WILDERNESS VISITOR MANAGEMENT

AND

ANTARCTIC TOURISM

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Wolfson College

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DECLARATION

The work presented in this thesis was undertaken at the Scott Polar Research Institute of the University of Cambridge, between October 1992 and June 1995, under the supervision of Dr William Adams.

This thesis is the sole work of the author and does not exceed the page limit set by the Board of Graduate Studies, nor has it been submitted, in whole or in part, for a degree at this or any other university.

Pamela B. Davis
30 June 1995
SUMMARY

This thesis investigates the question of what kind of management is needed to cope with the increasing numbers of tourists who are visiting wilderness areas in Antarctica. Previous research has addressed Antarctic tourism largely as a policy issue. This research looks at Antarctic tourism in the context of the debate on wilderness and focuses on the implications for tourism and on the thinking about protection of natural areas. Through the examination of some historic and contemporary examples of the development of tourism in natural areas, its effects, and management’s responses to it, the argument is made for developing a framework for visitor management in wilderness areas that takes account of the characteristics of wilderness in Antarctica.

As Antarctica’s future is decided by the Antarctic Treaty System, and its members reach agreement by consensus, visitor management planning must be carried out within these constraints. Past and current responses to environmental protection and tourism, particularly in North America, are examined in order to assess the viability of a workable visitor management plan in Antarctica. The most common approach to visitors has been anthropocentric, encouraging and facilitating human uses. This results in a struggle between the enjoyment of visitors and the retention of natural areas not dominated by humans. This thesis presents new data and analyses the findings from a visitor questionnaire distributed to Antarctic cruise passengers during the 1993/94 austral summer to establish who visitors are, their motivations, their understanding of voluntary visitor guidelines, and their desire for services and facilities. This information is augmented by data drawn from on-site observations about visitor activities, the concentration of use ashore, and the success of supervisory techniques. These data provide baseline information on the characteristics of Antarctic visitors and visitation that could facilitate the development of practical strategies for visitor impact management. Finally, this thesis outlines some potential visitor management plans that could be pursued outside the framework of Antarctic Treaty System.
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Without the supervision of Dr William Adams, who spent hours reading, thinking, advising, guiding, encouraging, and rereading the work in progress, this thesis could not have been completed. Dr David Walton also contributed a generous portion of his time, further improving the work. Additional refinements and improvements could not have been made without the huge chunks of time and valuable input of Drs Peter Clarkson, Wendy Arundale, Gareth Rees, John Heap, John Shears, Pat Altham, Joan Whitehead, Liz Cruwys, and Beau Riffenburgh. My good friends Liz and Beau deserve special acknowledgement as they were always there, ready to help, and did — many, many times. Rosemary Graham did her utmost to sort out my grammar, spelling, and clarify the writing. Any faults remaining, however, are my own.

Finally, to my fiancé, Gareth Marshall, who worked beside me, acted as production manager, cartographer, humorist, and head of the cheering section, thanks for being there night and day.
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Finally, to my fiancé, Gareth Marshall, who worked beside me, acted as production manager, cartographer, humorist, and head of the cheering section, thanks for being there night and day.
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ACRONYMS

The acronyms used in this thesis include those common within the Antarctic political community and those particular to visitor management.

<table>
<thead>
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<th>Acronym</th>
<th>Description</th>
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<tbody>
<tr>
<td>ANI</td>
<td>Adventure Network International</td>
</tr>
<tr>
<td>ASMA</td>
<td>Antarctic Specially Managed Area</td>
</tr>
<tr>
<td>ASPA</td>
<td>Antarctic Specially Protected Area</td>
</tr>
<tr>
<td>ATCM</td>
<td>Antarctic Treaty Consultative Meeting</td>
</tr>
<tr>
<td>ATCPs</td>
<td>Antarctic Treaty Consultative Parties</td>
</tr>
<tr>
<td>ATS</td>
<td>Antarctic Treaty System</td>
</tr>
<tr>
<td>C-Cap</td>
<td>Carrying Capacity Assessment Process</td>
</tr>
<tr>
<td>CEE</td>
<td>Comprehensive Environmental Evaluation</td>
</tr>
<tr>
<td>CCAMLR</td>
<td>Convention on the Conservation of Antarctic Marine Living Resources</td>
</tr>
<tr>
<td>COMNAP</td>
<td>Council of Managers of National Antarctic Programmes</td>
</tr>
<tr>
<td>CPR</td>
<td>Canadian Pacific Railway</td>
</tr>
<tr>
<td>CRAMRA</td>
<td>Convention on the Regulation of Antarctic Mineral Resource Activities</td>
</tr>
<tr>
<td>CCAS</td>
<td>Convention for the Conservation of Antarctic Seals</td>
</tr>
<tr>
<td>EIA</td>
<td>Environmental Impact Assessment</td>
</tr>
<tr>
<td>FNNPE</td>
<td>Federation of Nature and Natural Parks of Europe</td>
</tr>
<tr>
<td>GAO</td>
<td>Government Accounting Office</td>
</tr>
<tr>
<td>IAATO</td>
<td>International Association of Antarctica Tour Operators</td>
</tr>
<tr>
<td>IEE</td>
<td>Initial Environmental Evaluation</td>
</tr>
<tr>
<td>IGY</td>
<td>International Geophysical Year</td>
</tr>
<tr>
<td>IUCN</td>
<td>International Union for Conservation of Nature and Natural Resources</td>
</tr>
<tr>
<td>IWC</td>
<td>International Whaling Commission</td>
</tr>
<tr>
<td>LAC</td>
<td>Limits of Acceptable Change</td>
</tr>
<tr>
<td>MPA</td>
<td>Multiple Use Planning Area</td>
</tr>
<tr>
<td>NPCA</td>
<td>National Parks and Conservation Association</td>
</tr>
<tr>
<td>NPS</td>
<td>National Park Service</td>
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<td>National Science Foundation</td>
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<td>NWPS</td>
<td>National Wilderness Preservation System</td>
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<tr>
<td>PCSC</td>
<td>Pacific Coast Steamship Company</td>
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<td>Protocol</td>
<td>Protocol on Environmental Protection to the Antarctic Treaty</td>
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<tr>
<td>ROS</td>
<td>Recreational Opportunity Spectrum</td>
</tr>
<tr>
<td>RSPB</td>
<td>Royal Society for the Protection of Birds</td>
</tr>
<tr>
<td>SCAR</td>
<td>Scientific Committee on Antarctic Research</td>
</tr>
<tr>
<td>SPA</td>
<td>Specially Protected Area</td>
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<tr>
<td>SRA</td>
<td>Specially Reserved Area</td>
</tr>
<tr>
<td>SSSI</td>
<td>Site of Special Scientific Interest</td>
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<tr>
<td>UNEP</td>
<td>United Nations Energy Programme</td>
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<tr>
<td>VIM</td>
<td>Visitor Impact Management</td>
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CHAPTER 1

INTRODUCTION

1.1 MANAGING VISITORS IN A WILDERNESS

If there is any perspective that dominates contemporary thinking about parks, and about recreation in general, it is the *consumer perspective* [emphasis added] .... To speak of man as the measure of all things is not only to state a cliché but to describe a world in which the rhythm of life is tuned only to the pace of human enterprise. It is not that we are necessarily going too fast, but that we risk losing contact with any external standards that help us to decide how fast we want to go (Sax 1976: np).

Until recently, Antarctica has been a self-willed land — the original definition of 'wilderness'. Now, with modern technology and economic prosperity, many of the world's people can compress time and space and travel to remote destinations that before were inaccessible to all but a few explorers. Antarctica was one such place. Record numbers of visitors (nearly 8,000 cruise ship passengers in 1994) (NSF 1994) are narrowing the gap between the remote and the accessible. While 8,000 visitors may not seem significant, the number is likely to grow rapidly. Enzenbacher (1995: 179) has reported that of all the cruise passengers who have travelled to Antarctica since the late 1950s, more than 35% have done so during the three summer seasons from 1990/91 to 1992/93. Both the short- and long-term impacts of those visitors remain inadequately investigated, as does the significance of visitors' actions in a wilderness.

That humanity has conquered, by means of technology and science, much of the planet's surface is no longer a matter of debate. Whether it can continue to do so without endangering its own existence and that of the earth's other inhabitants is debatable. As visitors beat a path into what has been called 'the last wilderness' (Hall and Wouters 1995: 155), questions must be raised about what responsibilities and duties are part of that journey.

The encounter with a self-willed land and humanity's desire to control nature forces a reconsideration of the role humans will allocate to themselves in Antarctica. Managing a wilderness has been recognised as a contradiction (Nash 1982; Hendee *et al.* 1990a; Oelschlaeger 1994) but, to paraphrase Oelschlaeger (1994: 144, footnote 9), it is an indispensable condition.
1.2 DEFINING THE PROBLEM

The Antarctic has been regarded as a region of vast natural resources, and waves of economic activity — sealing, whaling, fishing — have lapped its shores (Herber 1992; White 1994). Most recently, the tourist industry has used it as a destination, attracting much attention in the process (Annals of Tourism Research 1994; Beck 1994; Hall and Johnston 1995).

There is concern that there may be adverse impacts on the fauna and flora. In response, the Antarctic Treaty Consultative Parties (ATCPs), who, through the Antarctic Treaty System (ATS), have served as the governing body for all activities in Antarctica since the Treaty entered into force in 1961, have promulgated over 138 Recommendations on environmental protection, management, and tourism (Harris 1993: 263). The adequacy of these regulations, with respect to tourism, has been questioned, however, by many authors (Cook 1990; IUCN 1991; Nicholson 1991; Enzenbacher 1992a).

There are also those who believe that tourism provides the grass-roots support for conservation (IUCN 1991: 55; Smith 1994: 221), or is a viable 'sustainable' economic activity (Herber 1992; Hall and Wouters 1994; White 1994). As Smith (1994: 221-222) has said:

To balance the first impression that the impacts of tourism are all negative, there is also a strong sentiment supportive of the view that tourism will 'save Antarctica' by virtue of a substantial number of well-educated travelers who are familiar with its resources and whose voices would be heard in defence of conservation policies.

But what is the conservation message of an international group of well-educated travellers and how would it be accomplished? Do conservation policies based on economic arguments protect a continent from the changing requirements of the leisure industry?

Johnston and Hall (1995: 300) offer a traditional view of Antarctic tourism:

Tourism in polar regions requires a high quality environment since it is the landscape itself that serves as a major drawcard for tourist activities whether they be educationally, culturally or adventure oriented. Even heavily used destination areas will need to meet tourist expectations of polar wilderness, however that may be defined for the particular destination. If the image and reality do not match for the tourist because of obvious environmental damage, the experience itself can be negatively affected, as can the industry.

This assessment of tourism in polar regions mirrors Sax's (1976: np) view that 'the consumer perspective' has become the primary concern. The tourism industry wants a pristine Antarctica and recognises that it is "a global symbol of the state of the natural world" (Hall and Johnston 1995: 2). The landscape is meaningful but its value is largely
utilitarian, its various features only serving the needs of the consumer. The question ultimately is whether a wilderness can be valued and protected for intrinsic qualities outside of those of use to humans. It is a question worth asking because, in the long run, economic interests can and do change.

Tourism is an economic activity concerned with marketing a product, the destination or activity, to people who are travelling outside their normal places of work and residence (Witt et al. 1991: 2). There are additional definitions of who is a 'domestic' or 'international' tourist, as well as who or what visitors are (ibid.). These definitions are not relevant here, as the primary reason for them is to place them in a category for economic evaluation and statistical purposes. The crucial distinction here is that the tourist industry is concerned with marketing a product to tourists, whereas wilderness managers are concerned with protecting the wilderness while allowing visitors to enjoy appropriate activities without degrading the environment (Hendee et al. 1990a). What appropriate activities are follows from what value and meaning is bestowed on wilderness. This issue is discussed in Chapter 3, Section 3.2.4. This thesis, therefore, does not investigate tourism management but visitor management in the Antarctic wilderness. The use of the word 'visitor' rather than 'tourist' reflects this distinction and is commonly preferred among researchers of wilderness management. In the Antarctic context, tourists are defined as "visitors who are not affiliated in an official capacity with an established National Antarctic Program" (Enzenbacher 1992b: 17) and, although tourists are included under the heading of visitors, the term 'tourist' is common in the Antarctic literature. It is rejected here because it carries with it the economic implications of the tourist industry instead of the considerations of conservation.

Other aspects of Antarctic conservation problems have been and are being explored. These include: regulation of tourism under the Antarctic Treaty System (ATS) (Enzenbacher 1995), environmental management using Geographical Information Systems (GIS) (Harris 1993), and a variety of other management concerns. Kriwoken and Keage (1994: 37) have "examined key factors in the identification and selection of Antarctic protected areas", Dingwall (1994: 49) has considered "the design and delimitation of protected areas", and Holdgate (1994: 104) has led the way in proposing how international designations of protection could be used in Antarctica to reassure "the world community that the Antarctic environment, which some regard as a 'global common', is being safeguarded appropriately".

Another problem remains: to formulate a visitor management policy for Antarctic wilderness that is directed toward a practical means to ensure that its intrinsic qualities are not compromised in favour of immediate human use. This requires management on two levels: a methodology to prevent and correct impacts at sites visited and a philosophical approach to management that determines how the continent is to be protected and according to what precepts.
Not until the XV Antarctic Treaty Consultative Meeting (ATCM), were the wilderness values of Antarctica formally recognised by the Antarctic Treaty Parties. The most comprehensive environmental protection regime, the Environmental Protocol to the Antarctic Treaty (Protocol) (awaiting ratification (see Section 4.1.5)), now recognises its 'intrinsic value ..., including its wilderness and aesthetic values' (SCAR 1993: 256).

The current approach to managing tourists is threefold: through a set of voluntary visitor guidelines designed by the tour industry (see Section 4.3.1), through the Environmental Protocol, which covers all human activity in Antarctica (see Section 5.1.4), and through the Kyoto Recommendations on tourism (see Section 4.3.3).

Are these measures sufficient? Are voluntary visitor guidelines adequate to protect the flora and fauna from visitor impact and does the Protocol go far enough to safeguard the intrinsic values of this wilderness? The Protocol's definition of 'a minor or transitory impact' has not been established nor does the Protocol provide any measurable limits or standards by which to judge any activities (SCAR 1993: 264). The Kyoto Recommendations in many ways formalise (but do not make mandatory) the established guidelines. Moreover, have these types of control proved satisfactory in the past?

1.3 THE AIMS OF THE THESIS

The current approach to management ignores the large body of research available on visitor management in wilderness areas, reserves, and sanctuaries that could be consulted in considering how to protect this wilderness from the increasing pressure of visitors. The existing measures are concerned with maintaining the tourist industry in Antarctica by way of behavioural guidelines and a general statement of environmental good intentions. The field of visitor management can offer the ATCPs more successful and more protective strategies than those presently employed. The dominant human/nature paradigm is 'a conservation ethic predicated on the platitudes of human self-interest' (Oelschlaeger 1994: 138). This is evident in the ATCPs' designation of Antarctica as a "natural reserve, devoted [emphasis added] to peace and science" (ibid.) by ATCPs.

The danger from tourism in Antarctica is not that visitors may intentionally harm the wildlife or disrupt the environment but that, little by little, the marketing of tourism will take over and Antarctica will become a backdrop for all kinds of activities not in keeping with its value as a wilderness.

This thesis addresses both threats to Antarctica, by investigating the adequacy of measures to control or prevent visitor impacts, and what sort of framework can be established to prevent the loss of Antarctica as a continent of wilderness. The first aim of this thesis is to provide an alternative ecocentric framework for decision-making. Oelschlaeger (1991: 293) said ecocentrists
take natural systems as the dominant reality, such that even life itself must be set in a larger evolutionary frame of reference that contains inorganic components; protection of a species (rather than an individual) and its supporting context is therefore critical to an ecocentrist.

Eminent wilderness management authors Hendee et al. (1990a: 531) regarded biocentrism as a fundamental (or 'the') concept for visitor management:

Biocentrism emphasizes the maintenance of natural systems at the expense of recreational and other uses, if necessary, because wilderness values depend on naturalness and solitude. The goal of this philosophy is to permit natural ecological processes to operate as freely as possible, because wilderness values for society ultimately depend on the retention of naturalness and solitude.

Their definition is still rooted in an anthropocentric soil but this reflects the complex and sometimes contradictory task that visitor managers face when charged with providing for both visitor enjoyment and wilderness protection in a national setting (see Chapter 2). The ecocentric management framework is preferred here as it can address the issue of scale in this thesis: some practical on-site methodology is required for reducing impacts but it must be guided by a theoretical concept that covers more than the protection of individuals (or specific colonies of birds and mammals); it must also include the protection of the continent.

This framework requires, among other things, a definition of wilderness, provided in more detail in Chapter 2. It is worth pointing out that the ATCPs have chosen the word 'wilderness' to describe Antarctica but they have not defined it, recognising that any definition is loaded with cultural connotations. Johns (1994: 149), executive director of the Wildlands Project (US), tendered a simple, useful definition for the purposes of this framework:

Wilderness is the term ecocentric or biocentric people give to land that has not been significantly degraded by humans, land that still supports ecological processes....

The argument that not all activities are consistent with the preservation of Antarctica's unique wilderness requires deeper consideration of the existing anthropocentric paradigm of humankind/nature relationships and the alternative biocentric framework. Without acknowledging the historical pattern of humanity's relationship with nature, Antarctica's unique position as a continent of wilderness, without a native population, cannot fully be appreciated and protected. Chapter 2 also investigates the relationship of humankind with nature and how various themes have worked their way into wilderness management.

The second aim of the thesis is to examine how visitor management fits into wilderness management, how visitors were courted in order to publicise the need to protect and conserve wilderness areas, and finally the necessity of imposing restrictions...
on visitors and their activities. In this context, the *status quo* of Antarctic visitation is presented and analysed on the basis of the responses to a visitor questionnaire disseminated during five Antarctic tour ship cruises. These data clarify who visitors are, their motivations, what they seek to do, and how they rate their behaviour ashore. Qualitative data were added to these quantitative data, in the form of on-site observation and analysis of the behaviour, activities, and supervision of visitors ashore. Together they indicate whether the existing management strategies provide adequate protection under the current ATS framework.

The third aim of this thesis is to investigate models of visitor management and to assess their applicability to Antarctic visitation. Three models — Carrying Capacity, Visitor Impact Management (VIM), and Limits of Acceptable Change (LAC) — and two management plans from sub-Antarctic islands were studied. A preliminary survey of the literature revealed that no models of visitor management or critical analyses were to be found outside the United States (US). However, two of the models used — carrying capacity and LAC — have been instituted in natural areas outside the US.

Arctic regions are excluded from consideration, other than incidentally. Visitor management in the Arctic must address the issue of indigenous people and land use, and this represents a different problem.

The final aim of the thesis is to offer a management model that provides both a practical on-site methodology for reducing impacts and a proposed continental framework to safeguard Antarctica's wilderness value within the existing political climate of the ATS.

**1.4 THE ORGANISATION OF THE THESIS**

The remainder of the thesis comprises six chapters. Chapter 2 investigates the definitions of wilderness, reviews the dominant paradigm of humankind's relationship with nature, and presents an alternative paradigm. In the process, the meanings of wilderness are discussed and the concepts of managing visitors in a wilderness are introduced. Within this context, Chapter 3 provides a more detailed account of the historical development of visitor management, from the creation of access for visitors to the imposition of restrictions on them. This account is drawn primarily from North American sources, the large wilderness National Parks, where many of the same issues faced conservationists and developers — namely, intrinsic value versus economic utility — in the face of rapid technological changes. These two chapters offer a context for consideration, in Chapter 4, of Antarctica's conservation, how it developed, and the current policies. Chapters 5 and 6 present and analyse data collected in the field. Chapter 5 presents the results of a visitor questionnaire, distributed during the 1993/94 field season. They provide a deeper understanding of visitors' motivations, behaviour,
and ethics. Actual behaviour and the implications of that behaviour are assessed in Chapter 6, where eleven ship visits to the field site are studied. Finally, Chapter 7 examines five visitor management systems and assesses their applicability and workability within the ATS.
CHAPTER 2
HUMANKIND'S RELATIONSHIP WITH NATURE

2.1 INTRODUCTION: IS WILDERNESS CULTURALLY DEFINED?

2.1.1 Wilderness as 'otherness'

Wilderness is a condition of 'otherness'. It exists in opposition to civilisation. The meaning of wilderness is derived from the value placed on it by different cultures, civilisations, or individuals. "The emphasis here", said Nash (1982: 5), "is not so much what wilderness is but what men think it is". Thoreau described wilderness as "a civilization other than our own" (Nash 1989: 37).

Nash (1982: 1-3) traced the etymology of wilderness from the early Teutonic and Norse languages. 'Will', meaning self-willed, uncontrollable, and from that 'willed' to the adjective 'wild', being utterly lost, confused, and unruly. The Old English 'deor' (animal) was combined with it to denote creatures not controlled by humans. One of the earliest occurrences of the term is in the eighth-century epic Beowulf and was used to describe the savage beasts inhabiting a craggy, forested region. The term 'wild-deor-ness' came to mean the place where wild beasts dwell.

While the term has historically implied a hostile place, an alternative meaning — with favourable connotations — has recently developed. Contemporary wilderness management authors Hendee et al. (1990b: 7) observed that three diverse philosophical values consistently emerge in humankind/nature relationships: the experiential 'the direct value of the experience', the scientific 'gaining knowledge about wilderness', and the spiritual.

The United States' Wilderness Act of 1964 says:

A wilderness, in contrast with those areas where man and his own works dominate the landscape, is hereby recognized as an area where the earth and its community of life are untrammelled by man, where man himself is a visitor who does not remain. An area of wilderness is further defined to mean in this Act an area of undeveloped Federal land retaining its primeval character and influence, without permanent improvements or human habitation, which is protected and managed so as to preserve its natural conditions and which (1) generally appears to have been affected primarily by the forces of nature, with the imprint of man's work substantially unnoticeable; (2) has outstanding opportunities for solitude or a primitive and unconfined type of recreation; (3) has at least five thousand acres of land or is of sufficient size as to make practicable its preservation and use in an unimpaired condition; and (4) may also contain ecological, geological, or
other features of scientific, educational, scenic, or historical value (PL 88-577, Section 2c as quoted in Hendee et al. 1990a: Appendix).

These areas are to be protected and administered for the use and enjoyment of the American people in such manner as will leave them unimpaired for future use and enjoyment as wilderness (Section 2(a)).

This is a definition of wilderness conceived by those who see themselves as separate from it; it is a contrast to civilisation, where humans dominate the landscape. Wilderness, in this US definition, can be used for primitive recreation and may have other values (scientific, educational, scenic, or historical) for humankind. As a definition, it is clear about the qualities that describe it and about Americans' relationship to it.

Another similar, but more global, definition is provided by the International Union for Conservation of Nature and Natural Resources (IUCN), which defines wilderness as a

Large area of unmodified or slightly modified land, and/or sea, retaining its natural character and influence, without permanent or significant habitation, which is protected and managed so as to preserve its natural condition (IUCN 1994: 18).

The management objectives and selection criteria in IUCN's Wilderness category 1b (cf. Section 3.4.), that elaborates on this definition, have much in common with those of the Wilderness Act, including: the designation of a large area, having unmodified characteristics, subject to the forces of nature, providing enjoyment for future generations, with ecological, geological, scientific or historic value.

The IUCN definition and accompanying criteria also allow for indigenous human communities "living at low density" to continue living there. They recognise, in contrast to the Wilderness Act, that in many nations wilderness is also the home of indigenous peoples.

The Sierra Club (US) published a world wilderness inventory and used a classification system based on the Wilderness Act. In that inventory, areas were counted as wilderness if they looked like wilderness: that is, the Club did not consider the area's historical use, and included only areas of 400,000 hectares (1544 square miles) or more. The Club also included those areas inhabited by traditional, indigenous people and in some cases peoples practicing traditional pastoralism. In our inventory, it is only modern man who is a visitor who does not remain (McCloskey and Spalding 1988: 21).

The decision to leave 'modern man' out of a wilderness designation stresses the contrast between wilderness and modern (technological) life.
The challenge of redefining 'wilderness' is a contemporary one, derived from the desire to protect its values and qualities. Godin and Leonard (1979: 141) found that confusion over the meaning of wilderness was one of the major problems of wilderness managers. The way it is defined reflects the culture that has defined it and how members wish to use it. For a technological society and its technologically sophisticated members (as opposed to indigenous peoples living within its boundaries), wilderness is born when it becomes scarce and is special, i.e. different from the predominant type of land use.

Other cultures and religious groups would find this idea of wilderness, as a contrast to civilisation, foreign — if not incomprehensible. Antarctica, however, is a contrast to civilisation (and has no native peoples) and in this sense can wear the mantle of wilderness.

2.1.2 Wilderness versus nature

A definition of 'wilderness' requires an awareness of cultural bias. Non-technological peoples do not see themselves living in a wilderness (Stankey et al. 1990a: 48). Jo Aqguisho (1988: 283), speaking for North American native peoples at the Fourth World Wilderness Congress said:

For us there is no word for wild, it is not in our vocabulary, the closest we come to that is free; so then we speak of freedom in the natural order of things with the inherent rules and obligations of freedom.

Osherenko (1992: 281-282), in her review of human/nature relations in the Arctic, noted the consistent theme of the intertwining of humans with nature that culminates in a "commonly perceived bond" but cautioned that there is no single shared perception of that relationship. The features of this bond, however, are often: a human identity with nature, 'i.e. not being separate from it', pantheistic and animistic religious traditions, and a belief in equality or respect for other members of nature's community. Norma Kassi (1988: 301), of the Vuntat Gwich'in Nation in north-western Canada, explained:

while you may think of us as living in the wilderness of northern Canada, we think of ourselves as being of the wilderness. We and our activities are part of our natural wilderness system and have been so for tens of thousands of years.

Eastern religions also often view humankind's place in nature differently. The Taoist expression 'tzu-jan' meaning 'self-so', used in modern Chinese to translate the English word 'nature', embodies the idea that all modalities of being display themselves as they are: it is non-discriminatory and non-judgmental (Wei-ming 1984: 118). Wei-ming characterised the general Chinese world view of humanity as forming one body with the universe.
Nature as a concept is different from wilderness generally.

Buddhist scholar Schmithausen (1991a: 22) defined nature as having two aspects:

One is nature in the sense of eco-systems including characteristic sets of species of plants and animals; especially eco-systems essentially untampered with by human activities, i.e., wild nature. In a sense, however, such eco-systems where man's activity is careful and in harmony with nature, and which are hence close to nature, may also be called 'nature'.

The other aspect is nature in the sense of natural entities. In this case, we are mainly concerned with individual animals and plants as living or even sentient beings. From this point of view, there is little reason to distinguish between wild and domesticated ones. In clinging to life and recoiling from pain, both are alike.

In the first case, nature is akin to wilderness but without hostile or negative connotations, and may include humans; in the second, nature is inspirited, a concept missing from Western thought.

Despite the different cultural viewpoints, a sense of idealism pervades both definitions — untrammelled nature that has not been or is not dominated by human creations or use.

2.1.3 Antarctica: wilderness and wild nature

Antarctica has no indigenous population; it has no national wilderness definition. On one level, its natural systems are not home to humans; on another, it is part of humankind's global home.

Defining wilderness vis-à-vis Antarctica, uncovers what wilderness means, further, how humans see themselves and, ultimately, why humans are managing their activities there. Thus the real purpose behind devising any such meaning is to define what is desired.

Antarctic wilderness, using IUCN's 'global' terminology, might be defined as a continental ecosystem of essentially unmodified wild nature, where humanity's own works do not dominate the landscape and human activities do not degrade the natural systems on a local or global scale. This vast sheet of ice and snow will only mirror the image of what humankind brings to it. How it is defined theoretically will reveal what the global human/nature relationships have become. Investigating that image in more detail provides a practical way of protecting and managing it as a wilderness.

Wilderness, whatever its meaning and value, does not exist in the contemporary world without boundaries or borders around it, without a human label or designation. It becomes categorised as a park, a protected area, a reserve — something defined and delineated. Even Antarctica is divided according to (unrecognised) land claims (Art. IV, Antarctic Treaty) (Heap 1994)).
Visitor management in Antarctica will be guided by the definition and theoretical framework adopted by decision-makers, hence the need to explore these aspects on a deeper level. Antarctica will ultimately be regarded as an economic resource, a commodity, an object for human use or a place protected as a unique and valuable ecological community with intrinsic value. The Antarctic Treaty Consultative Parties (ATCPs) are policy-makers, not wilderness managers, and yet they are developing policies for the use and preservation of this wilderness. Decisions based on immediate human needs will not necessarily be able to contend with inevitable changes in those needs. As Sax (1976: np) observed about parks:

A park full of human improvements will of necessity be a place that reflects the fashions and interests of the moment; it will emphasize and glorify the values of the moment. A natural park has nothing so much as the quality of timelessness. It stands outside the scale of human achievement.

Although Antarctica's seas have been plundered by sealers and whalers as an economic resource, historically its remote position has protected it from the post World War II tourism boom (cf. Section 2.5.3). In the last decade, visitors have come, as they have come to every remote corner of the earth, and risk humanising the largest expanse of remaining wilderness. Conflicts among visitors will arise inevitably, due to the paradigms of the humankind/nature relationship. This chapter considers how conceptions of wilderness are shaped by these dominant views and how they have been used in management situations.

There are paradoxes however. Management is an inherently human activity, at best characterised by a biocentric respect for nature that concentrates on limiting human impact, at worst an anthropocentric tampering with the conditions of wilderness. Yet without management, little wilderness would exist. Most of the current research on wilderness management has been done within culturally determined areas of wilderness, like parks, reserves, and sanctuaries. Crowe (1974: 166) suggested that the purpose of all parks, which preserve areas of human-designated wilderness, is the same internationally, but claimed that the secondary benefits are different. Urban populations use wilderness to balance life, whereas less-developed nations use parks to raise money. The purpose may, on paper, be the same, but the thinking behind these benefits suggest an anthropocentric frame of mind. Wilderness exists for reasons other than to fulfil human recreational or philosophical needs: it is linked to the character of human existence.

Wilderness management is a recent phenomenon and one that can be traced directly from the cultural and historical origins of anthropocentrism and biocentrism/ecocentrism. The latter two terms have been defined in Chapter 1, but what
is an anthropocentric view of nature? Hendee et al.'s standard work on wilderness management defined anthropocentrism as:

A philosophical viewpoint which sees wilderness primarily from a human-oriented perspective. The naturalness of the wilderness is less important than facilitating human use and convenience. Programs that would alter the physical and biological environment to produce desired settings are encouraged (1990a: 531).

2.2 THE DOMINATION OF NATURE

Numerous authors (Glacken 1967; White 1967; Nash 1982; Diamond 1991; Oelschlaeger 1991) have investigated the relationship between humans and nature. The recurring aim of their works has been to establish how humanity has found itself destroying the environment from which it arose. Agriculture, religion, and science and technology all figure prominently in the work of these authors as factors that have facilitated humanity's split from nature's fold. In the following sections, brief summaries explain how these factors have shaped this relationship.

2.2.1 Hunter/gatherers and the natural world

Diamond (1991: 164) has pointed out that for most of our history, humans have engaged in a cynegetic (hunter/gatherer) lifestyle. How did early Palaeolithic humans view themselves in the natural world? According to Oelschlaeger (1991: 11-12) they thought of themselves as one with plants and animals, rivers and forests, as part of a larger, encompassing whole (which we would term a natural process or wild nature).

Evidence of this belief can be found in the totemic associations hunter–gatherer clans established with a species of plant or animal that identified them as part of the natural world. It is a conceptual system, rooted in natural history, that stretches back into a remote past to 'the point of origin' (ibid.: 12-13).

Other evidence of this kinship exists in Palaeolithic cave paintings, depicting the inter-relationships between animals and humans. When portrayed, human and animal spirits are combined, forming a hybrid that suggests equality, not control. The spiritual significance of the paintings is further heightened by the womb-like atmosphere of the cave that identifies the cave and humans with the Magna Mater, or Great Mother (ibid.: 23).

The Neolithic metamorphosis from cynegetics to farming was not, as previously believed, due to their "incessant quest for food" or because of "meagre and relatively unreliable" natural resources (Sahlins 1972: 2). Furthermore, as Oelschlaeger (1991: 24-25) has said, it is a "modernist gesture to say they were subsistence economies looking for a better way of life". Diamond (1991: 164) also discounted this traditional
characterisation and offered the view that it provided a different way of life. Archaeological remains from early agricultural sites have revealed that with the advent of agriculture there was also an increase in the type and frequency of disease as the quality and variation in diet decreased (ibid.: 168).

The climatological changes associated with the Wisconsin / Weichselian Ice Age (ending circa 10,000-15,000 BP) certainly affected Palaeolithic ecosystems, but cultural changes would nevertheless have been evolving over numerous generations (Houghton et al. 1990: 202, 289; Oelschlaeger 1991: 25). However, with agrarian advances a role change was inevitable — instead of being part of the Magna Mater, humans became farmers and objectified nature. During this great cultural conversion, an awareness of their separation from the natural world occurred and mythologies were required to explain it. This need is prevalent in both polytheistic and monotheistic religions.

As agriculturalists, humans employed polytheistic religions that focused on plant, animal, and human fertility. The religious life of cynegetic cultures switched from harmony and integrity with the Magna Mater to focusing on the Earth Mother as, "a goddess of fertility rather than an all-embracing mother of creation" (ibid.: 34).

2.2.2 The impact of Judaeo-Christian religions on nature

Agriculture changed the lifestyle and viewpoint of humans with regard to nature. The apparent order and harmony of nature has historically suggested a plan, in which humans came to believe they were deeply involved (Glacken 1967: 116). Many civilisations had introduced impressive innovations that changed their lives or brought order to them, but many researchers (Leopold 1966; Glacken 1967; White 1967; Nash 1982) believed that it was not until after the advent of the Judaeo-Christian religions that humans sharpened their own role as controller of nature and applied science and technology to help conquer it. The foundation of these religious beliefs was that it is God's will for humans to exploit and control nature for their own ends (White 1967: 1203).

White (ibid.: 1205) illustrated this marriage of religion and technology with the 'new' plough of the seventh century. Its vertical knife, horizontal share, and mouldboard created a friction so great that it required the strength of eight oxen to pull it over the land — more oxen than any one peasant could afford. The land no longer sustained and defined a single family's existence but was subdued by a machine controlled by several families. Those families were following the dictats of the Church and turning a worthless wilderness into a civilised land. "Wilderness," as Leopold (1966: 264) said, became "the raw material out of which man has hammered the artifact called civilization".

The domination of nature is not exclusive to Judaeo-Christian beliefs. For example, in ancient China, one Confucian master advocated the subjugation of nature by
humans (Schmithausen 1991b: 24), and in contemporary Japan, workers perform a ground-clearing ceremony to atone for the destruction of forests (ibid.: 1991b: 61).

The Judaeo-Christian traditions, however, brought with them a new order (missing from previous Hellenic and Eastern religions) that facilitated the subject/object role: the abandonment of cyclical time for linear time, and their own story of creation (Ling 1968: 10; Oelschlaeger 1991: 33). Wei-ming (1984: 113) discussed the Chinese view of nature and acknowledged that the apparent lack of a creation myth or a cyclic or linear notion of time was

predicated on a more fundamental assumption about reality; namely, that all modalities of being are organically connected.

Under the Judaeo-Christian religions, humanity's relationship with nature was transformed: the community member became the community leader. Genesis (28.13-15) clearly sets forth the role of humans.

Then God said, 'Let us make man in our image and likeness to rule the fish in the sea, the birds of heaven, the cattle, all wild animals on earth, and all reptiles that crawl upon the earth .... Be fruitful and increase, fill the earth and subdue it, rule over the fish in the sea, the birds of heaven, and every living thing that moves upon the earth'.

One Christian clergyman, Strachan (1983: 194), spoke to the group assembled at the Third World Wilderness Congress, and confessed

that the Church has sinned grievously over the centuries by being the main instigator of the split between nature and grace, matter and spirit.

He traced this split back to St Cyprian in the third century

There is no salvation outside the Church and He can no longer have God for his father, who has not the Church for his Mother (ibid.: 195).

Mother Nature and Mother Earth had been replaced by Mother Church.

Next the Church taught that God's grace did not extend to the rest of creation. This labelled nature as valueless except in so far as it served humankind and ultimately God (Oelschlaeger 1991: 33).

Strachan (1983: 196) made the case that it was the Church, not the Bible, that is to blame for the 'subdue the earth' sentiment. He found the Bible full of praise for nature and for the role of humans as stewards of nature. Saint Francis and his heretical ideas about the equality of all creatures were a matter of theological rather than biblical dispute. Glacken (1967: 151), too, pointed out that the theological writings are more elaborate in their rejection of the beauties of nature and their insistence of contemplation of God.
Certainly alternative Judaeo-Christian views exist that look for ways of reconciliation. White (1967: 1206) suggested that because science and technology have grown out of Christian attitudes toward man's relation to nature .... More science and more technology are not going to get us out of the present ecological crisis until we find a new religion, or rethink our old one.

There are those like Moore (1992: 109), who have rethought traditional beliefs, "discovering messages and meanings ... which hitherto had eluded them". Moore (ibid.: 112) re-evaluated theological philosophy about nature, concluding that Christians were giving new meaning to the "doctrine of human dominion", and will "... have something to contribute to the survival both of our home, the Earth, and our species, humankind".

2.2.3 The tools of transformation: science and technology

As Moltmann (1984: 133) explained, technology and science require a subject/object relationship. A human subject studies nature as an object or uses it as a product. This view necessarily places humans outside nature, and hence the definition of 'wilderness' as a place that contrasts with urban civilisation.

During the Middle Ages, humanity's view of nature underwent several changes. At first, wild nature was thought to house pagan enemies in the groves of trees, and the medieval monks of cloistered societies used an axe to reduce wild nature to divine order (Oelschlaeger 1991: 71-73). Next, wilderness was seen as a symbolic source-book for the divine message and, finally, nature's components were interpreted as earthly examples of how God's mind and creation worked (White 1967: 1206). The further investigation of wilderness as a manifestation of God's plan, whether or not it was wholly appreciated as such, could not proceed without science and new technologies.

Astronomy challenged the medieval scientific paradigm and disrupted the hierarchy of the divine plan. The theory of heliocentrism, advocated by Copernicus (1473-1543) (whose work was published posthumously) and by Giordano Bruno (1548-1600) (who was burned at the stake for his views), changed the focus of humankind's gaze and the implications of what was seen. When in 1572 the Dane, Tycho Brahe, saw a 'new' star (a supernova) his observations contradicted the accepted belief in the immutability of the heavens (Debus 1990: 89). Mathematics had helped him describe the system and his new observational equipment aided him and his staff in their regular observations of the planets, preparing the way for a more accurate set of star tables (ibid.: 92).

Johannes Kepler (1571-1630), Tycho's heir and disciple, was on a quest to discover a universal mathematical order and, consequently, sought to establish consistent mathematical relationships among the sun and planets. He concluded that this relationship was based on regular solids: an icosahedron, a dodecahedron, a cube and a tetrahedron.
He continued this work and, on the basis of his laws of planetary motion, developed mathematical expressions for universal order \((ibid.: \ 92-95)\). The doctrine of the immutability of the heavens was further undermined by Galileo Galilei (1564-1642), who observed through his telescope that Venus circled the sun, as indicated by Venus' moon-like phases, and that the sun itself had surface spots that rotated, revealing its axial motion \((ibid.: \ 96)\).

Technology had literally changed humanity's perspective on nature. Galileo, with the aid of a telescope, had become an observer outside of nature (Oelschlaeger 1991: 78). These discoveries did not, however, challenge "earth as a planned abode" (Glacken 1967: 176). They explained nature through efficient cause and matter-in-motion but did not threaten the dogma of final cause (Oelschlaeger 1991: 80). Through mensuration, the natural world was being revealed in an objective way, separate from the viewer.

Francis Bacon (1561-1626) lauded the acquisition of knowledge as a power with which humankind could shape all things. It was a symbolic return to Eden, where God had asked Adam to give the animals names (Glacken 1967: 472; Oelschlaeger 1991: 82).

The end of our foundation is the knowledge of causes, and secret motions of things; and the enlarging of the bounds of human empire, to the effecting of all things possible (Bacon 1990: 210).

While there was some dispute among scientists as to how far technology could go and still be good for humankind, knowledge was the key to its wise use. Science could raise humanity to its rightful place as master of nature and repair the damage done by sin (Oelschlaeger 1991: 83).

René Descartes (1596-1650) also saw the potential for a new world based on science. Nature was a mechanism and animals were mere machines. They act, he said, according to the disposition of their organs, just as a clock which is only composed of wheels and weights is able to tell the hours and measure the time ... (Descartes 1990: 284).

The prize for humans' success in subjugating nature was awarded to the eighteenth century by French naturalist George-Louis Leclerc, Le Compte de Buffon, who believed that his Age had witnessed the final stage in the struggle for dominance. He observed that we have made, cultivated, fertilized the earth; its appearance, as we see it today, is thus quite different than it was in the times prior to the invention of the arts (Worster 1977: 7).

By 1859, Charles Darwin's \textit{Origin of the Species} was distressing Christian theologians by suggesting that instead of nature having been created for human use, humans had been created along with and from the same stuff as the rest of nature \((ibid.: \)
George Marsh's book *Man and Nature; Or, Physical Geography as Modified by Human Action* (published in 1864) chronicled civilisation's destructive impact on the environment (Nash 1989: 38). Marsh did not challenge anthropocentrism, being satisfied that it was humankind's place to dominate nature, but he felt that nature's inter-relationships were far too complex for humans to understand and that technology would be needed to rehabilitate the planet (*ibid.*: 38). Just before the turn of the nineteenth century, Thomas Malthus's book *An Essay on Population* raised the possibility that nature had limiting factors beyond human control. In less than the hundred years between Buffon and Marsh human domination of nature had progressed from a glorious triumph to a potential defeat.

2.3 RE-EVALUATING THE RELATIONSHIP BETWEEN HUMANS AND NATURE

In contrast to the view that nature was an inanimate substance that humans could shape into something useful, other thinkers found that all or parts of nature were valuable and sentient. This re-evaluation arose from a combination of factors: humans were re-examining their treatment of nature, and nature was being rediscovered as a desirable resource in the face of the increasing demands of industrialisation.

2.3.1 Ethics: the treatment of nature and its components

Eastern and Western doctrines about human treatment of other living forms are dissimilar. The Buddhist precept to abstain from killing or injuring any living animate being is fundamental to the religion, although Schmithausen (1991c: 1-3) has pointed out that there are, in that admonition, different interpretations of what qualifies as sentient. For example, Indian Buddhism by and large regards only animals as sentient because they are capable of perception and sensation. The early forms of Indian and Tibetan Buddhism rejected the killing or injuring of plants, seeds, water, and earth, and believed those actions to be fundamentally immoral (Schmithausen 1991c: 24). Tantric Buddhism does not admit plants into that circle, whereas Jainism does grant plants, water, wind, and fire admission.

Nature, as a living force, was also recognised by the Greeks and Romans, and existed outside *jus commune*, or man-made law. *Jus naturale* addressed the state of raw nature and the biological principles of birth, reproduction and death. Within these principles was another canon, *jus animalium*, that implied animals had natural rights independent of humans and their governments (Nash 1989: 17).

In the West, the theory of natural laws, and the existence of right and wrong outside revelation or legislation, was not seriously recognised until the seventeenth century. John Locke (1632-1704) is thought by some to be the most important source of
America's natural rights heritage. His system included a state of nature that was also pre-social, pre-government, and he maintained that all people were equal before God. This gave them certain fundamental or absolute rights — "Life, Liberty, Health, Limb or Goods" (Locke 1993: 117). Goods referred to property or possessions that persons had a right to through their own labour. Animals could be considered as property and derived their rights through their owners. In opposition to Descartes, who saw animals as insensible, Locke reasoned they could suffer and, consequently, it was morally wrong to harm them needlessly — not for the impact on the animal but on humans. Locke felt that the lack of compassion that allowed cruelty to animals, especially by children, would lead to cruel behaviour toward humans (Nash 1989: 19).

