proposed activity following completion of the EIS. Selection of the proposed action from the options evaluated (including the option of abandoning) is the focal element in the EIA procedure. Information should be provided on the methodologies useful for decision making. Often a best-worse scenario is useful.
- 5) *Implementation following a favourable judgement*.
- 6) *Implementation of mitigation procedures*. Unavoidable impacts should be identified and procedures to mitigate them should, if possible, be instituted.

- 7) *Monitoring of key indicators of environmental change.*
The key indicators (from 3) c)) should be monitored. Comparisons should be made between the changes taking place and the predictions made in the EIS. This needs a systematic environmental monitoring programme.
- 8) *Dissemination of Environmental assessments and impact statements.* For reviewing.

APPENDIX B.

The idea presented in section 6.2.3. is that a possible competent board could approve tourism related activities in the Antarctic on similar conditions to the ones that Danish Polar Center enforce on expeditions before allowing entry to Greenland. Approval of expeditions to enter Greenland may be granted by Danish Polar Center on *inter alia* the following conditions (further conditions exists for scientific expeditions):

1. The expedition must comply fully with all general and local rules, regulations, bye-laws etc.
2. Entry into Greenland must take place through routes specified in the application and approved by the Polar Center.
3. The expedition must report to the local authorities (viz. the municipality or the police) at the start of the expedition, which must follow the route indicated in the application and shown on the map(s).
4. In case of change of route and/or cancellation of the venture immediate notice must be given to the local authorities as well as to the Danish Polar Center.
5. The time and place of departure from Greenland after completion of the expedition must be reported without delay to the local authorities and the Polar Center.
6. The expedition must assume full responsibility for any injury and personal, governmental, municipal and similar property in Greenland and for any other consequences in Greenland land or sea territory caused by the implementation of the expedition project.
7. The expedition must remove all litter, including drums, empties, waste etc. from the activities in the expedition area prior to the departure from the area.

8. The expedition must cover any expenses defrayed by the Danish authorities in connection with search and rescue operations, if any, initiated to assist the expedition. If deemed necessary by the Polar Center, the expedition must produce an insurance policy or bank guarantee to cover any such expenses. The expedition must accept the facts and conditions in relation to search and rescue operations outlined.. [elsewhere in the guidelines].
9. If deemed necessary by the Polar Center the expedition must carry radio equipment, such as an emergency radio-beacon. The expedition should note that the activation of such emergency equipment - due either to failure or to a distress situation - may initiate a search and rescue operation for which the expedition will be held responsible.
10. A copy of the Danish Polar Center's letter of approval must be carried by each of the field parties of the expedition so that it can be produced on request from any local authorities (municipality, police etc.) encountered during the stay in Greenland.

APPENDIX C.

Antarctic Treaty recommendations on tourism and relevant extracts from Antarctic Treaty Consultative Meetings.
From Heap (1989).

Introductory Note

Commercial Tourism

Until 1966 virtually all expeditions to the Antarctic had been organized by governments or had some measure of governmental backing. In that year, however, there appeared in the Antarctic for the first time a commercially organized, ship-borne tourist expedition. In subsequent years commercial tourism increased using ships and aircraft. The areas most frequently visited by sea were the Antarctic Peninsula, Victoria Land and Ross Island. A peak was reached in 1974-75 when about 3750 tourists visited Antarctica in seven cruises carrying between 400 and 800 passengers each. In more recent years ship-borne tourism has normally involved two ships, each carrying 100 to 150 passengers and making two to four voyages during a summer season. Most landings are made at occupied scientific stations. Regular airborne tourism began in 1977 and developed using long range passenger aircraft flying from Australia and New Zealand. Almost all these flights have overflown parts of Antarctica and returned home without landing. Airborne tourism diminished considerably following the tragic crash on Mount Erebus, Ross Island, on 28 November 1979 with the loss of 257 lives. In the last year or two there has been the beginnings of adventure tourism, using aircraft to penetrate and land deep within the continent, offering the possibility of visits to the South Pole itself.