In the eighteenth century, a by-product of the democratic revolutions in America and France was the extension of ethical thinking to animals. Ideas, like those of Locke, about the rights of humans inspired a few individuals to apply them to other species. This was not a fully-fledged call to respect the rights of all of nature's creatures or to put them on an equal footing but a call to acknowledge that causing pain to animals was a form of tyranny. In the last quarter of the eighteenth century, Dr Humphrey Primatt, an English minister, argued that, as pain was a form of evil, "cruelty to any form of life was 'ATHEISM' and 'INFIDELITY'" (ibid.: 23). Jeremy Bentham, writing in 1789, developed a doctrine known as utilitarianism, that was based on the premise that pain was bad and pleasure good. The utility of an act was the consequence of the action that caused one or the other. Unethical actions were those that caused pain. In contrast to Descartes, he believed that animals felt pain and that laws should be extended to cover anything that can suffer (ibid.).

Rights for 'beasts', as an idea and as a legal principle, were slowly being acknowledged. Legislation protecting animals against cruelty was first enacted in the Massachusetts Bay Colony in 1641. Domesticated animals gained some measure of protection, and cattle were given the right to be rested and refreshed while being driven (Nash 1989: 18). Richard Martin (1754-1834), an Englishman, and organiser of the Society for the Prevention of Cruelty to Animals (after 1840, the Royal Society for the Prevention of Cruelty to Animals) in 1824 pushed through the Ill-treatment of Cattle Act. This marked the first time that cruelty toward animals was a punishable offence nationwide in the United Kingdom (ibid.: 25). In Britain, concern about the humane treatment of animals resulted in the passage in 1876 of the British Cruelty to Animals Act, which permitted vivisection only in licensed medical centres and only if pain was minimised (Nash 1989: 26). The United States allowed vivisection until 1966, when the Animal Welfare Act was passed (ibid.: 30).
2.3.2 Nature as a useful resource

The successful subjugation of nature unintentionally resulted in endowing it with a new attractiveness. Industrialisation affected wilderness in at least two ways. First, it provided Romantic escapist with a lost paradise and relief from urban stress (Flemming 1974: 330; Worster 1977: 125). The New World's wilderness attracted the interest of sophisticated Europeans, like René de Chateaubriand and Alexis de Tocqueville, who visited America to sate their desire for an experience of wilderness (Nash 1982: 51). Romantic poets, painters, and philosophers hailed the spiritual qualities of wilderness and established a basis for the appreciation of nature instead of regarding it with fear and hatred (ibid.: 51). Second, wilderness in America was becoming attractive not only for its spiritual features, but also because it was a storehouse of economic resources. The expansion and development of the United States was driven by what seemed to be its unlimited natural resources. Industry was encouraged to consume the land and convert it into an economically viable commodity. By the 1890s, however, the Census Bureau reported that the frontier, and hence the unlimited wilderness, was closed (Koppes 1988: 232-233). Preservationists (conservationists today) saw their opportunity to justify saving wilderness for the public good and utility as well as for the spiritual health of the nation.

These circumstances led to the development and later to the appreciation of wilderness parks — the first areas of preserved wilderness.

The world's first large-scale wilderness to be protected in the public's interest, in 1872, was Yellowstone National Park. The original advocates of the scheme were not concerned with preserving wilderness but with preventing the private acquisition and exploitation of its resources. The pattern of acquisition and capitalisation that took place in and around Niagara Falls in the mid-1800s served as a lesson for the early park planners (Sax 1976: np). It was the spectacular attractions of the New World — Niagara Falls, the Mississippi River, Lake Superior, the Grand Canyon, and Yellowstone's hot springs and geysers — that captured the interest of many people, not the wilderness itself (Nash 1982: 108). This theme, conserving a feature of wilderness, was to become an important aspect of wilderness management.

In the same year as the creation of Yellowstone National Park, a New York State Park Commission was set up to investigate the preservation of the Adirondacks as a park. It was not set up, the commissioners stated, "for mere purposes of recreation, but ... the simple preservation of the timber as a measure of political economy" (ibid.: 118).

The conservation movement of the Progressive Era, under the presidency of Theodore Roosevelt, was dominated by "efficiency, equity, and esthetics" (Koppes 1988: 233). Advocates of efficiency sought to use natural resources by developing them, others added their voices to resource use by promoting "economic democracy", and the
proponents of aesthetic values embraced wilderness preservation (*ibid.*: 235). Preservationists sought to conserve wilderness by stressing its utility.

2.3.3 The intrinsic value of nature

The idea of nature as a whole community meant that its components gained value. A few individuals brought forth arguments that generated deeper thinking about nature-as-an-organism.

In the West, men like Henry More (1614-1687), an animist at Cambridge who taught that there was a spirit in nature, and John Ray (1627-1705), who saw nature as infused with a spirit, though that spirit was subordinate to the divine one, used the incredible diversity of life as proof of a supreme being (Nash 1989: 21; Oelschlaeger 1991: 101-102). Ray epitomised the natural theology movement and argued that nature-as-an-organism was proof of a designed earth. This approach reconciled the 'knowability' of nature with the deviations of organisms in nature that were beginning to be understood (Oelschlaeger 1991: 101-102).

Ray's contemporary, Baruch Spinoza (1632-1677), tried to create a system in which humans were a part of — and not apart from — the natural world. He saw nature as a community of inter-relationships where all things were manifestations of divine substances. He is seen by some 'deep ecologists' like George Sessions, to envisage and foreshadow modern "ecological consciousness and environmental ethics" (Nash 1989: 20).

Many, however, regard Darwin as the harbinger of biocentrism and the revolutionary in environmental thinking (*ibid.*: 43; Oelschlaeger 1991: 233). John Muir, after reading Darwin in 1867, noted humbly in his book *A thousand-mile walk to the Gulf*:

this star, our own good earth, made many a successful journey around the heavens ere [before] man was made, and whole kingdoms of creatures enjoyed existence and returned to dust ere [before] man appeared to claim them. After human beings have also played their part in Creation's plan, they too may disappear without any general burning or extraordinary commotion whatever (Muir in Nash 1989: 42-43).

Darwin's work created a biological framework for nascent biocentric wilderness philosophy. His discoveries, formulated in *The Origin of the Species* and *The Descent of Man*, challenged thinking about human/nature relationships. Humankind did not appear to have been created separately but from all of the other species of the earth. Darwin felt we should be tolerant and "sympathetic toward the earth and all that lives" (Worster 1977: 184). Humans were involved with all of nature and were not intended to be just rulers of other creatures.

The giants of this new environmental thinking were Henry David Thoreau, John Muir, and Aldo Leopold. They bestowed an immediacy on nature. They saw her as
organic, as infused with spirit, and they saw human beings as a part of that wholeness. Humankind was not, as most thought, the rightful ruler of nature but a lost and sometimes erring subject. We have arrived here, Thoreau felt,

.... by avarice and selfishness, and a grovelling habit, from which none of us is free, of regarding the soil as property, or the means of acquiring property chiefly, the landscape is deformed, husbandry is degraded with us, and the farmer leads the meanest of lives. He knows Nature but as a robber (Thoreau 1981: 149-150).

By returning nature's sacredness to her Thoreau (1817-1862) helped restore a "new wilderness mythology" in which humanity could revivify its culture. This is what he meant when he said "in Wildness is the preservation of the World" (ibid.: 613).

Muir (1836-1914) was a much bigger public figure in his time than Thoreau. As the father of the American conservation movement, he made direct, personal contributions by helping to establish six national parks in the US. He also founded the Sierra Club, an advocacy group for wildlife (Oelschlaeger 1991: 172). During his walk to the Gulf of Mexico, his ecocentrism shone through. Nature had a value outside of her utility to humans:

The world, we are told, was made especially for man — a presumption not supported by all the facts. A numerous class of men are painfully astonished whenever they find anything, living or dead, in all God's universe, which they cannot eat or render in some way what they call useful to themselves (ibid.: 185-186).

Both Thoreau and Muir established a wilderness philosophy, but Muir's greatest contribution was his overwhelming success in introducing the idea of wilderness in a tangible form — the national parks.

Leopold's (1887-1948) land ethic is considered to be the basis for contemporary wilderness philosophy. Its precepts fill out the idea of wilderness. He said in the foreword to A Sand County Almanac:

That land is a community is the basic concept of ecology, but that land is to be loved and respected is an extension of ethics. That land yields a cultural harvest is a fact long known, but latterly often forgotten (Leopold 1966: xix).

Leopold took apart the Western paradigm of nature — of land as a commodity. Its abuse by humans, he said, derived from "our Abrahamic concept of land" (Leopold 1966: xviii). The answer was nothing short of a revolution — a shift of values "reappraising things unnatural, tame and confined in terms of things natural, wild, and free" (ibid.: xix).

From these thinkers and many others came the dictum that humans should return to nature's fold and rejoin her cycles. This philosophy, brought into the 1960s, called for a reassessment of values from utilitarianism or 'shallow ecology' to non-
anthropocentrism or 'deep ecology' a term first used by Bill Devall (Nash 1982: 257). Deep ecology is a new paradigm to replace nature-as-a-machine. It implies that there is no "ontological divide between human and nonhuman" (Fox, in Oelschlaeger 1991: 301) and that by seeing such a divide one necessarily fails to be a deep ecologist. Naess (1990: 88) offered a 'deep ecology platform' that reveals how these basic human/nature relationships are to be seen:

1. The flourishing of human and non-human living beings has value in itself. The value of non-human beings is independent of their usefulness to humans.
2. Richness of kinds of living beings has value in itself.
3. Humans have no right to reduce this richness except to satisfy vital human needs.
4. The flourishing of human life is compatible with a substantial decrease of the human population. The flourishing of non-human life requires such a decrease.
5. Present human interference with the non-human world is excessive, and the situation is rapidly worsening.

The evolution of wilderness as an idea does not end with deep ecology, biofeminism, ecocentrism or any other of the new interpretations. Perspectives on what wilderness is, have continued to evolve. The concern here is the impact of these perspectives on wilderness managers and what the outcome has been.

2.4 THE NEED FOR MANAGEMENT: GLOBAL ECOLOGICAL CRISIS AND SUSTAINABLE DEVELOPMENT

Just as a global environmental crisis had loomed over the second half of the nineteenth century, this danger was acknowledged again in the 1960s and 1970s. In 1970 Ehrlich's book, The Population Bomb with Malthusian overtones, warned that the world, filled to capacity with 3.5 billion people, was running out of food (Adams 1990: 28). Dunlap and Catton (1979: 60) concluded that by the 1960s it was obvious that agricultural and industrial technology were the cause of the disappearing biosphere. Just as Galileo, who peered at the moon through a telescope in 1610 (Debus 1990: 96), had extended humanity's self-awareness, the 1969 moon landing forced us to see earth from a new perspective. Technology had once again obliged us to reconsider our position.

The degradation of natural areas has been the focus of many national and international meetings. The International Union for the Conservation of Nature and Natural Resources (IUCN) received material in 1961 from the Nature Conservancy and the Society for the Promotion of Nature Reserves revealing the scale of the international environmental crisis and that "vast numbers of fine and harmless creatures" were dying as the result of habitat destruction (Sheail 1976: 238). At the 1972 Stockholm Conference
on the Human Environment, Barbara Ward warned the world community of impending disaster (Moore 1992: 104).

Consumption of land, whether for enjoyment or development, was acknowledged as a growing danger. Environmentalism in the industrialised world prompted polemics against ecology and conservation versus development (Adams 1990: 27). It was from this background that sustainable development was born.

The definition of sustainable development most commonly used in the literature comes from Our Common Future (World Commission on Environment and Development 1987: 43)

development which meets the needs of the present without compromising the ability of future generations to meet their own needs.

As Adams (1990) pointed out, sustainable development was not an entirely new idea. It had sprung from concerns about nature preservation at home and abroad, ecology and management globally, and the predicted environmental crises.

At the turn of this century Gifford Pinchot, President Theodore Roosevelt's head of the Division of Forestry, was promoting conservation of the forest's commodities (Nash 1990: 34). Nature was seen as a stockpile of raw materials that became valuable when humanised. Environmental protection was couched in terms of economic prosperity. At the Fourth World Wilderness Congress, held in Denver in 1987, sustainable development was the topic of several presentations. Ruckleshaus (1988: 270) blamed conventional development for causing "desertification, soil erosion, impoverishment of rural people and the loss of tropical forests ...". His fear, however, was for the loss of markets for developed nations if "developing economies do not resume their expansion". He went on to say that today "Environmental degradation equals the absence of development" (Ruckleshaus 1988: 270). Technology again would bring order to nature.

Tourism, as an industry, has recently been painted with the sustainable development brush. This linkage, only possible this century, is due primarily to four factors: population changes, increase in per capita real income, increased leisure, and improved technology (Clawson 1974: 117; UNEP 1992: 3). The pros and cons of sustainable tourism per se are not relevant at this point. More important here is how those advocating sustainable tourism regard wilderness.

Sustainable tourism is defined by the Federation of Nature and National Parks of Europe (FNNPE) as

all forms of tourism development, management and activity, which maintain the environmental, social and economic integrity and well-being of natural, built and cultural resources in perpetuity (FNNPE 1993: 5).
It entails "simply combining conservation principles with development in the area of tourism" (ibid.). However, it also acknowledges that "in some protected areas, tourism simply has no place at all ...(ibid.: 1). The acknowledgement that some areas may not be suitable for tourism exhibits a more sophisticated view of basic wilderness recreation principles than the naive belief that conservation principles can simply be combined with tourism development.

FNNPE's members use IUCN protected area categories to describe their areas and thereby extend management to a range of natural conditions. The purpose of National Parks, for example, is to protect outstanding natural and scenic areas for scientific use and for education and recreation ... commercial extraction and development are not normally permitted (FNNPE 1993: 8).

Protected Landscapes should exhibit a "harmonious balance between people and nature" (ibid.: 9). A range of conditions and activities is managed, accepting the appropriateness of a variety of activities for specific types of area.

Sustainable tourism is an economic argument promoted in both urban and wilderness areas. Problems arise, however, when it is considered in the context of wilderness management. Butler (1991: 209) pointed out:

"It has to be appreciated that tourism is an industry and, as such, is much like any other industry .... There is no more reason to expect tourism, on its own accord, to be 'responsible' than there is to expect the beer industry to discourage drinking ...."

Ecotourism, a part of that industry,

involves travelling to relatively undisturbed natural areas with the objective of admiring, studying and enjoying the scenery and its wild plants and animals, as well as any cultural aspects found there (Ceballos-Lascurain 1991: 31).

It has often been argued that ecotourists (customers) want a high level of environmental quality and that it is in the interests of the operators to promote green practices:

If significant environmental damage occurs, products lose their attraction, especially for the all-important repeat customers — in business as well as leisure tourism .... Consumer demands are certainly more sophisticated than a decade ago and the quality of the environment is increasingly important as a part of the travel experience (World Travel & Tourism, E.R.C. 1993: 8).

When nature becomes a 'product', it is valued only as a product. Tour operators are not the only ones to see natural areas as products. At the IV World Congress on National Parks and Protected Areas, participants heard that aggressive marketing of goods and services was essential for a manager of protected areas, who like a
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banker ... uses the park's assets as a base upon which to build customer satisfaction, investment, and interest (McNeely 1993: ix).

The problem, Butler (1991: 206) explained, is that, having visited the Canadian Arctic, their next destination might well be Antarctica, and after that the Andes ... much of their expenditure is not made in the local region ... there is nothing in the true wilderness for him to spend his money on!

Tuan (1974: 95) too has not found that this kind of modern sightseeing brings humans and nature together. Often much of this travel "seems motivated by the desire to collect as many National Park stickers as possible".

2.5 THEMES OF WILDERNESS MANAGEMENT

Since humans took up the hoe, they have been managing wilderness. Their record thus far is a successful one — they have managed it to the extent that approximately only 34% of it is considered still to be wild (McCloskey and Spalding 1988: 21). As others have said, to manage wilderness is a contradiction in terms (Nash 1982: 339; Hendee et al. 1990a: 15). What is being managed now is, of course, humans' use of nature.

To discuss the themes of wilderness/nature management, two assumptions must be met: first, nature has to be seen as a positive or valuable entity; second, it has to be protected by some kind of legal designation, whether park or reserve.

Muir and others recognised that it was essential to designate an area, to make it a park or reserve to protect it. The lessons of Niagara Falls were known to the creators of parks of the west and taken seriously (Sax 1976: np). Visitors began coming to Niagara Falls in the early 1800s, and by the 1860s (less than 60 years after land surrounding the Falls was sold into private hands) not a single vantage point remained where one could see the Falls without paying a fee to the landowner. Protecting the attractions in Yellowstone was a prime reason for making it the nation's first National Park in 1872.

'Wilderness management' is a relatively recent concept and it has undergone change as a result of the same polemics about humans and wilderness — is nature for humanity or is humanity a part of nature? The following section briefly outlines four themes in wilderness management.

2.5.1 Protecting attractions and species

Early management in the United States was concerned with entertaining the public. Many areas like, Niagara Falls and Yosemite National Park, were protected for their value as attractions, not as wildlands needing protection from overuse (Chase 1987: 36; Dilsaver 1992: 238, 244). These attractions were regularly 'managed' to please...
visitors: soap was dumped into the geysers at Yellowstone National Park, so that eruptions would occur at times more convenient for visitors, spotlights illuminated Yellowstone's Old Faithful geyser, bears were fed with hotel garbage before groups of 'photographers', and live chickens were tossed over the cliffs at Yosemite National Park (Nash 1990: 32-33). To entertain waiting tourists, radio music was provided in between shows.

In contrast to the Americans, the British took a much greater interest in the humane movement, as Britain had little wilderness of its own left to manage. In the nineteenth century, concern for particular species was stimulated by the demands of the fashion industry and big-game hunting. Killing birds so their plumes could be used on ladies' hats caused an outcry and finally protection of birds was introduced in both Britain and the United States (Sheail 1976: 5; Nash, 1989: 49). Additionally, egg and plant collectors in Britain threatened several species with local extinction. The preservation of African game was another concern shared by the British and the Americans. Excessive hunting was threatening to wipe out large populations of wild animals in Africa, just as it had in the American West (Nash 1982: 343).

2.5.2 Preserving the ecosystem

The need to protect wildlife and its habitat gained international momentum and was largely a result of expanding European trade and hunting (Adams 1990: 17-18). Africans living in areas of wilderness (their homes) were thrown out of the newly created reserves as they were considered poachers — they were not allowed to be hunters like white men (Nash 1982: 364; Adams 1990: 17-18). This situation later caused difficulties as Africans came to see reserves as foreign (Nash 1982: 364).

The idea of an international organisation to protect wildlife was debated in 1909, and in 1913 the Swiss government appointed a committee of international scientists to debate the subject (ibid.: 358). World Wars I and II delayed progress, but in 1947 a provisional International Union for the Protection of Nature emerged. Its objectives were "the preservation of the entire world biotic environment" (ibid.: 361). From 1956, this organisation was known as the International Union for the Conservation of Nature and Natural Resources (IUCN). IUCN protected nature for economic as well as "social, educational and cultural reasons" (ibid.: 362). Anthropocentric justifications were still in the forefront of conservation.

This concern about a biotic system did not arise out of the blue. In 1927, Charles Elton in Cambridge had been working on the idea of food chains and a hierarchical pyramid to explain the community of nature. Arthur G. Tansley, disliking the anthropocentric connotations of this approach, in 1935 proposed 'ecosystem' as the term to replace it (Nash 1989: 57).
2.5.3 Controlling tourism/visitors

Human modification of a designed earth, in response to climatic change, embodies what Glacken (1967: 5) identified as the predominant idea in Western ideology about our relationship with nature. Technological inventions have given humans not only a greater understanding of nature's functions and mastery over some of her elements, but the ability to conquer space and visit remote places. In this time-space compression (Harvey 1990: 284), humans have subjugated space for their purposes and turned nature into a commodity for their use. "Time taken to traverse space has shrunk ..." (Harvey 1990: 240).

The availability of transport has been the key factor in the increase in the numbers of visitors to parks. Nash (1982: 318) related that before modern highways were built, a trip from San Francisco into the Sierra Nevada trailheads took three days of "tough driving". If someone lived on the east coast and depended on railways, travelling to the western parks was not feasible within the two-week vacation period of most visitors.

During Yellowstone National Park's early days, preservationists fought to exclude railway lines from the park, in marked contrast to their counterparts in Canada, because they feared the change the railways would bring (Henderson 1992: 11). Despite this, early planners at Glacier National Park (created in 1910) believed that the Park's distance from the nearest railway station protected it from over-visitiation (Martin, personal communication, 1993). Now, two million people visit Glacier annually.

Remoteness does not presuppose a vast tract of land. Even in a nation as small, in land area, as Great Britain some species were protected by their remoteness. Sheail (1976: 55) noted that in the case of many rare plants "Their survival was attributed to the remoteness of the fen from the nearest railway station and the fact that a boat was needed to explore the area thoroughly".

The post World War II visitation boom and the philosophy that parks are for everyone had created increased expectations of the environment (Aldridge 1974: 301). The first major tourist campaign in the US, Mission 66, was launched after the war, to renovate and enlarge disintegrating park facilities and accommodate more tourists (National Park Service 1980: 1).

By 1963, however, the parks were being overrun. The Leopold Report warned Congress that the condition of the parks and their management was endangering the value of the parks themselves. Park policy should "minimize human disturbance to park ecosystems" (NPCA 1989: 4). Recommendations were made to "preserve the biosphere and discourage unchecked autonomous tourism" (Dilsaver 1992: 35). At the same time, the Wilderness Act of 1964 noted explicitly that recreation was only "one of the many values of wilderness ..." (Cole 1990a: 361). The National Park Service (1980) reported to Congress in State of the Parks that a number of serious problems from various activities and sources — including fossil collecting, backpackers, boating,
overabundance of visitors, and off-road vehicles — were threatening the parks' natural and cultural resources.

The grandchildren of those who had saved the wilderness from destruction were, it was said, loving the wilderness to death.
CHAPTER 3
VISITOR MANAGEMENT: FROM CREATING ACCESS TO IMPOSING RESTRICTIONS

3.1 MANAGING WILDERNESS FOR VISITORS

In considering any future visitor management in Antarctica, one must first have an understanding of how and why justifications for visits to wilderness/natural areas were developed, what problems arose, and the various methods employed to mitigate adverse impacts. This understanding will generate awareness of potential scenarios and, with the aid of hindsight, should make it possible to avoid some common pitfalls. Examples are drawn from various sources, including the larger North American wilderness parks and remote islands like the Galápagos Islands and Madagascar. Each of these areas faces obstacles that result from accessibility problems and government directives or orientation. All these experiences can contribute to a fuller view of Antarctic visitation and management.

Wilderness preservation has evolved from the designation of wilderness areas, the first step (as Muir and others realised) in attempts to tackle conflicts between users and uses. The provisions for managing human use of wildnesses or natural areas are generally accepted as resting on three basic conditions (Hendee et al. 1990a). First, the wilderness or natural area must be legally designated. This step allows all potential managers and users to acknowledge its boundaries and status and to establish enforceable rules and regulations concerning its use. Second, the area's designation should include management objectives (about the type and extent of use, or visitor experiences) that are translatable into management actions. Finally, the area should have a comprehensive management plan integrating each type of use into the system (see Chapter 7).

This chapter examines the early development of visitor management and focuses on the issues that faced (and continue to face) managers as they saw their natural areas grow into popular tourist destinations. Somewhere in the midst of these experiences and ideas the question arises of what conditions are being managed — recreation, wilderness, or both?
3.1.1 Wilderness visitors and the erosion of wilderness

The literature on wilderness management is dominated by the experience of North America. Tourism was pursued by the United States and Canada for divergent ends — wilderness preservation for the one and economic livelihood for the other.

In the US, wooing the public was a crucial part of the campaign to save wilderness. When the Hetch Hetchy Valley in Yosemite was dammed in 1913 to ensure that 500,000 people in San Francisco had fresh water, preservationists realised that this area, and others like it, could not be defended on scenic merit alone (Runte 1987: 82-83). Therefore, encouraging tourism in the parks was a way of establishing a political/economic base that would be powerful enough to stand a chance against resource-based business interests. Preservationists saw roads, trails, and crowds as generally preferable to dams, reservoirs, and grazing (ibid.: 91).

In contrast, the earliest Canadian parks were created to guarantee the railways a monopoly in the tourist industry (Bella 1986: 196). Bella (ibid.: 197) noted that Banff, Yoho, Glacier, and Jasper National Parks were all created for the financial benefit of the railways: the Canadian Pacific Railway (CPR) in the case of the first three; the Canadian National Railway served Jasper. Banff (known as Rocky Mountains National Park) when Canada's first National Park was created there in 1885) owed its existence to the commercial potential of its hot springs (Marty 1984: 68; Dearden and Berg 1993: 195). Canada welcomed tourism and resource development in its parks as a purely economic investment (Turner and Rees 1973: 32; Henderson 1992: 11; Dearden and Berg 1993: 197).

The Canadian national dream, as envisaged by Sir John A. MacDonald, Canada's first prime minister following Confederation in 1867, was of a railroad bringing raw materials and produce from the hinterlands into Quebec and Ontario's industrial areas (Bella 1986: 196). When British Columbia became part of the Confederation in 1871, the Canadian Government was committed to building the transcontinental railway and extending settlement into a wilderness unbroken by Euro-Americans (Lothian 1977: 10). In Canada, the wilderness was a multi-purpose stage. The Rocky Mountains Park Act of 1887 provided:

for the preservation of the landscape, the protection of wildlife, and the leasing of lands for purposes of residence and trade, but also permitted the working of mines within the park, the pasturage of cattle under permit and management of hay lands (Lothian 1977: 11).

Although their reasons for promoting parks were dissimilar, the US and Canada shared both an economic desire to capture part of a European tourism market (believed to be worth $500 million yearly in 1915) and a nationalistic desire to be appreciated for what Europe did not have — wilderness (Turner and Rees 1973: 32; Runte 1987: 93).
The US campaign, 'See Europe if you will, but see America first', included fanciful depictions of natural features, like Bryce Canyon (near the Grand Canyon), complete with European and Oriental architectural additions (Runte 1987: 80-93). Regardless of what tourism did for the parks — preserve them or provide economic opportunities — access and lodging were crucial if they were to attract the public.

Initially in North America, railways carried most visitors to the parks but cars soon surpassed them. At Yosemite in 1916, for example, 14,527 visitors came by car while the railway brought 14,251. By 1917, the ratio was three to one in favour the car; the following year it was seven to one — 26,669 passengers came by car versus 4,000 by rail (ibid.: 156).

A park's success, measured by the amount of tourism, was initially a direct result of its proximity to a railway line. Glacier National Park, created in 1910, had nearby rail service via the Great Northern Railway and experienced significant tourism from the start (Walter 1982: 4). Tourism at Waterton (its sister park and coterminous with Glacier) was not as prominent because the CPR's line was 35 miles to the north. Access improved in 1926, when a road linking the parks was built, and the Great Northern Railway Company began building the Prince of Wales Hotel in Waterton (ibid.: 9). Another improvement, a power-launch service bringing visitors from Glacier, on one side of the lake, to Waterton, on the other side, caused the number of tourists to rise dramatically for the next few years (ibid.: 9).

Improved access enabled more tourists to visit the parks, but what did they expect when they got there? In Canada, the Banff Springs Hotel was styled after the chateaux of the Loire to attract the same wealthy classes that patronised the great spas of Europe. These tourists were promised all of the excitement of the wild west, the mighty rivers and mountains but they could experience them in "comfort, nay, in luxury" (Marty 1984: 68-69).

They wanted to visit healthful spas, climb mountains (sometimes employing CPR-accredited Swiss guides (W. Adams, personal communication, 1995)), pursue scientific or literary interests, or hunt the remaining stocks of wild animals. An excerpt from the local newspaper reported that tourists had expressed interest in seeing a "live b'ar" and were perfectly satisfied when their guide "pumped a bullet" into a bear that came face to face with the party during their travels (Marty 1984: 81). Tourists had come to see a land of complete contrast to their own, but to do so in comfort.

Both the Canadian and the US governments gave their blessing to the development of tourism in their wilderness areas. In Canada, this policy was all part of the government's dictate to make the park 'a civilized garden in a wilderness' (Lothian 1977: 12; Marty 1984: 74). The public parks of Canada, known as Dominion Parks, were "pleasure grounds for the benefit, advantage, and enjoyment of the people of Canada" (Lothian 1977: 13).
The US parks were promoted by the government and later by the National Park Service (NPS), rather than by the entrepreneurs, but the approach was similar. In 1918, Stephen Mather, Director of the newly created NPS, was sent a letter by the Secretary of the Interior, Franklin Lane, setting forth the policies of the two-year-old agency. The message was that parks remain "absolutely unimpaired" for future generations and that they be used for the pleasure of the people (Dilsaver 1992: 235). This language became a part of the Wilderness Act of 1964 (cf. Section 2.1.1). The practice of park management was to encourage and facilitate recreation and amusement.

With tourism as the justification for parks, the NPS needed to encourage more visitors and ensure their enjoyment. Mather aimed his first tourism campaign at the increasingly popular Yosemite National Park. In 1925, the concessionaires were brought together, under the Yosemite Park and Curry Company, and found ideal business conditions — improved roads, capital, protection from competition, and encouragement to build new and larger accommodation. Two years later, park visitors could choose to stay in the luxurious Ahwahnee Hotel in addition to tents, cabins, and campsites (Dilsaver 1992: 238).

In both the US and Canada, access, accommodation, and activities were the basic necessities of wilderness parks; they served the public enjoyment.

The early development of tourism in Alaska followed a similar path and serves as an example closer to Antarctic tourism. In 1901, Henry Gannett, Chief Geographer of the US. Geological Survey, wrote about his journey to Alaska for National Geographic magazine. In the last two paragraphs of the long article he identified what may possibly Alaska's greatest asset:

This is the scenery .... The Alaska coast is to become the show-place of the earth, and pilgrims, not only from the United States, but from far beyond the seas, will throng in endless procession to see it. Its grandeur is more valuable than the gold or the fish or timber, for it will never be exhausted. This value, measured by direct returns in money received from tourists, will be enormous; measured by health and pleasure, it will be incalculable (Gannett 1901: 196).

He spoke with some degree of hindsight. Nearly twenty years before, the Pacific Coast Steamship Company (PCSC) had led the way in promoting the first Alaskan tourism (Nash 1981: 7); its freight-hauling ships had begun to take on board passengers who were willing to pay to see the sights. In 1883, one daring captain demonstrated that he could take his large steamship into Glacier Bay, right up to an active glacier (or 'live' as it was called then) (ibid.).

Much of the impetus for these early trips came from John Muir's accounts of his experiences in Alaska. Others followed. The number of tourists who cruised to Alaska in 1884 was 1,650, rising to 5,007 by 1980 (ibid.). In Muir's day, the cost of such a round-trip from San Francisco to Glacier Bay was $130, which he considered a cheap
and easy price (Hinckley 1965: 70). At 1993 prices† that would be $2453, hardly cheap. By 1932, the trip from Chicago by rail and by ship on the Yukon River cost approximately $550 ($4962 at 1993 prices) not including by side trips (Wilson 1977: 19). In 1994, a 17-day tour of Alaska and the Yukon cost approximately $4700 (Arctic Experience Ltd 1994: 86).

Muir himself had a mixed reaction to all this: he was pleased that so many had escaped civilisation but dismayed that the tourists appeared to miss the point. For a wilderness explorer like Muir, who carried a loaf of bread and some tea with him on his hikes, the prospect of a breed of tourists who looked at a glacier only until the dinner bell rang was discouraging (Nash 1981: 7).

Tourists, miners, and adventurers/explorers coming to Alaska encouraged the building of hotels, and in 1901, a luxury hotel was opened in a converted mansion. Other major milestones in tourism were reached when Mount McKinley was established as a National Park in 1917 (now Denali), and the Alaska Railroad was completed in 1923. The Curry Hotel opened near McKinley and provided visitors with a good view, golf, tennis, and swimming.

The potential for airborne tourism to Alaska was recognised by Robert Marshall in the late 1930s, but it was not until 1947 that an ex-military pilot began offering one-day stop-overs from Fairbanks to Nome, the Bering Strait, and Kotzebue, then back to Fairbanks (ibid.: 17). Passengers could be flown into 'native' villages, where they would watch dancing and buy souvenirs.

3.1.2 The cost of doing business

Providing services for visitors has its financial costs. The recent chalet controversy at Glacier National Park illustrates another aspect of providing accommodation. The following information is based on an interview with Robert Dunkley, Landscape Architect at Glacier National Park (Dunkley, personal communication, 1993).

The park's nine original chalets were built in 1913-1914 and served those who wanted access into the backcountry. Many were built without formal planning — some were located near possible avalanche areas, or grizzly bear habitat, and many had few or no proper sewage disposal facilities. In 1954, the NPS took over two chalets, renovated them and leased them out as concession operations. A series of patch-work repairs was made to upgrade the sewage and water facilities. The fully booked summer season attests

† Figures are based on author's own calculations using the following indices: Burgess (1990: 27); Consumer Price Indexes (BLS) (1975: 210); and Producer Price Indexes (1994: 497). Due to the difficulties associated with the accuracy and consistency of different economic time series, these figures should be treated as approximations only.
to their popularity — reservations open on 1 January of each year and are all taken by the 15th.

The NPS, as a result of amicable and welcome pressure from the Wilderness Society and Sierra Club, in 1993 was issued by the State of Montana with a compliance order to upgrade the facilities because the current system involved dumping sludge on park grounds. An alternative sewage and water system was proposed: it would operate for 60 days each season and serve 2,000 visitors — at a cost of $2.5 million. Park officials decided it was best to close the chalets down entirely. A furious public responded with over 700 letters of protest, pleading with officials to reverse the decision.

The public who used these chalets felt they were a traditional part of their experience and that they should be maintained at whatever cost to the park service and environment. Based on 60 nights of bookings each season, at $70 per night, it would take over 35,000 nights or about 595 years to pay for the system. Economically the chalets are not viable and environmentally they appear inadvisable. Alternatives, like opening a tea house, were being considered but the sewage and water problem would remain.

The upkeep costs of roads and structures in parks is enormous. A report on park conditions by the National Parks Conservation Association (NPCA 1992: 2) quoted the General Accounting Office (GAO) of the United States, which had estimated there was a $2.2 billion backlog of park projects. Recent estimates place the figure at $5 billion (Mitchell 1994: 31). This makes a crucial point: the facilities draw people to the parks, but, once they are there, they become expensive to maintain.

In US parks, many roads were designed for the visitation levels of 40 years ago and are no longer adequate for the increasing crowds. Visitors complain about road conditions in places like the Grand Canyon (NPCA 1992: 14; Mitchell 1994: 45). The most depressing aspect of having provided access for so many people is that 95% of the visitors arrive by car and never get out of them to walk (NPCA 1992: 14). These 'windshield tourists', so nicknamed by one writer, need rangers to direct traffic rather than for their interpretative skills (Mitchell 1994: 21). This sort of trip to a wilderness park has become a kind of three-dimensional cinema for urban visitors who want to see a wilderness in an air-conditioned, insect-free environment. Congress, by improving and upgrading roads, building more accommodation, and encouraging what has become an unending stream of visitors, has responded to political pressure and approved this use of parks.

Once the facility is built, it is extremely difficult to take it away, however detrimental it may be to the environment. The policy of encouraging tourism in national parks by providing easy access, lodgings inside the park, and other facilities has created an increasing and changing demand. Duffus and Dearden (1990: 222) noted this sequential change: the initial exploratory users require little in the way of infrastructure or
facilities; the general users who follow them demand facility development. There is abundant evidence of the facilities problem throughout parks worldwide. In Africa one park director observed (Olindo 1974: 60) that a simple campsite can grow — eventually becoming a township inside a park. The company that took over Yellowstone Park concessions in 1973, the Music Corporation of America, advertised its facilities inside the park thus:

It's not just another American convention hotel. It's a great American castle .... All your worldly needs are provided for .... This isn't no-man's land. Or primitive wilderness. This is civilization (Sax 1976: np).

As Dilsaver (1992: 250) said, "the best development is no development". If wilderness is to be where "the earth and its community of life are untrammeled by man", then introducing excessive urban comforts and unnecessary facilities defeats the definition.

Wild nature, preserved as parks or sanctuaries, exists in a practical sense as islands of natural areas within a generally urbanised landscape or country. The preservation of wilderness has been accomplished, in North America, largely by appealing to the public, and convincing them of its spiritual qualities, utility, and recreational possibilities. In modern societies visitors have come to expect access to and accommodation in most parts of the earth. Those who have travelled 500 or 5,000 miles to see a 'wilderness' or natural area have little choice but to use the roads, trains, or planes that will deliver them to the doorstep of these areas and beyond. However, allowing the tourist industry to dictate what facilities and services will be available in a wilderness or natural area does not ensure that the values of that area will be protected. There is a lesson here for the development of tourism in Antarctica.

3.1.3 Other natural areas: remote islands

Thus far the focus of this thesis has been on tourism in wilderness areas in North American, and particularly US, National Parks. Remote islands face the same problems of increasing visitor numbers and the demand for development. How they confront these issues depends on whether they are managed by a government or a private organisation, and the economic component to tourism development.

The popularity of tourism in remote, exotic natural areas, like Ecuador's Galápagos Islands, is a useful gauge for Antarctic tourism. Prior to 1970, tourism in the Galápagos was uncontrolled, but they were not easily accessible to international visitors (Kenchington 1989: 227-228). During 1970, a number of chartered yachts were taking 6-12 visitors around the islands, but by the year's end a total of 4,500 visitors had been recorded (ibid.: 228). Kenchington (ibid.) reported that increased air services in 1978 contributed to greater access and the total rose to 12,000. It jumped to 18,000 in 1980 when the airport was upgraded.
Galápagos National Park's first master plan called for a ceiling of 12,000 visitors per year. This limit was raised to 25,000, but revised again in 1987 to 30,000 (de Groot 1983: 295). In the following year 32,500 visitors were recorded (Kenchington 1989: 229). The accuracy of official statistics has been questioned by Boo (1990: 99), who cited other estimates of almost 50,000 visitors for 1986, far above any limits set. Burger and Gochfeld (1993: 255) also reported over 50,000 visitors arriving annually in the late 1980s. The official 1988 visitor numbers reported by the National Park were over 40,000 (Noticias de Galápagos 1990: 32), illustrating the difficulty of policing operators and gaining reliable visitor statistics.

The Park's existing management strategies include: feeding and housing visitors aboard the cruise vessels; limiting visits to two of the five zones which comprise the National Park; and allowing only 90 people ashore at one time in Intensive Visitor Zones and groups of no more than 12 in Extensive Visitor Zones (Kenchington 1989: 228). In all, there are 43 designated visitor sites, 18 of which are designed for higher-volume visitation (ibid.).

Most of the visitors fly to airports in Baltra or San Cristóbal and then transfer to cruise ships (Boo 1990: 96). Visitors are accompanied by naturalist guides who must have three years of university training or its equivalent, and undertake special training prior to working in the islands (Boo 1990: 96).

Kenchington (1989: 230) concluded that the factor controlling tourism numbers is the capacity of aircraft, not limits set by the national park service. Further increases in visitor arrivals have led to the development of small accommodation facilities and recreational activities. Most of these are geared to national tourism (Boo 1990: 96). There is, however, a growing international 'economy tourism' that is based on hotel accommodation and day trips to nearby islands (Broadus 1987: 14).

Improved access has been a challenge to the system. Areas close to the airport at San Cristóbal have seen a dramatic increase in visitation: on Isla Lobos the number of tourists increased from 26 in 1979-80 to over 3,095 during 1986-87 (Boo 1990: 101). As tourism has expanded into areas close to transportation centres, it has fostered the development of additional visitor accommodation. These conditions will certainly test the resourcefulness of the Park's managers. However, by establishing a zoning system and by requiring official guides to accompany the ever growing numbers of visitors, the managers have more preventive control.

At a workshop in 1993 on the rezoning of Galápagos National Park and the redesign of the tourist system, new proposals were considered to improve these aspects of management. Wurz et al. (1994) prepared a report updating the earlier visitor study and recommended a Limits of Acceptable Change (LAC) system (cf. Section 3.3.3). A fundamental part of that report was a survey assessing motivations, expectations, and management preferences of visitors to the park.
Like visitors to the Galápagos Islands, visitors to Madagascar are interested in the unique flora and fauna in the native environment (Stephenson 1993: 263). Although Madagascar has six National Parks and 11 Strict Nature reserves, the main reserve visited by foreign tourists is the Périnet Reserve (ibid.).

Many of Madagascar's reserves have management plans in place or under implementation and make allowances for ecotourism at 'appropriate' sites (ibid.). Evidence suggests, however, that without additional visitor management planning, there are likely to be adverse impacts. Stephenson's study (ibid.) recommended that reserve management: (i) survey and monitor the impact of visitors on faunal and floral communities; (ii) develop 'honey pot' areas that are suitable for visitors; (iii) design interpretative strategies for tourist information, including the provision of trained guides; and (iv) provide the local population with financial incentives that foster a greater respect for the reserve: that is, expand hotels, catering, and other "tourist-related employment opportunities".

These recommendations were proposed at a time when Madagascar received approximately 3,900 foreign visitors a year. Those who come stay in a comfortable hotel nearby and reach the reserve by road and rail (ibid.). Expanding the infrastructure to support tourism is a familiar scenario. What railways and cars did for North American parks, ships and aeroplanes are now doing for remote islands like the Galápagos and Madagascar.

The problems described in this chapter, whether they occur in large wilderness parks or remote islands, constitute the most obvious and overlooked threat from tourism — the loss or destruction of natural areas by encroaching civilisation in the form of development. This loss arises from a desire to develop wild areas as an economic product available to tourists, coupled with vague management objectives about the role of visitors. Visitor management planning by the application of numerical limits, which can easily be raised, disregards the research on impact-types and the inter-relationships of visitors, flora, and fauna, and it completely ignores the issue of facility development in natural areas.

Whilst limitations on the type of visitors permitted in particular areas can smack of elitism, this charge ignores the basis for the decision. At issue is what is allowed not who is allowed. Paying to see a play, a museum, or a ballet does not entitle a patron to use a skateboard, radio, or personal lighting accoutrements to enhance their experience. As Hardin (1988: 326) said:

Wilderness can be preserved only by explicitly asserting that equality of distribution, desirable though it may seem, must not be made the paramount goal of society.

Visitation in wilderness areas challenges traditional management attitudes about visitors and the types of services to be provided. If such areas are maintained primarily
for visitors' uses, regardless of how they use wilderness, then facilities will continue to be provided and the wilderness will continue to be degraded. Moving thousands, or tens of thousands, or even hundreds of thousands of people into remote natural areas requires an infrastructure that may include airports, hotels, restaurants, and docking facilities.

An important part of Antarctic visitor management is to acknowledge that, without specific planning for visitor use, the potential for unwanted change (as defined by management) is high. The following section outlines briefly the major concerns of wilderness managers and puts these problems into context for developing management frameworks.

3.2 A MANAGEMENT CONUNDRUM — LOVING WILDERNESS TO DEATH

The unmitigated success of encouraging wilderness appreciation is felt by nearly all park, reserve, and sanctuary managers (Clawson 1974: 116; FNNPE 1993: 10). The danger now is from over-popularity, from 'loving wilderness to death'.