Non-governmental expeditions

Such expeditions also began to appear in the Antarctic in 1966. Their purposes for the most part are recreational and adventurous and they normally find their own way to the Antarctic in yachts or other small ships. Some of them carry out scientific research which contributes, and is complementary, to the work of governmental expeditions. They are distinguished from governmental expeditions by being inspired by an individual and having little more than notional support from the government of the country in which they are organised. They are distinguished from tourism by being heavily dependent on sponsorship or other private contributions in cash or kind. The preparedness of such expeditions can be as much a function of the support they have been able to raise as of the objective risks they take; the consequent requests for assistance from governmental expeditions have sometimes caused disruption to scientific programmes and a major aim of the consideration engendered by these expeditions within the Treaty fora has been to encourage such private expeditions towards adequate preparation and self-sufficiency.

Consultative Meeting consideration of issues and measures adopted

The main concerns of the Consultative Parties have been to ensure that:

- a) information about tourist and non-governmental expeditions is provided in advance (IV-27(1));
- b) conditions for visits to stations may be made known (IV-27(2), VI-7(2) and VIII-9(2)(a));
- c) scientific research activities are not prejudiced (IV-27 and VI-7);
- d) visitors to the Antarctic not sponsored by a Consultative party are aware of the relevant provisions of the Treaty, Recommendations and accepted practices (VII-4(2), VIII-9 and X-8 Part I);
- e) the environmental effects of tourism can be monitored (VII-4(3) and VIII-9(3));
- f) provision exists to concentrate the impact of tourism if this should be considered environmentally prudent (VII-4(3) and VIII-9(2)(b); see also extracts from Reports of the IXth and XIIth ATCM's);
- g) tour operators are encouraged to carry experienced guides (X-8, Part III);
- h) Consultative Parties consult each other about non-governmental expeditions organized in one country and requesting assistance from another (X-8, Part II);
- i) non-governmental expeditions are encouraged to be self-sufficient and to carry adequate insurance (X-8, Part II).

IV-27: Effects of Antarctic Tourism

Recognizing that the effects of tourist activities may prejudice the conduct of scientific research, conservation of fauna and flora and the operation of Antarctic stations,

The Representatives recommend to their Governments that:

1. The Government of a country in which a tourist or other non-scientific expedition is being organized furnish notice of the expedition as soon as possible through diplomatic channels to any other Government whose station the expedition plans to visit;
2. A Government provide on request information as promptly as possible regarding the conditions upon which it would grant permission for tourist groups to visit Antarctic stations which it maintains; and
3. Such permission be withheld unless reasonable assurances are given of compliance with the provisions of the Treaty, the Recommendations then effective and the conditions applicable at stations to be visited.

VI-7: Effects of Tourists and Non-Government Expeditions to the Antarctic Treaty Area

The Representatives,

Noting the increase in recent years in the number of tourists and also in the number of visitors who are not sponsored by the Consultative Parties to the Antarctic

Treaty Area;

Considering that the activities of such visitors can have lasting and harmful effects on scientific programmes, on the Antarctic environment, particularly in Specially Protected Areas, and on historic monuments;

Desiring to ensure that such visitors are afforded the best view of stations in the Antarctic compatible with the research programmes being undertaken;

Recalling paragraph 5 of Article VII and Article X of the Antarctic Treaty and Recommendations I-VI and IV-27;

Recommend to their Governments that:

1. They should exert appropriate efforts to ensure that all tourists and other visitors do not engage in any activity in the Treaty Area which is contrary to the principles and purposes of the Antarctic Treaty or Recommendations made under it;

2. They should inform, in so far as they are able, those responsible for expeditions to the Treaty Area which are not organized by a Consultative Party but organized in, proceeding from, or calling at, their territory, of the following:

a) that final arrangements to visit any station be made with that station between twenty four and seventy two hours in advance of the expected time of arrival;

b) that all tourists and other visitors comply with any conditions or restrictions on their movements which the station commander may stipulate for their safety or to safeguard scientific programmes being undertaken at or near the station;

c) that visitors must not enter Specially Protected Areas and must respect designated historic monuments;

3. Advance notice of all expeditions to the Treaty Area not organized by a Consultative Party, but organized in, proceeding from or calling at that Party's territory, shall be given, in so far as is possible, to the other Consultative Parties. Such notice shall include the relevant information listed in Recommendation I-VI;

4. Until such time as this Recommendation becomes effective in accordance with Article IX of the Antarctic Treaty, it shall be considered, as far as feasible, as a guideline.