Godin and Leonard (1979: 141-2) considered the major management problems in wilderness areas and found that site deterioration was the most common complaint of managers. Other areas of concern were user conflicts, lack of baseline resource data, confusion about the meaning of wilderness (cf. Chapter 2), and associated uses not in keeping with the wilderness concept.

The 1980 State of the Parks report (National Park Service 1980: 5) listed seven categories of threats to National Parks; physical impacts from visitors accounted for 12% of the total number of threats, but visitor impacts were felt in other categories as well. The report explained:

The very presence of park visitors necessitates vehicle use and requires facilities to provide adequate care for the people and their belongings. Park roads, trails, concession accommodations, utilities, access routes, sewage lagoons, landfills, required maintenance equipment use and facilities, water lines, and the like are all associated with the scheme of public use of the parks (National Park Service 1980: 20).

Additionally, physical removal of resources comprises another separate category that includes the effects of visitors (specimen collection of plants, rocks, and artefacts accounts for 8% within this category) (ibid.: 14).

By 1987, the GAO reported that only limited progress had been made in documenting and mitigating threats to the parks. The principal findings were that only half the units in the system had prepared the required management plans, only limited documentation and monitoring of the resource conditions had been completed, and funding for major projects was unavailable (GAO 1987: 2-4).
A survey of managers (Washburne and Cole 1983: 4) in the National Wilderness Preservation System (NWPS) in the US revealed that crowding and user conflicts were the main problems of social impacts and that biophysical impacts such as "changes in vegetation and soil, wildlife impacts, water pollution, litter and improperly disposed of human wastes" were also significant. Measures to reduce these problems were often not implemented until after the resource had been damaged or loss of solitude had occurred. Contradictory information about policies was also cited as an impediment to improving visitor behaviour (ibid.: 15). This problem also surfaces among Antarctic visitors who are often given conflicting information about proper behaviour ashore (see Chapter 6).

Cole (1990a: 363), who has studied the problems of wilderness visitor management in the NWPS, concluded that most wilderness managers could not state specific objectives for visitor experiences (i.e. what activities are appropriate) and had little information on wilderness users. Few had a management plan of any kind. This situation in turn resulted in damage to continue in most areas.

Thus, the three major problems common to wilderness areas and of concern to managers are: increasing numbers of users, user conflicts, and human impacts on flora and fauna. A more detailed discussion, revealing the complexity of these problems, is intended to help management identify preventive measures and recognise the need for a conservation philosophy. Additionally, understanding visitor expectations and determining visitor knowledge is a useful key to more effective management.

3.2.1 Increased visitation

A two-fold threat accompanies increasing visitation: first, unplanned change or alteration can occur in the natural environment; second, structures or 'site hardening' (e.g. the construction of walkways) will develop to accommodate the greater number of visitors, ultimately urbanising the wilderness.

Alterations to the natural environment can be obvious, as is the case of physical impacts such as braided trails, or more ambiguous, as in the case of biological impacts such as changes in reproductive success. At certain sites, in Antarctica for example, paths can be worn in moss beds or algae can be churned. From a management viewpoint, the most important principle is that there is no direct correlation between visitor use and environmental variability (Graefe et al. 1990: 1). This is discussed at length in Section 3.3.2.

'Site hardening' has been the most prevalent form of management strategy for accommodating more visitors. The brief summary of the development of National Parks in North America in Section 3.1.1 illustrates this response: more visitors, more roads, more hotels, more facilities. This affects both on-site impacts and the erosion of wilderness generally.
Because the effects of increases in visitation are complex and inter-related with many other factors, it is more productive to consider this problem in conjunction with the following two sections.

### 3.2.2 Use/user conflicts

Jacob and Schreyer (1980: 369, quoted in Kuss et al. 1990: 192) defined user conflict as recreational dissatisfaction that users attribute to other individuals. This tendency is magnified with more and different kinds of uses. For ecocentric management, recreational dissatisfaction is important because it signals a conflict between how different visitors use the area and how it is designated.

For management, there are two relevant generalisations: first, with relatively homogeneous users, fewer conflicts are likely to occur; and second, users who are attuned to the park's or reserve's message — why the area they are visiting is unique and what behaviour is appropriate within that environment — will cause fewer problems.

In Antarctica, for example, conflicts might arise between those who want to abseil down icebergs, as happened in 1993/94 at Cuverville Island (K.Crosbie, personal communication, 1993) and those who want to enjoy the beauty of the icebergs in the bay. This example illustrates the potential for conflicts if management does not make clear what the visitor's experiences are to be in Antarctica's wilderness.

Conflicts and the perception of crowding can also occur when several Antarctic cruise ships have to queue or rearrange their schedules to avoid multiple landings on one site. As Kuss et al. (1990: 190) made clear though, crowding is a "subjective judgment of an individual, not an objective fact". Consequently, there is no single predictable visitor response to varying use levels (ibid.: 189).

The expectations of visitors also affect both the level of satisfaction and user conflicts. In Japan parks have far higher use-densities than in the United States: in 1972, Fuji-Hakone-Izu had 72.9 million visitors (Senge 1974: 127). So, not surprisingly, when Asian visitors come to the Grand Canyon, a park where many Americans feel cramped by the presence of others, they are less likely to find conditions crowded (Mitchell 1994: 45). This example also illustrates cross-cultural variability in the social and personal norms applied by visitors in judging the appropriateness of certain conditions. Because of the international make-up of Antarctic visitation (see Chapter 5), the same dilemma about perceptions could arise. For some passengers, knowing that three other ships were waiting to land at a site would be disturbing, whereas others might not be concerned.

Another aspect of crowding is group size and the method of travel which, Kuss et al. (1990: 207) have found, are the most visual means for determining perceived homogeneity among groups. In Antarctica, the method of travel may be the same, but people are very sensitive to group size and type of ship. The author overheard numerous
discussions among passengers and staff in which they were commenting on other ships' unsatisfactory size or type as compared to the ship on which they were travelling.

User conflicts also arise when numerous activities are permitted which are not consistent with the stated value or use of the area concerned (for example, if water-skiing is permitted on a lake in a National Park when the area is designated as a wilderness) or when certain users cannot find alternative settings for their activities (riding all-terrain vehicles in natural areas restricted to walkers) (Stankey 1980b: 29).

A.E. Keir Nash (1988) argued that a person's view of nature is affected by career choice and that a basic division exists between the white-collar urban-based users with an aesthetic ideology, and the blue-collar machine-in-nature group with a more applied view of nature. Wildlands policy in the US favours the former group and justifies this by arguing that they have been displaced by the latter as a result of historical prejudice. Nash (ibid.: 32) believed that the experiences of those who wish to engage in non-mechanised recreation are not unjustly impaire by those who do and advocated a more democratic, open-for-all, approach. This recreational view has been supplanted by the idea of a spectrum of recreational opportunities (cf. Section 3.3.3), favoured by most US wilderness policy designers, but Nash's view could well remain a position adopted by any one or more of the nations subscribing to the Antarctic Treaty. Again the need for an explicit policy that states what the value of the area is, and therefore what the appropriate activities are, becomes apparent. Without some guidance, there is a greater risk that Antarctica as a wilderness could be compromised, especially if all activities are considered suitable. These conflicts are a useful pointer about the challenges of designing definitions, statements, aims, and objectives about the human relationship with Antarctica in the future.

3.2.3 Human interactions with flora and fauna

Another set of challenges in visitor management concerns the control of potential impacts on flora and fauna. Just as there is no single predictable visitor response to varying use levels, so there is no single predictable response by wildlife to human presence. Plant life, too, responds in variable ways to visitor use (Kuss et al. 1990). Knight and Cole (1991: 238) suggested four ways in which recreational activities can affect wildlife — "harvesting, habitat modification, pollution and disturbance". In Antarctica, for example, although harvesting is not allowed, wildlife might be affected by the building of facilities, by pollution from ships or on-shore activities/facilities, and by disturbance associated with visitor activities.

There is the tendency for lay persons to look for simple patterns in use-impact relationships and to focus only on mitigating the direct factors. There are many factors that influence impacts on wildlife: the type of activity, its timing, location, frequency, and predictability (ibid.: 241). Human/wildlife interactions can also be indirect, resulting
from changes in vegetation, habitat, or other environment variables (Kuss et al. 1990: 163). Even animal watching can endanger breeding success and damage habitat, disrupt relationships with other species, and interfere with territorial behaviour and bonds with offspring (Edington and Edington 1986: 35; Duffus and Dearden 1993: 149). The study by Cooper et al. (1994: 277) supported claims that noise from aeroplanes and helicopters frightens king penguins and can lead to panic and possible fatalities. At Glacier Bay National Park (Alaska), officials suspected that increased cruise ship activity may have affected the habitat of humpback whales (National Park Service 1980: 14).

A review of use–impact relationship studies reveals that no general formula can be applied to determine precisely how the number of people using a given area will affect its wildlife. Kuss et al. (1990: 163) concluded that:

the number of people using a given area plays a smaller role in human-wildlife relationships than selected characteristics of recreational use, such as frequency of use, type of use, and the behavior of visitors.

Of particular importance to Antarctica is research on group dynamics. The New Zealand Department of Conservation (1993: np) included a short section on the impact of large versus small tour ships, noting that the small ships "cater for a more mobile clientele who spend more time ashore in more vulnerable places". Botswana's tourist industry has related problems. Barnes (1992: 9) observed that small group operations are more mobile, more flexible in their travel plans, and harder to control. Although he does not specify why, one might speculate that they are less inclined to follow accepted procedures for tour operators and can more easily slip through the cracks of enforcement.

Two additional impact relationships are pertinent: (i) flora and fauna have varying tolerances to different activities; and (ii) recreational use can create critical situations for some species that at a different time or place would have no effect. For example, in Antarctica inflatable boats may be tolerated more readily by some species than others, while the same boats touring the waters at breeding time might stress a colony of birds or seals that, later in the season, would not be affected. Flora and soils can respond in similar ways: the type of impact and the amount of use can both have further impacts that are similarly inconsistent in their relationship. That is, no one formula can be applied to predict an outcome (Kuss et al. 1990: 9).

Although much work has been done on plant ecology and recreation use in temperate, sub-alpine and alpine regions (see, for example, Bayfield 1973; Liddle 1975; Johnson and van Cleve 1976; Cole 1985), little research has been done in the Antarctic and sub-Antarctic. Scott and Kirkpatrick (1994), however, have published the results of their work on Macquarie Island, one of Tasmania's sub-Antarctic islands, indicating that visitation was affecting plant life and that 'site hardening' (more boardwalks) would be required in future.
In the case of Antarctic tourism, one cannot yet say that 100 people on a beach compared to 20 or 400 will produce a specific impact or reaction in the ecological community.

3.2.4 Visitors' expectations and motivations

Expectations arise on many levels. There are the expectations visitors have of Antarctica, their cruise, and what they will gain on a personal level. Chapter 4 (Section 4.2.2) discusses some of the promises and the expectations generated by the industry. These expectations can be different for first-time visitors and for repeat visitors. Several authors (Shelby et al. 1983, in Pearce 1988: 159; Duffus and Dearden 1990: 222) have pointed out that because many first time visitors to an area lack the experience and information to enable them to develop realistic expectations, they disregard conditions that experienced users might find undesirable. In natural areas this can lead to degraded conditions. Data presented in Chapter 5 (Sections 5.8 and 5.9) discloses that some inexperienced Antarctic visitors expected or desired the same sort of services and facilities they have found in other leisure destinations.

There is undoubtedly a conflict between tourism and wilderness researchers. During a symposium on tourism development, Kahn (1980: 7) prophesied:

I can summarize the basic picture by saying that 200 years ago mankind was everywhere scarce, everywhere poor, everywhere powerless before the forces of nature. Two hundred years from now, barring bad luck and very bad management — not ordinary bad management, but dedicated bad management — mankind should be almost everywhere rich, almost everywhere numerous, almost everywhere in control of the forces of nature.

The visitors to Phillip Island, Australia, provide a relevant example of the tourism/wilderness conflict. In a single evening, over 2,400 visitors line up at dusk to watch the penguins emerge from the sea and walk across the sand dunes to their burrows. A study undertaken by Varcoe, Preston, and Byrne (1985, in Pearce 1988: 207) found that: 85% of the visitors expected less than 500 other visitors to be present; 75% of the overseas visitors expected some kind of seating; 67% expected cover from natural weather conditions; and 63% wanted a running commentary. Pearce (ibid.: 207) remarked on the authors' surprise at the contradiction between a desire for naturalness and for facilities. He cited the large number of international visitors and rightly suggested that they ascribed assorted meanings to 'naturalness' — but the reason is more basic than this. The historic development of wilderness travel, as discussed Chapter 3, reveals that many visitors long for wilderness but preferably within a comfortable setting.

When confronted with the situation of tourists watching a natural spectacle, management explained away the problem in human, cultural terms; that is, managers
have to recognise diverse concepts of naturalness etc. Such a solution was offered by Pearce (*ibid.*: 209):

This difference between visitor groups highlights the continuing need to monitor visitor attitudes and serve multiple groups in a tourist audience with interpretive explanations of both the animal activity and management practices.

This is true but offers nothing in respect of the appropriateness of the activity in a natural setting. It is reminiscent of the early audiences at Yellowstone National Park, who were drawn to watch bears feeding on park-provided garbage.

This incongruity epitomises the gap between wilderness and tourism management. Tourism operates within an anthropocentric framework: the appropriate kinds of accommodation, the relationship between hosts and guests and tourist motivations. All human leisure activities are acceptable, so long as no obvious harm is done and the activities can be sustained in future. Wilderness visitor management must be directed ecocentrically: how to maintain and protect natural areas that, through their appeal to tourists, have become overused. In Antarctica, the dominant reality is a system without human beings, recreational activities to be considered cautiously.

The framework for what constitutes 'appropriate activities' must be derived from ecocentric and anthropocentric wilderness management philosophy: the retention of naturalness versus the alteration of the environment to produce a desired setting (see definitions in Chapters 1 and 3). In natural areas, where activities are limited to those dependent on wilderness, the definition of appropriate activities stems from whether, in order to engage in them, the visitors must alter their surroundings to produce the setting desired. Any activity requiring facilities or other alterations of the natural conditions is not wilderness-dependent. These examples illustrate how appropriate activities might be defined but the definition also requires a framework in which to apply it and is recognised as a judgmental process.

The common ground for tourism and wilderness managers is the desire to grasp the motive/expectation relationship and thereby improve the fit between visitor and environment. The theory for motivational analysis is complex and not within the purview of this thesis. However, Pearce (*ibid.*: 24), a prominent tourism researcher, reviewed this topic and found that many authors have adapted the hierarchy of motives (physiological, safety and security, love and belongingness, self-esteem and self-actualisation) of the behavioural psychologist A.H. Maslow. Pearce (*ibid.*: 28-29) has combined this approach with the idea of a 'tourist career model' and used it to explain how individuals may choose a specific type of travel based on their motivational needs (cf. Figure 3.1).
Figure 3.1. The relationship of Antarctic visitor motivations with Maslow's theory of human motivation and Pearce's model of tourists' travel careers.
In the context of Antarctic travel, some visitors may be seeking to increase their self-esteem through some form of self-development, whereas others may be fulfilling more basic physiological needs such as rest and recreation. The motivations of Antarctic visitors (discussed in detail in Chapter 5) can be overlaid satisfactorily on the tourist career ladder, illustrating the applicability of this concept to Antarctic tourism (Figure 3.1).

Other researchers such, as Bull (1991: 14), have similarly identified a number of personality traits that can be used to split tourists into meaningful types: 'venturesomeness' (the degree of risk required), 'hedonism' (the degree of comfort required), 'changeability' (impulsiveness or seeking something new), 'dogmatism' (extent to which ideas can change), and 'intellectualism' (amount of culture required). These categories are used in the marketing of tourism products (places and experiences) and can be used as predictors of where and how tourists will travel. Bull (ibid.: 19) matched these types of tourists to their resource needs, and two of the types are particularly interesting in the context of Antarctic tourism. He found that "Wilderness lovers/anthropologists" are drawn to extreme climates, natural resources, basic amenities, and remote access whereas 'Individual Inclusive Tourists' are drawn to visiting, during the appropriate season, places with picturesque resources, good individual amenities, and access "not too difficult but off the beaten path". This notion readily encapsulates and echoes the motivational findings discussed in Chapter 5, the former being 'nature lovers' and the latter placing importance on 'seeing new places'. The different levels in a travel career can also reflect the type of amenities desired and can assist managers in deciding for whom their area is best suited.

Generally speaking, dissatisfied tourists result from the mismatch or lack of opportunity in respect of the desired outcome in their 'tourist career' and the activities or settings — the environmental fit — of their holiday experience. Knowing this, at least on an intuitive level, tour operators either offer a range of opportunities or direct their marketing towards individuals seeking particular types of experiences.

### 3.2.5 Visitor knowledge

The concern of visitor management in Antarctica should be to ensure that visitors, tour operators, and staff understand and respect its wilderness values. Visitor education is not just about giving visitors a series of facts about penguins, other birds, or seals but about imparting what Naess calls 'self-realisation', or identifying yourself as a part of the whole of nature (Rothenberg 1993: 140). This goes against the dominant paradigm and might cause those who follow it to make derisive comments. A framework that recognises Antarctica's values is needed to promote the meaning of Antarctic wilderness on both theoretical and practical grounds.
A similar struggle for meaning exists between cathedrals and tourists. Pearce (1982: 116) pointed to the conflict felt by clergy who must open their cathedrals to tourists while ensuring that worshippers can participate in current religious functions. Cathedrals are dependent upon tourism for financial reasons but clergy do use controls to safeguard the rights of worshippers. In other words, it is acknowledged that not all activities are appropriate and that some needs have priority over others. The value and function of the church would be impaired if it were decided that everyone had a democratic right to enjoy it in whatever way they chose. Pearce (ibid.: 116) justifiably concluded:

It is highly likely that the future of cathedrals and tourism rests on a publicity campaign designed not so much to encourage all tourists but to select the right kinds of cathedral visitors.

Determining the level of knowledge visitors have is important to prevent or lessen adverse impacts on the environment. By examining a motivational framework and determining what visitors are looking for and how they expect to achieve it, a more effective method of conveying the message could be developed.

The difficulty in using tourism's search for motivation, based on Maslow's scheme, the apex of which is self-actualisation (Figure 3.1), is that it is anthropocentric. As interpreted by tourism researchers, it conflicts with the deep ecologists' scheme, embodied in Naess's self-realisation. Rothenberg (1993: xix), in discussing these differences, said:

Abraham Maslow thought that one of the criteria for true self-realization was independence from one's environment. But for Naess's Self-realisation, it is exactly the opposite. One approaches fulfillment through empathy with the world beyond the ego.

Countering the dominant world view of nature with respect to tourism can be justified in Antarctica by offering several arguments that form the basis of an ecocentric management position:

1. The case for Antarctica's uniqueness must be made: it is the last continent that has not been made over for human purposes;
2. Antarctica must not be thought of as only a tourist destination. Any activities permitted are strictly limited to those in keeping with its wilderness qualities, and all recreational activities will not be encouraged; and
3. If there is any human use of Antarctica at all, it is to provide an opportunity to learn self-realisation.

In this context, educating visitors by providing them with guidelines is both ineffectual and shallow. The need for something deeper demands visitors should not be
instructed in ecosophy (Naess's concept, discussed in Devall and Sessions 1985: 74), as many would not be prepared to abandon the dominant world view, but management objectives and aims should include helping visitors to broaden their thinking.

3.3 THE SEARCH FOR HARMONY — IMPOSING RESTRICTIONS

The lesson seems to be that tourism, like other kinds of resource utilization, needs limitations and controls if only to protect what draws the tourist in the first place (Nash 1981: 4).

Although it has been said that "the worst thing that can happen to the nature of an area is for that area to be declared a National Park" (Kalliola 1970: 306), without such a declaration no plans for its continued future, or control of commercial development, can be attempted.

The overwhelming message from park managers is that there is a need to determine management objectives with respect to visitors (Aldridge 1974: 301; Graefe et al. 1990: 11; Carlson, personal communication, 1993; Nielsen, personal communication, 1993; Potter, personal communication, 1993). Graefe et al. (1990: 6) said that:

[the] critical step in visitor impact management is the determination of management objectives which identify the resource conditions to be achieved and the type of recreation experience to be provided.

Washburne and Cole (1983: 15) concluded, in their survey of the problems of wilderness managers, that it "is largely a function of the philosophy and tradition of an agency" that affects the kind of problems experienced. Consequently, knowing what your visitors are to do and not do, must precede the creation of a practical planning framework.

Visitor management strategies are designed to prevent degradation or to correct it where it has occurred (assuming the 'original' natural state is known). Ideally, preventative strategies should be employed prior to the first visitors entering a park (Baker and Lusk 1991: 66). Reactive responses are employed to correct or restore an area to a desired condition. Responses or controls can be applied internally, for instance by taking corrective measures inside the area, or imposed externally, like limiting where and how people come into the area. Other management restrictions are qualitative or quantitative: the activities in the park area or the numbers of people in the area. Finally, some corrective strategies, whether they are direct or indirect, can be based on how they affect the visitor. Enforcement and zoning according to use intensity (including land classification systems) are examples of direct strategies, while physical alterations, education of the visitor, and economic constraints are examples of indirect management approaches.
Wilderness management professionals have developed techniques to solve problems brought about by increasing numbers of visitors and their impacts. An excellent source-book for particular techniques is by Cole et al. (1987), who have assessed the appropriateness, effectiveness, and benefits of tactics applied in a variety of systems. Jim (1989) has also provided a useful summary of available visitor management techniques and discussed their advantages and disadvantages. Although these resources are useful in areas where objectives, values, and visitation policies have been established, they will not be discussed in relation to Antarctic tourism, because specific tactics, taken out of the context of a management plan, can amount to little more than bandages that treat symptoms whilst ignoring the underlying causes (Cole 1993: 22). The message clearly is to start with the objectives for an area, whatever size, and then select visitor management strategies to prevent or correct unplanned change.

3.3.1 Visitor management through carrying capacity

One of the earliest strategies for dealing with increased visitor use called for applying the concept of carrying capacity to wilderness management. Carrying capacity can be applied to biological or physical systems, recreational use, and social use to represent "an amount of use above which unacceptable results will occur that can only be corrected by reducing use" (Washburne 1982: 726). Popular in the 1960s and early 1970s, carrying capacity was an attempt to quantify the capacity of the land or water to support a specific number of recreational participants. Its roots are in Neo-Malthusianism and grew from the concern that swelling visitor numbers were causing severe impacts, and the belief that, with an efficient system, recreational impacts could be kept under control (Mercer 1979: 113).

In one of the classic papers on recreation ecology, Wagar (1964) expanded the meaning of carrying capacity, defined primarily in terms of ecology, and infused it with social aspects as well. Not only could the resources on land and water be affected by visitors, but also too many visitors could affect the enjoyment of others. A great deal of research and analysis has dealt with these issues — more than 2,000 papers were published between about 1964 and 1986 (Stankey et al. 1990b: 217). Among researchers, there was concern about how to apply the concept. Ten years after his classic article, Wagar (1974: 278) dismissed the idea as totally unrealistic, given the complexity of the system.

Many other authors also had major problems with carrying capacity. First, because many studies had revealed that some of the effects of recreation were only vaguely related to the amount of use, reducing numbers did not always result in a proportional reduction in impact (Washburne 1982: 726; Stankey et al. 1990b: 217). (See also Graefe et al. (1990) for a bibliography of human-impact studies.) Recovery, too, can be slow. Second, in an attempt to make complex decisions easier, carrying capacity
was used as a technical assessment rather than a judgmental process of determining impacts, values, and human needs (Stankey et al. 1990b: 218). Finally, and most importantly, the method lacked a framework for how, when, and where to apply it. Accordingly, it offered managers no alternatives when it was unsuccessful in reducing impacts (McCool and Lucas 1989: 68).

Washburne (1982: 726) proposed an alternative to the traditional carrying capacity model that emphasised monitoring for conditions as opposed to comparing use levels (Figure 3.2). Rationing and numerical capacity are still a main feature of this model but they do not drive management decisions. Use emerged as a poor indicator of conditions in the wilderness, and Washburne (ibid.: 727) concluded that "it seems better to concentrate on the underlying conditions desired [emphasis added], and to take corrective action where necessary — which may or may not involve reductions in recreation use".

Shelby and Heberlein (quoted in Graefe et al. 1990: 91) proposed another renovation of the traditional approach, the Carrying Capacity Assessment Process (C-Cap). These innovations are important but still depend on use levels and users' perceptions of environmental characteristics. Such approaches overlooked the problem that one standard of use-limit does not suit all sites or resources and that site conditions are changing (ibid.: 92-93). In Antarctica, for example, 100 people at a particular site early in the breeding season can be harmful, but benign later. C-Cap has a seven-step process that introduces descriptive and evaluative elements into the concept of carrying capacity (Figure 3.3). Shelby and Heberlein's important innovations switch the management focus from defining maximum use to identifying desired conditions and use levels (Stankey et al. 1990b: 219).

In their review of the literature on the carrying capacity of recreational settings, Stankey and Manning (1986: 47-48) supported the revised model:

We believe it represents an important conceptual framework within which to view recreation management. The carrying capacity model provides a basis for examining several important interactions: between supply and demand considerations, between concerns about resource conditions and perceived recreational quality, and between the quantity of recreational opportunities supplied and the quality of experiences derived from them.

From the traditional approach to the alternatives, computing numerical carrying capacity has moved from a central position to an intermediary one, and finally it has become one tool in a range of strategies as the inadequacies have become more apparent. A 1983 survey of managers in wilderness areas found that less than half had determined the carrying capacity of their areas (Washburne and Cole 1983: 4). Although carrying capacity has been regarded as a significant factor for over 30 years, it is still far from reliable as an indicator of environmental damage.
Figure 3.2. Traditional and alternative models of Carrying Capacity assessment (after Washburne 1982: 726).
Organise / evaluate background information

Identify general experience / opportunity to be provided

Identify important impacts:
- ecological
- physical
- facility
- social

Collect data on:
(a) defining specific experiences
(b) establishing evaluative standards
(c) existing conditions

Develop management alternatives — limit impacts to acceptable levels

Select strategy

Monitor impacts

Figure 3.3. Carrying Capacity assessment (C-Cap) (after Shelby and Heberlein in Graefe et al. 1990: 91).
Research into carrying capacity has generated two important areas of research on visitor management: (i) controlling use through examining impact, and (ii) defining desirable conditions in wilderness areas. These ideas have revitalised the concept of carrying capacity, but they have also spawned their own models. The next two sections examine these frameworks.

3.3.2 Visitor Impact Management (VIM)

In their alternative planning framework known as Visitor Impact Management (VIM) Graefe et al. (1990) used a descriptive and evaluative process. Their objective was to develop a process that would take into account the physical, environmental, and social aspects of recreational carrying capacity.

Based on their review of the literature about impacts and carrying capacity, they list five scientific issues that should be incorporated into any visitor management programme (ibid.: 1-2):

1. Impact Interrelationships: There is no single, predictable response of environments or individuals to recreational use. Instead, an interrelated set of impact indicators can be identified. Some forms of impact are more direct or obvious than others, but any impact indicator or combination of indicators could become the basis for a management strategy.

2. Use-Impact Relationships: The various impact indicators are related to the amount of recreation use a given area receives, although the strength and nature of the relationships vary widely for different types of impacts. Most impacts do not exhibit a direct linear relationship with user density. Use/impact relationships vary for different measures of visitor use and are influenced by a variety of situational factors.

3. Varying Tolerance to Impacts: One of the most important factors affecting use/impact relationships is the inherent variation in tolerance among environments and user groups. All areas do not respond in the same way to encounters with visitors. Some species may benefit at the expense of others who are negatively impacted or displaced. The same holds true for various recreational user groups. Some groups may enjoy high user densities, while others find such use levels unacceptable.

4. Activity-Specific Influences: Some types of recreational activity create impacts faster or to a greater degree than other types of activity. Impacts can vary even within a given activity according to type of transportation or equipment used and visitor characteristics such as party size and behaviour.

5. Site-Specific Influences: The impacts of recreation are influenced by a variety of site-specific and seasonal variables. That is, given a basic tolerance level to a particular type of recreation, the outcome of increasing use levels may still depend on the time and place of the human disturbance.

These principles set out the need to describe and evaluate conditions before considering what must be a range of management strategies. As the previous discussions make clear, reducing visitor numbers will not necessarily control impacts. The VIM
system is based on identifying and evaluating impacts, measuring them against standards, implementing management strategies, and monitoring conditions to detect any changes. Graefe et al. (1990) stressed that VIM can be used with other planning frameworks or as a management tool for localised problems. Its eight step sequential process is reproduced in Figure 3.4.

The most obvious and important difference between this approach and the carrying capacity models is the focus, which is not on amount of use but on any discrepancy between the conditions desired and the existing conditions. From that step

Figure 3.4. The Visitor Impact Management planning system (Graefe et al. 1990: 10).
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![Figure 3.4. The Visitor Impact Management planning system (Graefe et al. 1990: 10).](image-url)
(5), managers need to identify the probable causes (step 6), and then apply strategies (step 7) to reduce or alleviate impacts. Another notable feature of this approach is the first step — preassessing the database. In this step, background information is gathered in order to make an initial assessment of the problem. This includes legislative and policy directives, and visitor surveys with baseline data on users, their motivations, and other characteristics.

The strong evaluative connection with Washburne's (1982) model means that objectives are no longer simply stated but reviewed "for consistency with legislative mandate and policy direction" and for specific "visitor experience" (Graefe et al. 1990: 10). The emphasis must be on objectives that specifically define the pre-existing ecological conditions and expected social experiences. The shortcoming of most plans is the lack of specific objectives that state the conditions desired — without which nothing can be measured and no strategies prescribed (Hendee et al. 1978: 80, in Graefe et al. 1990: 11).

Whilst models of carrying capacity recognise the need to compare the conditions desired with actual conditions, there are no distinctive points from which to start. Step 3 in the VIM model directs managers to select the measurable impact indicators that are most appropriate whether physical (visible erosion, soil compaction), biological (species diversity, reproduction success, ground-cover density), or social (visitor perception of crowding, visitor satisfaction, number of encounters with other groups per day). This step incorporates the environmental as well as the recreational needs of the area and provides for a sequential system that managers can use in rectifying visitor impacts.

3.3.3 Limits of Acceptable Change (LAC)

In the past ten years, another approach has been introduced which is Limits of Acceptable Change (LAC). This approach acknowledges the inevitability of change with use in a natural environment and focuses on the limits managers set for change. Previously managers assumed that use was the main cause of any problems and that limiting use would be the best solution (Lucas and Stankey 1985: 2).

The LAC process also admits that allowing all types of uses everywhere will degrade the resource and that not every user participates in wilderness-dependent activities. For example, studies of wilderness visitors showed that a large minority (30-40%) come to a wilderness to participate in certain recreational pursuits because there is no other place where they occur, or the visitors were not aware that other areas are available (Stankey 1980b: 29). This example introduces another basic component of LAC — the Recreational Opportunity Spectrum (ROS) of environmental conditions, ranging from urban to pristine (a problematical word but one of their choosing) (Hendee et al. 1990a: 533). The diversity of conditions is represented by different classes of social, resource, or managerial variables (Stankey et al. 1990b: 223).
The LAC system itself is a familiar sequential process that incorporates nine steps and focuses on establishing appropriate use levels (Figure 3.5). Stankey et al. (1990b: 221) observed that it consists of four principal components: (i) the specification of acceptable and achievable conditions (defined by measurable parameters); (ii) an analysis of the relationship between existing and acceptable conditions; (iii) identification of management actions deemed most suitable to achieve those conditions; and (iv) a programme of monitoring and evaluating actions.

The succession of visitor management models from carrying capacity to either VIM or LAC or both (Graefe et al. 1990 describe them as similar), reflects the complexity of devising a dual system that allows for wilderness conditions to be maintained and for visitors to enjoy wilderness qualities. LAC is more useful in large wilderness area planning where a range of conditions is necessary or desirable, while VIM's objective is to examine and eliminate the causes of visitor impacts (ibid.: 95). VIM has been applied to numerous parks, national monuments, and reserves in the US; LAC is being tested in the US and several other countries, including Ecuador's Galápagos National Park.

There are two areas for caution, however, noted in the literature about LAC and ROS: the difficulty in selecting impact indicators and the complexity of applying ROS.

![LAC Planning System Diagram](image)

Figure 3.5. The Limits of Acceptable Change (LAC) planning system (Stankey et al. 1985, in Graefe et al. 1990: 94).
Watson and Cole (1992: 68) described three problems in finding appropriate indicators: (i) defining indicators in specific and quantitative terms; (ii) uncertainty in selecting the most significant indicators; and (iii) difficulty in selecting indicators in cases where reliable monitoring methods are not available.

Williams et al. (1992: 739) considered the problem of variability in user-based social impact standards. The aim was to: (i) identify the magnitude of the variance sources (subject, occasion, area, and social impact indicator); (ii) eliminate unreliable estimates of standards; and (iii) make them applicable across different wilderness areas. The problem is that users adjust their expectations to different situations, and these appeared to change over time, although Williams et al. (ibid.: 753) concluded that social standards do appear to be highly generalisable across areas. This finding suggests that it is more advisable to select specific indicators unique to an individual system.

Recognising that defining acceptable conditions is largely a value judgement confounds the selection of social indicators, as little is known about what visitors regard as acceptable (ibid.: 754). Thus if visitors' normative standards change over time, as suggested by Williams et al. (ibid.: 754), then for the Antarctic tourism industry, where most visitors are not repeat visitors (see Chapter 5), there is a great danger that visitors will simply accept lower and lower standards.

ROS planning has its difficulties, too, particularly in defining recreation. The definition adopted was a behavioural one that stated recreation was "a type of human experience based on intrinsically rewarding engagements during non-obligated time" (Driver and Tocher, quoted in Driver et al. 1987: 203). This definition would include anything from penguin watching to snowmobiling. A recreational setting is an "opportunity to engage in a preferred activity ... in a preferred setting ... to realize desired experiences ..." (Driver and Brown, quoted in ibid.: 204).

Not all activities are wilderness-dependent or appropriate and, if a range of opportunity classes are available to users elsewhere, wild nature does not have to be all things to all people. It is a reversal of the democracy-of-use theory that in effect is responsible for much misuse and over-use. Notwithstanding the concept's simplicity, applying the concept requires understanding of the interactions between users and the environment. Determining standards for impact indicators depends on the type of opportunity to be provided and where it occurs rather than on any absolute measure (Clarke 1982: 11).

Returning to the ROS component of LAC may be useful, as its message may be applicable to Antarctica on both a macro and micro scale. (For information on the evolution of ROS see Driver et al. 1987 and Clarke 1982.) The idea of a continuum of available activities in the outdoors appeals to visitor management planners because it stresses controlling or reducing impacts by redirecting inappropriate activities. Certain activities could be deemed inappropriate in a wilderness like Antarctica, and those
wishing to partake in them could be redirected elsewhere, for example, to Iceland or Alaska, where adventure recreation already exists. Thus, in Antarctica, ATCPs (or their appointed planners) in theory could adopt one of three positions on ROS classes. First, using a two-class system, they could consider sites like King George Island with its numerous bases as one class (some variant of the urban end of the scale), and the remainder of Antarctica as another class (pristine). Second, they could designate a range of classes in Antarctica. Third, they could decide that numerous places on the globe are available for a wide range of activities, and all of Antarctica should be designated as pristine or near-pristine, allowing only limited tourist activities in specified zones.

3.4 IMPLICATIONS FOR WILDERNESS DESIGNATIONS IN ANTARCTICA

Defining what the term wilderness means in Antarctica requires not only an understanding of various philosophical and cultural definitions but also a practical application that stems from a wilderness management planning framework. How wilderness is managed is intrinsically linked to the philosophical issue of what it is (Stankey 1982: 150). Management must take its direction from the place of wilderness in the ecocentric−anthropocentric spectrum. This ranking is most often a function of its legal designation, which in turn reflects its cultural meaning in a given society at a given time.

For Antarctica, the only continent without a native population, the management of visitors must take its cue from how ATCPs define wilderness areas. Currently there is no hierarchical wilderness planning and, without it, Antarctica will experience many of the same challenges that have faced other natural areas and probably some new challenges of its own. The ability to devise a plan is more than setting down a progression of logical planning steps. Visitor management research has identified the ever-growing complexities of the human/nature relationship. Armed with knowledge of the patterns of change resulting from more visitors and increasing demand, the ATCPs must take the first step in wilderness management and adopt a formal designation that will help managers to devise a workable management plan. The most significant tasks associated with the establishment of a management plan are (Stankey 1982: 151): (i) acquiring accurate baseline information; (ii) developing a planning framework that includes goal-setting, objectives, standards, and action plans; (iii) understanding the consequences of actions; (iv) developing a management philosophy; and, (v) establishing a spectrum of environmental classes in natural areas.

In view of the highly culturally specific character of the term 'wilderness', it would seem appropriate to use an existing, internationally recognised definition. IUCN's (1994: 9) system of categories has been developed to allow for international
compatibility. Category I incorporates Ia, Strict Nature Reserve, and Ib, Wilderness. A Strict Nature Reserve is defined as:

Area of land and/or sea possessing some outstanding or representative ecosystems, geological or physiological features and/or species, available primarily for scientific research and/or environmental monitoring (IUCN 1994: 17).

The stated objectives of management for Category Ia are (ibid.: 17):

- to preserve habitats, ecosystems and species in as undisturbed a state as possible;
- to maintain genetic resources in a dynamic and evolutionary state;
- to maintain established ecological processes;
- to safeguard structural landscape features or rock exposures;
- to secure examples of the natural environment for scientific studies, environmental monitoring and education, including baseline areas from which all avoidable access is excluded;
- to minimise disturbance by careful planning and execution of research and other approved activities; and
- to limit public access.

IUCN's guidance for selection further elaborates the specific meaning of Strict Nature Reserve (ibid.).

- The area should be large enough to ensure the integrity of its ecosystems and to accomplish the management objectives for which it is protected.
- The area should be significantly free of direct human intervention and capable of remaining so.
- The conservation of the area's biodiversity should be achievable through protection and not require substantial active management or habitat manipulation (cf. Category IV).

Finally, organisational responsibility is set out (ibid.):

Ownership and control should be by the national or other level of government, acting through a professionally qualified agency, or by a private foundation, university or institution which has an established research or conservation function, or by owners working in cooperation with any of the foregoing government or private institutions. Adequate safeguards and controls relating to long-term protection should be secured before designation. International agreements over areas subject to disputed national sovereignty can provide exceptions (e.g. Antarctica).

The specific mention of Antarctica, as an exception to this guidance on ownership and control, obliquely implies that the definition has been formulated with Antarctica in mind.
The counterpart to this category, a Wilderness Area, is defined as a large area of unmodified or slightly modified land, and/or sea, retaining its natural character and influence, without permanent or significant habitation, which is protected and managed so as to preserve its natural condition (ibid.: 18).

Its objectives echo the language of US legal definition of wilderness:

- to ensure that future generations have the opportunity to experience understanding and enjoyment of areas that have been largely undisturbed by human action over a long period of time;
- to maintain the essential natural attributes and qualities of the environment over the long term;
- to provide for public access at levels and of a type which will serve best the physical and spiritual well-being of visitors and maintain the wilderness qualities of the area for present and future generations; and
- to enable indigenous human communities living at low density and in balance with the available resources to maintain their lifestyle.

IUCN's guidance for selection of a Wilderness Area has an entirely different feel from those for a Strict Nature Reserve (ibid.):

- The area should possess high natural quality, be governed primarily by the forces of nature, with human disturbance substantially absent, and be likely to continue to display those attributes if managed as proposed.
- The area should contain significant ecological, geological, physiogeographic, or other features of scientific, educational, scenic or historic value.
- The areas should offer outstanding opportunities for solitude, enjoyed once the area has been reached, by simply quiet, non-polluting and non-intrusive means of travel (i.e. non-motorised).
- The area should be of sufficient size to make practical such preservation and use.

The organisational responsibility remains the same. These categories can sometimes 'nest' within another category in a single area if size permits. Thus Antarctica could belong in both parts of Category I.

The language used to describe each part of Category I indicates a different philosophy. The objectives and guidance for selection of a Strict Nature Reserve are stated in 'scientific language' i.e. preserve habitats, maintain genetic resources, include baseline monitoring and "conservation ... through protection and not ... substantial active management or habitat manipulation". Human presence is limited to what is necessary to carry out some of the objectives, and public access is limited. A Strict Nature Reserve (Category Ia) is allowed to operate primarily as an ecosystem and secondarily for human use.
'Wilderness' (Category Ib), on the other hand, is distinguished by language that suggests visitor experiences, i.e. "ensure future generations have the opportunity to experience", "provide for public access", and "offer outstanding opportunities for solitude, once the area has been reached ... by ... non-polluting and non-intrusive means of travel". Does this mean that wilderness managers have to provide access for visitors? Does "at levels and of a type" imply particular facilities and activities, as is further suggested by the phrase "serve the best physical and spiritual well-being of visitors"? If so, what are the specific experiences visitors will have? Physical or spiritual well-being may mean downhill skiing to some visitors, yet that may not be the intention of the designation. The primary objective may be wilderness management, but the wilderness is managed for human use and the approach is more anthropocentric. For visitor management planning, this must be made clear.

A summary table of management objectives for all IUCN categories lists scientific research as the primary objective for a Strict Nature Reserve, and wilderness protection and maintenance of environmental services as the primary objectives for a Wilderness (ibid.: 8). They both share the same overall category designation but their objectives and uses are disparate with the potential for confusion.

The use/type of use challenge faced by managers, who have developed various approaches like carrying capacity, VIM, or LAC, occurs again here. Category Ia limits public access, allows an unspecified number of scientists, and does not forbid, as Ib, non-polluting, non-intrusive travel. One has to infer from the two descriptions that the difference between a Strict Nature Reserve and a Wilderness (although both are considered Category I) is that the former exists for science whereas the latter exists for tourism and recreation. Both categories permit human use; nothing in them suggests that they be allowed to exist for their own intrinsic value.

Chapter 2 (Section 2.3.3) argued that nature has intrinsic value. On Leopold's land ethic is built the deep ecology platform that hovers close to the evolving concepts of visitor management. Systems such as LAC and ROS seem to be approaching, although anthropocentrically, reconciliation in terms of how or if wilderness areas are used. By recognising that if all human activities are permitted to take place in all areas degredation will result, the designers of LAC and ROS imply that all activities are not appropriate, that human use of nature is not always justified. This is an ongoing and possibly idealistic struggle in which visitor management planners engage: to acknowledge land and its non-human inhabitants as valuable in their own right.

3.5 A PLACE TO BEGIN

Antarctica's future will lie in the hands of its political managers, all of whom will bring their own cultural views to a potential definition of wilderness. The definition is
likely to be influenced by the economic interests of all parties and those who put pressure on them. Selecting an internationally recognised definition of a protected area ensures a large measure of legitimacy and precedent but, as wilderness visitor management has learned in the past, plans still need specific objectives that clearly outline the experiences available to visitors. Without such objectives, as the history of tourism in natural areas has shown, unmanaged access and activities could degrade the unique qualities of Antarctica.

Since it is effectively impossible to prohibit Antarctic tourism, and probably undesirable, because Antarctica exists as a unique example of a unaltered natural area, planners must decide whether tourism will be allowed to develop in Antarctica as it has elsewhere or whether it should guided by a different philosophy.