VII-4: Effects of Tourists and non-Governmental expeditions in the Antarctic Treaty Area

The Representatives,

Noting the increase in the Antarctic Treaty Area in the number of visitors who are not sponsored by Consultative Parties;

Considering that both Governments and such visitors would benefit from having available to them an agreed statement:

a) of accepted practices in the Treaty Area including, *inter alia*, the need for self sufficiency and prior notification of intended arrival at a station, which such visitors

would be expected to follow (to which could be appended the particular conditions imposed by each government for a visit to any one of its stations); and
b) of the relevant provisions of the Antarctic Treaty and of the Recommendations made under it;

Recalling Recommendations VI-7 and VI-11 concerning the possible harmful effects of such visitors on scientific programmes and on the Antarctic environment; Convinced of the need to avoid unnecessary interference with natural ecological systems which are not sufficiently understood and continue to be the subject of research;

Conscious that the Treaty Area contains many unique features of historical, scenic and general scientific interest;

Recommend to their Governments that:

1. They keep under review, in the light of existing Recommendations, the effects in the Treaty Area of tourists and other visitors who are not sponsored by Consultative Parties;

2. They consider drawing up at the Eighth Consultative Meeting a statement of those accepted practices and relevant provisions about which all visitors to the Treaty Area should be aware;

3. They consult each other well in advance about the possibility of designating at the Eighth Consultative Meeting an adequate number of areas of interest to which tourists could be encouraged to go, and about the criteria to be used to determine such areas;

4. They use their best efforts to ensure that the provisions of the Treaty and subsequent Recommendations relating to the conservation of Fauna and Flora are applied in practice to all visitors who are not sponsored by Consultative parties, as well as to tourists.

VIII-9: Effects of Tourists and non-Governmental expeditions in the Antarctic Treaty Area

The Representatives,

Recognizing that tourists and other persons not sponsored by Consultative Parties are visiting the Antarctic Treaty Area in increasing numbers;

Acknowledging that tourism is a natural development in this Area and that it requires regulation;

Recalling Recommendation VII-4, and particularly the need to avoid increasing interference with natural ecological systems which are not yet sufficiently understood;

Recognizing the necessity to restrict the number of places where large numbers of tourists may land so that the ecological effects may be monitored;

Recommend to their Governments that:

1. They use their best endeavours to ensure that all those who enter the Antarctic Treaty Area, both those sponsored by Governments and those not so sponsored, are aware of the Statement of Accepted Practices and the Relevant

Provisions of the Antarctic Treaty in Annex A to this Recommendation;

2. They request all organizers of tourist groups, except in an emergency, to:

a) visit only those Antarctic stations for which permission has been sought and granted in accordance with Recommendation IV-27;

b) land only within the Areas of Special Tourist Interest listed or defined in Annex B to this Recommendation;

3. When granting permission for tourist groups to visit Antarctic stations which they maintain, Consultative Parties shall require tour organizers to report their activities within the Treaty Area. These reports shall be made at the end of the season to the Consultative Parties whose stations they have visited, in accordance with the requirements listed in Annex C to this Recommendation. The Consultative Parties shall transmit any such reports received by them to the next Antarctic Treaty Consultative Meeting;

4. They keep Annexes A, B and C to this Recommendation under review at successive Consultative Meetings.

ANNEX A

Statement of Accepted Principles and the Relevant Provisions of the Antarctic Treaty

Introduction

The following statement is intended for the guidance of all those who visit the Antarctic. The Antarctic Treaty was negotiated in Washington in 1959 by the states which had established scientific stations in the Antarctic during the International Geophysical Year (1957-58) in order to perpetuate the close scientific co-operation which had marked that period. It provides, *inter alia*, that the Antarctic shall be used for peaceful purposes only and that any measures of a military nature shall be prohibited; that there shall be freedom of scientific investigation and that the results of such investigation shall be made freely available; that any nuclear explosions and the disposal of radioactive waste material in the Antarctic is prohibited; that notification of an expedition to the Antarctic shall be provided in advance; and that each of the Antarctic Treaty Contracting Parties shall exert appropriate efforts to the end that no one engages in any activity in the Antarctic contrary to the principles or purposes of the Antarctic Treaty.

Recommendations of Antarctic Treaty Consultative Meetings

The Treaty requires that meetings shall be held from time to time to consider and recommend measures in furtherance of its principles and objectives. Amongst these are measures of which all those who enter the Antarctic Treaty Area, both those sponsored by Governments and those not so sponsored, should be aware. The following notes indicate the nature of these measures and the reader

is referred to the Recommendations of successive Consultative Meetings for the details.

Protection of the Antarctic Environment

The ecosystem of the Antarctic Treaty Area is particularly vulnerable to human interference and the Antarctic derives much of its importance from its uncontaminated and undisturbed condition and the effects it has on adjacent areas and the global environment. For these reasons the Consultative Parties recognise their special responsibility for the protection of the environment and the wise use of the Treaty Area.

Conservation of Wildlife

Animals in the Antarctic are in almost all cases tame and are therefore peculiarly vulnerable. Both animals and plants are living under extreme conditions and great care has to be taken to avoid upsetting the natural ecological system. They are protected by the following five mechanisms under the Agreed Measures for the Conservation of Antarctic Fauna and Flora:

i) Protection of Native Fauna

The killing, wounding, capturing or molesting of any native mammal or native bird is prohibited except in an emergency or in accordance with a permit issued under the authority of a Participating Government. Any attempt to do any of these things is also prohibited under the same conditions.

ii) Harmful Interference

Every effort shall be made to minimize harmful interference with the normal living conditions of any native mammal or bird.

iii) Specially Protected Species

Two species of seal, Fur Seals and the Ross Seal have been designated as Specially Protected Species and permits may only be issued in relation to these species in accordance with certain restrictive criteria.

iv) Specially Protected Areas

Certain areas of outstanding scientific interest have been designated as Specially Protected Areas in order to preserve their unique natural ecological system (see Annex I). No person may enter such an Area except in accordance with a permit issued under the authority of a Participating Government. Such permits may only be issued in accordance with certain restrictive criteria.

v) Introduction of Non-Indigenous Species, Parasites and Diseases

No species of animal or plant not indigenous to the Antarctic Treaty Area may be brought into the Area except in accordance with a permit issued under the authority of a Participating Government. Special precautions have to be taken to prevent the accidental introduction of parasites and diseases into the Treaty Area.

Pelagic Sealing

The Consultative Parties, having regard to the possibly damaging ecological consequences that might arise from the exploitation of Antarctic seals for commercial purposes, negotiated the Convention for the Conservation of Antarctic Seals. This Convention entered into force on 11 March 1978.

Waste Disposal

In addition to the measures for the conservation of Antarctic Fauna and Flora outlined above, the Consultative Parties have prepared a Code of Conduct for Antarctic Expeditions and Station Activities including, *inter alia*, recommended procedures for waste disposal (see Annex II).

Protection of Historic Monuments

Every effort should be made to prevent damage or destruction to any historic monuments. The Consultative Parties have listed a number of such monuments for special protection (see Annex III).

Facilitation of Scientific Research: Sites of Special Scientific Interest

There are many scientific investigations being carried out in the Antarctic which could suffer from accidental interference. For example, long term studies of the population dynamics of a penguin colony may require that visitors be kept to an absolute minimum. Intensive scientific work in one area may require that a nearby ecologically similar area be kept undisturbed and uncontaminated for reference purposes. Again, certain electromagnetically 'quiet' areas, where sensitive instruments have been installed for recording minute signals associated with upper atmosphere studies, may require that visits to the site should be kept to a minimum.

For these and similar reasons the Consultative Parties have designated certain Sites of Special Scientific Interest in the Antarctic (see Annex IV). Each Site is subject to a management plan designed to protect the particular scientific investigations being undertaken. Persons wishing to visit Sites of Special Scientific Interest should, well in advance, consult the national office responsible for the administration of a permanent Antarctic scientific expedition or, if this is not possible, should consult the station commander of the scientific station nearest the site which it is intended to visit.

Tourism and Non-Governmental Expeditions to the Antarctic Treaty Area

An important feature of the Antarctic Treaty is that cooperation under it is facilitated by the prior exchange of information about planned activities. The Treaty commitment covers any expedition organised in or proceeding to

the Antarctic from any state which is a Contracting Party to the Antarctic Treaty. A consolidated list of the information to be exchanged is attached at Annex V.

It is a traditional principle that expeditions render all assistance feasible in the event of an emergency. There is in the Antarctic a number of unoccupied huts and refuges which may be used by any expedition in an emergency, in which case the authorities who maintain the hut or refuge should be informed of what use has been made of it.