The lessons from wilderness and natural areas elsewhere suggest the following minimum actions:

1. designate Antarctica and formulate a management plan;
2. decide on a management philosophy and specify visitor activities;
3. select specific tourist areas that can be maintained and monitored to preserve naturalness;
4. develop visitor management plans and objectives for these areas; and
5. use a planning framework that recognises that impact/use inter-relationships are based on more than carrying capacity.
CHAPTER 4

ANTARCTICA, CONSERVATION, AND VISITORS

4.1 THE ANTARCTIC TREATY SYSTEM

4.1.1 The challenge: managing visitors under an international treaty

The constraints on visitor management in Antarctica arise from practical and logistical limitations when policy is determined by consensus agreement among Consultative Parties to the Antarctic Treaty. What may be a workable plan in other reserves and parks under national jurisdiction, may not be feasible in Antarctica due to politics, scale, lack of on-site personnel, and environmental conditions. The aim of this chapter is to examine how the Antarctic Treaty Consultative Parties (ATCPs) formulated the current restrictions on human activity and to ascertain whether these will adequately cover the rising number of visitors to the continent.

4.1.2 The Antarctic Treaty System: a brief history and structure

The management of human activities in natural areas is generally derived from the laws and regulations promulgated by the government of the area concerned. In Antarctica, this is accomplished through the international co-operation of the 42 nations which are part of the Antarctic Treaty System (ATS).

This system was an extension of the international scientific co-operation that had been established during the International Geophysical Year (IGY) (1957-58). Shapley (1985: 83-84, 88) noted the IGY's three most significant achievements: first, a gentleman's agreement was made that scientific stations and exploration would not have the political or legal significance they had had in the past. Second, the IGY gave rise to an international administration for the region with the creation of the Special Committee on Antarctic Research. (The name was later changed to Scientific Committee on Antarctic Research (SCAR) when it became clear that science would continue after the 'year' (1 July 1957 to 31 December 1958) was over (Beck 1986: 48)). Third, nations agreed on an exchange of scientific personnel to work in Antarctic Weather Central (the main weather-data collection point) during the year. The IGY became a banner for international scientific co-operation that overlooked land claims and political differences in order to work toward a common scientific goal.
Before the end of the IGY in 1958, the Government of the United States invited the seven Antarctic claimants (Argentina, Australia, Chile, France, New Zealand, Norway, and the United Kingdom) and the four other IGY participants in Antarctica (Belgium, Japan, South Africa, and the USSR) to join in negotiations for the establishment of an Antarctic regime (Peterson 1988: 40). After numerous meetings and formal negotiations, the parties produced the Antarctic Treaty, which was signed by the delegates of these 12 participating nations (ATCPs) on 1 December 1959, and entered into force on 23 June 1961 (ibid.: 41). At present 26 countries have consultative status.

The ATCPs now meet every year to exchange information and discuss matters of Antarctic interest (these meetings are known as Antarctic Treaty Consultative Meetings (ATCMs)). Since 1983, countries that are parties to the Treaty but not Consultative Parties have been invited as observers to these meetings (Heap 1994: 8). Special Consultative Meetings are convened by Consultative Parties as necessary.

4.1.3 The Antarctic Treaty: its functions and components

The Antarctic Treaty is essentially a peace treaty whose members are free to pursue scientific investigations as long as they are non-military. These two points are stated clearly in the preamble and reiterated in Articles I and II. A truce in respect of sovereignty (Article IV) is the glue that binds these nations together (ibid.: 19). (For the complete text of the Treaty, see Appendix A.)

The Antarctic Treaty System is more than just the Treaty; it includes the "whole complex of arrangements made for the purpose of regulating relations among states in the Antarctic" (ibid.: 8). These include Recommendations, actions taken by states to give effect to those Recommendations (the names of these measures were changed at the XIX ATCM in Seoul, 1995) (Clarkson, personal communication, 1995), three separate conventions — the Convention for the Conservation of Antarctic Seals (CCAS) (London 1972), the Convention on the Conservation of Antarctic Marine Living Resources (CCAMLR) (Canberra 1980), the Convention on the Regulation of Antarctic Mineral Resource Activities (CRAMRA) (Wellington 1988) — and the Protocol on Environmental Protection to the Antarctic Treaty (Protocol) (Madrid 1991) (ibid.). Additional elements of the system include the results of the Meetings of Experts, the decisions reached in Special Consultative Meetings, and SCAR's independent scientific advice. (For a summary of these conventions, see Appendix B.)

The ATS developed along pragmatic lines. Until 1989, no systematic attempt was made to devise a comprehensive programme for the protection of Antarctica's environment. Protection has proceeded in much the same way as for the IUCN Category Ia's Strict Nature Reserve, which recommends that an area's conservation be "achievable through protection and not require substantial active management ..." (IUCN 1994: 17).
Even before the Treaty entered into force, Brian Roberts, one of its architects, had anticipated that non-active management alone would be insufficient for conservation within the area covered by the Treaty. His work with the British Graham Land Expedition of 1934-37, and his later career as head of the Polar Regions Section in the UK Foreign Office, had armed him both with practical biological knowledge and with negotiating savoir-faire that he carefully worked into the Treaty (Heap 1991: 43-44).

4.1.4 Conservation and the Treaty

One point made in Chapter 2 was that nature-as-an-organism would be valued highly only when each of its components was recognised as useful and valuable. The conservation strategies used in parks and reserves are thematically analogous to the conservation strategies developed by the ATCPs: (i) decide on the boundaries; (ii) protect the species or attractions and manage for those selected; (iii) devise a system of protected areas where certain activities are permitted or excluded; and (iv) protect the entire ecosystem.

In Antarctica, the first conservation measure, that of designation (although only general rather than specific designation), was addressed in the Antarctic Treaty by delineating the area covered as south of 60° South.

4.1.4.1 Protecting species

The next concern was to protect flora and fauna in the area. Roberts foresaw the potential conflict between economic interest and wildlife conservation in Treaty Article VI, which states that "nothing in the present Treaty shall prejudice or in any way affect the rights, or the exercise of the rights, of any state under international law with regard to the high seas".

Article IX(f) (Heap 1994: 13) provided the necessary loophole as it allowed for further consideration of the issue of "the preservation and conservation of living resources in Antarctica". A general set of rules, drawn up during the IV SCAR meeting (1960), furnished Roberts with an opportunity to read them into the record at the I ATCM (10-24 July 1961) as Recommendation I-VIII, and allowed the ATCPs to become comfortable with the idea of conservation. Discussions continued into the II ATCM (18-28 July 1962) and formal adoption was achieved during the III ATCM (2-13 June 1964) (Heap 1991: 45). These measures, known as the Agreed Measures for the Conservation of Antarctic Fauna and Flora (Agreed Measures), protected flora and fauna in the areas south of 60° South, and included ice shelves (see Appendix B).

The Agreed Measures protected flora and fauna on the Antarctic continent and ice shelves but did not extend to whales or pelagic seals in the high seas.

Whales were covered under a set of regulations, came into existence in 1946, when the International Convention for the Regulation of Whaling was signed, giving the
International Whaling Commission (IWC) the responsibility of regulating the whaling industry (Bonner 1990: 390). The potential threat to pelagic seals was recognised by the Treaty powers when, in 1964, a pilot Norwegian sealing expedition visited the Antarctic (ibid.).

During the same 1964 ATCM meeting, Roberts laid the foundations for remedying this omission and was again able to use an existing pelagic sealing agreement within SCAR (Heap 1991: 45). Discussions held from 1964 to 1972 resulted in the Convention for the Conservation of Antarctic Seals (CCAS) (see Appendix B).

Having provided protection for seals, albeit under the guise of future exploitation, again Roberts looked ahead, and wrote of his concern for "conserving the Southern Ocean generally" (Heap 1991: 45). Krill, the basis of Antarctica's food chain, needed protection, as did the fin fish populations, before being jeopardised by industry.

4.1.4.2 Protecting the ecosystem

The third conservation theme was ecosystem protection. The outline of this new regime, the Convention on the Conservation of Antarctic Marine Living Resources (CCAMLR), was accepted at the IX ATCM in 1977, signed in Canberra in 1980, and came into force in 1982 (Bonner 1990: 390). The Convention protected not only the marine areas of the Treaty, south of 60° South, but included the area between that latitude and the Antarctic Convergence which is inseparable from the Antarctic marine ecosystem (Heap 1987: E3). Those 'marine living resources' (any form of life useful to humankind) are defined as "fin fish, molluscs, crustaceans, and all other species of living organisms, including birds" (ibid.: E3). This ecosystem approach has been recognised as a major innovation of CCAMLR (Nicol 1991: 229; Kock 1994: 10).

Without doubt, this was a welcome, precautionary approach based on conservation for humankind's potential needs. It stresses the need to prevent an imbalance arising among marine stocks due to over-harvesting and in doing so at least partially recognises the intrinsic value of the marine ecosystem (Heap and Holdgate 1986: 205). The establishment of a Commission was one of CCAMLR's greatest accomplishments. Its management responsibilities include: (i) conducting research on the ecosystem and its components; (ii) compiling data on populations and other related factors; (iii) designating the size, age, and sex of species which may be harvested; and (iv) other conservation measures necessary based on the best scientific evidence available (Heap 1987: E6). Membership is open to any state that has an interest in research or harvesting in the Convention area and to regional economic integration organisations having one or more members among states that are parties to the Convention (ibid.: E11).

The arguments concerning the success and failure of CCAMLR provide useful fodder for tourism management. The fish stocks were already depleted before CCAMLR was agreed, and it was not until 1989 that more stringent conservation measures went
into effect (Kock 1994: 3). The fishing countries had claimed that scientific advice was uncertain due to lack of information and, consequently, that conservation measures should not be enacted (ibid.: 11). Proponents of CCAMLR argued that, with an ecosystem approach, the lack of precise information made precautionary measures even more sensible (ibid.: 11). The power to devise the necessary measures was restricted by CCAMLR's requirement that there be unanimous agreement among members, and thus the measures agreed upon were those acceptable to the least enthusiastic members. Inspections carried out by CCAMLR Inspectors can result in the loss of licences and in the imposition sanctions on captains of fishing vessels where infringements are recorded (CCAMLR 1994: 15).

The Convention on the Regulation of Antarctic Mineral Resource Activities (CRAMRA) took six years to negotiate before terms could be agreed. Exploration could not take place until its impacts on Antarctica had been assessed (Article 4) (Bonner 1990: 391). As in the case of CCAMLR, a Commission (Articles 18-22), an Advisory Committee (Articles 23-27), and Regulatory Committees (Articles 29-32) serve as CRAMRA's management arm. The Convention governing this activity has never become active since it became obvious that the necessary condition that all states with claims to territorial sovereignty in Antarctica would be parties to it, would not be met (Article 9) (Heap 1994: 192). The present situation is addressed under Article 7 of the Protocol and prohibits mineral activities, except for scientific research.

4.1.4.3 Protecting areas

Although not foreshadowed in the Treaty, another source of conservation has been the designation of protected areas. The first of these, Specially Protected Area (SPA), was promulgated by way of the Agreed Measures (Article VIII) to protect areas of "outstanding scientific interest ... in order to preserve their unique natural ecological system" (ibid.: 2050). This classification prohibited collecting native plants (except with a permit), driving any vehicle, and entry by nationals except by permit.

A new zone, the Site of Special Scientific Interest (SSSI), was adopted at the VII ATCM (1972) and elaborated at the VIII ATCM (1975) to protect scientific investigations from harmful interference (Heap 1987: 3102-3103). SSSIs filled needs not provided for by SPAs, by allowing more active scientific investigations, providing protection for ongoing investigations, and including non-biological sites within the designation (IUCN 1991: 335). A management plan is required for SSSIs, to include details of its location, the scientific investigation to be pursued there, and information concerning sampling, any pedestrian or vehicular routes, and the proposed expiration date.

Marine Sites of Special Scientific Interest were adopted in 1987 as Recommendation XIV-6 to protect "inshore marine sites of scientific investigations" (Heap 1994: 2098). Again, as in the case of SPAs and SSSIs, the emphasis was on
protecting scientific interest or scientific investigation rather than strictly the area itself. During the XV ATCM (1989), Specially Reserved Areas (SRAs) and Multiple Use Planning Areas (MPAs) were introduced, the former to safeguard "areas of outstanding geological, glaciological, geomorphological, aesthetic, scenic, or wilderness value" (ibid.: 2108) and the latter to add a category of protection "where co-ordinated management of activities would minimize harmful environmental impacts" (ibid.: 2110).

Historic Sites and Monuments had been covered in 1961 by Recommendation I-IX and stated that governments should adopt all adequate measures to protect such tombs, buildings or objects of historic interest, from damage and destruction (ibid.: 2085).

Later ATCMs began to consider further protection, such as extending the area around the site, because there was risk of interference, due to the increasing level of human activities on the continent (ibid.: 2113).

The idea of tourist zones was taken up by Roberts, but outside the Treaty area. He did add Areas of Special Tourist Interest to the 1975 Falkland Islands Dependency Conservation Ordinance (derived from the Agreed Measures) because he believed these areas should be established "where tourist activity can be systematically assessed" (Roberts 1977: 101). This idea was carried within Recommendation VIII-9 (1977), which recognised the need "to restrict the number of places where large numbers of tourists could land so that the ecological effects could be monitored", but no such areas have been designated. Some ATCPs doubted the wisdom of designating them and were concerned about the lack of information on the effects of confining visitors [IUCN 1991: 56; Nicholson 1991: 420; Heap 1994: 2295].

The growing number of categories, the conflicting uses of Antarctica, and the gaps in the provisions were becoming clear to both direct and indirect participants. At the 16th General Assembly of International Union for the Conservation of Nature and Natural Resources (IUCN), in November of 1984, it was obvious that both the ATCPs and the IUCN General Assembly were thinking about conservation in Antarctica and would produce a comprehensive strategy if encouraged (Heap 1987: 15).

The Joint IUCN/SCAR symposium on scientific requirements for Antarctic conservation concluded that, as protected areas were only one component of a comprehensive strategy, management needed a structure based on rational, sustainable use that incorporated both scientific operations and tourism in its planning (Bonner and Angel 1987: 144). Additionally, the network of protected areas needed strengthening to include, for example, Heritage sites, Biosphere Reserves, and National Parks, like those elsewhere in the world (ibid.).

In 1991, IUCN published A Strategy for Antarctic Conservation, which analysed, among other things, the protected area system. It found much to be
commended, but also several weak points (IUCN 1991: 51-52). First, the variety of
categories was complicated and the sites were scattered. They were not related to any
other 'globally-accepted' set of definitions. Second, they believed an improved
biogeographical framework was needed to provide a basis for additional site selection.
Third, management planning had been inadequate and was only required for SSSIs. Finally,
most of the conservation areas had been created to protect communities, not
landscapes. Those areas that did protect landscapes were concerned with the specific
feature on a small scale.

IUCN recommended a number of actions necessary to implement an overall
conservation strategy: two are of particular interest to Antarctic visitation. First, Antarctic
conservation principles, policies, and goals needed strengthening.

The conservation of the Antarctic environment, with its outstanding wilderness qualities
and unique dependent and associated ecosystems, should be a principal objective of
international policy (ibid.: 65);

and

The new measures should indicate clearly which classes of activity are banned, and
which are permissible under defined safeguards. They should provide a framework
within which a comprehensive system of specially protected or reserved areas can be
designated (ibid.).

Second, IUCN (IUCN 1991: 70) said tourism measures needed strengthening in
four ways: (i) by instituting a comprehensive review of the issues (essentially Graefe et
al.'s 1990 preassessement database); (ii) by promoting interaction among all the parties
involved, with the aim of developing guidelines; (iii) by pro-active planning for Areas of
Special Tourist Interest; and (iv) by controlling the choices of tourist destinations.

A major problem for the Treaty Parties at this time was how to adapt IUCN
criteria and World Conservation Strategy criteria, which are based on terrestrial
ecosystems, to Antarctica and the associated marine ecosystem (Angel 1987: 113).
Categorisation in such cases is hard to justify unless "the protected area is very large
relative to the total area" (ibid.). Angel (ibid.) pointed out it is more realistic to devise a
management plan that determines

the limits of acceptability [emphasis added] for the impact of the exploitation on other
elements in the ecosystem before the level of exploitation is increased.

Thus the idea of zones would not be sufficient to provide protection. They would
have to be combined with Limits of Acceptable Change (LAC) (Section 3.3.3) to assist
management in setting realistic goals for each of those zones. Ultimately, the zones
would set the standards by which the degree and type of change could be measured.
Heap and Holdgate (1986: 206) maintained that except in the case of the slaughter of seals and whales, Treaty powers have avoided 'pushing back' frontiers, as was done in North America by establishing a system of conservation measures and protected areas. Further, Heap (1994: 2081) made the case that almost all countries set aside areas — whether parks, reserves, or heritage sites — and that this approach was reasonably and successfully used in Antarctica.

The conservation of parks, reserves, and remote islands was initiated — by drawing a circle around an area, saving a feature or attraction, and allowing an activity or activities to dictate the area's use and influence its management within some basic constraints. This has been deemed inadequate and, as Angel (1987: 113) commented, more is needed. More recently, Bonner (1994: 6) said: "Taking active steps, so as deliberately to prevent or reverse change in the area protected, is seen as essential in many cases". Having determined what activities are appropriate and how much impact is acceptable, managers adopt strategies accordingly.

The vast array of environmental protection measures — there have been over 138 Recommendations on environmental management (including tourism) through 1992 (Harris 1993: 263) — illustrated the need for cohesiveness. The origins of the Protocol reached back, in part, to earlier Recommendations. An excellent short review of the relevant ones can be found in Beck (1994). The ATCPs had long recognised that measures had to be undertaken to: (i) minimise the harmful human interference that might endanger Antarctica's scientific value as an uncontaminated region (Recommendation VI-4); (ii) observe a code of conduct that outlined such issues as waste disposal and environmental impact assessment (Recommendation VIII-11); (iii) identify the types of impacts that have occurred in the Treaty Area (Recommendation VIII-13); (iv) ensure that planning of activities included an assessment of possible impacts (Recommendation IX-5); and (v) establish a priority objective of implementing a comprehensive system of protection (Recommendation XV-1).

Not only was comprehensive management needed but there was a demand that environmental protection mechanisms should become mandatory, as in the case of CRAMRA (Heap 1994: 2001). It was thought by some that the lack of 'bite' for tourism Recommendations reflected a perceived lack of urgency because Antarctic tourism was on such a small scale (Nicholson 1991: 423). Lyons (1993: 112) pointed out that CRAMRA had elaborated environmental protection standards, acknowledging that activities had impacts on Antarctica and its dependent and associated ecosystems. To Antarctica's scientific values, CRAMRA also added ecological and wilderness values (preamble) (Bonner 1990: 391) (see Appendix B).
4.1.5 Comprehensive protection: the Protocol on Environmental Protection to the Antarctic Treaty

The Protocol on Environmental Protection to the Antarctic Treaty (Protocol) was signed in Madrid on 4 October, 1991 and so far has been ratified by 16 of the required 26 countries (ATCPs 1995a: 11). Antarctic Treaty Consultative Parties have agreed in the interim to begin implementing its provisions where possible. (For a summary of the Protocol, see Appendix B.)

Thus far, ATCPs had pieced together, very slowly, measures that would prohibit or regulate all human activities except tourism. The Protocol became the first comprehensive environmental management programme for all human activities in Antarctica — including tourism.

The relevant question about the Protocol vis-à-vis comprehensive environmental management is whether it provides an adequate framework for responding to the environmental impacts of visitors in a wilderness.

4.1.5.1 Designation and management of activities

Article 2 of the Protocol states the objective: comprehensive protection of the Antarctic environment, and the designation: Antarctica is a "natural reserve, devoted to peace and science". The ATCPs have not chosen a designation that corresponds to any existing IUCN category, though it is closest to Category Ia, Strict Nature Reserve, an area managed mainly for science (see Section 3.4). Heap (1994: 2020) explained that Article 3 of the Protocol awards priority to science over any other activities:

to preserve the value of Antarctica as an area for the conduct of such research, including research essential to understanding the global environment.

The Protocol does mention tourism and thus includes it among its objectives. It also reiterates that Antarctica's values include "wilderness and aesthetic" alongside its value as "an area for the conduct of scientific research" (Article 3) (ibid.: 2019). In this way, it is reminiscent of IUCN category Ib, Wilderness, that allows for public access and enjoyment.

Under the Protocol, the protected areas have been streamlined: Antarctic Specially Protected Areas (ASPAs) and Antarctic Specially Managed Areas (ASMAs) replace the five formerly existing categories. The difference between them is that ASPAs protect values, ‘environmental, scientific, historic, aesthetic, or wilderness’, whereas ASMAs protect activities (ibid.: 2082). Tourists are not normally allowed into ASPAs, as they are "areas kept inviolate from human interference" (Annex V, Article 3.2(a)) and permits are required for entry. ASMs do not require permits and are managed in such a way as to avoid possible conflicts between ATCPs and visitors and to minimise environmental impacts (Annex V, Article 4.1).
Tourists are not provided with separate areas, as some ATCPs have argued that this will encourage 'honey pots', concentrating impacts, and limiting the scope of activities (ATCPs 1992a: 5).

These so-called 'honey pots' already exist, as Figure 4.1 illustrates. Ten sites in the Peninsula account for 61.6% of all recreational visits. Roberts understood that by concentrating tourists into specific areas, it would be easier to monitor them, a particularly essential part of effective management, since currently little is known about visitor impacts on flora and fauna. During the 1989/90 season 36 visited sites were reported to the National Science Foundation (NSF); by 1993/94 this had risen to 69 (NSF 1994). (To comply with the reporting requirements of the ATS, at least one country, the US, compiles and distributes information it receives on tourist numbers.) Visitor managers have long recognised that low impact use can be achieved by concentrating use and impact in popular places (Cole and Krumpe 1992: 39). Harris (1993: 116; 1994: 285) argued that tourists should not necessarily be excluded from ASPAs, as what they protect is of great interest to tourists. He suggested that further management zones be set up within ASPAs and ASMAs, thereby allowing some flexibility at various sites. Although some flexibility could be useful, the opening of all ASPAs for visitation defeats the purpose of setting aside areas that are secure from human intervention and does not protect wilderness values. Areas must be established, particularly in the Antarctic Peninsula where the pressure from visitors is currently greatest, that are protected from all activities. Without them there are no control areas against which to gauge change and no areas that are simply allowed to exist without human interference.

Figure 4.1. The ten most popular sites, by visitor numbers, in the Antarctic Peninsula during the 1993/94 season.
Activities in these areas, where science directly or indirectly has priority, must also "be planned and conducted so as to limit adverse impacts" on the environment and associated ecosystems. These should avoid adversely affecting climate, air or water quality, flora and faunal populations, or other "biological, scientific, historic, aesthetic or wilderness significance" (Heap 1994: 2019). Additionally, monitoring is to take place to allow the assessment of conditions. There is still a failure to protect areas from any human use.

The Protocol provides a designation for Antarctica, a necessary step for any kind of management, and it requires that activities be conducted so as to limit impacts there. Further, these activities can be "modified, suspended or cancelled if they result in or threaten to result in impacts" (Article 3(b)).

How does the Protocol manage tourism? First, it permits tourism as an activity as long as it does not unreasonably affect the environment (as noted above) and states that all proposed activities are subject to an Environmental Impact Assessment (EIA) unless they have "less than a minor or transitory impact" (Annex I, Article 2). If there is uncertainty, then an Initial Environmental Evaluation (IEE) must be prepared. A Comprehensive Environmental Evaluation (CEE) must follow if the IEE indicates, or if "it is otherwise determined", that the impact is likely to be more than minor or transitory (Annex I, Article 3).

One criticism of the Protocol, by Lyons (1993: 116), is that proponents advocate their own operations or solutions to problems identified. It would of course be better if the assessment procedure was carried out by an independent group. Other criticisms are that tour operators do not have the expertise in environmental auditing necessary to conduct such an investigation, and that such self-policing may serve their best interests and not the interests of conservation.

Both of these criticisms are valid and have been temporarily remedied by the appearance of at least one firm, 'Poles Apart', able to conduct such audits and by the willingness of some tour operators to hire the firm for that purpose.

During the 1993/94 season, the first IEE of a commercial operation was prepared for Adventure Network International (ANI) to examine their airborne operations at Patriot Hills, Ellsworth Mountains (ATCPs 1994a). As this evaluation would seem to acknowledge both the requirements (although they were hortatory at this time) and the spirit of the Protocol, it is worth considering whether this approach adequately addresses the impacts of tourism. Enzenbacher (1994: 112) has noted that many ATCPs do not believe there is a need for a separate Annex on tourism.

ANI's operations are air-based and provide a service for tourists as well as scientific operations and national programmes. The company offers camp-based tours, flights to the South Pole for groups, ski tours, visits to an emperor penguin colony, and transport for mountaineers (ATCPs 1994a). A camp can accommodate 50 people and has
a blue-ice runway that requires little preparation or maintenance. Approximately 12 round trips from Punta Arenas are made each season. At the end of the season, the camp is dismantled and put in the snow hanger for winter storage (ibid.: 5).

The activities offered by ANI were appraised for the predicted impacts at all four of their camps. The table of predicted impacts at the Patriot Hills Camp is reproduced in Table 4.1. In this table, the existing conditions resulting from the impacts are conveyed in general terms. It would be desirable to state these quantitatively but until such time as this methodology can be developed, the general statement is adequate. The establishment of appropriate parameters is in progress. Campbell et al. (1994) have developed a visual technique for estimating fieldwork impacts on ice-free terrestrial environments; although it is not applicable to ice and snow conditions, a similar technique could perhaps be devised. The conclusion reached by Poles Apart (ATCPs 1994a: 24) was that the level of most activities was low at the local scale and negligible at the continental scale.

A second company, Quark Expeditions, requested that Poles Apart undertake an Environmental Audit that reviewed their environmental practices. This is not an Environmental Impact Assessment (discussed previously) but a historical review and critique of previous practices (ATCPs 1994b: 2).

Two sorts of activities were analysed for Quark. The first was visitor activities, including trips in inflatable boats, helicopter flights, shore landings, and shore activities such as barbecues, photography, and wildlife observation. The other type of activity was connected with ship operations and management, such as waste disposal and safety procedures (ibid.: 2).

For Quark's three ships, there were some minor concerns about the treatment of waste. For example, poultry products were not separated from other kitchen waste, and some plastic was mixed in with kitchen waste before the latter was disposed of (by approved means in the sea), and some prohibited packaging was observed (polystyrene beads and chips), contravening Recommendation XV-3(11).

The authors of the audit mentioned visitor numbers and guidelines and noted that, although passengers were given the IAATO guidelines (cf. Section 4.3.1) and instructed on proper behaviour ashore, there seemed to be little direct guidance once passengers had disembarked. Quark was reported as avoiding "overly frequented landings" but the reason for this decision was not given (ibid.: 33).

The auditors concluded that Quark operated in a safe manner and that it was careful not to impact the Antarctic and its ecosystems. Several recommendations for improvements were made.

The reports from Poles Apart are independent, seemingly thorough, indicate the authors' extensive knowledge of the rules and regulations and their application, and present a picture of generally well-run, conscientious operations. These companies are,
<table>
<thead>
<tr>
<th>Activity/Element</th>
<th>Nature</th>
<th>Duration</th>
<th>Impact</th>
<th>Extent</th>
<th>Duration</th>
<th>Intensity</th>
<th>Probability</th>
<th>Significance</th>
<th>Possible Mitigation</th>
<th>Description</th>
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<tr>
<td></td>
<td></td>
<td></td>
<td>Nature</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Yes/no</td>
<td></td>
</tr>
<tr>
<td>1 Ice hangar</td>
<td>long</td>
<td></td>
<td>disturbance of ice/snow</td>
<td>local</td>
<td>long</td>
<td>medium</td>
<td>definite</td>
<td>medium</td>
<td>yes</td>
<td>removal on decommissioning</td>
</tr>
<tr>
<td>2 Fuel pumping</td>
<td>long</td>
<td></td>
<td>fuel spill</td>
<td>local</td>
<td>short</td>
<td>medium</td>
<td>probable</td>
<td>medium</td>
<td>yes</td>
<td>use spill container or absorbent mat</td>
</tr>
<tr>
<td>3 Camp sullage</td>
<td>long</td>
<td></td>
<td>change ice/snow composition</td>
<td>local</td>
<td>long</td>
<td>medium</td>
<td>definite</td>
<td>medium</td>
<td>yes</td>
<td>install baffle-type grease trap</td>
</tr>
<tr>
<td>4 Operation of camp</td>
<td>long</td>
<td></td>
<td>reduce wilderness value</td>
<td>local</td>
<td>long</td>
<td>medium</td>
<td>definite</td>
<td>medium</td>
<td>yes</td>
<td>concentrate camp area</td>
</tr>
<tr>
<td>5 Access to ice-free areas</td>
<td>long</td>
<td></td>
<td>potential introduction of non-indigenous species contamination</td>
<td>local</td>
<td>–</td>
<td>–</td>
<td>probable</td>
<td>–</td>
<td>yes</td>
<td>clean equipment, limit access</td>
</tr>
<tr>
<td>6 Emissions</td>
<td>long</td>
<td></td>
<td>reduce wilderness value</td>
<td>local</td>
<td>short</td>
<td>low</td>
<td>definite</td>
<td>low</td>
<td>no</td>
<td></td>
</tr>
<tr>
<td>7 Aircraft</td>
<td>long</td>
<td></td>
<td>snow compaction</td>
<td>local</td>
<td>short</td>
<td>medium</td>
<td>probable</td>
<td>medium</td>
<td>no</td>
<td></td>
</tr>
<tr>
<td>8 Snowmobile &amp; sled use</td>
<td>long</td>
<td></td>
<td>snow compaction</td>
<td>local</td>
<td>short</td>
<td>medium</td>
<td>definite</td>
<td>low</td>
<td>yes</td>
<td>concentrate activity</td>
</tr>
</tbody>
</table>

Table 4.1. Predicted impacts of the Patriot Hills Camp (ATCPs 1994b: 23).
to the best of their ability, following the current tourist guidelines for environmentally low-impact behaviour.

The Protocol address the impacts of tourism on the environment on the level of an individual, i.e. whether a group of people engaged in an activity have harmed a specific community of plants or animals. The lesson of places like Niagara Falls is not that people trampled plants in a particular area or disturbed wildlife but that commercialisation of a wilderness by permitting any activity that seems initially benign, or even beneficial to someone, may erode the wilderness qualities of the area.

4.1.5.2 The gap in the system

These environmental assessments and historical audits certainly extend the capacity of the ATCPs to safeguard Antarctica's values from more than minor or transitory impacts, and they represent a significant step toward comprehensive protection. The Protocol and measures such as these audits do not address the problem of whether the activities are appropriate and in keeping with Antarctica's "wilderness and aesthetic" values (Article 3). Chapter 3 (Section 3.2.2) discusses the use/user conflicts that occur when visitors want to indulge in dissimilar recreation (Jacob and Schreyer 1980: 369, quoted in Kuss et al. 1990: 192) and the mismatch between the activities permitted and the area's stated value (what the park or reserve offers as its unique attributes) (Stankey 1980a: 29). If golf courses on ice fields do not produce more than "a minor or transitory impact", should they be allowed? Sax (1976: np) reasoned no, not because golf is an unsatisfactory activity but because it does not fit into the values of a wilderness area.

This question is exemplified by ANI's view that the "Ellsworth Mountains provide unique Antarctic recreational and tourism opportunities" (ATCPs 1994a: 20). It is recreational entrepreneurs who are deciding what opportunities are to be provided, instead of those charged with the environment's protection. The conservation of a continent cannot be undertaken on this basis. The lessons learned from attempts to promote the conservation of Antarctica (this chapter) and those learned by park and reserve managers (Chapters 2 and 3) emphasise that limited measures will not be sufficient to provide comprehensive protection.

The gap allows any activities to take place so long as they pass an environmental test. This is the wrong test. It is not a question of whether an activity fails some current standard of environmental impact but whether the activity is in keeping with the "intrinsic value of Antarctica" (Article 3). While it is not being suggested that tourism should be banned (nor has it been from early on) (Roberts 1978: 114), there is an acknowledged lack of information about many aspects of tourism and their impacts. What may be deemed acceptable now, e.g. playing golf at the "Ellsworth open", may fall out of favour, as various activities have done in North American parks (Anon. 1991: 163).
By allowing visitation to take the same course it did in other wilderness areas, beginning with the visits of a few to an unspoiled wilderness and progressing to the visits of many, due to improved access — new and different kinds activities and facilities arise. Managers realised that their current systems were inadequate to solve the problems created by such an open-door policy. The impacts, many of which come from activities not appropriate to the area, increase. The issue is not only how to provide good, safe systems of visitor management that reduce or prevent impacts, but how to establish criteria that will determine what the wilderness is to become (using, for example, IUCN's category Ib; see Section 3.4.). They include whether all recreational activities are allowed and where, and how much infrastructure can be permitted under the designations approved by those responsible.

Visitor management in Antarctica would presumably be conducted under the aegis of the Committee for Environmental Protection (Articles 11-12); 'tourism' is included among its 'other' responsibilities, since it is still considered a peripheral activity, one that can be managed alongside all the other human activities. Yet the World Tourism Organisation has forecast that tourism will become the world's largest industry by the year 2000 (FNNPE 1993: 10). This is of concern to the Federation of Nature and National Parks, whose members recognise the potential threat of unregulated and uncontrolled tourism. All of the member countries have laws, 'some better than others', for environmental protection, but they are preparing visitor management strategies to protect their nature and national parks. One look at a travel brochure advertising holidays in the Arctic reassures the uncertain that expensive holidays, in inhospitable climates and for those with a sense of adventure, have already arrived (Figure 4.2) (Arctic Experience Ltd. 1994).

The ATCPs, as stated in the preamble of Recommendation VIII-9, acknowledge tourism as a legitimate use, "a natural development". The Protocol controls human activity on a small scale and addresses the general and important environmental concerns — waste management, safety, reporting, inspection, importation of exotics, marine pollution, and area protection and management.

Some pragmatic issues arise from whether the values of a specific environment are promoted as intrinsic, or recreational, or a mixture of values, the two:

1. Can these values co-exist in the same geographical location?

2. If Antarctica is an unique environment, is an open management philosophy, i.e. one that allows development if it has only a minor or transitory impact, appropriate for long-term conservation? Is recreation or wilderness being conserved?

3. If recreation is permitted, are facilities allowed? If so, where and how many?

4. Can multiple operators use blue-ice runways and set up camps?
TOUR 27g
Spitsbergen, Greenland & Iceland

This is a great opportunity to explore a part of Greenland which is largely off the beaten track. As there is no basic infrastructure for visitors, it is likely to remain so except to ship based expeditions such as ours.

North-east Greenland is the world’s largest natural Park. Over here we find some fascinating wildlife - musk oxen, arctic hare and wolves, and supports huge breeding colonies of birds and large-footed geese as well as the beautiful great northern diver. The rugged coast is highly indented with massive fjords cutting inland towards the great Greenland icecap. Huge icebergs, towering mountains and fragile tundra make it an area of extraordinary scenic interest as well.

On our voyage we travel from Spitsbergen across the Greenland Sea and through the pack ice to Danesborg, on Greenland’s east coast. We will spend a week making our way south following the shore to Scoresbyfjord. From here we head to Iceland, finishing the trip at the delightful town of Akureyri, in the north of the island. For those who wish, there’s the option to stay on and explore this extraordinary volcanic island, or you can fly back to the UK, after overnight in the capital, Reykjavik.

Note: the coast north of Scoresbyfjord may be inaccessible due to pack ice. If so, an alternative route via Jan Mayen will be taken and less time will be spent in Greenland.

Outline Itinerary:
Day 1: Fly from UK to Longyearbyen, via Oslo and Tromso.
Day 2: Arrive Longyearbyen in the early hours and transfer to our hotel for the night. In the afternoon we board our ship and set sail for Sønemøya, on the northern shore of Svalbard where we hope to see geese, Arctic guillemots and red-breasted divers with young.
Day 3: At sea and heading for the Greenland pack ice. Large whales are sometimes seen.
Day 4: We make our way through the interesting East Greenland pack ice. Polar bear sightings are possible.
Days 5-10: We arrive on the coast of Scoresbyfjord. Over the next week we spend time exploring up and down the coast. We visit Danesborg, base for the Danish Radio research station. From Kapisillit and a nearby research station in Lysenborg Fjord, At Myggehaugen, we go ashore in search of wolves on the tundra and land at Mesters Vig which has long been a centre for scientific research in the area. We visit Scoresbyfjord, a remote Greenlandic hunting community located at the entrance of the largest fjord in the world. There’ll be a chance to observe the traditional Inuit way of life. We sail up Scoresbyfjord and explore huge glacier fronts, a dramatic landscape dominated by giant icebergs. On shore we look for musk oxen and arctic hares. We try to land on Danmark Island, where great northern divers, pink-footed and barnacle geese breed in an area of lakes and marshes. At Kap Brewster we go ashore to explore cliff colonies of Kittiwakes, Brunnich’s guillemots and fulmars. And, on Stewart Island we’ll be looking at the remains of an Inuit settlement where there are sometimes sightings of polar bears and narwhals.
Day 11: At sea on route for Iceland, with whale sightings a possibility.

Day 12: We sail past Kolbeinsey and as we cross the Arctic Circle we land at Grimsey, just off the northern coast of Iceland, home to a small community of fishermen and farmers and hundreds of thousands of birds. We take a walk along the cliff tops and though many birds will have gone to sea, there may still be Kittiwakes, fulmars and arctic terns around.

Day 13: We arrive in Akureyri, the largest town in the north of Iceland, beautifully situated on the shores of Eyjafjördur, a scenic fjord. Fly from Akureyri to Reykjavik and overnight at Hotel Land. Day 14: Transfer to Keflavik Airport for flight to Heathrow. Note: an optional extension in Iceland can easily be arranged on this holiday - phone our Banstead office for details.

Departure Date: from London on 28 August

Bryan Alexander

Prices (4):

<table>
<thead>
<tr>
<th>Cabin type</th>
<th>Twin</th>
<th>Owner</th>
<th>Basic</th>
<th>Single</th>
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</thead>
<tbody>
<tr>
<td>Tour 27a</td>
<td>2207</td>
<td>3656</td>
<td>3106</td>
<td>3422</td>
</tr>
<tr>
<td>Tour 27b</td>
<td>2766</td>
<td>3209</td>
<td>3634</td>
<td>3998</td>
</tr>
<tr>
<td>Tour 27c</td>
<td>2445</td>
<td>1350</td>
<td>3349</td>
<td>3677</td>
</tr>
<tr>
<td>Tour 27d</td>
<td>2661</td>
<td>3110</td>
<td>3568</td>
<td>3903</td>
</tr>
<tr>
<td>Tour 27e</td>
<td>2314</td>
<td>2763</td>
<td>4211</td>
<td>4556</td>
</tr>
<tr>
<td>Tour 27f</td>
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<tr>
<td>Tour 27g</td>
<td>2796</td>
<td>2675</td>
<td>3683</td>
<td>4012</td>
</tr>
</tbody>
</table>

Prices include:
Scheduled flights as stated; overnight tourist class hotel accommodation on land where stated; twin rooms with shower/wc inclusive of breakfast; participation in cruise inclusive of full board, cabin accommodation of your choice and services of English speaking guide; airport transfers to/from ship; airport taxes.

Note: transfers in Oslo are not included

Departure Dates: from London Heathrow
Tour 27a: North Spitsbergen 24 June - 04 July
Tour 27b: North Spitsbergen 14 - 24 July
Tour 27c: East Spitsbergen 15 - 25 July
Tour 27d: Round Spitsbergen 24 July - 05 August
Tour 27e: Franz Josef Land 25 - 08 August
Tour 27f: Franz Josef Land 16 - 29 August
Tour 27g: Spitsbergen, Greenland & Iceland 28 August - 10 September

FOR RESERVATIONS AND ADVICE, PLEASE CALL: 0737 362321

Figure 4.2. Sample of Arctic tours and prices (in pounds sterling) in 1994.
5. Should operators be permitted to team up with scientific bases that have runways to develop large scale commercial tourism?

6. Can any commercial operator establish land-based facilities?

7. Can tourists visit any site that is not specifically an ASPA?

8. Should specific sites, selected on the basis of carefully considered criteria, be set aside for tourism and, if so, should they be monitored?

9. What strategies will be used to mitigate on-site impacts? Closure, site hardening, site rotation? What will be the policy on wildlife disturbance, e.g. allow it until noticeable impacts are observed and can be measured?

10. Who will make these decisions?

Environmental management in Antarctica is at the critical stage where decisions could be implemented at the outset to prevent, as far as possible, the changes that have occurred as visitation increased in other parts of the world. The Protocol does a commendable job of issuing forth guidelines for the safe and proper conduct of activities, but it has yet even to consider whether all potential and, in some cases, likely activities will be permitted. The ATCPs have only decided how activities should progress, not whether they should progress.

In a more general discussion, a British environmentalist, Porritt (1994: 58), argued that people are avoiding consideration of the real issue (the unsustainable damage being done by more people travelling every year) in allowing themselves to be seduced into a marginally less damaging holiday.

The point of deciding what are appropriate activities in a wilderness environment, is that such a decision should remove from the equation people who do not wish to engage in wilderness-dependent recreation.

ATCPs must state specifically what activities are available to tourists in Antarctica, whether Antarctica is another wilderness recreation area, or whether it has other values. There is value in allowing people to experience a wilderness, but it must be valued for what it is — a wilderness.

### 4.2 THE VISITOR IN ANTARCTICA

#### 4.2.1 Creating access — by ship and by plane

As reported by Reich (1980: 205), the first offer of a commercial tour to the Antarctic came from Messrs Thomas Cook and Sons in Christchurch, New Zealand, in 1910. Interested parties wishing to make such a journey had to wait nearly 50 years before the opportunity arose again and this time it began in South America. As early as
1958, the first group of passengers (about 100), aboard the ship *Les Eclaireurs*, travelled to the Antarctic Peninsula.

The first ships taking tourists were Argentine and Chilean navy vessels (or vessels chartered by those navies): in 1958 *Les Eclaireurs* made two trips, carrying about 194 passengers, and in the following year the *Navarino* carried 84 passengers and the *Yapeyu* 260 passengers. Lars-Eric Lindblad, whose operations dominated Antarctic tourist travel throughout the 1970s, began organising regular visits in 1966, and made Antarctic tourism a small but potent reality (*ibid.*: 207). From the first 200 shipborne tourists in 1958, the number of visitors has steadily increased to over 8000 in the 1993/94 season (NSF 1994 and Figure 4.3). More importantly, larger-capacity ships carrying more passengers per cruise (*Ocean Princess* 480, *Daphne* 406, *Europa* 530, *Marco Polo* 486) (Enzenbacher 1993: 241; 1994: 107; NSF 1994: np) have joined the market, and the break-up of the Soviet Union has made available a number of additional ice-strengthened or ice-breaking ships. Of the thirteen ships scheduled to carry passengers during the 1994/95 season, eight are former Soviet ships (*ibid.*).

There were five operators during the 1990/91 season; by the following season, this number had doubled (Enzenbacher 1993: 241). The preliminary estimates for the 1994/95 season were that nine operators would make a total of 89 trips, an increase of 24

![Graph](image-url)

**Figure 4.3.** Recorded numbers of visitors in the Antarctic from 1980/81 through 1992/93 (Enzenbacher 1994: 107).
trips completed over the previous season (NSF 1994). The history of Antarctic cruise operators reveals that many go out of business, or reorganise under new names or new owners, or only spend a season or two in the Antarctic.

The fluctuations in the cruise industry, the increasing number of operators and ships, the large ships, and the existence of International Association of Antarctica Tour Operators (IAATO) and non-IAATO member ships, mean that there is much potential for change in the industry and make predictions about the rate of growth difficult.

Aircraft too represent an unknown factor in opening up travel to Antarctica. The early history of air travel and tourist overflights in Antarctica has been well documented by Reich (1980), Headland (1989), and Swithinbank (1993). The earliest tourist overflight was made in 1956, by a Chilean Douglas DC-6B just before Christmas. Regular flights did not begin until 1977, when Quantas used a Boeing 747 and Air New Zealand used a Douglas DC-10 to fly over the continent. It was estimated that, from 13 February 1977 until December 1980, 44 trips were made by 11,145 passengers (Reich 1980: 210). The tragedy of an Air New Zealand jet that crashed on Mount Erebus in 1979, killing all 257 people on board, until recently reduced the widespread interest in overflights (Swithinbank 1993: 103). Swithinbank (ibid.) noted that overflights reported since then have been made only by a Boeing 737 operated by the Chilean airline LADECO. During the 1994/95 season, however, Quantas scheduled and completed six Antarctic overflights (ATCPs 1995b: 1). The success of these overflights has prompted Quantas to announce that they will schedule 30 for the 1995/96 season (Enzenbacher, personal communication, 1995).

A strong possibility is that passenger flights will land in Antarctica. This can be accomplished in two ways: either by using a conventional runway or by using a blue-ice runway. There are four permanent runways in Antarctica but only Teniente Rodolfo Marsh Station, on King George Island, permits landings by private or commercial aircraft (Swithinbank 1993: 104). Moreover, the runway is short, narrow, rough, and requires maintenance. There is no all-weather instrument landing system (ibid.: 104).

Flying to Antarctica appeals to those who do not wish to experience the Drake Passage in unfavourable weather, or to those who want to eliminate the 'getting-to-your-destination' part of the trip. In 1981/82, Transoceanica which had chartered the World Discoverer, gave tourists the option of flying to King George Island and transferring to the ship for the Antarctic leg of the journey. Records indicated that 510 passengers chose this option (Enzenbacher 1992b: 19), but the service was discontinued later that season because the cruise company demanded reliable timing. Without the proper all-weather landing systems, and only one C-130 aircraft available at any time, this could not be guaranteed (Swithinbank 1993: 104).

Enzenbacher (1992b: 19) also mentioned that during the 1983/84 season the Chileans ran tourist flights from Punta Arenas to Marsh with C-130s and accommodated
tourists at the Estrella Polar 'hotel'. Tourists could be ferried by helicopters from Marsh to areas of interest in the South Shetland Islands. In 1985, a Cessna 404 aircraft crashed on Nelson Island, killing all 10 passengers and crew aboard (Swithinbank 1993: 104).

Swithinbank (1993: 104-105) documented some of the early helicopter operations carrying tourists, from ships and bases, and argued that they could enhance "the scope of travel for Antarctic visitors". Swithinbank (ibid.: 108) and others (Rounsevell et al. 1991; Wilson et al. 1991) have also recognised the potential for wildlife disturbance.

Blue-ice runways, on the other hand, are construction- and maintenance-free areas on which conventional wheeled aircraft can land. Swithinbank (1993: 108) referred to his part in identifying such runways. From the air he inspected 30 sites between 300 km and 600 km from the South Pole and landed at two of them. Aerial photographs revealed that perhaps another 93 sites were possible, although only a few of them would prove suitable given the specific conditions required for slope, grade change, length, crevasses, and crosswinds (ibid.: 109).

One blue-ice runway in current use is ANI's in Patriot Hills. Swithinbank (ibid.: 107) argued against those who feel that ANI has "opened the flood gates" for tourists, on the grounds that being first at the South Pole is desirable, being second is not. The price — US$27,000 - $30,000 — also discourages all but the very rich. Climbing Vinson Massif, the highest peak on the continent, costs between US$22,500 and $25,000. Additionally the high cost of running an Antarctic business on an exclusive client base keeps the competition at bay. These may well be limiting factors at present, but the combination of economic opportunity, the appropriate technology, and a world full of rich people will turn the tide, judging by the experiences of other remote areas.

Airborne tourism introduces another set of options for travellers but emphasises the need for special emergency planning and air navigation rules (Nicholson 1991: 425). The recent Air Transport Meeting in Washington, DC, agreed that ANI should be treated in the same way as a national operator in weather and flight emergencies (Walton, personal communication, 1995). Accommodation must be provided for passengers on any flights that land in Antarctica. Weather conditions and aircraft maintenance dictate that facilities will be developed.

A specific proposal for a 'holiday town' in Antarctica was submitted by Helmut Rohde and Partners (Anon. 1989: 22) and was considered in May 1989 by the Australian Committee on Environment, Recreation and the Arts (Australian House of Representatives 1989: 24). The proposal sought to build an airport, visitor education and research centres, accommodation, a hospital, search and rescue facilities, and facilities for Antarctic Treaty organisation needs. A detailed environmental study of the area, near Davis Station in the Vestfold Hills, would be conducted. Project Oasis would use new environment-friendly technology and provide facilities for 344 visitors, 70 researchers, and 174 staff — up to 16,000 people a year could be provided for.
The Committee turned down this proposal and made a Recommendation (14) that until such time as a detailed conservation strategy is developed for the Australian Antarctic Territory the Australian Government [does] not approve tourist proposals which consist of the construction of airstrips and on-shore tourist accommodation (Australian House of Representatives 1989: xi).

The Protocol does not specifically forbid the construction of land-based facilities in Antarctica. Instead, it goes the long way around and requires an Environmental Impact Assessment to be conducted. Without clear objectives and stated conditions, entrepreneurs will be able to interpret the Antarctic Treaty and the Protocol to convince authorities that this kind of development is sustainable tourism. Dingwall (1990: 10) felt that, despite financial and logistic obstacles, the expansion of tourism will continue and the demand for facilities remain high. Dingwall's (ibid.) remedy was to apply sound conservation principles to ensure comprehensive planning.

As recently as June 1995, there was a strong indication that a seasonal camp will be set up in the South Shetland Islands where passengers could spend several days ashore in tented facilities. The enterprise had been proposed for the 1995/96 season (Walton, personal communication, 1995).

4.2.2 Marketing Antarctica — promises and expectations

From the start, the promise has been an opportunity to go where only explorers have been before.

Some people are bored at the prospect of going to the same old places year after year. Traditional spots have become old hat for them. If you are one of these persons, if you are adventurous and curious, if you want to go where not so long ago only explorers set foot, we extend an invitation to participate in an exciting adventure which you will never forget. Fresh, unspoiled vistas in hard-to-reach, remote lands can give you a new lease on life (Lindblad Travel 1976: preface).

The emphasis was on the novelty of being one of "very few people in the world today [to] have been to these far-off places" (ibid.: preface). This marketing approach preceded ecotourism. There is no mention of minimising any disturbance of fragile habitats. What was being offered was adventure travel for those who wanted to be among the first to see unspoiled vistas.

Two future possibilities for Antarctica, as suggested in the brochure, include a few emergency airfields for modern jet aircraft and an Antarctic University, heated and powered by atomic fuel and sheltered by a huge plexiglass canopy .... Nothing is impossible with modern technology (ibid.: 1).

At the time, there was no hint that any of these activities (as viewed by the travel company) were anything but part of the march of technology. It was this technology that
allowed tourists to "thrill at [Antarctica's] majesty and beauty" (ibid.). Antarctic tourists were there to experience, as one traveller said, "an exciting, thrilling adventure. The histories of the great Antarctic explorers had come alive ..." (Moore, 1968: 15).

Codling (1982: 3-4) described her voyage to Antarctica as a researcher and quoted Society Expeditions' brochure, supporting its theme of conservation. The thrill of exploring was still predominant but the exploring was now done with "minimal impact on the environment" and in the hope that passengers will "return home with everlasting memories of the wonders of nature and an increased awareness of our responsibility towards preserving it" (ibid. 4).

More recent brochures promote the conservation/minimal impact message but market conservation through their ability to provide greater access to remote places within Antarctica. Companies still warn that any landings or sight-seeing are weather-dependent but stress how their particular ship is equipped to meet their proposed itineraries, by virtue of the ship's shallow draft, or by the use of zodiac boats, or helicopters. Another feature highlighted by all the ships is the quality of accommodation and cuisine.

Mountain Travel.Sobek invited travellers to join the Professor Molchanov for a "memorable, once-in-a-lifetime adventure and cruise expedition style" to the Antarctic Peninsula. "[Our] inflatable landing craft will allow us to land virtually anywhere along the peninsula". "Disposal of shipwaste is carefully monitored" (Mountain Travel.Sobek 1992).

The explorer and adventure theme is strong. Society Expeditions (1989: A3) described the voyages available adding: "like other great discoverers, you won't just pass by. You'll land, explore and experience true moment-to-moment, 'hands-on' adventure".

The American Museum of Natural History Discovery Tours chartered the icebreaker Kapitan Khlebnikov to take passengers into remote regions. "Now," we are told, "we have the rare opportunity to follow in [explorers] footsteps and make significant discoveries of our own" (American Museum of Natural History 1993).

Mi-2 helicopter flights are also on offer:

operated responsibly to avoid endangering wildlife. We feel privileged to explore these untamed lands and do everything possible to see that their fragile ecosystems remain undisturbed (ibid.).

The overwhelming message conveyed to potential customers is that on their trip to Antarctica they will become explorers, using ships, inflatables, and sometimes helicopters to take them into untamed lands. Expectations are therefore high and ships must schedule their trips carefully to avoid seeing other ships during their cruises. Coming across other cruise ships would spoil the belief created that 'their passengers' are
among the first in the area. The message is also rendered stronger and more credible by the increasing use of academic institutions to promote these tours.

4.2.3 Increased visitation

The documentation of visitation (described as tourism in the Antarctic literature) has been remarkably good, particularly as there is no Secretariat or visitors' services department to compile such statistics. This has been the result of the work of Reich (1980), Headland (1989), and Enzenbacher (1994), who have gathered statistics about the number of passengers who travelled to Antarctica aboard ships and aircraft.

In 1990, Nadene Kennedy at the National Science Foundation (NSF) began compiling estimates of passenger numbers and ship visits. Most Antarctic tourism was conducted by US tour operators and they were required by Treaty reporting regulations to provide this information (Kennedy, personal correspondence, 1993).

There are some inconsistencies, however, between figures reported to NSF and those calculated by researchers at 'tourist landing sites' (Enzenbacher 1994: 109). On Cuverville Island, from 7 December 1992 to 3 March 1993, the author counted 2094 visitors rather than the 1589 reported by the ships to the NSF. Enzenbacher (ibid.) suggested that this may be because some operators outside the US do not report, or because some ships fail to report accurately. It implies that visitation may be greater than the records suggest.

Reich (1980: 207) reported that between 1958 and 1979/80, 80 cruises carried an estimated 16,640 passengers. Enzenbacher (1993: 107), who has compiled figures from 1980/81 to 1992/93, estimated that over 52,000 tourists have visited Antarctica since 1958 (Figure 4.3). Her figures do not include Reich's (1980: 210) 11,145 overflight tourists between 1977 and 1980, or the 2128 from the 1994/95 Quantas overflights (ATCPs 1995b: 1). Another 8,000 tourists from the 1993/94 season must also be added to the total (NSF 1994), as well as those from the 1994/95 season.

Thus over 60,000 tourists have landed on the continent and another 13,100 have flown over it. These numbers do not tell the whole story, however. There has been a vast increase in the number of passengers landing and the number of visits per site each season. NSF data summarised in Figure 4.4 show the number of visits to the ten most popular sites in 1993/94 as compared with 1989/90. At many sites the number of passengers has doubled, tripled, or even quadrupled. More alarming, perhaps, is the increase in the number of visits (disruptions) during the season (cf. Figure 4.4). If the season runs for 12 weeks (approximately from 1 December to 1 March), then the average number of visits per week has increased from 0.7 to 2.8.

Additionally, the number of sites reported to have been visited has risen dramatically: 36 sites in 1989/90, 36 sites in 1990/91, 45 sites in 1991/92, 51 sites in 1992/93, and 69 sites in 1993/94 (NSF 1994). There is a tendency to find new sites each
season, vastly reducing the areas that have never been visited. The result is a competition for space that risks creating conflicts between visitors, wildlife, and scientists.

### 4.3 IMPOSING RESTRICTIONS

#### 4.3.1 IAATO guidelines

In 1989, two organisations published visitors' or travellers' codes to guide the behaviour of visitors in Antarctica. This happened, Beck (1990: 343) reasoned, because some Antarctic cruise operators and expedition leaders/naturalists recognised inadequacies of the existing system of regulation. It may equally have been an anticipatory response to what tourist industry representatives saw as an imminent call for more regulation from the ATCPs (Stonehouse 1989: 57).

Naveen et al. (1989) brought out an Antarctic Traveler's Code, and soon after similar guidelines were issued by three of the major Antarctic cruise companies (Antarctic Ship Operators 1989). In 1991, this group become known as the International Association of Antarctica Tour Operators (IAATO), which was founded to "encourage safe and environmentally-responsible cruises and expeditions to Antarctica" (IAATO 1992). Membership currently stands at 13 with two associate members (IAATO 1994).

The IAATO guidelines filled a void that the ATCPs had not sufficiently addressed — what was the recommended or proper behaviour that could guide tourists ashore in an
area without the familiar visitor centres, signs, boardwalks, and other means of controlling or educating visitors. How are mainly urban visitors, 'explorers' for the duration of their visit, informed about the behaviour appropriate in a wilderness setting?

The guidelines (Figure 4.5) have undergone several revisions since their introduction but they offer what is, in most cases, common-sense advice for environmentally sound behaviour. However, some guidelines are more straightforward than others. For example, "maintaining a distance of 15-20 feet from penguins, nesting birds, and crawling seals; 50 feet from fur seals" is self-explanatory. What is not obvious is the difference between a crawling seal and a fur seal. While doing fieldwork, the author observed that many passengers cannot tell the difference between the seals or recognise the significance of that difference — at least until they are chased by one. Similarly, advising passengers to be alert to nests while ashore is not particularly useful as skuas and gulls do not build familiar-looking nests in familiar places.

These brief examples (see Chapter 5 for an in-depth analysis of the effectiveness of visitor guidelines) illustrate the problem with simply issuing common sense guidelines

<p>| | |</p>
<table>
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<tbody>
<tr>
<td>1.</td>
<td>Maintain a distance of at least 15-20 ft from penguins, nesting birds, and crawling seals; 50 ft from fur seals;</td>
</tr>
<tr>
<td>2.</td>
<td>Be alert to the presence of wildlife and nests while ashore;</td>
</tr>
<tr>
<td>3.</td>
<td>Do not get between a marine animal and its path to the water, nor between a parent and its young;</td>
</tr>
<tr>
<td>4.</td>
<td>Be aware of the periphery of a rookery or seal colony, and remain outside it;</td>
</tr>
<tr>
<td>5.</td>
<td>Do not touch the wildlife;</td>
</tr>
<tr>
<td>6.</td>
<td>Never harass wildlife for the sake of photography;</td>
</tr>
<tr>
<td>7.</td>
<td>Keep all noise to a minimum to avoid stressing animals;</td>
</tr>
<tr>
<td>8.</td>
<td>Avoid walking on, stepping on, or damaging fragile moss and lichens;</td>
</tr>
<tr>
<td>9.</td>
<td>Take away only memories and photographs: do not remove anything else;</td>
</tr>
<tr>
<td>10.</td>
<td>Return all litter to the ship for proper disposal;</td>
</tr>
<tr>
<td>11.</td>
<td>Do not bring food of any kind ashore;</td>
</tr>
<tr>
<td>12.</td>
<td>Do not enter buildings at research stations unless invited to do so;</td>
</tr>
<tr>
<td>13.</td>
<td>Historic huts can be entered only when accompanied by a proper authority;</td>
</tr>
<tr>
<td>14.</td>
<td>Smoking is prohibited when ashore;</td>
</tr>
<tr>
<td>15.</td>
<td>When ashore, stay with the group and/or one of the ship’s leaders;</td>
</tr>
<tr>
<td>16.</td>
<td>Listen to the expedition leader, lecturers, and naturalists: do not hesitate to ask them for guidance.</td>
</tr>
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</table>

Figure 4.5. IAATO voluntary visitor guidelines (Stonehouse 1992: 323).
what may be obvious to an experienced naturalist is not always obvious to a visitor. The guidelines do not take into account the physical on-site conditions, seasonal factors affecting the site, or the extent of environmental awareness or the range of cultural factors that affect how visitors behave in a wilderness. Visitors require interpretation, clarification, and sometimes elaboration.

Guidelines are one way of influencing behaviour, but they are not a substitute for better supervision or education.

4.3.2 Tourism annex

In November of 1992, after the Protocol had been signed, the XVII ATCM convened in Venice to discuss tourism. For a more detailed discussion of the tourism debate see Vidas (1992).

Despite widespread opposition, France introduced to the Protocol a preliminary draft Annex VI on Antarctic Tourism that they had produced with Chile, Germany, Italy, and Spain (ATCPs 1992b). They had three arguments for such an Annex: (i) it would allow States to enact a coherent body of laws on such regulation and avoid inconsistencies; (ii) it would create a rule with "indisputable legally binding force"; and (iii) by adopting such an Annex with binding force, it would enable all the States party to the Protocol, not just those with most of the visitors, to be involved in the regulation (ATCPs 1992b: np).

The principle of this proposed Annex was that:

any visit or stay in Antarctica may be organised provided that they do not adversely affect either the environment of Antarctica and its dependent ecosystem, or the conduct of scientific activities (Article 1).

Thus there is no limitation on the activity, so long as it does not adversely affect the environment or scientific work. There is of course no definition of what 'adverse effects' are in a wilderness such as Antarctica.

The other articles deal with (ibid.: np):

1. definitions of tourists, tour organisers and other related parties (Article 2);
2. areas of tourist interest to be designated (Article 3); surveillance and inspection of areas visited;
3. the transportation used to carry visitors (Article 9); and
4. a number of measures relating to safety, administration, logistics, insurance, and applicability during emergencies.

IUCN submitted a policy discussion paper that pointed out its own expertise in the management of protected areas and the contribution it could make to tourism policy in
Antarctica (ibid.: 1). IUCN felt that Antarctica should be open to tourism but also pointed out that a proposal for a major land-based facility in the Australian Antarctic Territory had caused the Government to prohibit development until a conservation strategy was promoted. They proposed several solutions: a new set of Recommendations; a further Annex regulating tourism, appended to the Protocol, with an Environmental Code of Practice or a "new, dedicated legal instrument under the ATS" (ATCPs 1992a: 2). They argued that all other major human activities — past, current, and potential — had already been covered by a legally binding instrument.

Other recommendations included: giving weight to existing conservation principles in force on sub-Antarctic islands, such as permits, official supervision, limitations on places visited, restrictions on activities while on land, and the provision of tourist facilities and information (ATCPs 1992b: 5).

Also stressed was the need for information on visitors, their activities, and impacts. Specifically:

more and reliable data, based on investigation of the demographic profiles of tourists, their intended objectives and expectations ... their attitudes and behaviour toward environmental conservation and wildlife protection (ibid.: 6).

SCAR and IUCN made several recommendations at a Workshop on Antarctic Protected Areas (Smith et al. 1994) that applied to tourism issues not adequately covered in the Protocol.

Recommendation 16 said:

That, in the absence of specific reference to management of tourism in the Protocol, the Treaty Consultative Parties be urged to give consideration to establishing the conservation principles for assessment and management of all tourist operations, and should give due weight to the opportunities and constraints for tourism deriving from protected area management (ibid.: 8).

Recommendation 17 said:

That the Treaty Consultative Parties be urged to encourage and support research into and monitoring of tourist activities, in particular to assess the nature and degree of impacts and to facilitate improved planning and management of tourism (ibid.: 9).

Further, this Recommendation refers to "identifying areas or zones within protected areas for specific use by tourists" and the complexity of tourism management involving

programme planning, licensing of operations and issue of permits, supervision ... development and maintenance of facilities, and management costs and revenues (ATCPs 1992c: 8).
On related matters, Recommendation 21 encouraged the Committee for Environmental Protection (formed within the Protocol) to develop an information strategy to collect, store, and evaluate data on the management of protected areas. This was not only important in order to satisfy Protocol requirements but to aid the preparation of information and education resources for tourists. Recommendation 13 concerned inspection visits to ASPAs and ASMAs to ensure their use was consistent with their management plans. Because of the impracticality of providing a warden service, permit procedures must be strictly enforced to control area use. "This will allow appropriate conditions to be specified [emphasis added]" (Smith et al. 1994: 7). Finally, Recommendation 22 urged that ATCPs consider the application of internationally recognised designations for protected areas, and highlight the "exceptional and universal conservation value in Antarctica" by creating a title such as Antarctic Heritage Landscape (ibid.: 10), analogous to the World Heritage Sites created under the World Heritage Convention.

4.3.3 Kyoto Recommendation on tourism

In April 1994, the ATCPs met in Kyoto, Japan, and agreed upon a new tourism Recommendation that recognised "the need for visitors and organisers to have practical guidance on how best to plan and carry out any visits to the Antarctic" (Recommendation XVIII-1) (ATCPs 1994c). Specifically, they recommended that all governments circulate the Guidance for Visitors to the Antarctic and the Guidance for Those Organising and Conducting Tourism and Non-governmental Activities in the Antarctic (Recommendation XVIII-1 is reproduced in Appendix C).

The first set of guidelines, Guidance for Visitors to the Antarctic, serves two functions: first, it formalises the existing IAATO guidelines and elaborates on them, but the guidelines are still hortatory; second, it highlight the application to visitors of other elements in the Protocol.

The guidelines are, by and large, principles of common sense to which general related information has been added. For example, under A.1, concerning the use of transport, it is forbidden to use aircraft, small boats, or vessels in ways that disturb wildlife. This is conceptually useful but offers no practical advice on how to avoid disturbing wildlife. Under A.1 (4), visitors are advised not to use guns or explosives. Keeping Antarctica pristine, heading E, prohibits disturbing or polluting lakes or streams.

This approach to visitor management is so indirect as to be potentially confusing. Is the aim of "not using guns" to prohibit hunting and "not polluting lakes" a restriction on some consequences of camping — e.g. do not contaminate lakes with waste products that may result from camping — but not on camping itself? Camping has taken place during the 1992/93 season, when a tour ship disembarked 16 passengers and four crew
to overnight on Waterboat Point. Passengers brought sleeping bags and slept around closed buildings on the Point. This was witnessed by the author, who was on board the participating ship. It was also referred to in an NSF (1993) report. As already noted, there are strong indications that at least one other tour company is planning a similar activity.

Since there are tour organisers like ANI that can and do use blue-ice runways, a plethora of activities is open to visitors. If the ATCPs welcome this sort of use, then it should be specified and the appropriate strategies applied to limit impact.

The Guidance for Operators (see Recommendation XVIII-1 in Appendix C) provides a checklist of the regulatory requirements in the Protocol. The first category concerns planning and preparation for ships visiting the Antarctic and the second category concerns proper conduct in the Antarctic Treaty Area. Finally, ships are advised that within three months of the end of their activities, they must make a full report.

The items in this guideline checklist warn operators that their business must be run according to the rules and regulations of the ATCPs. Much of the record-keeping is sensible, as are the safety recommendations. One area of responsibility has been discussed (see Section 4.1.5): the requirement that operators prepare, or employ someone to prepare, an environmental assessment and also monitor their visitor activities for any adverse effects. From a wilderness management perspective, it is odd that not only have tour operators formulated their own guidelines but are also responsible for monitoring their activities as well.

In a natural area, it is normally the duty of management to ensure that conditions are such as to prevent avoidable violations, and assist users or tour operators in finding ways to educate people about low impact use. It is hard to imagine park managers in Yosemite National Park asking their users to monitor the effects of their activities. Certainly there will be bias, whether on the part of the users or the managers, but it would seem more appropriate to err on the side of management standards than those of users. Without a proper management staff, this approach may be all that is currently feasible, but thought needs to be given to more active management as the numbers of visitors, their conflicts, and activities increase. Is this management strategy suitable for 20,000, 30,000, or 50,000 visitors? Unlikely as it may seem today that visitors will come in much greater numbers, the majority of natural areas, including the Galápagos National Park and countless others have experienced a tremendous boom in visitation. Passive management has not prevented impacts.

The Council of Managers of National Antarctic Programmes (COMNAP) prepared an information paper for the Kyoto meeting that reported their intention of adopting a plan that offered to help IAATO identify "high traffic sites", determine "acceptable limits to visitor numbers", establish a COMNAP database showing "the
annual frequency, volume and estimated impact to all visits to specific sites; and to encourage IAATO to participate and contribute to the data base” (ATCPs 1994d: 6).

At the most recent ATCM in Seoul, Korea (1995), the discussion agenda included the need for collection of standardised data about tourist and non-governmental activities. Argentina, Chile, New Zealand, and the UK presented a joint working paper on the subject, including draft documents. This was welcomed by many delegations, though there was some discussion about the level of detail in the present drafts. IAATO stressed that the reporting burden should be no greater for them than for other organisations (ATCPs 1995a: 15).

4.4 CONCLUSIONS

The Antarctic Treaty System has been concerned with preventing adverse impacts on Antarctica's scientific and, more recently, its aesthetic values. The result has been a comprehensive, but as yet unratified, environmental management programme. The approach to tourism has been to place it in the general category of human activity. When the phrase, increasing tourist activity, was used, it has meant more tourists, not new and different activities.

Current management of tourism is concerned with prohibiting the harassment of wildlife or stepping on plants, safe ship operations, and environmentally sound waste management. Yet it still lacks a management strategy covering present and potential activities. The present activities are on a small scale. The adequacy of current regulations is being questioned. IUCN has, for example, made numerous suggestions about improving conservation in Antarctica, including strengthening conservation policies and the goals of conservation principles, and setting aside tourist areas. What has yet to be provided are measures to ensure that large-scale visitation, the concomitant facilities, future activities, and the demand for new and different activities do not threaten Antarctica's aesthetic values. In fact, there has been no decision about Antarctica's place on the environmental recreational continuum or about what activities are relevant to that place. This is the real need and a crucial part of visitor management — what experiences are visitors to have? If Antarctica is to remain a wilderness, then steps must be taken to ensure it remains so.

Existing studies of tourism impact concentrate on fauna and flora (e.g. on Torgersen Island, near Palmer Station, and on Cuverville Island (Enzenbacher 1994: 109)). Little or no attention has been paid to the development pressure on wilderness and natural areas elsewhere in the world. Elsewhere, the gradual but inexorable build-up of tourism facilities has attracted more and different kinds of visitors and is recognised as a threat to natural areas because it destroys habitat and the very naturalness that attracts people to these areas.
What remains is to provide a theoretical framework and practical guidance on this question. This is offered in Chapter 7. The manoeuvring necessary to accomplish this task is likely to be slow and to take place through the Recommendation (now Resolution process, see Section 4.1.3). However, an additional instrument is needed which:

1. specifies appropriate use, and the activities of visitors in Antarctica;
2. specifies how and where these activities can take place;
3. establishes an objective monitoring procedure for assessing long-term impacts; and
4. appoints a management assessment team who can review the data collected, set objectives and standards, assess conditions, and apply strategies as necessary.

The following two chapters discuss field data on current visitors, their socio-economic characteristics and behaviour. Such data are recognised by IUCN as being essential for protected area management (see Section 4.3.2).
CHAPTER 5

ANTARCTIC VISITORS: WHO ARE THEY?

5.1 INTRODUCTION

Antarctica is a continent of wilderness. Historically, wilderness has been anthropocentrically managed for tourists by presenting it as a place of entertainment that can be enjoyed in home-like comfort (see Section 3.1). Such management approaches are particularly well established in North America, and the ideas, attitudes, and methodologies developed there have travelled around the world. The success of this approach is all too obvious to park managers in industrialised countries who struggle with record numbers of visitors (see Section 3.1). For the past 25 years, professionals have been investigating new techniques (see Chapter 4) and have grappled with user conflicts as they developed strategies for visitor management.

The central challenge in wilderness visitor management is to reconcile two potentially incompatible goals — maintaining a wilderness and allowing recreational human activities (however restricted). In tackling this reconciliation, the fundamental principle of wilderness visitor management remains to permit the greatest possible degree of visitor freedom but only in designated areas. Without basic information on visitor characteristics and the nature of the demands on the landscape, a light-handed and low-profile approach is not possible (Lucas 1980: 1). Lacking these data, it is neither possible to control and minimise human impacts on wilderness areas, nor to do so in ways that allow visitors to enjoy their visits.

In contrast, Antarctic visitor management is in its infancy and as such has few objectives or strategies with which to mitigate potential impacts of the growing number of visitors. As indicated in Chapter 4, the only visitor management strategy employed in Antarctica is a set of voluntary visitor guidelines, developed by the International Association of Antarctica Tour Operators (IAATO) and followed by their member ships (Figure 4.5).

Knowledge of visitors, which includes both their expectations and motivations, as well as basic numbers and site usage, is essential for visitor management planning (Lucas 1990: 355; Watson et al. 1992: 2). Quantitative information detailing visitors and visitor-use characteristics, however, is not available for the Antarctic Peninsula. Research on tourism activity and trends by Enzenbacher (1992, 1993, 1994) has provided data on visitor numbers for 1989/90 to 1992/93, and there are studies of tourism in sub-Antarctic
islands by Cessford and Dingwall (1994), who have completed a survey of visitors to New Zealand's sub-Antarctic islands. However, details are not available on who these visitors are, or what they seek to do.

This thesis represents an attempt to fill this gap in knowledge. The data contained in this chapter are derived from a questionnaire given to Antarctic cruise passengers during the 1993/94 austral summer. Those surveyed included passengers cruising both to the Antarctic Peninsula and to the historic sites of the Ross Sea area. The questionnaire is divided into eight categories: basic visitor demographics, visitor motivation, reasons for cruise and ship selection, pre-cruise reading and knowledge, continuing education aboard ship, activities and facilities desired, response to recommended visitor behaviour, and a set of ethical questions based on that behaviour. The objectives of this chapter are to build an Antarctic visitor profile, compare it with other known wilderness/natural area visitor profiles, look for distinguishable user groups, and consider the self-rated onshore behaviour of these groups vis-à-vis IAATO voluntary visitor guidelines.

The answers to each question are presented for all passengers and by demographic categories of sex, age, educational level, and ship. For Ship 1, where information from three cruises was obtained, differences between cruises are also documented. Section 5.10 considers a comparison between Antarctic visitors and other natural area visitors as described, and considers the implications of ship influence with reported onshore behaviour.

It is acknowledged that caution must be exercised regarding the accuracy and honesty of passengers' responses in certain areas of this questionnaire, particularly in their rating of their behaviour and that of other passengers, and in their responses to ethical questions.

A portion of the work described in this chapter has been published in Davis (1995).

5.2 METHODOLOGY

5.2.1 The 1993/94 questionnaire

A prototype questionnaire was tested aboard five Antarctic cruise ships during the 1992/93 austral summer. Data from this questionnaire were used to identify methods of asking questions that would permit statistically useful data to be gathered and to refine further the types of questions to be asked. The redesigned questionnaire (Appendix D) was then distributed in 1993/94 to three different IAATO member ships for five cruises. Questionnaire design was drawn primarily from Bell (1993) and Cohen and Manion (1989), and was supplemented by discussions with survey and statistical experts.
5.2.2 Administering the questionnaire

The revised questionnaire was distributed to passengers aboard Ship 1, which transported the author to the 1993/94 field site, Hannah Point, Livingston Island, South Shetlands, Antarctica (62° 39'S, 60° 38'W) (cf. Figure 5.1), and subsequently was distributed by a researcher on two later cruises. A second set of questionnaires was distributed on the return voyage to passengers aboard Ship 2. Later in the season, when Ship 3 arrived at Hannah Point, their cruise leader agreed to participate and distributed copies of the questionnaire to their passengers.

From the five cruises, a total of 667 completed questionnaires were returned. The overall response rate for the five cruises was 49.9%, but this varied from 87.3% to 24.3%. The response rate to the questionnaire shows clearly that there was a higher rate of return when the questionnaire was distributed by the author, and the purpose of the research explained in a letter read to passengers (Figure 5.2). In the three cases where the author did not distribute the questionnaire personally, the return rate was lower: 24.3%, 30.8%, and 37.2% respectively. Reference to each ship is by number (Ships 1, 2, and 3), based on the order of its agreed participation in the questionnaire. This numbering system is also used in Chapter 6 for ships visiting Hannah Point.

Figure 5.1. Sketch map of the Antarctic Peninsula showing the ten most popular sites, by numbers of visitors, in the Antarctic Peninsula during the 1993/94 season.
Dear Passenger:

The survey I am asking your assistance with is a part of my PhD research on visitor impact management in remote areas. My initial inquiries have concerned: 1) how remote areas are protected i.e., do you designate them as parks, reserves etc.; 2) what is the relationship that people have with these areas; 3) how are decisions made to avert impacts on wildlife; and 4) what visitors expect and want when they visit such a place. I am seeking to apply the methodology park/reserve managers have developed concerning protection to Antarctica. From personal interviews and reading I’ve done, one message is clear: know the visitors as well as their needs and expectations.

In completing this survey, I must stress that there are no right or wrong answers. Many of the questions ask for factual information. I am seeking to quantitatively assemble a visitor profile -- who comes to Antarctica, what are their backgrounds, and why they have come. We know from previous trips that visitors are from many countries and have different reasons for their visit.

Other questions on the survey seek to define the range of wildlife and environmental ethics. Different people and cultures have varying views on our relationship with wildlife and nature. I am interested in pursuing this to gain a greater understanding of our needs with respect to nature and what we can learn about the relationship we have with her.

This is a voluntary questionnaire. However, the more completed surveys I receive, the better the picture I have of Antarctic visitation. All views are welcome as they form an integral part of our global understanding. I deeply appreciate your time in completing this questionnaire and hope you will add any comments you’d like to make in the space provided -- or on an extra sheet of paper.

Your sincerely,

Pamela B. Davis

Figure 5.2. The letter read to passengers concerning the questionnaire.
Table 5.1. Response rate for each ship/cruise in the study. Totals are based on NSF 1993/94 figures except *, where total is based on count as reported by expedition leader to author. † Some lecturers/crew answered questionnaires aboard ship 1/cruise 1; these were not counted as passengers by NSF. 'A' indicates author administered.

<table>
<thead>
<tr>
<th>Ship / Cruise</th>
<th>Total passengers aboard</th>
<th>Surveys returned (%)</th>
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<tr>
<td>Ship 1 / Cruise 1A</td>
<td>435</td>
<td>69.9†</td>
</tr>
<tr>
<td>Ship 1 / Cruise 2</td>
<td>489</td>
<td>24.3</td>
</tr>
<tr>
<td>Ship 1 / Cruise 3</td>
<td>413</td>
<td>30.8</td>
</tr>
<tr>
<td>Ship 2A</td>
<td>71*</td>
<td>87.3</td>
</tr>
<tr>
<td>Ship 3</td>
<td>148</td>
<td>37.2</td>
</tr>
</tbody>
</table>

The method of questionnaire distribution varied greatly between different samples. On Ship 1, cruises 2 and 3, the research supervisor was to read a covering letter (Figure 5.2) to all passengers, explaining the reason for the questionnaire, and the cruise director was to put a copy of the questionnaire in each passenger's cabin. Sufficient copies of the questionnaire were prepared for passengers on one additional cruise. On the second cruise, the letter was not read, but after a lecture the questionnaire was left at the front of the room for passengers to take if they chose to do so. Questionnaires for cruise 3 were distributed in the same manner. Consequently, there was a lower return rate on cruises 2 and 3. On Ship 3, a set of questionnaires with the covering letter was sent aboard with researchers from the Scott Polar Research Institute, but the researchers indicated that the letter was not read to the assembled passengers. Only one questionnaire was left in each cabin (although many cabins were shared). Among those returned, half a dozen or so couples completed the questionnaire together (both answering on the same form). These were discarded because it was unclear who had given a particular answer and therefore the responses could not be coded. Despite these problems, the return rate obtained in this study compares well with other comparable research. The interpretation of visitor responses has been approached cautiously but indicates strongly the direction of visitor responses, ultimately providing baseline information in this area.

Other studies of surveyed cruise passengers include that by Cessford and Dingwall (1994: 323), who had a return rate of about 41.5% from their survey of sub-Antarctic island cruise passengers. Using an interview technique, the UK Royal Society for the Protection of Birds' (RSPB) survey of Orkney Islands ferry passengers gained a sample population of approximately 6% of the total number of passengers (Hooper 1991: np). Finally, Watson et al. (1992: 8) used Dillman’s guidelines for mailing questionnaires to a group who stayed overnight in their test area and, instead of the expected return rate of 60%, they had returns of 81%. This corresponds well to the
author's response rate, as cruise passengers necessarily stayed overnight and had more time to complete the questionnaire.

The study by Watson et al. (1992) does not shed much light on non-respondents on Antarctic cruises as Watson et al. found that non-respondents were repeat users of an area. It is doubtful that this reasoning is applicable to this questionnaire, as the author has found that Antarctic cruise passengers are eager to relate how many previous voyages they have made and offer their opinions. There are several possible reasons why people did not respond to this questionnaire: some passengers did not want to work during their holidays, some may have had misgivings about the study, or others simply did not get around to it. To minimise non-responses due to language difficulties, the questionnaire was translated by native speakers into German and French. Aboard Ship 3, 29 passengers completed questionnaires in German, and aboard Ship 2 one couple completed the French version.

The questionnaires reached approximately 8% of the total number of Antarctic tourists in 1993/94, based on the National Science Foundation's (NSF 1994) estimate of 7,957 shipborne passengers.

5.2.3 Ships participating in the 1993/94 questionnaire

A brief description of each ship's marketing profile is offered, based on cruise brochures and observations by the author. Additional information is provided in Table 5.1 on the number of ships and cruises, the total number of passengers, and the questionnaires returned.

Ship 1 was the largest vessel bringing passengers to Antarctica during the 1993/94 season. The brochure for Ship 1 stressed affordable luxury. "On board, you'll find all of the facilities you'd expect on a superb luxury liner: a night-club, health spa, two restaurants, piano bar, broad sun decks, a swimming pool and Jacuzzis, boutiques, a small casino, library and more" (Orient Lines 1993: 6). The cruise price ranged from $4,900 to $15,500 for a cruise lasting 17 or 24 days. For Antarctic cruises, the 800 passenger capacity ship was marketed for half that number.

Ship 2 was a former Russian polar vessel and accommodated approximately 75 passengers. It was the smallest of the three ships. The brochure described accommodations as "extremely comfortable", though not all rooms had a private bath. The ship facilities included two saunas and a small heated swimming pool. Entertainment was limited to videos and occasional non-Antarctic talks by lecturers (Quark Expeditions 1994: np). Cruise prices ranged from $4,550 to $6,900 for a 12 day voyage.
Ship 3 was an intermediate-sized, German-owned ship, with berths for 250 passengers. The ship "presents a harmonious yacht-like appearance with elegant interior decor. Amenities include the Music Salon, Conference Center, Observation Lounge, Sauna Center (complete with jacuzzi) and a civilized single seating in the dining rooms". Cruise prices ranged from $5,580 to $12,910 for 15-20 day trips (MarQuest. 1993/94: 10).

5.2.4 Statistical interpretation

Statistical analysis was undertaken using $2 \times 2$ contingency tables based on a chi-square ($\chi^2$) test. The procedure is a test for independence of two factors; the null hypothesis assumes the two classifications to be independent, while the alternate hypothesis assumes them to be dependent (McClave and Dietrich 1988: 647-662). This test was chosen as a means of distinguishing how factors such as sex, age, educational level, and ship travelled on may affect passenger responses on the questionnaire. All results reported in the text are significant at the 95.0% level, and in many cases at the 99.5% level. A set of the relevant contingency tables is reproduced in Appendix E. In the results section, 'significant' is used in a statistical context.

5.3 BASIC VISITOR PROFILE

The basic visitor profile was the first of the questionnaire categories to be analysed and was compiled from nine areas of information. The results of these categories were performed for all ships comprehensively. The questionnaire is reproduced in Appendix D.

5.3.1 Sex

Across the whole dataset, women accounted for 56% (371) of the passengers and men 44% (292). Four people neglected to answer the question. No significant difference in the distribution of sex was found among the samples.

5.3.2 Age distribution

Nine age categories were listed on the questionnaire: 14 and under, 15-24, 25-34, 35-44, 45-54, 55-64, 65-74, 75-84, and 85 and over. Figure 5.3 illustrates the distribution of ages among the Antarctic cruise passengers surveyed. As expected, owing to the trip's cost, the age group of the highest number of passengers was between 65 and 74 years. Notwithstanding these data, 50% of the other passengers belonged in the lower age groups.
5.3.3 Nationality distribution

The questionnaire was intentionally designed to collect information on country of birth rather than nationality. 'What is the country of your birth?' was chosen in an attempt to measure, on a deeper level, the inherent cultural influences on passengers. For example, a woman born in Italy who moved to Canada in her mid-twenties might have an idea of wilderness that is quite different from someone born in Canada.

As Figure 5.4 indicates, the five countries where most passengers were born (US, UK, Germany, South Africa, and Canada) accounted for 92% of all the Antarctic cruise passengers surveyed. Twenty-five other countries accounted for the remaining 8% (53 passengers). This small number did not allow for nationality analysis on the level necessary to measure potential differences. Although the balance of nationalities differed among ships, a useful contingency table could not be constructed due to low frequencies in some categories (see Appendix E).

5.3.4 Previous trips to Antarctica

Of the 663 passengers who answered this question, 89% were visiting Antarctica for the first time, 7% had been once before and an additional 4% had visited more than twice. It is known that some of the repeat visitors answering the questionnaire were lecturers.

On Ship 1 12% were repeat visitors, whereas on Ships 2 and 3 6% and 2% respectively were repeat visitors.
5.3.5 Group size

Question 4 asked whether passengers had travelled on their own, with a companion (spouse, partner, friend), or with an organised group. In scoring the questionnaires, it was apparent that a number of the respondents interpreted 'group' as synonymous with ship, thus obscuring the answers for group. Passengers travelling alone accounted for 29% of the total and those with a companion accounted for 44%.

It is known that Ship 1 had a birdwatching group of about 25 aboard (Filby, personal communication, 1994) and Ship 2 had a group of about 40 scientists from the American Association for the Advancement of Science. The majority of passengers aboard Ship 3 were German, but whether they came with a specific tour group is not known.

5.3.6 Professional background

Visitors were asked to indicate the field of their current employment or, if retired, the field in which they were employed. Figure 5.5 illustrates the most common twelve categories of employment; their combined percentages comprise 77% of the total.

The categories are necessarily broad in order to incorporate as many related fields as possible. Medicine, for example, covered medical doctors, nurses, and psychiatrists. Teaching covered all levels of education. An 'other' category was included; some people wrote in a profession, others ticked it without specifying their profession.
5.3.7 Employment status

Fifty-two percent of passengers on the five cruises surveyed were retired (Figure 5.6). However, 44\% of passengers were still working, either in a full- or part-time capacity. This corresponds well to the age-range distribution below 64 (retirement age in the US and the UK (men only)), and suggests that younger working people as well as older, retired people travel to Antarctica.

The 'other' category consisted of people who said they did volunteer work, were housewives, 'still active' or those who ticked 'other' without giving a specific response. The high percentage of retired Antarctic passengers contrasts with those passengers surveyed aboard the sub-Antarctic cruises, 26\% of whom were retired (Cessford and Dingwall 1994: 323). This difference may be due to the high proportion of passengers from Australasia on the sub-Antarctic cruises, who have a more generous annual leave allowance than Americans do.

5.3.8 Educational level

The sensitive question of educational level, as well as allowing for the diverse educational systems and the categorisation of degrees that would be found among a multi-national group, necessitated that the information be gained by posing two questions. First, it was suggested (Whitehead, personal communication, 1993) that 'At
what age did you leave school?' would eliminate confusion over educational categories such as high school or 'A' levels, and second, the question 'what qualification did you attain' would permit people to describe the type of degree they achieved. Two additional choices were provided, 'no formal education' or 'rather not disclose'. To test for independence between educational level and certain demographic factors, the categories 'rather not disclose' and 'no university' were combined. It was assumed that those people who did not wish to disclose (only 27 out of 667) made that decision because they had not attended university.