Special Measures Relating to Tourist and Non-Governmental Expeditions

The number of non-governmental expeditions to the Antarctic is steadily increasing and there is a tendency for these expeditions to concentrate on the more easily accessible parts of the Antarctic. Frequent visits to scientific stations or undue dependence on the facilities of such stations can prejudice their scientific work. It is therefore required that the organizers of a tourist or non-governmental expedition should furnish notice as soon as possible, through diplomatic channels, to any other Government whose station the expedition plans to visit. Any such Government may refuse to accept a visit to a station which it maintains or may lay down conditions upon which it would grant permission including *inter alia*, that:

- i) reasonable assurance be given of compliance with the provisions of the Antarctic Treaty, measures adopted under it and the conditions applicable at stations to be visited;
- ii) tour organizers should ensure that prior to the commencement of the tour or expedition, procedures and systems for adequate telecommunications have been confirmed with the offices administering the Antarctic stations to be visited;
- iii) final arrangements to visit any station be made with that station between twenty-four and seventy-two hours in advance of the expected time of arrival;
- iv) all tourists and other visitors comply with any conditions or restrictions on their movements which the station commander may stipulate for their safety or to safeguard scientific programs being undertaken at or near the station;
- v) visitors must not enter Specially Protected Areas and must respect designated historic monuments;
- vi) tour organizers should report to the Governments whose stations they have visited, after completion of the tour, the name and nationality of the ship, the name of the captain, the itinerary of each separate cruise, the number of tourists accompanying each cruise and the places and dates at which landings were made in the Antarctic Treaty Area, with the number of persons landed on each occasion.

LIST OF ANNEXES

Annex I

Specially Protected Areas

Area No.	Name
1	Taylor Rookery, MacRobertson Land
2	Rookery Island, Holme Bay
3	Ardery Island and Odber Island, Budd Coast
4	Sabrina Island, Balleny Islands
5	Beaufort Island, Ross Sea
6	Cape Crozier, Ross Island (designation terminated by Recommendation VIII-2)
7	Cape Hallett, Victoria Land
8	Dion Islands, Marguerite Bay, Antarctic Peninsula
9	Green Island, Berthelot Islands, Antarctic Peninsula
10	Byers Peninsula, Livingston Island, South Shetland Islands (designation terminated by Recommendation VIII-2)
11	Cape Shirreff, Livingston Island, South Shetland Islands
12	Fildes Peninsula, King George Island, South Shetland Islands (designation modified by Recommendation V-5 and terminated by Recommendation VIII-2)
13	Moe Island, South Orkney Islands
14	Lynch Island, South Orkney Islands
15	Southern Powell Island and adjacent islands, South Orkney Islands
16	Coppermine Peninsula, Robert Island
17	Litchfield Island, Arthur Harbour, Palmer Archipelago

Annex II

Extract from the Code of Conduct for Antarctic Expeditions and Station Activities relating to Waste Disposal [Section 1.2, paragraph 1 of Annex to Recommendation VIII-11]

Annex III

List of Historic monuments [Section 1.4, Annex to Recommendation VII-9]

Annex IV

Sites of Special Scientific Interest [Section 3.1, Recommendations VIII-4, X-5 and 6, XII-5, XIII-7, 8 and 9]

Annex V

Standard format for the Annual Exchange of Information [Section 5.1, Annex to Recommendation VIII-6]

GUIDANCE FOR VISITORS TO THE ANTARCTIC

Antarctic and its surrounding islands are one of the few places in the world which are still relatively unchanged by man's activities. Scientists still know very little about the ecological situation in the Antarctic. At the present early stage in research on these matters, some restrictions and precautions may seem unnecessarily harsh, but preliminary studies indicate the need for great caution. By following a few very simple requests, you can help preserve the unique environment of this region.

1. Avoid disturbing wildlife, in particular do not:
 - walk on vegetation;
 - touch or handle birds or seals;
 - startle or chase any bird from its nest;
 - wander indiscriminately through penguin or other bird colonies.
2. Litter of all types must be kept to a minimum. Retain all litter (film wrappers, tissue, food scraps, tins, lotion bottles, etc) in a bag or pocket to be disposed of on board your ship. Avoid throwing tin cans and other trash off the ship near land.
3. Do not use sporting guns.
4. Do not introduce plants or animals into the Antarctic.
5. Do not collect eggs or fossils.
6. Do not enter any of the Specially Protected Areas and avoid Sites of Special Scientific Interest.
7. In the vicinity of scientific stations avoid interference with scientific work and do not enter unoccupied buildings or refuges except in an emergency.
8. Do not paint names or graffiti on rocks or buildings.
9. Take care of Antarctic historic monuments.
10. When ashore, keep together with your party.