According to the questionnaire results, 41% of passengers had no university or postgraduate education. Of the remaining 59%, 32% had been to university and 27% had pursued postgraduate studies.

5.3.9 Origin of funds for trip

Due to the sensitive nature of a financial inquiry, this question was phrased:

*Question 10. Did the funds for this trip come from:*
  *Savings*
  *Disposable income*

*If there were other financial circumstances concerning this, that you feel comfortable indicating, would you do so.*
  *Other*
  *I would prefer not to disclose.*

This gave the passengers two options: not disclosing the source of funds or writing in the details of their particular situation (only 29 passengers did not wish to
disclose). Fifty-two per cent of those passengers responding to the questionnaire used their savings to fund the trip, but another 40% drew money from their income (Figure 5.7). These two types of funds suggest that two diverse approaches to and profiles of holiday spending are involved. Is the type of funds used dependent upon age? Do older passengers draw on savings while younger passengers use their income? Surprisingly, a chi-square test revealed that age and the type of funds used were independent. It may have been that retired passengers regarded investment and salary income as a single category: 'Income'.

5.3.10 Summary

A typical Antarctic visitor, based on those questioned, is a man or woman between 64 and 75 years of age, travelling with a companion, highly educated, retired, and formerly in the field of business, medicine, teaching, science, office administration, or travel/tourism. This trip is likely to be their first to Antarctica. The primary source of funds has been savings. Their country of origin is probably the United States, Germany, or the United Kingdom.

This 'stereotype' is misleading, however. A significant number of passengers are younger, working professionals and from many different nations. For some of the passengers this was their second trip.

While there may have been a typical ship and approach at one time, the so-called expedition model developed by Lars-Eric Lindblad (Stonehouse 1992: 215), the situation today reveals increasingly diverse cruising styles, ranging from former Soviet research vessels to luxury cruise ships.

Figure 5.7. Funding utilised by the passengers surveyed to pay for their Antarctic cruise.
Having established an overall visitor profile, further identifying whether there were sub-groups of visitors aboard the different ships would refine this knowledge about visitors. From a management point of view, it would be useful to know whether age, profession, and educational levels differed among the passengers on each of the three ships. Differences among the ships' passengers were observed:

**Ship 1:** Fifty-two percent of this ship's passengers were aged between 65 and 85 years and 38% were between 45 and 64. Approximately 58% of the passengers had university and graduate-level education. The two most frequently indicated professions were business and teaching.

**Ship 2:** The mix of ages on this ship was more evenly distributed than on the other two: 31 people over the age of 65 and 31 people below. Eighty-six percent of Ship 2's passengers, the largest percentage among the three ships, had university or postgraduate degrees. The largest professional category was scientist.

**Ship 3:** Sixty-one percent of this ship's passengers were over 65 years of age and 35% between 45 and 64. Passengers aboard this ship were the least educated: 55% did not have a university degree of any kind. Business and medicine were the most frequently indicated careers mentioned.

### 5.4 Classifying Visitors: Are There Different User Profiles in Antarctica?

Wilderness managers recognise that in a given wilderness, protected area, or reserve, a diverse range of interests will be pursued by visitors (Hendee 1990). Reserves managed by groups such as the RSPB found that three profiles emerged, according to the reserve visited: serious birdwatchers, tourists, and local/family people (RSPB 1993). The manager at the National Audubon Society's Corkscrew Swamp Sanctuary also found that dissimilar groups, sometimes with conflicting demands, visited the reserve (Carlson, personal communication, 1992).

Visitors' primary motivations are expressed in the way they use what the region offers. These might be active forms of use — climbing, hiking, skiing, or snowmobiling — or passive forms — photography, bird- or whale-watching, contemplation, or the pursuit of solitude. Visitors may be motivated to see Antarctica because it is a new place, a seventh continent, or because they are nature lovers (see Section 5.4.1). The implications for visitor management concern the type of control that ultimately will be necessary if Antarctica's designation as a "natural reserve, devoted to peace and science" is to remain intact (SCAR 1993: 256).
It is vital to recognise differences between user groups in considering the framework for an area’s appropriate use. It is well established that not all uses will produce the same impact (Graefe et al. 1990: 238-239; Hendee 1990: 188). Likewise, not all users will come equipped with the same knowledge or skills about wilderness areas, and the message, whether in the form of guidelines or a management plan, will need to incorporate information suitable for diverse cultural, educational, and wilderness-knowledge levels. This section analyses the ship visitors’ specific motivations for travelling to Antarctica, why they chose their particular cruise, and what appealed most to them. Furthermore, at the end of each subsection, a demographic breakdown of the different passenger responses is highlighted in order to build a picture of user groups within the established profile.

5.4.1 Why do people visit Antarctica?

For management purposes, it is essential to know why people visit Antarctica and whether they can be categorised in different user groups. Question 11 sought to obtain this information by asking:

Why are you visiting the Antarctic? (Possible answers Yes/No).
I am interested in polar regions
I am a nature lover
This will be my 7th continent
I am accompanying my travel partner
I have visited the Arctic
My interest is in photography/film making
I enjoy seeing new places
Other

More than one answer was permitted. Of those listed, 'enjoy seeing new places' had the highest percentage response, and 'interest in polar regions' was third after 'nature lover' (Figure 5.8). Only 2% of the passengers who responded said that they had always wanted to see Antarctica. These responses are only a gauge of a minimum level of sentiment — people may not have bothered to write in answers when they were able to tick a box. A majority, 79% of the passengers, were motivated to travel a considerable distance at great expense to 'see a new place' rather than because they were 'interested in polar regions'. 'Nature lover', a general motivational response, received a higher percentage than 'interest in polar regions'. These motivations contrast with a national report on US National parks (Research and Forecasts 1991) that found 'seeing nature' (86%) was the primary motivation and 'seeing someplace new' (76%) was the third most popular reason. Similarly, Littlejohn's (1991: np) study found that the primary reason for a visit to Glacier National Park was to 'view wildlife and scenery'. Both findings support the assumption that US wilderness visitors would indicate nature or wildlife as the most important motivation for their visit. The other choices, such as 'this will be my 7th
continent' and 'I am accompanying my travel partner' received between 20% and 30% agreement from passengers. Knopf (1987: 793) noted that other studies had also found that between 25% and 50% of people travelling to natural areas were responding to social obligations imposed by others. Stankey and Schreyer (1985: 253-254) noted numerous studies that link a person's environmental attitude to their type of visitor motivation. For example, a significant difference was found between those who travelled to a park because they were interested in it as a place in which to increase their knowledge, skills, or release tension, and those who visited a park to pursue their favourite activity.

The question of how Antarctic cruise passengers' motivations were affected by demographic factors of sex, age, educational level, and ship revealed (Appendix E1):

- Fewer women than men gave photography and film making as one reason for their travel (cf. Table E1.1).
- 'Nature lover' (cf. Table E1.2) was more meaningful to those under 44 years of age, '7th continent' (cf. Table E1.3) was more important for those aged 65 and over; and 'visited Arctic' (cf. Table E1.4) was more important for those aged 65 and over than for other age groups.
- For those of a higher educational level, 'seeing new places' (cf. Table E1.5) was more important than for those without formal education, as is reaching a '7th continent' (cf. Table E1.6).
- 'Enjoy seeing new places' (cf. Table E1.7) was a far more important factor for Ships 1 and 2 than for Ship 3.

Figure 5.8. Primary reasons given for Antarctic visit amongst the cruise passengers surveyed.
• For Ship 1's passengers on the second and third cruises, gaining a '7th continent' (cf. Table E1.8) was more important than for those passengers on the first cruise.

5.4.2 Reasons for ship selection

Question 12. Why did you chose this particular cruise? (Possible answers Yes/No)
Recommended by travel agent
Recommended by family/friend
Travel brochure looked attractive
Saw an interesting ad
Best itinerary
Most appropriate scheduling
Other

Question 13. What appealed to you most about this particular cruise? (Possible answers Yes/No/Didn't matter).
Size of ship
Facilities aboard
Itinerary
Lecturers as advertised
Value for price
Other

Questions 12 and 13 will be considered together in this section as the responses indicated that many, if not most passengers, saw them as one.

According to the data (Figures 5.9 and 5.10), itinerary was the most important factor in cruise selection. Itinerary does not, by itself, explain where people get initial information about a cruise. This seems to have come from three sources: 'recommended by travel agent' (12%), 'recommended by family or friend' (16%) or having seen 'an interesting ad' (26%). This pattern of ship selection was reinforced by the information provided in question 13. For nearly 60% of the passengers, ship size 'didn't matter', nor did facilities (64%). Ship appeal was based on itinerary and the lecturers advertised in the brochure.

When examining reasons for selecting a particular ship, responses differed significantly according to age category, educational level, and ship (Appendix E2):

• 'Recommended by family/friend' (cf. Table E2.1) was more important for those 64 years of age and younger than the other age groups, while 'travel brochure looked attractive' (cf. Table E2.2) was important to those 65 years of age and older.

• Passengers with college or postgraduate education who answered yes were more likely to have had the trip 'recommended by family or friend' (cf. Table E2.3) than passengers without formal education. Passengers with higher educational levels relied more heavily on 'travel brochures' (cf. Table E2.4) than those without, and those without formal education answered that an 'interesting ad' (cf. Table E2.5) played an important role in ship selection.
Figure 5.9. Reasons for ship selection amongst the Antarctic cruise passengers surveyed.

Figure 5.10. Importance of various 'ship appeal' factors amongst the Antarctic cruise passengers surveyed.
The relevance of advertisements (cf. Table E2.6) was more marked on Ship 1 than on either Ships 2 or 3, and 'itinerary' (cf. Table E2.7) was far more important to passengers on Ship 1 than to those on the other two ships.

A further cruise-by-cruise analysis revealed that the importance of advertisements (cf. Table E2.8) was most significant for Ship 1, cruise 1, and that 'itinerary' (cf. Table E2.9) was most important for Ship 1, cruise 3 (Ross Sea/historic hut cruise).

Question 13, 'what appealed to you most about this particular cruise?', was answered differently by passengers, depending on factors of sex, educational level, and ship size (Appendix E3):

- More women than men felt their selection of ship was in part based on the advertised lecturers (cf. Table E3.1).
- More passengers with university and postgraduate education than without formal education rated the 'advertised lecturers' (cf. Table E3.2) as important in their selection of ship as well as 'value for price' (cf. Table E3.3).
- 'Ship size' was less important to people on the largest ship and more important to passengers on the other two ships (cf. Table E3.4).
- 'Facilities' were less important to passengers aboard the largest and smallest ships, with considerably more value placed on them by passengers of the mid-sized ship, Ship 3 (cf. Table E3.5).

5.4.3 Summary

According to this set of questionnaire results, Antarctic visitors were principally motivated to travel because they: (i) 'enjoy seeing new places'; (ii) are 'nature lovers'; and (iii) have an 'interest in polar regions'.

The ship was selected from travel brochures and advertisements. Passengers seemed principally motivated to select a cruise on account of the itinerary and advertised lecturers, and most (54%) felt that the trip was good value for money.

The effect of age on motivation is to shift from the general 'nature lover' — typical of the 44 and under age groups — to the goal-oriented travel motivation of older passengers, such as getting to a '7th continent' or because they have 'visited the Arctic'. For those with higher education, 'visiting a 7th continent' was also an important motivation.

Criteria for cruise selection differed amongst the age groups. 'Travel brochures' were more important for these of 65 years of age and older, whereas 'recommendation by a family or friend' was more typical of those under 64 years of age.

Even though passengers were most frequently motivated to travel to Antarctica to see a new place, more passengers aboard Ship 1, cruise 1, were drawn by advertisements and more passengers aboard Ship 1, cruise 3, used the proposed itinerary as a criterion. Ship size was not important to passengers aboard the largest ship: they did
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not select it because it was the largest or because it had better facilities. Profiles for Ships 2 and 3 are less clear from the answers to these questions.

5.5 VISITOR PREPARATION AND CONTINUING INTEREST

Four of the questions asked (14/15 and 22/23) were intended to measure and quantify the amount of educational preparation undertaken by visitors, and their continuing interest providing a baseline measure of visitors' knowledge. Differences among passengers were noted.

5.5.1 Reading done prior to the trip

*Question 22. Did you do any reading for this trip? If so, how many hours? (Possible answers None/1-5 hours/6-10 hours/10 hours +)*

*Question 23. Were those books about ... (Possible answers Yes/No)*

- History of exploration
- Wildlife
- Geology and glaciers
- Wildlife photography
- Science in Antarctica

Thirty-six per cent of the passengers responded that they had done over 10 hours of reading for their trip and only 10% responded that they had done no reading at all (Figure 5.11). Some passengers aboard Ship 1, cruise 1, had won the trip, or had taken it because a previous cruise had been cancelled and this cruise was offered instead. Other
passengers commented that they had read about Antarctica for years, though not necessarily for this trip, or had watched videos and television programmes. Neither of these aspects was singled out for separate measurement. The most popular subject was wildlife, accounting for 80% of the reading material, followed by exploration at 77% (Figure 5.12).

Differences were noted between the sexes and among those aboard the three ships (Appendix E4).

- More women than men read six hours and more (cf. Table E4.1).
- Ship 1 had significantly more passengers who read between 0-5 hours and over 10 hours than Ships 2 and 3; the amount of reading done by Ship 2's passengers was more evenly distributed among the various categories, with far more reading between 6-10 hours than expected; the bulk of Ship 3's passengers read 10 hours or less (cf. Table E4.2).
- A breakdown by cruise for Ship 1 revealed that passengers on cruise 3 (the historic itinerary) read significantly more (10 hours and over) than those on the other two cruises (cf. Table E4.3).

The subject of that reading (Figure 5.12) differed significantly among passengers, according to sex, educational level, and ship (Appendix E5).

- Significantly more men than women read about 'science in Antarctica' (cf. Table E5.1).

Figure 5.12. Subjects of books about Antarctica read before the trip by the cruise passengers surveyed.
Those passengers with postgraduate education were more interested in 'geology and glaciers' (cf. Table E5.2) and 'science in Antarctica' (cf. Table E5.3) than those with university or without formal education.

Among the ships, passengers aboard Ship 2 read more about the 'history of exploration' (cf. Table E5.4), 'geology and glaciology' (cf. Table E5.5), and 'science in Antarctica' (cf. Table E5.6), although Ship 3's passengers were more interested in those topics than passengers on Ship 1.

These results prompt several observations. First, there were more scientists on Ship 2 than on either Ship 1 or Ship 3 and this may account for the greater pre-trip reading of hard science. Second, despite the 'historic hut' itinerary of Ship 1's third cruise, these passengers did not read more about the history of exploration than the passengers aboard the other cruises. Third, Ship 3 also had more passengers interested in 'science in Antarctica' than would be expected statistically in a group of that size.

5.5.2 Continuing education aboard ship

Question 14. Did you attend the lectures? (Possible answers None/Some/Most/All)

Question 15. From the lectures you have attended was the following information provided: (Possible answers Yes/No)
IAATO voluntary visitor guidelines
Antarctic Treaty System
Wildlife likely to be seen
Mining and commercial interests
Other visitor guidelines
Protected areas in Antarctica
Science in Antarctica

Ship-board lectures, conditions at sea, and the location of the lecture theatre must be taken into account when examining this data (Figures 5.13 and 5.14). The lecture theatre aboard Ship 1 was in the fore section of the ship (not the most stable part of the ship in rough seas). The author, among others, often found it less than ideal for well-being at sea. Ship 2 used a lecture room at the top of the ship which was also rough in high seas. Ship 3 used a conference centre aft. Surprisingly, only 1% of the passengers said that they did not attend any of the lectures and 82% said they managed either 'most' or 'all' of them.

As noted in Figure 5.10, 58% of the passengers said that the lecturers were of specific appeal and influenced their ship selection. For Ship 1 this was particularly germane as Roger Tory Peterson, Sir Edmund Hillary, Sir Vivian Fuchs, and other noted naturalists and explorers were listed as lecturers in the ship's brochure. Ships 2 and 3 had less famous, though not less well-informed lecturers.

Question 15 sought to determine whether or not certain information on safe and proper conduct was disseminated to passengers. The question asked passengers to recall
Figure 5.13. Ship-board lecture attendance by the Antarctic cruise passengers surveyed.

Figure 5.14. Antarctic cruise passengers' attendance of ship-board lectures by subject.
whether certain subjects were discussed. In the case of the single, most important existing visitor management strategy, the IAATO voluntary visitor guidelines (Figure 4.5), 78% of the passengers recalled their having been discussed during a lecture. Another 75% remembered *other* guidelines being discussed (ships sometimes have their own guidelines that they publish in their promotional brochures). This question, however, was originally intended for questionnaire participants among non-IAATO member ships, although none of those ships participated in the research.

Wildlife was the topic remembered best among the choices: 80% of the passengers recalled this (or these) lecture(s). The remaining subjects, apart from 'mining and commercial interests', were all remembered and noted by at least 75% of the passengers. Figure 5.14 illustrates passengers' attendance of lectures by subject.

No differences were discernible for lecture *attendance* on the basis of sex, age, educational level, or ship.

The ability to *recall various lecture topics* did differ among passengers, according to age, educational level, ship, and cruise (Appendix E6).

- More of the passengers 64 years of age and younger attended or remembered the IAATO lecture than did the older passengers (cf. Table E6.1).
- Passengers with university and postgraduate education more often recalled lectures on 'IAATO guidelines' (cf. Table E6.2), the 'Antarctic Treaty System' lecture (cf. Table E6.3), and 'science in Antarctica' (cf. Table E6.4) than those without formal education.
- Among the ships, Ship 1 had significantly more passengers who recalled the 'IAATO lecture' (cf. Table E6.5), the 'Antarctic Treaty System' lecture (cf. Table E6.6), a lecture on 'mining and commercial interests' (cf. Table E6.7), and a lecture on 'science in Antarctica' (cf. Table E6.8), than Ships 2 and 3.

### 5.5.3 Summary

Fifty-six percent of the passengers spent six hours or more reading in preparation for their Antarctic voyage. The bulk of that reading was on exploration and wildlife and nearly 50% had read books on geology/glaciers and science. Differences between the sexes were noted, as women read more prior to their trip than men did. The amount of reading done by passengers aboard the three ships also differed.

The attendance of ship-board lectures was high, with 82% of the passengers going to 'most' or 'all' of them. Certain groups of passengers recalled specific lecturers more often than others: passengers of 64 years of age or younger recalled the IAATO guideline lecture more often than their older counterparts, those with postgraduate education more often remembered lectures on 'IAATO guidelines', the 'Antarctic Treaty System', other guidelines, and 'science in Antarctica', and Ship 1's passengers remembered the 'IAATO guideline' lecture better than those aboard Ships 2 and 3.
5.6 VISITORS' ASSESSMENT OF THEIR BEHAVIOUR

The current strategy used to control visitors is a set of voluntary guidelines devised by IAATO. In response to a growing concern about visitor numbers and behaviour, IAATO has recently updated the guidelines (Splettstoesser and Folks 1994). This section of the questionnaire dealing with visitor behaviour was based on the previous IAATO guidelines (Figure 4.5).

As IAATO members, all the ships surveyed had provided information about the guidelines to their passengers. This is usually done in a lecture venue. Consequently, it was important to ask passengers whether they recalled attending a lecture on the IAATO voluntary visitor guidelines before asking them about specific guidelines. Seventy-eight percent responded that they recalled the IAATO lecture (Figure 5.14). Questions were asked about the frequency of violations of the IAATO guidelines to explore links between such violations and visitor characteristics.

Visitors were asked to rate their own behaviour and that of their fellow passengers in two separate questions. These were:

**Question 18. While on landings did you ever find yourself accidentally:** (Possible responses Yes/No/Don't know)
- Between a seal and the water?
- Between a seal and its young?
- Inside the periphery of a penguin rookery?
- Inside the periphery of a seal colony?
- Walking on plants?

**Question 19. While on landings did you ever observe anyone:**
- Closer than 5 feet (1.5 m) to any wildlife?
- Touching wildlife?
- For a photograph, cause an animal to move?
- Collecting a natural object or artefact?
- Smoking or eating on shore?

In the first instance, passengers were asked if they ever found themselves accidentally contradicting one of the guidelines and, in the second case, whether they had ever observed anyone else contravening certain guidelines.

Figure 5.15 illustrates the results of the first question. In three out of the five categories, between 28% and 34% of the passengers admitted some guideline infractions. The two categories in which very few problems existed are similar; in both cases the subject of the guideline is more obvious. Generally, it is difficult to get between a female and her pup without knowing it; and similarly, it is unlikely that one could enter a seal colony without realising it. However, passengers landing on a beach, taking off their lifejackets, organising their camera equipment, and deciding in what direction to walk,
can get between a seal and the water without realising it. Chapter 6 discusses some of these situations in more detail.

Among the passengers questioned, 33% found themselves inside a penguin colony, suggesting one of several scenarios: first, passengers do not understand what it means to be inside the periphery of a penguin colony, i.e. they do not know what defines a penguin colony; second, that conditions exist making it difficult for passengers to obey this guideline; third, they disregard it because they do not understand the potential for harm; and fourth, they have been told by some naturalists that 'it is okay'. Finally, they may be disregarding it deliberately.

Walking on plants raises a separate problem. Would passengers accustomed to grass, bushes, and trees recognise mosses, lichen, and algae? Nine percent of the passengers indicated 'don't know', that they did not know whether they had stepped on flora — higher than any of the other five choices. The author has overheard some ships' naturalists informing their passengers that stepping on algae was acceptable while others forbade it. It is unclear from the guidelines whether algae are included (lichens are a symbiotic partnership of algae and fungi), and whether the prohibition encompasses encrusting terrestrial algae and seaweed. In any case, it is confusing for those who cannot distinguish an alga from a lichen to be told that some plants can be walked on and that others may not.

The 'don't know' answers were instructive. In each category but the aforementioned, 1-3% of the passengers indicated that they did not know whether they had contravened the guidelines. This is simply a minimum; others may not have admitted

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**Figure 5.15.** Percentage of the Antarctic cruise passengers surveyed admitting accidental guideline violations.
or recognised their lack of knowledge about particular guidelines. These violations are more likely to be inadvertent. Passengers may not have the working knowledge assumed by the designers' of the IAATO guidelines followed by the ships.

The second question (question 19) asked passengers to rate the behaviour of others in five situations drawn from the IAATO guidelines. The most problematic violation was maintaining the advised distance (15-20 feet) from wildlife (Figure 5.16). The five foot distance was chosen to leave no doubt that a passenger had deliberately disregarded the guideline and had not simply misjudged the recommended distance by several feet. Some incidents, of course, may have been caused by the penguins.

5.6.1 Visitor use characteristics: effects of age, educational level, and ship on behaviour

In respect of question 18, age, educational level, and the ship travelled on did statistically affect passengers' responses to specific guideline prohibitions. The following differences were found (Appendix E7):

- Passengers of 64 years of age and under more often found themselves between a seal and the water than did those aged 65 and over (cf. Table E7.1).
- Passengers with postgraduate education more often violated prohibitions about being 'inside the periphery of a penguin colony' (cf. Table E7.2) and 'walking on plants' (cf. Table E7.3) than those with or without university education.
- Passengers aboard Ship 2 were also more likely to find themselves 'between a seal and the water' (cf. Table E7.4), 'inside the periphery of a penguin colony' (cf. Figure 5.16. Percentage of the Antarctic cruise passengers surveyed who witnessed accidental guideline violations.

```
<table>
<thead>
<tr>
<th>Guideline violation observed</th>
<th>Frequency</th>
</tr>
</thead>
<tbody>
<tr>
<td>Closer than 5ft. to wildlife</td>
<td>74%</td>
</tr>
<tr>
<td>Touching wildlife</td>
<td>9%</td>
</tr>
<tr>
<td>Photographing or harassing wildlife</td>
<td>22%</td>
</tr>
<tr>
<td>Collecting</td>
<td>15%</td>
</tr>
<tr>
<td>Smoking or eating</td>
<td>13%</td>
</tr>
</tbody>
</table>
```

Figure 5.16. Percentage of the Antarctic cruise passengers surveyed who witnessed accidental guideline violations.
Table E7.5), and 'walking on plants' (cf. Table E7.6) than those aboard Ships 1 and 3.

- Passengers aboard Ship 1 differed in their responses according to the cruise. Cruise 1's passengers more often found themselves 'between a seal and her young' (cf. Table E7.7) and 'walking on plants' (cf. Table E7.8) than those on cruises 2 and 3.

- Ship 1's second and third cruise passengers found themselves inside a penguin colony more often than those on the first cruise (cf. Table E7.9).

In the case of behaviour violations, the situations that each cruise experiences may account for some of the problems of its passengers. For example, getting between a seal and her pup is only possible, in places where there are nursing females.

The perspective inherent in question 19 is the awareness of the observer. Thus the relationship of any factor to guideline adherence is not how often passengers follow a guideline, but how often they observed it.

Both age and ship had a statistically dependent relationship with certain observed guideline violations (Appendix E8).

- Passengers of 64 years of age and younger were more likely than older passengers to notice 'wildlife being touched' (cf. Table E8.1), 'photographic harassment' (cf. Table E8.2), or 'collecting' (cf. Table E8.3).

The ship pattern is similar, but ships differed slightly in respect of the type of problems they had (Appendix E8):

- 'Distance' (cf. Table E8.4) was a greater problem for passengers aboard Ships 1 and 2, 'photographic harassment' (cf. Table E8.5) of wildlife was a greater problem for passengers aboard Ship 2, and 'collecting natural objects or artefacts' (cf. Table E8.6) was a greater problem among those aboard Ships 1 and 2.

- A cruise-by-cruise analysis of Ship 1's passengers revealed that more visitors aboard cruise 1 were seen 'closer than 5 feet' (cf. Table E8.7), 'touching wildlife' (cf. Table E8.8), and 'smoking and eating ashore' (cf. Table E8.9) than aboard cruises 2 and 3.

5.6.2 Summary

The data arising from visitors surveyed about IAATO guideline adherence demonstrates that two types of violations are occurring: inadvertent and deliberate. The former violations signal a lack of knowledge or awareness on a practical level that can be addressed through educational strategies. The latter identify a different layer of human/wildlife interaction that may have complex cultural roots or may simply be the tendency for humans to regard their relationship to wildlife selfishly.
5.7 VISITORS' ENVIRONMENTAL AWARENESS AND ETHICAL STANDARDS

Two types of questions were used to provide some information regarding visitors' environmental awareness and ethics. The first of these concerned how well informed visitors were about environmental conditions in Antarctica prior to their trip, and how these views changed (or not) after their experiences. The second group of questions sought to investigate some initial level of the ethical standards of visitors to Antarctica. Both of these inquiries could ultimately assist managers in identifying where visitor education is needed.

5.7.1 Environmental awareness

Question 16. Based on what you knew prior to coming to Antarctica, how did you rate the impacts of the following on the environment? (Possible answers No opinion/None/Low/Medium/High)

Science
Mining
Tourism

Question 17. Based on what you have learned on this trip, how do you now rate the impacts of the following (same list) on the environment?

One measure of visitor knowledge of environmental issues was made through the use of a two-part question: questions 16 and 17 (Figure 5.17). Pre-trip knowledge was assumed to have come from various media sources. Views changed and shifted among the total ship population during the trip. The point of including mining, not an activity currently taking place in Antarctica, was to see whether the media, directly or indirectly, may have influenced people's views on mining.

Fifty-two per cent of the passengers believed, before the cruise, that the impact of science was medium to high and, afterwards, this increased slightly to 65%. Passengers had the opportunity to visit several scientific bases in the course of their cruise, sometimes also visiting old abandoned bases. Passengers' judgements were based on this first-hand experience in Antarctica. The percentage of responses in 'no opinion' and 'none' categories declined after this experience.

Similarly, the percentage of passengers regarding mining as having a 'medium' to 'high' impact increased from 30% before their trip to 37% afterwards. As there are no mining operations in Antarctica, the question indicated two things: first, that some people's actual knowledge in this area was inaccurate and these notions were probably derived from the media; second, the information allegedly disseminated while on ship was either incorrect or non-existent. Those passengers may have been responding to what they judged to be the potential impacts of mining. In the case of those who
Figure 5.17. Antarctic cruise passengers’ declared knowledge of science, mining, and tourism before and after their Antarctic trip.
responded initially with 'no opinion' or 'none', their visit reassured them that there was no impact, and percentages declined. Manfredo and Bright's (1991: 4) study concerning the effects of communication on users, suggested that the more people 'knew' about an issue, the greater their ability to resist counter-messages and maintain their initial position. Thus, visitors who had a pre-trip opinion about the impact of mining might maintain it despite being told there was no mining.

The greatest shift in passengers' knowledge about tourism's impact was from 'no opinion' into each of the remaining categories: 'none', 'low', 'medium', or 'high'. Their actual experiences did not produce any wide swings in opinion. Of those who had an opinion, 94% believed tourism to have some impact.

On the subject of mining, sex was the only demographic factor that affected how passengers responded to these questions. On the impact of mining on the Antarctic environment (pre-trip knowledge), men and women were at opposite ends of the scale (Appendix E9):

- More men than women believed impact to be 'none' or 'low', and more women than men believed the impact to be 'high' (cf. Table E9.1).

These differences were maintained through post-trip knowledge:

- More men than women still believed there was no impact, and more women than men believed the impact to be high (cf. Table E9.2).

However, generally, after their first hand experience both sexes felt mining-impacts would be medium to high.

5.7.2 Ethical standards

24. You have been sitting on a rock away from the rest of the group, watching older penguin chicks in a crèche (penguin nursery). One inquisitive chick heads your way. It is tempting to touch it. Would you? (Possible answers Yes/No)

25. You and a friend are by yourselves taking photographs at your last landing site in Antarctica. You notice a pile of 6 large elephant seals with one particularly fine fellow on top. He has been dozing on and off for several minutes but has yet to open his eyes. Would you be tempted to make a noise or otherwise try to attract his attention?

26. The ship's naturalist is taking a group to look at a penguin colony. You are observing the distance regulation but the naturalist moves closer and indicates it is okay to do the same.
   a. Would you move closer?
   b. Do you tell the tour director about the distance violation?

27. You enter a base built in the 1950s and notice that there are many maps of the base and island lying around. You have had an interest in this base because your
friend was stationed here. Since it's not really historic and the map is one of many, would you be tempted to take one for your friend?

28. You notice a photographer getting within five feet of a nesting gentoo penguin. You have noticed that skuas have been patrolling the colony so you gently remind him that he is too close and he tells you to mind your own business. Do you mention this to the naturalist?

This set of questions was designed to provide additional insight into passengers' behaviour vis-à-vis the guidelines and the justifications used by passengers when they contravene guidelines.

The 'correct' responses are from the framework devised by IAATO. The 'wrong' answers, those which contradict IAATO guidelines, in the case of questions 24 (would you touch a chick?), 25 (would you make a noise to attract a seal's attention?), 26a (would you move closer?), and 27 (would you collect?), are 'yes'. For questions 26b (would you report a distance violation?) and 28 (would you admonish a photographer for getting too close?), there is no right or wrong answer based on IAATO guidelines, 'yes' however, is the expected answer.

Although there were sufficient 'wrong' answers to suggest that a good many people were honest, the results are not proffered as a definitive study on the topic. These data offer a possible contributions to understanding people's ethical behaviour.

The overall responses to the ethical questions are reproduced in Figure 5.18. A small number of passengers admitted that, in a special situation, they might be tempted to contravene one or more of the guidelines. In what situations do people feel justified in

![Figure 5.18. Percentage of Antarctic cruise passengers surveyed who admitted/reported a hypothetical violation.](image-url)
doing so? A higher percentage of passengers felt that taking a map (13%) was justifiable than either touching a chick (4%) or harassing a seal (11%).

In the case of taking a map or a photograph, there is a material gain, something tangible, a prize despite the violation. The personal pursuit of photography may also give people an excuse to justify their behaviour. Admonishing a photographer, something 71% of the respondents say they would do, gives people the opportunity to right a wrong, to behave correctly. This same justification is at work in question 26a and b: 49% of the people would break a guideline and move closer (if advised to do so) and 38% would soothe their consciences by reporting the violation.

5.7.3 Visitor use characteristics: effects of sex, educational level, and ship on behaviour

Concerning these questions, differences among passengers were based on sex, educational level, and ship (Appendix E10):

- Women were significantly less inclined to be tempted to 'harass a seal for a photograph' than men were (cf. Table E10.1).
- Passengers with university or postgraduate education were more inclined to be tempted to 'harass a seal for a photograph' than those without (cf. Table E10.2).
- Those on Ship 2 were also more likely to admit that they would 'harass a seal for a photograph' (cf. Table E10.3). Passengers aboard Ships 1 and 2 would be more likely to contravene a guideline if 'allowed by a naturalist', whereas those aboard Ship 3 would not (cf. Table E10.4).
- More men than women would also be tempted to take a map (cf. Table E10.5).

5.7.4 Summary

In short, by the end of their trip and on the basis of their own observations, just over 80% of passengers believed that science and tourism both had an impact in Antarctica, although to a different degree: the impact of science was thought to be greater. Just over 50% believed that mining had an impact.

The vast majority of passengers (cf. Figure 5.18) felt ethically compelled to adhere to the IAATO voluntary visitor guidelines. The results suggest that in some areas there are fundamental differences between the sexes and among those of differing educational levels. The ship one travels on also influences ethical behaviour, or at least the idea of what is ethical behaviour. This is discussed in more detail in Chapter 6.

5.8 CURRENT ACTIVITIES AND FUTURE DEMANDS

The impacts of wilderness visitors, whether they take the form of the unintentional harassment of wildlife or the physical alteration or pollution of the
environment (Cole 1990b: 426), will depend on the nature of the activities they undertake. It is therefore important to have data on both current and future recreational demands.

The activities desired by the passengers surveyed are illustrated in Figure 5.19. Forty-three percent of the passengers were interested in day hikes, but other activities such as fishing, climbing, skiing, and camping were also of some interest.

A small number of passengers indicated that they had participated in day hikes (or half-day hikes), fishing, and climbing. Fishing is likely to be done in an impromptu and informal fashion. No brochure advertised fishing opportunities. One operator did plan a climbing trip for experienced climbers, at the end of the 1993/94 season (Cross, personal communication, 1993), but climbing here is liberally interpreted as hill climbing or rock scrambling. Activities engaged in ashore are discussed at length in Chapter 6.

Question 20. What additional activities would you like to see on an Antarctic trip? If you have participated in any of these during your trip, please tick the last column. (Possible answers Yes/No/Participated)

Day hikes  
Fishing  
Climbing  
Snowmobiling  
Skiing  
Camping  
Scuba diving  
Other

Figure 5.19. Activities preferred by the Antarctic cruise passengers surveyed.
Question 21. Are there facilities or services that would be useful?
Visitor centre in Antarctic Peninsula
On-site interpreter
Visitor rest facilities on site
Small huts for overnight use
Airport
Chalet or guest house
Other

The desire by passengers for services or facilities is shown in Figure 5.20. The question asked, in one sense, was: 'what is lacking or what would make your on-shore visit more enjoyable?' and, in another, 'how much human development would add to your level of comfort in a wilderness setting?' The majority of passengers rejected the notion of additional facilities but there seemed to be a solid minority who felt a visitor centre (24%), rest facilities (20%), or overnight huts (15%) were of value.

In the case of question 20 differences among passengers were based on sex, age, and educational level (Appendix E11):

- Men were significantly more interested in 'scuba diving' than women (cf. Table E11.1).
- Those passengers of 64 years of age and younger were more interested than older passengers in 'day hikes' (cf. Table E11.2), 'climbing' (cf. Table E11.3), 'skiing'
(cf. Table E11.4), 'camping' (cf. Table E11.5), and 'scuba diving' (cf. Table E11.6).

- Those passengers with university and postgraduate education were more interested in 'day hikes' (cf. Table E11.7) and 'skiing' (cf. Table E11.8) than those without university education.

Sex, age, and educational levels also influenced the desire for facilities (question 21) (Appendix E12):

- More men than women were interested in 'visitor rest facilities' (cf. Table E12.1) and an 'airport' (cf. Table E12.2).
- 'On-site interpreters' (cf. Table E12.3) were thought useful by more passengers over 45 years of age than by younger groups, and 'small huts for overnight use' (cf. Table E12.4) were thought useful by more passengers of 64 years of age and younger, than by older groups.
- Those passengers with university and postgraduate education were more inclined to favour 'on-site interpreters' (cf. Table E12.5) than those without it and passengers with postgraduate education were more likely than those without it to favour an 'airport' (cf. Table E12.6).

If offered a wider range of recreational activities, younger age groups expressed a greater interest than did older passengers. Educational level and sex affected the type of activities in which passengers expressed an interest.

Given the choice of facilities ashore, those men who responded 'yes' to visitor rest facilities and an airport did so more often than women. On-site interpreters were typically more popular with passengers aged 45 years and older and with university or postgraduate education. Finally, passengers of 64 years of age and younger more often found pleasing the idea of small huts for overnight use.

5.9 WRITE-IN COMMENTS, SATISFACTION LEVEL, AND ADDITIONAL COMMENTS

The questionnaire was designed to allow respondents to write in answers for some of the questions. Generally about 10% of the passengers wrote a response to a blank on the questionnaire. In order to categorise them, the responses were grouped according to recurring themes. However, of those who did write a response, many were individualistic and this categorisation was not easily accomplished.

To question 11, 'why are you visiting Antarctica?', the three commonest responses were: 'always wanted to see Antarctica' (19), 'have a personal connection with someone who has been there' (10), and to 'see a wilderness' or 'concerned about wilderness' (7). People noted that they were 'birdwatchers' (6), 'loved penguins' (4), 'loved ice' (3), wanted to see it 'before tourism took over' (1), or that it was a 'different
holiday' (1). A total of 23 miscellaneous answers were recorded in addition to the above.

To questions 12 and 13, many passengers wrote responses that were already listed in one of the other questions; these were coded accordingly. Consequently, few supplementary answers were provided. Five passengers commented that one reason they had chosen a particular ship was the single-cabin discount (these were offered by Ships 1 and 3). Responding to question 12, nine passengers indicated that they knew the naturalist.

While 625 passengers did not give any answer to question 20, 16 of those who did respond felt all the activities listed were unnecessary, four wanted helicopter rides, three wanted facilities to mail letters, one asked for shopping, and one for motorised travel to the interior. Several passengers gave answers not directly related to the question: five wanted the bases cleaned up and one asked for more time ashore. Eleven others gave a variety of miscellaneous answers.

To question 21, a total of 624 passengers did not write an answer and, of those who did respond, 26 felt that no additional development was necessary, three were against helicopter rides, and the remainder offered a range of miscellaneous responses.

Question 29 sought to determine the level of passenger satisfaction by asking whether Antarctica had met their expectations. Ninety-five percent of the passengers answered 'yes' or 'more than', leaving only 5% who responded 'no' or 'less than'.

Finally, general comments were made by 245 passengers. The most frequent comment was that 'they loved the trip and wanted to keep things the way they are' (51). The next most frequent comment was made only by those passengers on Ship 1, the largest ship. Thirty-two of them wrote that the ship was too big and that the number of passengers going to Antarctica should be restricted. The same number had a specific complaint about the cruise. Another 23 described their concerns about tourism. Other comments or concerns included: 'ship waste' (3), 'litter at scientific bases' (7), 'more education' (14), 'against helicopters' (4), 'mineral extraction' (7), and 'bad weather affecting enjoyment of cruise' (7).

5.10 DISCUSSION

Visitors to Antarctica, whether they are motivated to see a wilderness, a new place, or because they want to reach their seventh continent, are coming to a wilderness. The Antarctic Treaty Parties have recognised Antarctica's "intrinsic value ... including its wilderness and aesthetic values" (SCAR 1993: 256). The degree to which visitors are or are not encouraged to be wilderness visitors or tourists will determine how much and what sort of management is needed for Antarctica to remain a wilderness.

In the analysis below, profiles of US wilderness visitors are used as a gauge against which to compare the profile of Antarctic visitors revealed by this study. The
Antarctic visitors are also compared with a similar profile of visitors to Galápagos National Park compiled by Wurz et al. (1994). Management strategies can then be assessed and applied, not only in order to define appropriate uses and activities, but to anticipate typical problems that arise as a result of increasing numbers of visitors, user conflicts, human/wildlife conflicts, or the physical alteration of the area.

5.10.1 Comparing visitor profiles

Perhaps the most obvious demographic differences between US wilderness visitors and Antarctic visitors are the numbers of men versus women and the age categories. Most Antarctic visitors are 55 years of age and above and the numbers of men and women are nearly equal. By contrast, US wilderness visitors are younger and predominantly men. Between 70% and 85% of wilderness visitors are male (Roggenbuck and Lucas 1987, in Watson et al: 1992: 15), although others suggest (Lucas 1985 in Watson et al. 1992: 15) that the percentage of female visitors is increasing. Watson et al. (1992: 16) noted that the percentage of wilderness visitors over 55 years of age was between 5% and 10%. Lucas (1980: 48) also found this age range under-represented compared to the national age profile. Past studies had indicated that 20-40% of US wilderness visitors were between 16 and 25 with another 20-30% between the ages of 26 and 35 (Watson et al. 1992: 16).

The number of men and women visiting Galápagos National Park was more equally split, with women in a slight majority (56%) (Wurz et al. 1994: 15). This was the same percentage as for Antarctic visitors. The mean age among respondents to the Galápagos questionnaire was 42 (ibid.), with 43% between 21 and 40 years of age, 29% between 41 and 60 years of age, and 19% of the visitors between 61 and 80 years of age. Thus, the Galápagos visitors fall between the younger US wilderness visitors and the older Antarctic visitors.

The situation in wilderness or remote areas is not unlike that of the early wilderness visitors to parks like Yellowstone or Glacier National Park in the US, where accommodation and entertainment were provided. Many people travelled to these places to enjoy a new setting for a favourite activity or to see an attraction, not experience wilderness for wilderness’s sake. The market was developed for the visitor who could afford the time and had the money to get to newly opened remote areas. As Butler (1991: 206) said, “there is nothing in the true wilderness for him to spend his money on!” Wilderness can be developed by entrepreneurs as a marketable product.

The younger age of the Galápagos visitors in comparison to those in Antarctica, may indicate that economic and social conditions in many countries have changed sufficiently that this kind of experience is available to younger participants. It may be a signal that Antarctic visitation is also changing.
Women and older passengers on Antarctic cruises in particular may feel, after reading the ships' brochures, that they do not need any special wilderness skills. Shipboard facilities, including a doctor and medical centre, fax and satellite phone service, provide a considerable safety net for the Antarctic experience.

Visitor management authors have all remarked that the most distinguishing characteristic of wilderness visitors in the US is their high level of education. Past studies have found that at least 40% of wilderness visitors have completed college (Roggenbuck and Watson 1989, in Watson et al. 1992: 17). Antarctic visitors show a similar profile: 59% have attended university or engaged in postgraduate work. Wurz et al.'s (1994: 17) study also found that 65% of Galápagos visitors had attended college, received technical training, or done postgraduate studies.

The strong positive association between visitors and high educational levels is not completely understood, but the widening of one's horizons both in terms of people and places is most certainly a factor. Wilderness recreation is also a part of the university lifestyle, with climbing clubs, rambling clubs, horseback riding, geology clubs, and birdwatching available to students.

Family groups are the most common units among wilderness visitors in the US, with organised groups accounting for less than 5% of the total (Watson et al. 1992: 10). Currently this is neither the case nor feasible in Antarctica, as organised groups are the only way (except the yacht market, which could still be categorised as small group travel) of getting there and few families can afford to go, although the author did notice half a dozen couples with children on two different ships. Some of these were sons and/or daughters of lecturers. The tour operator chartering Ship 3 was offering a substantial discount to people bringing their children, but this was only feasible because there was extra space available (MarQuest 1993/94: 10). However, in the Galápagos 36% of the visitors were travelling with family and 17% travelled alone (Wurz et al. 1994: 21). The difference between the typical family group visiting a domestic national park and those visiting Antarctica or Galápagos is certainly a function of cost and distance.