ANNEX B

Areas of Special Tourist Interest [No Areas of Special Tourist Interest have yet been designated]

ANNEX C

Matters to be reported by tour organizers

1. Name and nationality of ship
2. Name of captain
3. Itinerary of each separate cruise
4. Number of tourists accompanying each cruise
5. Places and dates at which landings were made in the Antarctic Treaty Area, with the number of persons landed on each occasion

Extract from report of IXth ATCM

A draft statement of accepted practices and the relevant provisions of the Antarctic Treaty, together with a draft containing practical guidance for visitors to the Antarctic, was considered for inclusion in Annex A of Recommendation VIII-9 but, owing to lack of time for full discussion, the matter was referred to the Tenth Consultative Meeting. No action was taken to list or define areas of Special Tourist Interest for inclusion in Annex B of Recommendation VIII-9.

X-8: Effects of Tourists and Non-Government Expeditions in the Antarctic Treaty Area

The Representatives,

Recalling that Annex A to Recommendation VIII-9 was to be discussed at the Ninth Consultative Meeting and that a draft text of a Statement of Accepted Practices and the Relevant Provision of the Antarctic Treaty was referred from the Ninth to the Tenth Consultative Meeting;

Recognizing that, in addition to the statement referred to in the previous paragraph which is primarily intended for the organizers of tourist expeditions, it would be helpful to the organizers of such expeditions to be able to provide to individual visitors a brief guide to good conduct in the Antarctic;

Noting that adventurous individuals organizing non-governmental expeditions to Antarctica may seek help or advice from offices administering Antarctic programs;

Recognizing, also, that in considering responses to requests for help from such expedition, an important concern is the possibility that such expeditions may, in cases of emergency, involve the offices administering Antarctic programs in financial or material loss;

Recognizing that suitably qualified guides accompanying commercially organized Antarctic tours would both benefit the tourists and help to ensure that the conservation and environmental measures adopted by the Consultative Parties were observed;

Reaffirming the traditional principle in the Antarctic of rendering all assistance feasible in the event of an emergency request for help, but noting that commercial overflights of Antarctica are operating in a particularly hazardous environment, where aircraft operation systems normally available elsewhere in the world are at a minimum, and where emergencies could arise which are beyond the capacity of permanent Antarctic expeditions to respond adequately;

Recommend to their Governments that:

I. Statement of accepted Practices and the Relevant Provisions of the Antarctic Treaty

They insert the attached statement of Accepted Practices and the Relevant Provisions of the Antarctic Treaty into Annex A to Recommendation VIII-9 for the purposes set

out in operative paragraph 1 of that Recommendation.

II. Non-Governmental Expeditions

If a non-governmental expedition approaches a Consultative Party for help or advice, that Consultative Party should inform the Contracting Party where the expedition to Antarctica is being organized and may request all relevant information about the expedition. They urge non-governmental expeditions to carry adequate insurance cover against the risk of their incurring financial charges or material losses in the Antarctic Treaty Area.

III. Tour Guides

To the extent practicable, they encourage commercial tour operators to carry tour guides with experience of Antarctic conditions, who are aware of the considerations which underlie the Agreed Measures for the Conservation of Antarctic Fauna and Flora and for the protection of the Antarctic environment.

IV. Commercial Overflights in Antarctica

They notify commercial aircraft operators that the present level of tourist overflight activity:

- i) exceeds existing capabilities for air traffic control, communications and search and rescue in the Antarctic;
- ii) may interfere with normal operational flights in support of expeditions engaged in ongoing scientific programs in the Antarctic;
- iii) exceeds the capacity of their Antarctic operations to respond adequately to an unplanned emergency landing.

Extract from report of Xth ATCM

The Working Group on Tourism had before it a paper from the SCAR Working Group on Logistics entitled 'Tourist and Private Expeditions to the Antarctic', a draft statement of accepted practices together with the relevant provisions of the Antarctic Treaty, and a draft containing practical guidance for visitors to Antarctica for inclusion in Annex A of Recommendation VIII-9. These material had been forwarded to the Tenth Antarctic Treaty Consultative Meeting owing to lack of sufficient opportunity for their consideration at the Ninth Antarctic Treaty Consultative Meeting.

XI-3: Air Disaster on Mount Erebus

The Representatives,

Recalling with respect that in the years of exploration and research many have travelled to and worked in Antarctica and not returned;

Noting that on 28 November 1979 two hundred and fifty-seven people of several nationalities lost their lives when the aircraft in which they were travelling crashed into the slopes of Mount Erebus, Ross Island, Antarctica;

Aware that in spite of the determined and courageous

action of members of the New Zealand and United States Antarctic expeditions the bodies of some of those who died could not be recovered;

Aware, too, that no permanent memorial may be placed on the ice slopes at the site of the tragedy;

Express their deep sympathy with the relatives of those who died and with the Government and people of New Zealand; and

Recommend to their Governments that the site on the northern slopes of Mount Erebus where the accident took place be declared a tomb and that they ensure that the area is left in peace.

Extract from report of XIth ATCM

Plenary heard with sadness the statement of the delegation of New Zealand about the air disaster on Mount Erebus on 28 November 1979 in which two hundred and fifty-seven people of several nationalities lost their lives. Wishing to express their deep sympathy with the relatives of those who died and with the people and Government of New Zealand, the Meeting welcomed the Chairman's recommendation that steps should be taken to ensure that the site where the accident took place should be declared a tomb and should be left in peace. The Meeting adopted Recommendation XI-3.

In Plenary discussion of this Agenda Item attention was drawn to the need to consider whether steps should be taken to designate Areas of Special Tourist Interest provided for in Recommendation VIII-9 and to the increasing number of non-governmental expeditions seeking help from some Consultative Parties.

Regarding Areas of Special Tourist Interest, work was begun on the principles that might be adopted if such Areas were to be designated but discussion indicated a measure of doubt as to whether it would be prudent to proceed further with the designation of such Areas. It was agreed that there should be further study of the issues raised in discussion with a view to further consideration of the topic [at the Twelfth Consultative Meeting].

Regarding non-governmental expeditions the value was recognized of adopting a common response to inquiries when a Consultative Party was approached with a request for assistance from such an expedition. It was agreed that this matter should be taken up again at the next Consultative Meeting.

Extract from report of XIIth ATCM

The Meeting discussed the implications of the increase of tourism and non-governmental expeditions in Antarctica. It was agreed that the isolation of the region meant that assistance by national programs to such activities was expensive, disruptive to research programs and sometimes hazardous to life and equipment.

The Meeting agreed that emergency assistance was a humanitarian obligation, but that the risks and costs involving other assistance in Antarctica might best be reduced by Consultative Parties urging upon private expeditions and tour operators the need for careful and thorough planning and for self-sufficiency in their operations. In accordance with Article X of the Antarctic Treaty, the Meeting emphasized the importance of ensuring that non-governmental expeditions to the Antarctic Treaty Area observed the principles and purposes of the Antarctic Treaty and the relevant measures adopted under it. To this end it was agreed that Consultative Parties should do their best to ensure that such expeditions were made aware of these provisions. It was also agreed that Consultative Parties should keep each other fully informed about commercial or private expeditions being planned in their countries.

It was noted that non-governmental expeditions and tour operators should be covered by adequate insurance and by some form of guarantee that would demonstrate their responsibility for their activities. A view was also expressed that responsibility for compliance by non-governmental expeditions with the provisions of the Antarctic Treaty and Recommendations adopted at the Consultative Meetings should be placed upon those States whose physical or juridical persons organize such expeditions or participate in them. Since there was no agreement as to where responsibility for non-governmental expeditions should lie, the draft Recommendation which had been tabled was withdrawn.

It was agreed that the ideas expressed in the previous paragraphs might be followed up and that further consideration be given to them at the Thirteenth Consultative Meeting.

Extract from report of the XIIIth ATCM

Tourism

68. The Delegation of the Federal Republic of Germany presented an information paper summarizing the obligations of member states in cases of tourism and non-Governmental expeditions to Antarctica, which it had originally prepared for the use of its own authorities. It was noted that the earlier Recommendations on Tourism and non-Governmental expeditions had been developed over a number of years and responded to developments as they had occurred. Since there was insufficient time to give this matter adequate attention it was referred to the next Consultative Meeting. The United Kingdom Delegation suggested that it might then be appropriate to attempt to codify the existing Recommendations.