The income and occupations of visitors have also been measured in many US wilderness areas, although Lucas (1980: 1) noted that the lack of consistency in categories has made direct comparisons difficult. The general belief is that all but a few US wilderness visitors are wealthy; data from various studies prove this to be incorrect (ibid.: 52; Roggenbuck 1988: 9). The variation in income patterns of those who visit wilderness areas is due, among other factors, to distance from destination and the type of recreation sought. There is a similar belief about Antarctic visitors. Although the trips are expensive on a relative scale, there are visitors who come from fields more modestly paid than business or medicine, such as teaching, science, office administration, travel/tourism, or government (cf. Figure 5.5). Others have taken advantage of other financial conditions to make such a trip possible.
Wurz et al. (1994: 18) found that foreign visitors were "relatively affluent", 65% earning over $35,000, but warned that the data should be interpreted with caution due to difficulties with the question. This does suggest that a significant number of visitors to remote destinations like Antarctica and the Galápagos are likely to be more affluent than those visiting US National Parks. The researchers involved in the studies previously mentioned all acknowledge the difficulty of gathering and interpreting information about income and professional backgrounds, as well as applying their findings to different studies. Comparisons can be made in a general way and any standardisation of categories would be useful.

Another difference is that, whereas many wilderness reserves report repeat visitors, only 11% of Antarctic visitors had been before. For example, Lucas (1980: 55) found that between 39 and 70% of users had visited a specific area before: Glacier National Park, USA, reported 41% repeat visitors (Littlejohn 1991: 6), Corkscrew Swamp Sanctuary in Naples, Florida, USA, saw approximately 29% repeat visitors (Word Craft 1990: 6), and one UK RSPB reserve found 60% had visited previously (RSPB 1993). Many Antarctic visitors consider this a 'once in a lifetime trip', a very different attitude from that of domestic and US wilderness visitors. Galápagos visitors seem to lie between these extremes. Wurz et al. (1994: 20) found that 24% of all visitors had prior experience in Galápagos and that 60% of Ecuadorian respondents reported at least one prior visit. The familiarity of repeat visitors with appropriate behaviour can, at one level, reduce one set of impacts and, at another, create new ones. Some visitors or naturalists/lecturers may see themselves as old hands and 'above the rules'. On the other hand, repeat visitors may also feel more responsibility toward an area they visit frequently.

Antarctic visitors, US wilderness visitors, and Galápagos visitors all share a high level of education and have professional backgrounds. These factors are probably most important for designing visitor information, as these visitors understand the more complex reasoning behind low-impact procedures (Watson et al. 1992: 17).

The greatest deviations between Antarctic and US wilderness visitors, of the demographic factors compared are the nearly balanced male/female numbers, the older group of visitors, and the majority of first-time visitors. These factors move Antarctic visitors away from the US wilderness visitor profile. How visitors see themselves, their personal motivations, and how they want to express this, can tell managers how far from the familiar wilderness profile these visitors are and what the consequences of this are likely to be. As noted in Chapter 3 (Section 3.2.4), visitors with motivations such as a love of nature may be more content with basic amenities, whereas those seeking to satisfy physiological needs may require more.
The basic motivation among these sorts of groups exists at different points along an environmental continuum. For wilderness visitors it is to experience wilderness, for Antarctic visitors it may be generally to see a new place.

For Antarctic visitors, current activities are extremely limited, and users — with rare exceptions — are only allowed to experience Antarctica for one or two hours at a time without urban conveniences. This situation is on the brink of change with the camping opportunity likely in 1995/96. It will be interesting to see what amenities are provided for these visitors (Chapter 4, see Section 4.2.1). This is an appropriate place to consider how visitor profiles may affect future uses of Antarctic wilderness.

5.10.2 Antarctic visitor profiles: the impact of demographics

Distinctive user groups based on sex, age, educational level, and ship were apparent from passengers' answers to the questionnaire.

There were only minor differences, between men and women, except in their responses to facilities and ethics. A minority of passengers were interested in facilities but, of those, men had a significantly greater preference for rest facilities, an airport, and a chalet or guest house than women did. Significantly more men than women said they would be tempted to take a map from an old base or would be tempted to make a noise or otherwise attract the attention of an animal they wanted to photograph. Photography and film/making also had a higher motivational preference with men than women. On the whole, women were more satisfied with the present conditions, did not express the need for additional facilities, and were less tempted to violate behavioural guidelines.

Age also contributed to visitor profiles. Predictably, the younger group had a higher than expected interest in hiking, climbing, camping, and scuba diving. This presents managers with two types of users or potential users ashore — those younger visitors who would be interested in activities ashore and older visitors who may be content with the status quo. Even though most of the activities listed on the questionnaire are not currently being offered by tour companies, a shift toward younger visitors may encourage demand for additional recreation. Unlikely as it may seem that scuba diving or skiing holidays could become popular in Antarctica, other protected-area managers have recently had to cope with "previously unimagined activities" and the potential impacts of those recreational activities on natural areas (FNNPE 1993: 55-56). This repercussion has already been noted by other researchers (Cessford and Dingwall 1994: 325; Enzenbacher 1994: 111). This shift toward younger visitors may already be under way, as the data from Figures 5.3, 5.7, and 5.6 indicate a significant number of younger, employed, income-based visitors.

Age, as a demographic factor, did not influence the amount or type of preparation (reading) that passengers engaged in before their cruise. However, there was a significant difference among age groups existed regarding their recollection of and/or
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Similarly, older passengers reported seeing fewer violations, in the case of four
out of five examples, than the other age groups. Passenger responses to the questions on
hypothetical behaviour (questions 24-28) did not reveal any differences among age
groups.

Of course, there is no information about the age of the violators' of each
guideline, but one wonders if it was the older passengers who did not remember IAATO
guideline lectures and whether they were not also likely offenders ashore. Other factors
may be operating: first, conditions ashore make walking more difficult. Uneven ground
and guano-covered rocks sometimes force passengers to spend more time looking at their
feet than at the flora and fauna. Second, if younger passengers are more inclined to be
nature lovers, they may also be more interested and aware of guidelines and rules of
behaviour. As there seemed to be no relationship indicated between age and ethical
behaviour, it does not appear that older passengers have different ethics.

Age and educational level influenced passenger motivations significantly. The age
categories differed motivationally, with more of the older passengers visiting Antarctica
to get their '7th continent' or because they had 'visited the Arctic'; the younger groups
(64 years of age and below) tended to describe themselves as 'nature lovers'. The
educational level of passengers had a similar affect on two categories of motivation. More
passengers with university and postgraduate education than without indicated that visiting
their '7th continent' and 'seeing new places' was important.

Of all the factors analysed for their affect on the outcome of a particular question,
it was those passengers with differing educational backgrounds who formed user groups
within the Antarctic visitor profile. This factor affected ship selection, facilities,
continuing education, and behaviour and ethics.

Those with university and postgraduate education were more likely than visitors
without university education to have selected a particular cruise and ship on the basis of a
family or friend's recommendation, a travel brochure, or appropriate scheduling.

When passengers were questioned about whether additional facilities or services
would be useful, nearly one-fifth of those passengers favoured having additional on-site
interpreters. An airport was favoured only by a minority of the passengers (11%) but
46% of those were postgraduates.

Ship lectures were generally well attended and those with university and
postgraduate education had better recall of subject matter, in four out of seven areas.

This same trend was also clear regarding behaviour ashore. Violations — being
inside a penguin rookery or walking on plants — were recognised more often or admitted
more often by those with more education. There was no difference in the number or kind
of violations they observed.
The hypothetical question about the photographic harassment of an elephant seal was the only ethical question that those with university education answered differently from those without. More of the former found themselves tempted to disregard the guideline. This may be explained by how people of different educational levels view animals and it is discussed in more detail in Section 5.10.4.

Passengers with higher education were not necessarily better visitors or more cognisant of wilderness management. In fact, in some areas like behaviour, their record was worse than that of visitors without a university background, despite their having better recall of the IAATO guideline lecture. They were more interested in having various facilities and did not make the connection that additional facilities would alter wilderness conditions.

5.10.3 Ships: developing a visitor type?

Each ship had a distinctive profile, not just in the way it marketed itself to passengers according to what it had to offer, but also in the way staff supervised the activities of its passengers ashore. In essence the ship created a management environment and was the single most important factor affecting the behaviour of passengers. The issue of on-shore supervision is discussed in Chapter 6.

Since less than 5% of those who visit US wildernesses do so in groups (organised groups are to most people the antithesis of wilderness travel), the Antarctic tour ships are in the special position in the wilderness travel market that they alone have contact with virtually all of their visitors.

Among the tour ships there is criticism of competitors’ size, luxury, or technical design regarding pollution control devices. If the ships acknowledge the differences among them, do they cater to or create a different type of user?

Most passengers felt that neither size nor facilities were important (58% and 64% respectively). A minority of passengers responded that they chose a ship because it was smaller and had fewer facilities or because it was a larger ship with more facilities. People were most influenced by itinerary, the identity of lecturers, and price.

A summary of ship profiles in the areas in which attitudes differed markedly — reading done for the trip, ship-board education, behaviour ashore, and ethics — indicates who these ships cater for:

Ship 1:

*Abroad this ship, 37% of the passengers had read for more than ten hours prior to their Antarctic trip. Although the lecturers were among the best known in their fields and the ship was scheduled to visit historic huts and see the largest ice shelf by area, the Ross ice shelf (Williams and Hall 1993: 403), neither subject created exceptional reading interest in the passengers.*
Passengers aboard this ship had a higher than expected positive response when asked if they had attended lectures on 'IAATO guidelines', the 'Antarctic Treaty System', 'mining and commercial interests', and 'science in Antarctica'.

The data in Figures 5.15 and 5.16 confirm that several guideline violations were a problem; being between a seal and the water, being inside the periphery of a penguin colony, walking on plants, and being closer than 5 feet. Ship 1's passengers were more at fault regarding the distance guideline.

Ship 2:

Approximately 33% of the passengers had read more than ten hours prior to their Antarctic trip. They were the most well read on the 'history of exploration', 'geology and glaciers', and 'science in Antarctica'.

Their lecture attendance, although on a par with that on the other ships, did not inform them as well. Most passengers did recall lectures on IAATO, the 'Antarctic Treaty System', 'mining and commercial interests', and 'science in Antarctica' but fewer than expected when compared to the other ships.

In every problematic area of behaviour, they were the worst offenders except, 'being closer than 5 feet', where they came second.

Ship 3:

This ship was the least well read: only 19% of the passengers had read more than ten hours of reading. 'Science in Antarctica' was their most popular subject.

Passengers' attendance and recall of lectures aboard this ship was lower than expected in comparison with the other ships.

The percentage of passengers admitting accidental violations, or observing violations of others, was significantly less than for the other ships.

In other words, on Ships 1 and 2, where many passengers were more highly educated, well-read, and had good recall of lecture topics (including the IAATO guidelines), behaviour was significantly worse than on Ship 3, which had fewer passengers with university and postgraduate education, were the least well read, but who behaved best ashore. The difference is attributed to the ships' staffs, who by their advice, example, and leadership to a large extent determine the behaviour and attitude of passengers — those who follow guidelines and those who do not. An important point to make about the self-assessed behaviour question is whether some ships' passengers were more honest in their responses than others. This may or may not be due to how the questionnaire was introduced to them, or whether a letter was read, but it may also reflect the stricter enforcement or interpretation of guidelines by Ship 3.

The behavioural environment is created by direct and indirect guidance from the lecturers/naturalists. Manfredo and Bright (1991: 5) found that status in a social group can affect group behaviour, in that those with higher status show a tendency to exhibit less behavioural change when presented with a contrary argument than subordinate group members do. They explained:
if persuasive appeals affect only the beliefs and attitudes of subordinate group members but group leaders are making decisions for the entire group and are having an influence on group followers, the desired behaviour changes may not occur (ibid.).

The argument that the large ships, carrying more passengers, have greater impact than the smaller ones (Sitwell 1993: 46) does not follow from these data. Each ship's passengers rated their behaviour and that of their shipmates according to the IAATO guidelines. It was clear from their own assessments that the smallest ship was the worst offender. The New Zealand Department of Conservation’s (1993: 5) report on tourism also noted that small ships can have greater impact because they are more mobile and passengers tend to disperse more. Barnes (1992: 9) noted that smaller tourist operations in Botswana are harder to control. Supervision and/or the message delivered by ship's lecturers and naturalists are the most likely factors to which these differences can be attributed. Obviously the problem is more complex than purely ship size. It is not ship size but the influence of the ship's staff in the yet unravelled supervision/education puzzle. Williams (1988: 22) has commented:

The most highly involved and committed participants make up the leisure social world, and it is they who set the tone for attitude and behaviours related to the activity.

5.10.4 Visitor behaviour: do the guidelines work?

Approximately one-third of the passengers had particular difficulty with four specific guidelines. Since the aim of this research was not to count violations in a punitive way, but to determine how and in what situations they occur, there will be no discussion of the level of the percentages. The purpose of examining violations by ship was to look for possible associations between individual ships' policies and practices and the frequency of violations that occur. Visitors themselves admitted that guidelines were violated, and for visitor management purposes determining why is the critical issue.

In general, two classes of guideline infringements were committed and reported by ship passengers: inadvertent (as listed in Figure 5.15) and deliberate (as listed in Figure 5.16). Knight and Cole (1991: 289) found that accidental harassment was the most common problem with visitors in wilderness areas.

The most frequent inadvertent violations were getting between a seal and the water, being inside the periphery of a penguin colony, and walking on plants. Each of these situations suggests a lack of awareness of the fauna and flora and its environment. It is useless to repeat admonitions about these guidelines if passengers are not prepared or informed about them. While these are common problems, they appear to be correctable with indirect strategies such as better or different ship-board education and/or on-site interpretation.
Deliberate violations of the distance guideline occur under three scenarios: (i) passengers do not think they are bothering an animal by their close proximity; (ii) passengers want a photograph or a souvenir of some aspect of their experience and feel this is enough justification to contravene the rules; and (iii) someone in authority allows the guideline to be broken. These violations could be eliminated with the on-site supervision that all ships provide but obviously this does not always work.

A closer look at user characteristics revealed that there were differences among the passengers that can be categorised by age, educational level, and ship. Passengers under 64 and those with higher education found themselves contravening guidelines more often.

Younger passengers are often more mobile and consequently may encounter more situations where it is possible to come between a seal and the water. They may also feel that they can move out of range quickly should the seal become aggressive. There was a higher incidence of contravening this guideline among the more highly educated passengers. As previously indicated, a high level of education is the dominant distinguishing feature of a wilderness visitor and this is generally regarded as desirable because it is assumed that those with higher education will understand the message more readily (Watson et al. 1992: 17). It is not known why those with higher education more often contravened the guidelines, but perhaps they are generally less inclined to follow rules they believe are unnecessary. These data also suggest that Antarctic visitors may not be experienced wilderness visitors, i.e. not experienced in non-urban settings. They are urban-based tourists, and may have a far lower level of awareness of the appropriate behaviour. This will provide a greater challenge to managers in the future.

Ship 2, the smallest ship of the three studied, and the one with the most highly educated passengers, consistently had more difficulty with all the guidelines than the other two ships, with the exception of photographic harassment of animals, where Ship 3 also had a higher than expected number of incidents. The differences among ships regarding passenger behaviour suggest that the ships’ naturalists and lecturers are instrumental in providing on-site supervision and enforcement. Where the number of passengers is small, supervision may not be thought necessary on the assumption that few people will only have a limited impact. The assumption that there is a direct correlation between the number of visitors and their impacts has been made (Headland 1994: 278), but exhaustive reviews of use–impact relationships show this be incorrect (Graefe et al. 1990). Other considerations, such as site-specific influences, activity-specific influences, varying tolerances to impacts, use-impact relationships, and impact inter-relationships, must be analysed (ibid.: 1-2).

The hypothetical questions passengers were asked also produced some surprising results. It should be noted that passengers were asked if they would be 'tempted' to
contravene a guideline; again, the intention was not to trick people into admitting possible violations, but to help define the situations in which they might occur.

Why, if nearly three-quarters of the passengers observed others closer than five feet from wildlife, did so few indicate they would be tempted to touch a penguin? Only 4% of passengers admitted, in question 24, that they would be tempted to touch a penguin chick that approached them. One of the unique experiences visitors can have in the Antarctic is to be among wildlife that appears to be largely unconcerned about their presence.

A simple answer may be that being close is enough, or that when an animal does not flee, visitors feel they are not causing harm whereas 'actually touching it' would do harm. There are at least three other possible explanations: (i) it was the first of the ethical questions listed and passengers may have been more inclined to answer such an obvious question truthfully; (ii) they cannot take home the experience in a tangible form so it is not as important; or (iii) they have some fear of how the chick may react. An explanation for the latter view may be found in a study that examined the attitudes of Americans toward animals. Kellert (1980: 89) found a significant relationship between educational level and the attitude people had toward animals. He found that in those with high school education, a negativistic attitude (fear or avoidance of animals) was most common. Both high school and college graduates had an average to above-average humanistic attitude (affection for individual animals). Those with some graduate education had lower humanistic but higher ecologicist (concern for the system), moralistic (right/wrong treatment of animals), and scientistic (animals as biological systems) scores. The low humanistic/high scientistic scores for postgraduate passengers may explain their lack of interest in touching animals, as would the high negativistic score of the high school educated visitors. In other words, those without university education may be more fearful of animals and those with university or postgraduate education may not have great interest in touching them. Remember that question 19 asked whether passengers had observed others violating a guideline (closer than five feet and touching), so there was no way of knowing the educational level of those who did.

The ethical questions defined particular factors that may tempt passengers or allow them to justify their behaviour. For example, question 25, concerning the harassment of a seal for a photograph (11% said they would), brings up several such issues. First, passengers may not realise they are disturbing a seal by making noise. Most do not appreciate that the moulting process for elephant seals is an energetically demanding period (Boyd et al. 1994; Cruwys and Davis 1994: 313). Second, the visitor may not care about harassment impacts if a tangible product, a photograph, results from the encounter. Finally, they may have seen a naturalist or lecturer doing the same thing.

Question 28, involving a photographer, a nesting gentoo, and a skua, places a slightly different perspective on the situation. Now, it is not the visitor himself
committing a violation but someone else, who may have the same desire for a photograph. According to the IAATO rules both are disturbing wildlife, although some may argue about the degree of that disturbance, but that is not the issue. In this case, 71% of the passengers indicated that they would report the photographer to the naturalist after reminding him first themselves. Did nearly 75% of the passengers remind each other that they were too close? This kind of friendly enforcement does not appear to be terribly effective when such a high percentage of passengers remained too close.

Eleven percent of the passengers indicated that they would be tempted to take a map and could justify their action since it is not 'historic and one of many'. The temptation to take a souvenir, whether a rock, a map, or a photograph gained by any means, seems to be a fundamental mechanism in the fabric of modern life and at least one researcher believes it was an important factor in visitor behaviour (Tuan 1974: 95).

The dependence of passengers on the advice of lecturers and naturalists is illustrated by question 26. It also underlines the dilemma passengers can and do face when given conflicting messages. The IAATO guidelines are clear and yet 49% of the passengers would move closer if advised it was safe to do so (the word 'tempted' was not used here). Thirty-five percent of them would also report the violation to an authority. Is the message visitors receive that the guidelines are to be followed unless your ship's naturalists or lecturers instruct otherwise? This undermines the guidelines' purpose and effectiveness. Chapter 6 contains data suggesting that some naturalists act outside their area of expertise when assuring passengers of safety.

5.11 CONCLUSIONS

The profile of Antarctic visitors is not directly comparable with that of US wilderness visitors. The most important shared trait is their high level of education, the greatest contrast is the average age of their visitors. Age then, is the key indicator of a changing visitor profile that would alert managers that other changes, such as the desire for more recreational activities, may be near.

Notwithstanding the high level of education of most Antarctic visitors, they do not appear to be experienced wilderness users, aware of or accustomed to guidelines for wilderness behaviour. A high level of education may in fact bring another facet of difficulty into the management picture. The frequent problems illustrated the inadequate nature of the guidelines to prevent adverse impacts on flora and fauna. Visitor management planners would agree that guidelines are but one part of a management strategy; they are not complete in and of themselves. It is laudable that IAATO has created these guidelines for visitor management and that their ships, by membership of the organisation, are obliged to enforce them. Unfortunately, the guidelines are not necessarily easy to follow. Passengers may not understand fully the intent of the
guidelines, different users (as identified by age or educational level) may not, for their own reasons, follow them to the same extent, and supervision may vary considerably between ships. Staff may differ in their abilities to interpret, enforce, or assist passengers in their understanding of the guidelines. It is also clear that sex, age, educational level, and ship environment can create different user groups, changing the dynamics for education, adherence, and enforcement.

To assume that a single set of guidelines will control tourists in a wilderness — in fact, a continent — is short-sighted and risks destroying the very qualities that attract visitors to Antarctica.

Devising rules for visitors in a wilderness area is an anathema, rules and rigidity of behaviour are one of the aspects of human culture that people wish to rid themselves of when they visit a wilderness — whether or not they are wilderness visitors *per se* (Knopf 1987). This inherent contradiction forces those in the profession of wilderness management to research more thoroughly the ways in which an understanding of wilderness values can be transmitted to urban visitors and how to allow the greatest possible freedom.

Trends concerning visitors, visitor uses, and characteristics, are hard to predict specifically but from the data presented a dynamic and complex picture emerges. The high degree of change suggests that it is an evolving situation and one that will not wait for a gradual implementation of visitor management strategies.

Most visitors are happy with current levels of activities and lack of facilities, but the market is being created by the tour companies themselves, who are both designing the visit they sell and the guidelines they follow. As Sax (1976: np) observed:

People get the recreation that imaginative leadership gives them. No one wanted Disneyland any more than they wanted Yosemite National Park. The question is whether there is a legitimate place in this society for recreation that is not likely to be sufficiently profitable for private entrepreneurs.
CHAPTER 6

OBSERVATION OF VISITORS ASHORE

6.1 INTRODUCTION

The paucity of information about visitor behaviour ashore inhibits the ability of Antarctic Treaty Consultative Parties (ATCPs) and tour operators to divine the effectiveness of current controls. The aim of this chapter, therefore, is: (i) to analyse the activities of visitors ashore at Hannah Point, Livingston Island, South Shetland Islands (cf. Figure 5.1); (ii) to compare this on-site behaviour with the data in Chapter 5 on adherence to IAATO guidelines; and (iii) to assess the overall success of these guidelines on visitor behaviour. These data on how visitors see, interpret, and behave in the wilderness of Antarctica can ultimately be used to devise approaches to visitor management.

6.2 METHODOLOGY

The project manager selected Hannah Point as one site for the 1993/94 season work due to its popularity as a tourist site (see Figure 4.1). Fieldwork was undertaken from between 31 December and 17 February. There were five researchers on Hannah Point from 31 December to 20 January, and four until 17 February.

6.2.1 Physical and biological description of Hannah Point

The practical methodology was devised according to the physical and biological constraints of the site.

Hannah Point, on Livingston Island, is a spit of land approximately 2.1 km long, with a ridge, approximately 120 m high, running down the middle that is flanked by beaches on either side. The geology has been described by Hobbs (1968: 23-25) and consists primarily of massive andesites and zeolites near the tops of lava flows. Some fossils have been observed in the glacial moraine. The field camp was located near the moraine at the northern end of Hannah Point (cf. Figure 6.1a). The beaches were free of snow and ice during the period of fieldwork, except directly in front of the glacier. A formal floristic survey has not been published, although Stonehouse (1994) has undertaken a preliminary survey. Algae (Prasiola) were predominant in two areas: near the camp and on the slope nearer the landing area (Figure 6.1a). Generally, mosses and
Figure 6.1. (a) Sketch map of Hannah Point showing the extent of the visitation zones and main wildlife concentrations. (b) An enlarged view of Zones 1 and 2 illustrating the main routes used by visitors.
Lichens were distributed along the rocks at the southern end of the point. Lichens were also found on the top of the ridge near the camp. *Colobanthus quitensis* and *Deschampsia antarctica*, the only two Antarctic flowering plants, were distributed throughout the numerous scree patches along the ridge.

The fauna of Hannah Point is varied and numerous. They are distributed primarily along the southern end of the point (Figures 6.1b and 6.2). An estimate of breeding bird numbers is given in Table 6.1, and is based on a preliminary survey carried out during the 1993/94 field season.

Elephant seals (*Mirounga leonina*) breed on Hannah Point and several of the 1993/94 season's pups were observed. During the study period, elephant seal numbers decreased from 339 to 90 (Cruwys and Davis 1994: 313). This is a normal population decline for elephant seals as they complete their moult and return to sea. These were predominantly juvenile and sub-adult males. Only three adult females were positively identified and no socially mature males were seen. Weddell seals (*Leptonychotes weddelli*) of both sexes were frequently seen hauled out on the beaches, as were Antarctic fur seals (*Arctocephalus gazella*). One tagged fur seal was identified as a nine-year-old female, born on Bird Island, South Georgia. A single leopard seal (*Hydrurga leptonyx*) female was observed hauled out on the beach during the field season.
<table>
<thead>
<tr>
<th>Species</th>
<th>Estimated numbers (if known)</th>
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<tbody>
<tr>
<td>Gentoo Penguin</td>
<td>Pygoscelis papua</td>
</tr>
<tr>
<td>Chinstrap Penguin</td>
<td>Pygoscelis antarctica</td>
</tr>
<tr>
<td>Macaroni Penguin</td>
<td>Eudyptes chrysolophus</td>
</tr>
<tr>
<td>Southern Giant Petrel</td>
<td>Macronectes giganteus</td>
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<tr>
<td>Pintado Petrel</td>
<td>Daption capense</td>
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<tr>
<td>Wilson's Storm-petrel</td>
<td>Oceanites oceanicus</td>
</tr>
<tr>
<td>Blue-eyed Cormorant</td>
<td>Phalacrocorax atriceps</td>
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<tr>
<td>South Polar Skua</td>
<td>Catharacta maccormicki</td>
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<tr>
<td>Antarctic Skua</td>
<td>Catharacta antarctica</td>
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<tr>
<td>Dominican Gull</td>
<td>Larus dominicanus</td>
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<tr>
<td>Antarctic Tern</td>
<td>Sterna vittata</td>
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<tr>
<td>Sheathbill</td>
<td>Chionis alba</td>
</tr>
</tbody>
</table>

Table 6.1. Breeding birds on Hannah Point 1993/94 (Stonehouse 1994).

6.2.2 Summary of use estimation and measurement methods

Managers of visitors in natural areas are concerned with measuring visitor use in order to better establish where impacts are likely to occur, how they occur, and what strategies would be most successful in their prevention or limitation.

Lucas (1990: 362-365) reviewed various studies that measure recreation use and listed the major difficulties: (i) wilderness areas often have numerous access points; (ii) surveys are labour-intensive; and, (iii) depending upon the type of system used, specific activities may not be taken into account. The last problem occurs in the case of the NSF Antarctic visitor data, which, although an excellent resource on the sites visited and the number of visits and visitors these sites receive, provides no information about the type or duration of use.

Methods reviewed by Lucas included: observing visitors at trailheads on sample days (Lucas and Oltman 1971; Lucas et al. 1971, in Lucas 1990); automatic electronic trail traffic counters (Lucas et al. 1971, in Lucas 1990); automatic movie cameras (Marnell 1977, in Lucas 1990); voluntary self-registration (Lucas 1975, in Lucas 1990); and — the most successful — mandatory visitor-permit systems (Hendee and Lucas 1973; and Lime and Buchman 1974, both in Lucas 1990). These methods have been developed for and used in existing parks or other formally designated wilderness areas in the US.

At present voluntary self-registration is the method recommended by the Treaty Parties and used by the NSF. At the XIX ATCM in Seoul (May 1995), Argentina, Chile, New Zealand, and the United Kingdom produced a form for use by IAATO member ships to aid the collection of standardised information (ATCPs 1995c).
6.2.3 Preliminary methodology: data collection in 1992/93

A pilot methodology was developed on Cuverville Island (see Figure 5.1) during the 1992/93 season in order to measure adherence to IAATO guidelines (Figure 4.5). Five parameters were selected for measurement: (i) distance of visitors to wildlife (< 5, 15-10, and > 15 feet); (ii) instances of collecting any objects; (iii) instances of trampling plants; (iv) instances of photographic harassment; and (iv) instances of littering. The study area was divided into three sub-areas and each was covered by a researcher, who sat some distance from the visitors. Each of 12 separate visitor landings was sampled for one hour and the number of infractions observed, during each visit, was counted at five-minute intervals. At the end of the hour-long monitoring session, researchers compiled the figures so they could estimate the number of violations during each visit. These data were not used in this thesis as the role of that exercise was to develop the observation methodology for 1993/94 and not to count violations committed by passengers from different ships. The information on violations was collected by another researcher working on Cuverville Island.

6.2.4 Data collection in 1993/94

The revised methodology for the 1993/94 season sought to collect data from ship visits using a combination of the 'sampling at a trailhead' procedure and photographic recording. A form was prepared to account for the activities of visitors, their adherence to guidelines, and to allow a description of the conditions under which activities occurred (Figure 6.3). Site conditions, only generally known prior to the fieldwork, were the final determinant of how and where observers would be situated to collect information.

A remote observer, based at the camp, was used for the first five visits to make notes about the spatial distribution of visitors and time they spent at the site. This observer was concealed behind erratic boulders from a lateral moraine near the camp (Figure 6.1a). A survey level (with a 20× magnification telescope) and a camera with a 300 mm lens were set up, allowing this observer to make notes on behaviour and take photographs of the entire group. These notes and photographs were made at five-minute intervals throughout the visit. Unfortunately, it was not possible at that distance to distinguish with certainty passengers from staff or the sex or age of the visitors.

The author accompanied passengers and, when possible, took photographs and made written observations. The remote observer used the form reproduced in Figure 6.3 to record any remarks about the visit. After the visit, more detailed notes were made by the author and supplemented with notes made by other researchers.

The first six visits, excluding the visit of Ship 3 when the observer was not in place, were remotely observed in the way described above (cf. Table 6.2). It was decided after these visits that sufficient data had been secured about the main corridors of visitor movement and the spatial and temporal distribution of passengers during visits.
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<thead>
<tr>
<th>DATE:</th>
<th>SHIP:</th>
<th>WEATHER</th>
<th>Temp (°C)</th>
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<th>Sun (0-3)</th>
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<th>GUIDES ASHORE:</th>
<th>Ppt (s/r/h 1-5)</th>
<th>Wind (0-5)</th>
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<th>SEAL COUNT:</th>
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<th>TOURISTS</th>
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Figure 6.3. The data sheet used for recording ship visits.
<table>
<thead>
<tr>
<th>Ship / Cruise</th>
<th>Date of visit</th>
<th>No. of tourists aboard</th>
<th>Total no. of visitors ashore$^1$</th>
<th>No. of staff ashore</th>
<th>Duration of visit (min. 15 min.)</th>
<th>Minimum time ashore$^2$ (min. 15 min)</th>
<th>Duration of visit (hrs:mins)</th>
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<td>81</td>
<td>89</td>
<td>4</td>
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<td>18</td>
<td>22</td>
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</tr>
<tr>
<td>Ship 6</td>
<td>26 Jan. (a.m.)</td>
<td>90</td>
<td>121$^3$</td>
<td>15</td>
<td>150</td>
<td>75</td>
<td>293:25</td>
</tr>
<tr>
<td>Ship 3</td>
<td>28 Jan. (a.m.)</td>
<td>149</td>
<td>96$^3$</td>
<td>6-8?</td>
<td>75</td>
<td>15</td>
<td>44:00</td>
</tr>
<tr>
<td>Ship 5 / Cruise 2</td>
<td>31 Jan. (a.m.)</td>
<td>22</td>
<td>26</td>
<td>4</td>
<td>135</td>
<td>120</td>
<td>44:40</td>
</tr>
<tr>
<td>Ship 2</td>
<td>31 Jan. (p.m.)</td>
<td>75</td>
<td>58</td>
<td>5</td>
<td>105</td>
<td>45</td>
<td>60:55</td>
</tr>
<tr>
<td>Ship 7</td>
<td>7 Feb. (p.m.)</td>
<td>132</td>
<td>150$^3$</td>
<td>18</td>
<td>90</td>
<td>45</td>
<td>118:20</td>
</tr>
<tr>
<td>Ship 4 / Cruise 2</td>
<td>9 Feb. (a.m.)</td>
<td>70</td>
<td>70</td>
<td>4</td>
<td>195</td>
<td>75</td>
<td>125:25</td>
</tr>
<tr>
<td>Ship 8</td>
<td>10 Feb. (p.m.)</td>
<td>130</td>
<td>110</td>
<td>3</td>
<td>90</td>
<td>45</td>
<td>99:15</td>
</tr>
<tr>
<td>Ship 9*</td>
<td>11 Feb. (a.m.)</td>
<td>77</td>
<td>58</td>
<td>2-4?</td>
<td>120</td>
<td>-</td>
<td>84:40</td>
</tr>
<tr>
<td>Ship 5 / Cruise 3</td>
<td>12 Feb. (p.m.)</td>
<td>17</td>
<td>17</td>
<td>2</td>
<td>120</td>
<td>105</td>
<td>26:50</td>
</tr>
</tbody>
</table>

Total = 817
Mean = 120
Mean = 94:25

Table 6.2. Summary of ship visits at Hannah Point between 21 January and 12 February 1994. Note that some of the visitors ashore might have been crew members, who are not counted as staff as they were not supervising the visitors.

* Ship was not a member of IAATO.
1. This number includes staff.
2. This is the time between the first zodiac arriving and the first leaving to take passengers back to the ship; thus, it represents a maximum estimate of the minimum time ashore.
3. The number of visitors ashore differed from the figures given by the ship staff.
For the remainder of the ship visits (the last five, cf. Table 6.2), the remote observer made notes about visitor behaviour and supervision from the main visitor areas.

Some ships had been informed by IAATO of the team’s presence, whereas others had not. This is noted in Table 6.3, under ‘supervisory style’, and considered in the discussion section. Each ship was assigned a number based on the date of its visit to Hannah Point (Section 5.2.2).

6.3 RESULTS

6.3.1 A description of a typical landing

Ships arrived at Hannah Point with little or no warning. Occasionally researchers on Cuverville Island, with whom the Hannah Point researchers were in radio contact, indicated that a ship might be stopping on a particular day. Thus some ships did know of the team’s presence.

A visiting ship would usually anchor south-east of Walker Bay, dispatch a zodiac inflatable with staff, and check sea and landing-site conditions (cf. Figure 6.1a). Approximately thirty minutes later, other zodiacs would arrive with passengers and begin disembarking them on the landing beach. Researchers would typically arrive just as the first passengers were being landed because it took 20 minutes to walk there from camp. Most ships conducted a quick on-shore briefing, giving passengers information about what time to return to the landing beach and what could be seen on the island. Depending on the ship, passengers might follow staff/naturalists for a time before going off by themselves or in groups to observe and photograph animals. Occasionally, a small group invariably fewer than five people, would strike out on a longer walk.

6.3.2 Visit characteristics

6.3.2.1 Time ashore

The length of time visitors, as a group, were ashore ranged from 75 to 195 minutes, with an average time ashore of 120 minutes (cf. Table 6.2). Time ashore was measured from the arrival of the first zodiac of passengers to the departure of the last zodiac. Most ships offered passengers the opportunity to return to the ship whenever they pleased and, with the exception of Ships 3, 5, and 8, the first zodiaks returned with passengers about 45 to 75 minutes after landing (cf. Table 6.2). The duration of the shortest visit, by Ship 3, was due to high winds. Staff allowed visitors only 20 minutes ashore to ensure that all who did wish to land had the opportunity before conditions worsened. Ship 5, with the lowest passenger load of any ship, simply landed all passengers for the duration of the visit. Ship 8 landed passengers in two lots, each having from 45 to 60 minutes ashore.
<table>
<thead>
<tr>
<th>Visit summary</th>
<th>Supervisory Style</th>
<th>Site conditions</th>
<th>Visitor behaviour</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ship 4 / Cruise 1 21 Jan (p.m.) 89 (4) visitors (staff) ashore</td>
<td>Naturalist-led groups predominated. On-shore briefing about site. Passengers discouraged from going into Zone 3 (gentoo chicks). Group had been warned about project.</td>
<td>Physical: wandering gentoo chicks in Zone 3, site slippery and muddy. Weather: light rain, temperature = 5°C.</td>
<td>Controlled. Moderate trampling of algae-covered slopes by group and leader. 12 visitors within 15 feet; most of these were photographers.</td>
</tr>
<tr>
<td>Ship 5 / Cruise 1 22 Jan (p.m.) 22 (4) visitors (staff) ashore</td>
<td>Most passengers without direct supervision. One naturalist led walk to Zone 4 to look for fossils. On-shore briefing about length of time ashore. Visitors in small groups. Group had been warned about project.</td>
<td>Physical: wandering gentoo chicks in Zone 3, site muddy. Weather: no rain, temperature = 5°C.</td>
<td>Visitors distributed in small groups across all zones. Few violations noted. No problems with photographers recorded.</td>
</tr>
<tr>
<td>Ship 6 26 Jan (a.m.) 121 (15) visitors (staff) ashore</td>
<td>Groups led by naturalists for c. 30-40 minutes. Some passengers received on-shore briefing. No direct supervision observed after first 45 minutes. Group had been warned about project.</td>
<td>Physical: gentoo chicks scattered in Zone 3, site fairly dry. Weather: light wind, no rain, temperature = 3°C.</td>
<td>Distance infringement was the principal violation. Small number of offenders, mostly photographers, including a professional photographer from the ship, &lt; 15 feet from elephant seals.</td>
</tr>
<tr>
<td>Ship 3 28 Jan (a.m.) 96 (6-8) visitors (staff) ashore</td>
<td>Group restricted to landing beach due to weather. Supervised by naturalists at large. Time ashore limited to 20 minutes per group. Unknown if group knew about project.</td>
<td>Physical: dry. Weather: very windy and sea rough, temperature unknown.</td>
<td>No observed violations, passengers under strict supervision.</td>
</tr>
<tr>
<td>Ship 5 / Cruise 2 31 Jan (a.m.) 26 (4) visitors (staff) ashore</td>
<td>Passengers asked to stay in landing area due to weather. Short on-shore briefing. Small group of visitors followed naturalists. Group had been warned about project.</td>
<td>Physical: site slippery. Weather: moderate wind, no rain, temperature = 3°C.</td>
<td>Distance infringement was the principal violation, especially by photographers. Some problems caused by slippery conditions.</td>
</tr>
<tr>
<td>Ship 2 31 Jan (p.m.) 58 (5) visitors (staff) ashore</td>
<td>Passengers asked to stay in landing area due to weather. No on-shore briefing. Indirect supervision. Unknown if group knew about project.</td>
<td>Physical: dispersed gentoo chicks in Zone 3. Weather: moderate wind and drizzle, temperature = 2-3°C.</td>
<td>Distance violations observed, weather conditions made walking treacherous and several passengers were observed to fall.</td>
</tr>
</tbody>
</table>

Table 6.3a. Summary of supervisory styles, site conditions, and visitor behaviour during cruise visits to Hannah Point (21-31 January 1994).
<table>
<thead>
<tr>
<th>Visit summary</th>
<th>Supervisory Style</th>
<th>Site conditions</th>
<th>Visitor behaviour</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ship 7 7 Feb (p.m.) 150 (18) visitors (staff) ashore</td>
<td>Passengers disembarked single file. Supervisors with group. Line of lifejackets used as boundary marker. No on-shore briefing. No supervision after dispersal. Unknown if group knew about project.</td>
<td>Physical: dispersed gentoo chicks in all zones, especially Zone 3. Overall, fewer fauna than previously. Weather: moderate wind, occasional light precipitation, temperature = 5°C.</td>
<td>One naturalist set up camera near nesting giant petrel. Visitor behaviour poor. Penguins and petrels disrupted. Photographers very close to fauna. Passengers seen with food ashore.</td>
</tr>
<tr>
<td>Ship 4 / Cruise 2 9 Feb (a.m.) 70 (4) visitors (staff) ashore</td>
<td>Most passengers participated in naturalist-led tour. On-shore briefing conducted. Group had been warned about project.</td>
<td>Physical: gentoo chicks very dispersed in Zone 3, ground fairly dry, fewer fauna than previously. Weather: heavy snow showers, temperature = 0°C.</td>
<td>Good overall behaviour. One woman unaware of penguin colony and disturbed it. Algae slope badly trampled.</td>
</tr>
<tr>
<td>Ship 8 10 Feb (p.m.) 110 (3) visitors (staff) ashore</td>
<td>Passengers supervised by naturalists situated at boundary areas. No on-shore briefing but reminder to follow IAATO guidelines. Unknown if group knew about project.</td>
<td>Physical: dry ground, fewer fauna overall. Weather: calm and clear, temperature = 5°C.</td>
<td>Quick passenger dispersal caused penguins in vicinity to scatter. Passengers uninformed about fur seals. Some photographers violated distance guideline. One visitor observed collecting.</td>
</tr>
<tr>
<td>Ship 9 11 Feb (a.m.) 58 (2-4) visitors (staff) ashore</td>
<td>No on-shore briefing. Researchers asked to lead groups. Unlikely that group knew about project.</td>
<td>Physical: dry ground, few fauna on-site. Weather: light wind increasing to moderate at end of visit, temperature = 2°C.</td>
<td>Visitors' behaviour (as partially controlled by researchers) good but had been given no information about natural history.</td>
</tr>
<tr>
<td>Ship 5 / Cruise 3 12 Feb (p.m.) 18 (2) visitors (staff) ashore</td>
<td>Quick on-shore briefing. Passengers asked 'not to stray far'. Small groups led by naturalists. Group had been warned about project.</td>
<td>Physical: ground wet and slippery, few fauna on-site. Weather: moderate wind and rain, temperature = 2°C.</td>
<td>Fewer problems with distance infringements than on previous Ship 5 visits; coincident with fewer fauna on-site.</td>
</tr>
</tbody>
</table>

Table 6.3b. Summary of supervisory styles, site conditions, and visitor behaviour during cruise visits to Hannah Point (7-12 February 1994).
A single zodiac can hold 12-15 passengers, and ships may have three or four operating at one time. Thus it is possible for a passenger to come out in one zodiac, stay for five to ten minutes, and return on the first zodiac going back. The author observed one passenger who did not even get out of the zodiac and immediately returned to the ship.

6.3.2.2 Number of passengers ashore

IAATO members (ATCPs 1994e) have pledged that no more than 100 passengers will be put ashore at a time. This pledge was honoured by all but three ships (all IAATO members): Ship 6 reported 85 visitors and 15 staff but landed about 121 people (this number probably included ship crew), Ship 7 landed 150 visitors, and Ship 8 landed 130 passengers (cf. Table 6.2). In the case of the latter, this could be verified by the unusual disembarkation style: the group walked in single file, thus making it easy to count visitors coming ashore (Figure 6.4).

Approximately 820 visitors, from 11 cruises, landed at Hannah Point during the study period. The counting of visitors ashore (including staff) was completed by two researchers whose totals never varied by more than one or two people for each visit.

Figure 6.4. Visitors coming ashore single file in Zone 1 at Hannah Point (see Figure 6.1b).
6.3.2.3 Time ashore: magnitude and location

The amount of time visitors spend ashore has been used by some researchers as evidence that the activities of visitors have little impact compared with those of scientists (Codling 1982: 4; Headland 1994: 279). Whatever the logic of this argument, the growth of visitor numbers makes it vital to develop a visitor management strategy that will address both the present and the potential impacts of tourism in Antarctica.