69. The United States Delegation presented an information paper setting out public US policy towards non-governmental expeditions.

70. Some Delegations noted that tourism was one of the

legitimate uses of Antarctica and that the relevant regulations should tend to harmonize this use with other peaceful activities in Antarctica, in particular the scientific activities and that they should also tend to assure the compatibility of touristic activities with the need to protect the environment of the Antarctic.

Extract from report of the XIVth ATCM

120 The meeting noted that there had been a rapid increase in tourism and other non-governmental activities in Antarctica. Although so far tourism and non-governmental activities have had minimal adverse impact, very significant numbers of people were now involved in these activities and, given the concentration of such activities in various areas, there was potential for serious impacts, both in environmental terms of possible damage to fragile ecosystems and compounding existing waste disposal problems and in scientific terms on national research programmes.

121 Several delegations stated their concerns that:

- a) Although landings of cruise passengers are infrequent, they are localized and repetitive and usually occur at sites which are vulnerable to disturbance. Changes in the habitats or reduction of the breeding population of some species could possibly result from repeated visits by tourists. Waste disposal was also identified as a problem. The scale of human activity also presented risks to buildings and monuments of historic significance situated in the more accessible parts of the Antarctic continent. Some delegations said there was evidence to suggest that some violations of existing standards had occurred. The need for environmental factors to be assessed and monitored in the planning and conduct of non-governmental activities was also mentioned.
- b) Tourist visits to scientific stations are often welcome to station personnel but large numbers of visits can be disruptive. Some delegations indicated that the numbers of visitors to their stations had reached a threshold which had already interfered with their scientific programmes, and that future visits to their stations would need to be restricted.
- c) Possible accidents requiring search and rescue operations were of particular concern. These can be expensive and hazardous and demanding on the limited resources and facilities available. In this connection, it was noted that there have been accidents involving both tourist operations and also private expeditions. Some delegations stressed that in this respect, it was non-governmental expeditions that caused them most concern in relation to safety of human life and potential disturbance of the normal operation of scientific

and logistic activity in Antarctica. Others expressed equal concerns about tourist operations. In this connection problems of liability and insurance were mentioned as well as the need for ice-capable vessels.

122 Several delegations outlined their own policies and conditions governing tourist activities, based on Recommendations from Consultative Meetings. These give details of requirements and procedures for requesting permission to visit scientific stations, including prior notice; use of station facilities and rules of conduct; supervision and briefings from lecturers and professionally trained guides; safety and self-sufficiency of expeditions; and observance of restrictions of access to protected areas. It was noted that SCAR had produced a useful guide for visitors to the Antarctic and some countries have published leaflets in a format designed to provide an awareness and understanding of the global importance of Antarctica.

123 The Meeting recalled that the Antarctic Treaty Consultative Parties adopted their first Recommendation on the effects of tourism in the Antarctic in 1966, and by 1975 tourism was recognized as a development in the Treaty area requiring regulation. The Meeting therefore reviewed the existing measures adopted by the Consultative Parties. This process was considerably assisted by a document tabled by the United Kingdom (ANT/XIV/WP/16) which sought to consolidate, in a single statement, the relevant provisions of the Antarctic Treaty, Recommendations IV-2, VI-7, VII-4, VIII-9 and X-8 and elements from the report of the XII Consultative Meeting.

124 The concern was expressed that the existing measures were complex and that a more simple and transparent set of measures might assist operators to secure effective compliance.

125 Several delegations also expressed concern that the existing measures revealed some inadequacies; that there were significant gaps in information especially with respect to small private expeditions and suggested the need for an improved procedure for receiving reports from operators and private expeditions, and for exchanging this information among Treaty Parties. It was also suggested that, when feasible, measures should be taken to monitor non-governmental activities in Antarctica.

126 It was agreed that the question of measures relating to tourism and non-governmental activity should be the subject of consideration by national authorities before the next Consultative Meeting with a view to further considerations of the item at the XVth Consultative Meeting.

127 Finally the Meeting urged Consultative Parties to renew their efforts in the interim to disseminate information about the existing measures and promote compliance with them.