Examining where that time is spent, what user/wildlife conflicts may result, and how strategies may be devised to avoid or reduce impacts, is useful as it offers planners a baseline for site-specific management. To that purpose, visitor hours in the five zones at Hannah Point were measured for the first five landings (Section 6.2.4). This was achieved by sampling the number of visitors in each of five specific areas (see below) every five minutes. The total visitor hours for each visit, and the relative proportion of time spent in each of the zones, was then calculated to the nearest five minutes.

Zone borders were based on geological and/or biological features (cf. Figure 6.1). Zone 2, the area adjacent to the landing beach (Zone 1), was divided into 'a' and 'b' representing the areas to the east and west of Zone 1, respectively (cf. Figure 6.1). The zones are described as follows:

Zone 1 (Figure 6.5, see also Figure 6.11). This wide sheltered beach was used as the principal landing site and had an elephant seal wallow at the north end. Directly in front were several small chinstrap penguin colonies, with two nesting macaroni penguins on the edge of the lower colony. At the top of the beach is a ridge marked by an outcrop of jasper and nearby another wallow of elephant seals. Sheathbills, dominican gulls, and southern giant petrels also nested in the area.

Zone 2a (Figure 6.6). Located to the east of the ridge that marks one boundary of Zone 1, this zone is primarily a large chinstrap colony. Several macaroni penguins also nest in this area. While the bottom edge of the area is occupied by penguins, the top edge is rocky and offers protection for several southern giant petrels. It is a pathway through to Zone 3. A short, steep climb is necessary to go from Zone 1 to Zone 2a.

Zone 2b (Figure 6.7) A six to eight foot high rocky outcrop divides this zone from the landing beach. A wide pathway at the top of the landing zone offers easy access to Zone 2b. Both chinstrap and gentoo penguins nest here, as do the blue-eyed shags which utilise the higher cliffs bordering the back edge of this zone (facing Deception Island). A tall stack divides another beach, which was used by Ship 7. Elephant seals had established wallows in this area as well.
Figure 6.5. The top of the main landing beach in Zone 1 at Hannah Point.

Figure 6.6. The principal chinstrap penguin colony in Zone 2a at Hannah Point (see Figure 6.1b).
Figure 6.7. View of Zone 2b, showing main pathways from Zone 1 at Hannah Point (see Figure 6.1b).

Figure 6.8. View of the gentoo colony nesting on the slope of Zone 3 at Hannah Point. Also note the large wallow of elephant seals to the right of centre.
Zone 3 (Figure 6.8). Between Zones 2a and 4, this wide algae-covered slope was where the majority of gentoo penguins nested. One of the largest elephant seal wallows (accommodating up to 70 individuals) was located at the bottom edge of the slope, and seals had access to the sea via a rocky path.

Zone 4 (Figure 6.9). This zone was farthest from the landing area, and had no nesting penguins but did have several elephant seal wallows. Dominican gulls and skuas nested along the ridge. The area included the camp and was principally composed of compacted sand and rock. Fossils were found among debris in the moraine. This zone was normally entered by way of Zones 1, 2a, and 3, although a zodiac could carry passengers to the beach.

The results of the first inquiry, if and where areas of visitor concentration existed and how visitors distributed themselves at a site, are summarised in Figure 6.10. This figure illustrates the percentage of time spent in each zone (for the first five visits combined (see Section 6.2.4)). The total number of visitor hours for these five visits was 552 hours, 15 minutes. The largest percentage of time, 44%, was spent in Zone 1, the pick-up and drop-off point for passengers. Zone 2b, being the closest and easiest to reach from the landing site, was the next most-visited area with 26%, while Zone 2a had

Figure 6.9. View of Zone 4, looking north. The paths in the sand were made by the researchers; these disappeared after storms.
Figure 6.10. The spatial distribution of observed cruise passengers' time ashore at Hannah Point (see Figure 6.1 for geographical divisions). The data are based on five visits.

slightly higher visitation than Zone 3, with 15% and 13% respectively, as 2a provided access to 3. Zone 4, the furthest from the landing area, was only visited 2% of the time. The heavy concentration of use in a small area is typical of US wilderness areas (Lucas 1990: 374). It presents planners with two options for management. Sites need to be managed accordingly, i.e. strategies sought to reduce impacts, and/or direct visitors to sites selected on the basis of their capacity to accommodate safely the type of activity that is demanded. The landing beach at Hannah Point is rich in wildlife. With the knowledge that the highest concentration of use and the greatest average amount of time spent ashore is most likely to be where passengers land, the establishment of landing areas that do not disturb wildlife is an obvious first step for visitor sites. This point will acquire additional importance when considering the conditions under which guideline violations take place.

Factors such as weather, the time allotted for passengers ashore, staff and supervision (discussed in the next section), and site conditions, can alter the pattern of use and space for visitors. Different visits had quite different patterns of visitor movement. To examine how individual ships' visits compared to this average pattern, five visits (of four different ships) were studied. Figures 6.11a-e summarise the percentage of time that passengers spent ashore from the five visits concerned.

Descriptions of the specific visit conditions for each of the first five visits follow.
Figure 6.11.
The spatial distribution of observed passengers’ time ashore at Hannah Point for individual ship visits.
Ship 4 (21 January 1994) (Figure 6.11a)

This landing involved 89 visitors (including staff) and encompassed a period of 135 minutes. The total number of visitor hours ashore was 92 hours and 25 minutes. The weather conditions during the visit included a light drizzle and a temperature of 3°C. Ship staff led passengers just inside Zone 3, but not through it as the gentoo chicks were creching (huddling together and not on individual nests). Entry into Zone 4 was not permitted by the ship's staff on account of the creching chicks.

Ship 5 (cruise 1) (22 January 1994) (Figure 6.11b)

This ship landed 18 passengers for 105 minutes, accumulating 48 hours and 55 minutes of visitor hours ashore. In contrast to Ship 4, passengers aboard Ship 5 spent the majority of their time (36%) in Zone 3. For the duration of the visit, temperatures were warmer than average, approximately 5°C, and there was no precipitation. The visitors followed the tour leaders or dispersed themselves quickly all over Hannah Point. One tour leader took them into Zone 4 to look for fossils. Visitors spent over two-thirds of their time in Zones 2a, 3, and 4, away from the landing site. Given the opportunity, these passengers spent more time in Zones 3 and 4 than passengers from other ships.

Ship 6 (26 January 1994) (Figure 6.11c)

The visitor hours ashore for Ship 6 were calculated to be 293 hours and 25 minutes. The 90 visitors were not instructed to stay in a particular area. Despite this, only a few ventured into Zone 4, 54% of passenger time was spent in Zone 1, and 24% in Zone 2b. The reason for the difference between passengers on this ship from those on Ship 5 (cruise 1), with respect to distance travelled, is unknown. It might just represent a simple variation among groups of visitors in their desire to walk around the site. One man climbed up the ridge and was brought down by the ship's horn and shouts from several leaders. Weather during this landing was better than for the other four visits because wind was minimal, both on- and off-shore, and there was no precipitation.

Ship 5 (cruise 2) (31 January 1994) (Figure 6.11d)

This group of 22 visitors (including staff) spent a total of 135 minutes ashore. The accumulated number of visitor hours was 60 hours and 55 minutes. The weather during this visit was cloudy and windy, causing the expedition leader to ask visitors not to wander far from the landing site. Despite this warning, visitors were led by staff to Zone 3 to look at the gentoo chicks. Passengers on both this ship's cruises did not spend any significant amount of time in Zone 2b (8% and 13% respectively; cf. Figures 6.11b and 6.11d). The majority of the visitors' time (36% in both cases) was spent in Zone 3, a point far from the landing site. This suggests that staff and visitors on this cruise placed a high value on exploring or venturing much further than usual from the point of landing.
Passengers aboard this ship spent approximately 105 minutes ashore at Hannah Point. The number of passengers ashore reported by the leader was 74 but the observer recording visitor movement counted 58. This difference, about one zodiac load, was probably an overestimate on the part of the leader. As the weather conditions were poor (rain, wind, and a temperature of about 3°C), it was likely that some visitors chose to stay on the ship. Supervision was minimal, visitors did not follow naturalists and so were not influenced by how far naturalists went. The site was extremely slippery owing to the mixture of rain and guano that coated the area. These conditions undoubtedly encouraged visitors to stay close to the landing area and the total number of visitor hours for these 58 passengers ashore at Hannah Point was 60 hours and 55 minutes. Only 9% of passenger time was spent in Zone 3 and no one ventured into Zone 4.

Three of these five visits (Ships 5, cruises 1 and 2, and Ship 6) exhibit different patterns from the 'average' for the whole dataset (Figure 6.10) that are statistically significant at a 99.9% confidence level. As a group, the ships differed significantly from each other at the 0.001 level. The amount of time spent in the various zones by both Ships 2 and 4 was not significantly different and followed the average pattern. The relevance of this information is that, though a pattern of visitor time spent ashore in each zone can be calculated and provides management with baseline planning information, the variation among the different cruises stresses the need to consider how on-site conditions and supervisory styles can alter the expected pattern.

Most striking is the overall pattern that visitors spent 44% of their time concentrated at the point of entry. What most affected the distance travelled and time ashore, was whether staff and naturalists encouraged or led visitors into particular areas and how the staff interpreted certain guidelines. Additionally, the influence of staff (that is, how well they controlled where passengers went) varied and depended, to some degree, on the group. Passengers aboard Ship 5's second cruise were told to stay close to the landing area due to the weather but they still managed to spend 36% of their time in Zone 3: the same length of time passengers aboard the first cruise spent in more pleasant weather. The diverse interpretation of the IAATO distance guideline was obvious in Zone 3, where Ship 4's staff prohibited the entry of passengers and Ship 5's staff (on both cruises) took passengers through it. Supervision and the attitude of the staff ultimately had a stronger impact on time and distance travelled on-site than weather and site conditions.

The implication for management is that if passengers spend a significant portion of their time ashore close to the landing site, it should be an area capable of accommodating many people with minimal disturbance to wildlife. Equally important is the influence of staff in interpreting how guidelines are to be followed.
6.3.2.4 Adherence to voluntary visitor guidelines

The reason for observing and recording guideline violations was to look for possible conditions contributing to these occurrences. Counting violations committed by passengers aboard each cruise and comparing these results among ships was not undertaken for several reasons. First, there would be severe methodological problems in measuring with any degree of accuracy, without surveillance cameras and/or an increased number of observers, how many violations were committed by passengers aboard each ship; thus, field-data collection conditions did not allow data collection at this level of detail.

Second, even if such a comparison was made, due to the nature of the observations — that the first five visits were observed remotely and the next six visits were observed at close range — the methodology for counting violations was not uniform. For example, the remote observer was sampling at five-minute intervals from a distance of approximately 2 km. Even with a photographic record of these five-minute intervals, distance from an animal could not be gauged reliably; for example, because the guidelines regarding the distance between a penguin and a visitor may have been contravened because the penguin came into the visitor's space prior to the sample being taken. It would also be difficult to know at such a distance whether a passenger was collecting an object or picking up a lens cap.

Third, there is nothing to be gained from reporting or rating the ships on the basis of how many guideline violations their visitors had committed on a particular cruise, as different groups of cruise passengers are likely to demonstrate a different range of behaviour. As data from Chapter 5 have shown (Section 5.6.1), with a change in visitor demographics, a change in the type of violations could also occur. Staff changes or weather conditions also influence the behaviour of visitors and, as different companies charter different ships, such information would have limited future value. Data from Chapter 5 have already established that violations occur and that these violations occur with varying frequency depending upon the passengers on each cruise. The ratio of staff to passengers, recommended as one staff member for every 20 to 25 passengers (ATCPs 1992d: np), also differs from ship to ship, as does the effectiveness of the staff. Supervising 100 visitors ashore, rather than 20, also presents different challenges.

Finally, one aim of this thesis is to determine why violations happen, not to quantify them or to assign their occurrence to particular ships. Data from Chapter 5 (Section 5.6) identify the most problematic violations. Counting them will not produce any useful data on how to prevent such problems. Therefore, the following section examines the conditions under which violations occur and why.

In Chapter 5, two types of passenger violation were discussed: inadvertent and deliberate. This type of violation differentiation can explain the underlying reasons or conditions for passenger behaviour.
At the root of this analysis are three elements: supervision, site conditions, and how they influence and interact with the visitor goals. First, the style of supervision provided on a cruise can range from strict discipline, with naturalists leading groups, to complete freedom, with passengers on their own at a site. Those supervising passengers ashore may give adequate information, inadequate information, inconsistent information, no information, or simply not be available.

Second, site conditions such as physical barriers or challenges to movement on the site (rocky, steep cliffs, ice/snow, slippery rocks), zoological boundaries (nesting birds, seal wallows), navigational considerations for the ships’ staff (the best/safest harbour), and weather conditions, can exaggerate existing difficulties and may affect adherence to guidelines.

The inter-relationship of these factors and visitors’ expectations/goals — photography, walking, souvenir collecting, pursuit of solitude and climbing — can create conflicts that undermine the good intentions of these voluntary guidelines. Further, the passengers’ lack of familiarity with a complex, wild habitat can contribute to inappropriate behaviour. One way to gauge familiarity is to examine how visitors use a site. For example, non-birdwatchers may just walk along without noticing the environments and behaviours of various bird species. They are not aware of the complexity of that part of the ecosystem or the importance of its components for its role within that system. The environment cannot be valued because little is known about its workings. If its value is unknown, then visitors may show little concern over how they affect it. This is one reason why it is useful to know what activities visitors are engaged in.

As Chapter 5 demonstrated, different variables affect the degree to which visitors may or may not follow guidelines. The following section investigates how different styles of supervision and site conditions can affect visitor behaviour and suggests ways to improve the adherence to guidelines.

A worthwhile comparison among the cruises — based on supervision, site conditions, and visitor behaviour — is useful for examining how these factors affect conditions under which problems occur. This information is collectively summarised in Table 6.3. The following descriptions provide more detailed information for this comparison.

*Ship 4 (cruise 1) (21 January 1994)*

As soon as passengers landed, they took out cameras and, all standing in a line, were observed photographing the wildlife (Figure 6.12). At this point, many maintained a distance of between 5 and 15 feet from penguins and one man, in an attempt to frame a photograph, almost trod on one of the birds.
Visitor activities were mainly confined to walking, and watching or photographing the wildlife. Steady light rain and the staff's suggestion that passengers not go into or past Zone 3 resulted in a high concentration of use in Zones 1 and 2b.

This ship's staff included a well-known ornithologist. Information on passenger nationalities was not available from the staff.

Ship 5 (cruise 1) (22 January 1994)

The small group size and quick dispersal upon landing reduced the amount of time and impact in Zone 1. Their activities — walking, sitting, animal watching, and photographing — were carried out in smaller groups (people in twos and threes) than the larger ships and more people had the opportunity for solitude at the site. As a result of the on-shore briefing, passengers were encouraged to walk through Zone 3 and into Zone 4 to look for fossils.

Approximately 41% of the visitors (7 out of 17) spent a total of 40 minutes walking from Zone 3 into Zone 4 to look for fossils. It is unlikely that these passengers were birdwatchers as they spent little time in Zone 2b (8%), where the blue-eyed shags were found, or near the cliffs in Zone 1, where southern giant petrels were nesting. One naturalist commented that people had seen too many penguins. A few people in this group did, however, sit down alone and photograph the wildlife. Although the elephant
seals were relatively active — roaring, belching, and biting their neighbours — visitors showed little interest in them. Thus the main focus of passengers seemed to be to walk and explore the site in general, and not to observe wildlife behaviour or look for different species.

The staff indicated that 13 passengers were Americans, four were German, and one was Australian.

*Ship 6 (26 January 1994)*

The staff ashore included several well-known photographers, ornithologists, and experienced guides. Groups of passengers followed staff/naturalists for a period of 30-40 minutes, and then a leaderless group of 19 passengers was observed walking widely across the hillside. The direct supervision applied during the early stage of the visit stopped after about the first 45 minutes.

Long walks were not as popular with this group. Only four passengers walked into Zone 4 but none got further than half way to the camp. One passenger climbed up a tall cliff along the ridge and was brought down by the ship's horn and shouts from staff. Normally, passengers were not encouraged to climb. The predominant activities were photography, and animal- and bird watching.

The expedition staff reported that passenger nationalities included: Japanese, German, British, American, Australian, Belgian, Swiss, and Mexican. Among them were nine amateur shortwave-radio operators who had made arrangements to stop at another island to make numerous transmissions.

One of the most interesting comments overheard by the author during the entire season, came from the ornithologist on this trip. Speaking to another staff member he said, "Let's see if the shags (Zone 2b) haven't been scared off." Obviously, while the IAATO/ATS position is that visitors should not disturb fauna, naturalists recognise that this is not always true.

*Ship 3 (28 January 1994)*

Due to harsh weather, rough seas, and wind, two groups of about 48 passengers were limited to 20 minutes ashore. Supervision was strict, as all visitors had been asked to remain in Zone 1. Visitor activities were extremely limited but interest was shown in seeing the nesting macaroni penguins.

Earlier that morning, when the team at Hannah Point talked to the ship by radio, staff had decided that they would not land passengers, but invited the research team aboard. The invitation was accepted. After about one hour, the weather conditions improved slightly and passengers were put ashore in small groups. Consequently, researchers were not able to observe the first part of this visit. Two of the team members, who had travelled down to Hannah Point aboard this ship, expressed the view that, after
seeing landings by other ships, this ship's supervision was good. This seems to be confirmed by data in Chapter 5 (Section 5.10.3): this ship had the lowest percentage of violations admitted and reported by passengers.

The majority of the passengers were German. One child, of about 6-7 years of age, also participated in the landing.

**Ship 5 (cruise 2) (31 January 1994)**

During this cruise, the weather was dry but windy and, as a consequence, the expedition leader asked passengers to stay in the landing area because they might have to leave quickly. This was later revised to "don't wander far".

The geologist/naturalist asked the team how best to go through Zone 3. This may have been a precautionary move, as a result of knowing about the group’s research, as this ship's chartering organisation had initially expressed some misgivings about that research. The team recommended that, since the penguins were no longer nesting, they go slowly on the path as the slope was becoming slippery with guano. The site conditions had deteriorated by this time and walking on the rocky inclines was more difficult.

The research team on Hannah Point was asked questions by passengers who wanted to know about the work. One man asked about the 'impact study' and was told that the research concerned the management of visitors in wilderness areas. Another tourist thought that so many should not visit and that limits could be ensured by charging higher prices. Tour companies would certainly prefer to charge higher prices but market competition forces them to do the opposite. Nevertheless, higher prices would not guarantee better behaviour or fewer visitors.

**Ship 2 (31 January 1994)**

Due to the rain, the guano-covered rocks were slippery and hazardous. One woman, concerned to keep her balance, was observed nearly walking into the elephant seal wallow at the top of the landing beach. She only noticed the seals when one juvenile male roared at her.

Visitor activities were limited to watching the penguins and seals, with several expressing interest in the petrels, sheathbills, and blue-eyed shags, but only after they had been pointed out by researchers.

The questionnaire results presented in Chapter 5 (Section 5.10.3) confirmed that Ship 2 was the worst offender against the voluntary guidelines in each of the categories, except in the case of distance where they were second. These results, based on the answers from passengers on a different cruise, seem to bear out that supervision/interpretation by staff aboard this ship was not a priority. Upon leaving, one woman thanked the team for 'humanising' the visit for her. The author's interpretation of this
remark is that she felt the team had made it more understandable to her than it was before (Section 6.4.2).

Two-thirds of the passengers were American and one-third were Australian.

**Ship 7 (7 February 1994)**

The 1993/94 season was Ship 7's first in the Antarctic. The landing beach it chose was in Zone 2b, and it was the only ship to use that location. This particular beach was narrower than the regular landing beach, but birds and seals surrounded it. Several elephant seals maintained an agitated, watchful position during the entire visit.

The difference between the visit from Ship 2, with its limited supervision, and the visit from this ship was striking. Ship 7's passengers, not only had poor supervision, but seemed to lack information about appropriate behaviour ashore or about the wildlife. A small group of South Americans were observed walking inside one of the remaining penguin colonies and scattering penguins to have their photograph taken. The remote observer overheard a radio message to the leader that a group of people, on the cliff, were about to be attacked by a nesting petrel whom they had disturbed.

Passengers indicated to the group that they had enjoyed their visit here and their enthusiasm was clear from their boisterous behaviour. The lack of experience by staff and the lack of control resulted in numerous distance violations, as well as a few situations that could have been harmful to both wildlife and visitors.

Passengers aboard this ship were German, Australian, Swiss, South American, Italian, and Greek.

**Ship 4 (cruise 2) (9 February 1994)**

As passengers landed they were briefed by a staff member, who explained to them what they would see and where they could go. This company's staff spent more time than others did taking groups to see various site highlights. Initially, a group of 40-50 passengers (over half the total) followed the expedition leader, who took them to see the elephant seal wallow at the top of the landing beach. Another group walked through Zone 2a into Zone 3 to see the largest elephant seal wallow. Supervision/interpretation was also provided for those who wished to view the petrels from a distance of about 20 feet. The team escorted visitors to look at macaroni penguins, which the visitors were eager to see. During this time, one researcher witnessed a passenger (a woman who said she was Portuguese) walk through a penguin colony, disrupting half a dozen or so birds. She did see the birds but was apparently unconcerned or unaware that she had disturbed them.

One visitor informed us that the Drake Passage crossing was rough and that not many lectures had been presented. As a consequence, many people asked us more questions about what species they were seeing. Passengers had been told by their tour
leader that the team was on Hannah Point. Passengers asked about the 'tourist impact study' and researchers explained that the interest was in wilderness management and not tourist impact *per se*. One of the bystanders was an NSF observer (put on the ship to check on the compliance by American citizens of US laws in Antarctica), who said he did not think 'impact' was a good choice of words but that he had had passengers make comments about his spying on them.

At least two-thirds of the passengers were American. The remainder were from Germany, Australia, France, Sweden, Britain, and Portugal. One 12-year-old accompanied his grandparents. The ship also carried an Australian film crew, who were filming a series called 'Talk to the Animals' and studying the impacts of tourism.

*Ship 8 (10 February 1994)*

The role of the staff/naturalists was simply to act as markers to keep passengers from straying too far from the landing area.

The actions of the passengers seemed to betray lack of information about appropriate behaviour ashore. It was noticed, for example, that one man walked toward a macaroni penguin on the landing beach and actually drove it from its nest in an attempt to photograph it. Two fur seals had hauled out in Zone 1 and, although visitors had been warned about staying a certain distance from them, passengers had no idea how these seals differed from the elephant seals. One of the fur seals was particularly unsettled by the close proximity of visitors and looked for an escape route over the cliff.

One woman, who had been on other Antarctic cruise ships, expressed her view that this group was undisciplined. Conversations with passengers revealed that many did not know what they were looking at and had little familiarity with appropriate behaviour. The author was surprised to learn that this was not the first landing of the cruise.

The majority of the passengers were German, Austrian, and Swiss with about 20-25 Americans.

*Ship 9 (11 February 1994) (Non-IAATO member)*

The team was concerned about the expertise and experience of one naturalist, who insisted that the Weddell seal sleeping some 8-10 feet away was a leopard seal.

Fifty-eight passengers came ashore quickly and, when all were landed, the expedition leader asked the team members to take a group around and explain things to them.

After discussions with passengers, team members expressed a wide range of opinions about whether the passengers had been briefed, so different were their levels of awareness. The trip was one of the least expensive trips available: one woman reported that the prices were from $3500 to $5000. The usually conspicuous camera equipment was not evident in this group. This may have been due to the windy weather or may have
reflected the different type of visitor aboard the ship. The behaviour was more observant — that is, people were more careful about where they walked — but the group did not seem well informed about the wildlife.

The ship's passengers were mostly American, with 20 or so Canadians, several Italians, and Swedes, and four New Zealanders.

*Ship 5 (cruise 3) (12 February 1994)*

Hannah Point was this group's first landing and passengers conveyed their enthusiasm for the site when we spoke to them. One researcher reported that it was during this trip that he saw, for the first time, a person just sit down and watch the wildlife. She was a Dutch woman who had travelled before on this ship.

Behaviour was much the same as on earlier cruises: visitors followed the leaders and had less difficulty with distance violations as fewer penguins were on the site.

Nationalities aboard included a group of ten Dutch people, some Americans, two Japanese, and two from Argentina.

### 6.3.2.5 Landings observed from aboard Ship 1

Some visitor behaviour ashore possibly improved due to the likelihood that Ships 4, 6, and possibly 5, had told their visitors of the team's presence. Because violations occurred nevertheless, other factors — such as physical and biological site conditions — may have aggravated behaviour problems.

However, the data was enriched by additional perspective of observing visitors ashore at other sites. The author travelled aboard Ship 1 for nearly three weeks and made six landings in South Georgia and the Antarctic Peninsula. Descriptions of these landings are given below.

*16 December 1994 (Briefing on ship)*

The ship's assistant expedition leader gave the passengers a briefing on the IAATO guidelines on 15 December. His actual demonstration and explanation of the guidelines were thorough and delivered in an amusing style that was popular with the passengers. It was mentioned that South Georgia was not in the Treaty area, and therefore not under the guidelines, but that similar guidelines would be followed. The NSF observer also had the opportunity to outline his responsibilities and explain that he was there to see that US law in the Antarctic was observed. He said the most frequent problems that he encountered were people dropping tissues, plastic bags, and film containers, or stumbling into something because they were looking at their feet instead of their surroundings.

The number of passengers ashore was limited to approximately 100, except where noted. It was not possible to make an exact count during these visits.
16 December 1993 (Grytviken, South Georgia)

All passengers (nearly 430) were put ashore at King Edward Point, where the British garrison is stationed. Visitors were briefed about the poor conditions of many old whaling buildings, advised to watch their footing, and asked to be alert to wildlife. Almost all of the group walked to the old whaling station at Grytviken and proceeded to the grave of the explorer Sir Ernest Shackleton. Along the way, female elephant seals and pups were lying on the beach and visitors often stepped over them.

Near Shackleton's grave, passengers had to walk down a well-worn path to reach the cemetery. Their way was blocked by juvenile and sub-adult elephant seals but passengers merely walked around them (Figure 6.13). One woman was warned that she was dangerously close and that she could be bitten. Her response was, "Oh, I don't think they bite". Other similar warnings went unheeded by visitors. The NSF observer witnessed many such occurrences but said nothing to the passengers.

One crew member was observed poking a seal, others were seen smoking and eating ashore, and some were also observed antagonising a seal for a photograph. When the expedition leader was questioned about this he said that the crew had not yet been briefed.

None of the four researchers on the ship witnessed any supervision at all during the morning landing. One of the staff/naturalists, who was also a professional

Figure 6.13. Visitors walking close to elephant seals on South Georgia.
photographer, approached within five feet of seals and birds while taking pictures. Many visitors simply followed his example.

An afternoon hike up a cliff was organised to view some sooty albatross (*Phoebetria fusca*) on their nests. One of the birdwatchers wondered aloud if there were too many people there and if the birds were disturbed.

During a post-landing briefing with the passengers aboard the ship, the assistant expedition leader reiterated the code of conduct and warned that on tomorrow's landing fur seals with their pups would be around and to take care not to walk between the two.

18 December 1993 (Salisbury Plain, South Georgia)

As the name suggests, this landing site was a long beach extending back into a low, flat plain. King penguins (*Aptenodytes patagonicus*) were gathered in large numbers along some parts of the beach, but there was still abundant space around them that should have provided the opportunity for visitors to orient themselves and prepare their cameras and video gear for use without worrying about bumping into or disturbing any wildlife. The first zodiac set down approximately 30 feet from a severely injured Weddell seal, and proceeded to unload its passengers. These passengers removed their lifejackets and assembled to wash their boots (to avoid spreading exotic plants) about 15 feet from the injured animal. The photograph (Figure 6.14) shows that the injury is obvious and grave, but for another 20 minutes zodiacs continued to land passengers nearby. The author approached the animal at 20-25 feet and drew a large circle around it to stress the need to maintain a distance. One American professor walked over to a penguin carcass and imitated the author's action by drawing a small circle around it. When he finished, he looked up and laughed: "I'm doing this so he won't bite." Farther down the beach a leopard seal similarly injured was being videotaped at close range, the visitors again ignoring the animal's situation. One ornithologist approached this injured leopard seal and told passengers that the animal would not harm them. He stood 10 feet away and allowed passengers to get between it and the water to video the animal at close range (Figure 6.15).

During this visit, passengers completely disregarded all recommended behaviour and were encouraged to do so by the example set by some of the naturalists. The expedition leader stood next to a fur seal to have his picture taken (Figure 6.16) while the animal raised itself on its back flippers and growled.

Visitors to the large penguin colony farther inland were warned to stay out of certain areas by staff/naturalists and the researchers. Frequently the requests were ignored.
Figure 6.14. Visitors disembarking in front of an injured Weddell seal, South Georgia.

Figure 6.15. Visitors videotaping an injured leopard seal, South Georgia.
Figure 6.16. An expedition leader being photographed next to a fur seal, South Georgia.

18 December 1993 (Albatross Island, South Georgia)

Conditions at this site were different from those on Salisbury Plain. A small beach was immediately met by a steep, narrow, rocky path that led to more albatross nests. Below, and on one side of the path, was a fur seal colony full of breeding seals and pups; on the other side was a rocky slope. Visitors climbed up the cliff, using the tussock grass to steady themselves. Nearly all passengers made the landing (in groups of 100) despite being warned of the difficult conditions. Visitors were carefully supervised by staff, who were posted at various points along the path and near the nesting birds. Observance of the guidelines at this site was good.

20 December 1993 (Coronation Island, South Orkney Islands)

Prior to this landing, the IAATO guidelines were discussed and it was pointed out that the ship would be in the Antarctic Treaty area. Again the explanations were clear and well received.

The physical conditions of this landing beach were similar to those at Hannah Point. Passengers climbed up an old raised beach to see nesting Adélie penguins (*Pygoscelis adélie*). Prior to passengers landing, staff had decided what areas would be the safest. This meant that staff/naturalists had been posted at various points, which gave them better opportunities for interpretation and supervision. The ornithologist was overheard telling passengers that 15 feet really meant three feet.
20 December 1993 (Half Moon Beach, Nelson Island, South Shetland Islands)

This afternoon landing was the last one before the team was dropped off on Cuverville Island. The supervisory method had improved and now the staff/naturalists were being stationed at various points on the site. The site itself was similar to the one described above, having a wide beach and rocky hills further inland.

6.4 DISCUSSION

6.4.1 What do 'where and how long' mean?

The most important aspect of the data presented concerning visitor time ashore, where and how it was spent, is as an indicator of where use is most heavy, and what activities are popular in the area. This is not a measure of carrying capacity, it does not tell us how much use an area can absorb without detrimental changes, but that some areas experience a greater percentage of use and type of use, i.e. landing areas have a greater level of zodiac disturbance, localised water pollution, visitor noise, and potential for adverse human/wildlife interaction. This also informs managers where they can expect the most change and indicates where managers should be focusing their strategies to prevent or correct changes from excessive or inappropriate use. This can be considered at the macro scale (all of the Peninsula) or at the micro scale (certain areas of Hannah Point). For example, if population biologists decided that Hannah Point was a critical macaroni nesting site, then it might be reasonable to declare it off limits to outside disturbance. Or, if biologists/management decided that overall disturbance at sites must be reduced, then knowing that 44% of the time spent at Hannah Point was on a landing beach rich in wildlife, managers might set limits on the number of landings acceptable (if any) or establish whether alternative landing areas exist.

The motivations of passengers are also revealed by the amount of time spent in the different zones, when considered in conjunction with the type of supervision/interpretation available. For example, for both cruises aboard Ship 5, passengers spent comparatively less time in Zone 2b, where nesting blue-eyed shags and pintado petrels could be viewed. This was a much more popular area for Ships 4 and 6, both of which had well-known ornithologists, who could impart information about these birds to visitors.

Site conditions played their role too. Staff/naturalists, concerned about the weather, discouraged visitors from straying too far from the landing area, which meant that Ship 2's passengers (who had no specific ornithologist) spent less time in Zone 2b. The author observed that few visitors expressed any knowledge about or interest in birds other than penguins.

This raises another issue, that of 'attraction' species. One of the reasons that expedition leaders choose a landing site is that it has one of several key attractions: that
is, a particular species of bird, seal, or a landscape that forms part of a list often posted on a ship's bulletin board. These lists form a kind of memory hook upon which each site can be placed and remembered. What can happen, however, is that visitor participation drops when nothing new is available to see or put on a list. A variation on this theme was expressed by one man in his thirties, who said he thought "one hour ashore is about enough". The novelty is an important part of the experience and suggests that there can be a large element of superficiality in the visits.

Interpretation can be the means of deepening the experience. In parks, it is the interpreter's role to explain the values and help the visitor to understand what activities are appropriate (Aldridge 1974: 301). Further, the nature interpreter is there to unravel the many layers of meaning and relationships among the members of the ecological community (Regnier et al. 1992: 1-6). In this way, visitors to a wilderness such as Antarctica may be able to appreciate more than the temporary entertainment value of a few species. Currently, ship naturalists do not receive training to develop their interpretative skills. Not only would such training develop these skills, but it could also lead to greater standardisation of the way guidelines are interpreted and of the underlying message guiding the visitor management philosophy.

6.4.2 The 'why' of behaviour

These thoughts lead to the 'why' of behaviour; what were the conditions that allowed inadvertent or deliberate guideline violations? As noted in Table 6.3 and Section 6.3.2.4, two areas influence visitor behaviour: the supervisory style and, to a lesser extent, the site conditions (physical, biological, and weather). The question of how visitor behaviour was or was not influenced by the team's presence is illustrated by the random pattern of this knowledge and good or bad behaviour. For example, several instances of guideline violations by passengers from Ships 5 (cruise 2) and 6, who had been warned of the team's presence, were noted. By contrast, Ship 3's passengers, unaware that they were being observed, behaved well. The effect of the team's presence on passenger behaviour seemed to be slight and, although there may have been greater adherence to guidelines at the beginning of the visit, it is doubtful that passengers sustained awareness of the team throughout their time ashore.

More important were the supervisory styles. Based on that data, the following conclusions can be drawn:

1. Passengers who were accompanied by naturalist leaders in small groups gained more knowledge about the site and did not often violate guidelines. This was exemplified by Ship 4's two cruises and Ship 5's three cruises, all of which offered naturalist-led walks. The time visitors spent in the zones outside the
landing area (Zones 2a, 3, and 4) was consequently greater than for Ships 2 and 6 (Figures 6.11a-e and Table 6.3).

There were also no significant violations by visitors from Ship 9, because the researchers led people around the site in small groups. Ship 3's staff kept visitors in small groups within the landing site.

On-shore briefings were also conducted for these cruises and helped to clarify the behavioural guidelines.

2. Passengers on Ship 6 received onshore briefings but little direct supervision and/or interpretation. After 45 minutes, naturalist-led walks ceased and more problems with distance violations were noted with this group than with those aboard Ships 4, 5, and 9 (cf. Table 6.3). These passengers also spent the most time in Zone 1 — 54%, more than any other group (cf. Figure 6.11e), suggesting that without the encouragement of ship staff/naturalists, they were less inclined to go far from the landing area. The weather was favourable, further supporting this hypothesis.

3. Passengers who received no on-shore briefing and no direct supervision or interpretation (Ships 2, 7, and 8) (cf. Table 6.3) had the most difficulty with guideline adherence and were observed committing distance violations, collecting, and eating ashore. Three staff/naturalists from Ship 8 were posted as boundary markers and could only offer interpretation when passengers sought them out.

4. Several instances of staff/naturalists setting a bad example for passengers by walking on plants (Ship 4, cruise 1) and photographing animals at close range (Ships 6 and 7) were also observed (cf. Table 6.3) (note also Ship 1's visits, described in 6.3.2.5).

For passengers, photography was a factor that commonly played a role in distance violations. In Chapter 5, 11% of the passengers said they would be tempted to harass a seal to obtain a photograph (cf. Figure 5.18), indicating that the importance some visitors placed on photography exceeded any concern for the animal. Photography and film/making also played an important motivational role for 27% of the visitors (cf. Figure 5.8). This is not surprising, as many reserve or wilderness managers will acknowledge the difficulties of controlling photographers (Carlson, personal communication, 1993; Nielsen, personal communication, 1993).
Site conditions also contributed to difficulties ashore. If the ground conditions were slippery, passengers inadvertently found themselves too close to wildlife because they spent more time watching their footing than their surroundings.

Other site conditions, such as the developing gentoo chicks in Zone 3, revealed various interpretations of the distance violations. Ships 5 and 6 allowed visitors into Zone 4, whereas Ship 4 did not (cf. Table 6.3a). Allowing visitors to walk or not walk on the algae-covered slope is another example of the range of guideline interpretations.

More importantly, while behaviour was not necessarily a problem in Zone 1, the area was more crowded with visitors who had the potential to disturb or who may have disturbed the surrounding wildlife. Ship 5, with the smallest number of passengers ashore, spent relatively less time at the landing site as they required less organisation. The initial findings of one study (Nimon et al. 1995: 415) suggested that quick approaches by visitors to up to 1 m from the nest of gentoo penguins could increase a normal resting heart rate by 45-110%. The stress levels of nesting penguins on such a landing beach is unknown, but information such as that provided by Figure 6.10 emphasises the need to apply preventive management strategies were possible.

The relationship between the site conditions and supervisory styles was illustrated well by Ship 1’s visits (Section 6.3.2.5). Even in the open areas with little wildlife directly in front of the landing area, poor supervision caused guideline problems. The benefit of tighter supervision and of doing pre-landing reconnaissance (the visit to Half Moon Island by Ship 1) was obvious from the relatively few problems noted. The landing of a large number of passengers on Albatross Island (Section 6.3.2.5) was also successful under the stricter supervisory conditions implemented by staff.

Supervision ashore must be conspicuous, constant, and adaptable to the range of conditions at the landing site. The author was present during the IAATO behaviour briefings on Ship 1 and noted that, although they were thorough and well explained, some of the most thoughtless behaviour exhibited by visitors was committed by those aboard this ship. In this case, putting a large number of people ashore, with few staff, weak supervision, and wildlife immediately present upon landing, all contributed to a deterioration of appropriate conduct. This is where the combination of good supervision and suitable landing sites is important. Disembarking passengers directly in front of wildlife presents potential problems.

Large numbers of passengers without adequate supervision compound site-specific conditions. These large numbers of people may also be tied to their urban mindset. It is difficult to leave the group mentality behind. The way visitors behave ashore reflects this thinking. Almost immediately upon leaving the zodiacs, passengers took out their cameras and video recorders and began to document everything (Figures 6.13 and 6.17). This can cause inadvertent violations of the kind described earlier (Figure 6.15). Passengers were so eager to wash their boots, get their camera...
gear, and see the king penguins that they were not alert to what was going on around them. This is why staff/interpreters are needed to help visitors make the transition from their urban world to this natural one.

One of the naturalists aboard Ship 1 explained it as "urban people needing to cross bridges". She thought a new strategy was necessary. She suggested that naturalists take people as a group and work with them about what they see, deepening the experience and making it more interactive. Her concern about the large ships was that visitors could lose the impact of Antarctica with so many people around. Ship 5's staff usually used this form of supervision — naturalist-led groups. This enabled naturalists to build rapport with visitors and influence their behaviour by giving them more information about what they were seeing.

Experimental studies by Cialdini et al. (1981, in Pearce 1988: 151) found that people's attitudes are formed on the basis of direct experience. Thus, how the staff behaves is crucial in determining the outcome of visitor behaviour. A professional photographer moving too close for a photograph is understandable (Ship 6, Table 6.3a), though not acceptable. An expedition leader standing next to a fur seal to have his picture taken conveys a message that is both unacceptable and dangerous, and cannot help but erode good behaviour (Figure 6.16).

Figure 6.17. Visitors photograph their surroundings immediately after landing at Hannah Point.
Inconsistent interpretation of other guideline recommendations can also cause lack of compliance. If staff are unsure how to recognise a moss or lichen, or whether walking on algae is forbidden, it is not reasonable to expect visitors to follow this guideline (Chapter 5 and Table 6.3). More importantly, the 'why' of these guidelines is often not clear. To compound that problem with a general lack of supervision of passengers ashore means that the only guidelines followed are those remembered by individual passengers. This is where a training programme covering a set of specific topics could improve behaviour.

The deliberate act of informing passengers that "15 feet really means three feet" as reported in the narrative about Ship 1 (Section 6.3.2.5) may either be characteristic of an individual or have the broader implication that, away from on-site supervision, ship staff are more liberal in applying the guidelines.

The results in Chapter 5 (Figures 5.15 and 5.16) concerning behaviour, and the direct observations presented in this chapter, cannot be measured on any quantitative scale. Their commonalities, however, support the suggestion that given a range of site conditions and supervisory styles, a significant number of violations of IAATO's voluntary visitor guidelines occur. These do not occur as a result of malicious intent (even counting some of the thoughtless behaviour by those passengers on Ship 1), but because visitors are approaching the wilderness without much real knowledge about the natural world, as demonstrated by the examples in the previous section. For example, have 33% of the visitors really found themselves inside a penguin colony (Figure 5.15) or do many of them think that their experiences with penguins, scattered on the hillside or on a beach, fall into this category? Staff do not clarify this for them and the purpose of the guidelines is unclear. Should visitors stay 20 feet from all penguins or from all penguins in colonies? Nowhere is the reasoning explained, and it is this information that visitors need, not just a series of forbidden behaviours. Pearce (1988: 142) argued, in the context of the Lake District National Park (England), that signs and pamphlets are not enough to change the existing attitudes because they do not add to the information needed to change visitor behaviour.

Furthermore, the philosophy behind the guidelines, and ultimately the management plan, must be addressed. If the philosophy is anthropocentric, then conditions or situations are manipulated for human benefit. All sites become acceptable for human visitation because that is an important activity. Guidelines motivated by an ecocentric philosophy would put the interests of fauna and flora before human concerns. This also highlights the difficulty naturalists have in interpreting these guidelines when they operate from different philosophical points of view. The naturalist allowing passengers to videotape an injured seal (Section 6.3.2.5) did not believe he was directly harming the animal (his intent was not malicious); he was just giving visitors 'an unusual opportunity' to pursue their object-orientated goal (obtaining a close-up photograph).
Observation revealed only one instance of collecting by a passenger (Ship 8, Table 6.3b), although results from the questionnaire (Figure 5.16) suggest that this activity was more common than was observed (15% of the passengers saw someone else collecting). Visitors should have the opportunity to handle and see bones, rocks, egg shells, and preserved plant specimens, and to be told about their value. If the ships are to serve as visitor centres for learning about the Antarctic, then a small licensed collection (the Treaty does allow specimen removal for scientific purposes) for the use of naturalists could be encouraged. Removing an artefact from an historic hut, taking a fossil, collecting a plant, or a viable egg should certainly be discouraged and the reasons explained.

The nationalities of passengers must influence their behaviour ashore, as the meaning of wilderness and the character of humankind/nature relationships can vary. This is not to stereotype people or to make racial prejudices but to recognise that culture and upbringing can determine the degree of anthropocentrism present in one's attitude about nature. Research into affecting attitudinal change revealed that the speakers were important and most successful when they were demographically similar to the receivers (Pearce 1988: 153). For international groups, this means that cultural gaps are likely to be bridged by interpreters with the same background. It must also be recognised that staff members enforcing guidelines will also differ in how they interpret certain recommendations. The comment from the ornithologist aboard Ship 6, acknowledging that visitors can frighten away birds, indicated that at least some staff recognise that visitors have an impact, though it is rare to hear them admit it openly.

These criticisms of supervision, however, do not address the real problem — that it is a superficial and anthropocentric approach to regulating visitor behaviour. It does not help people to cross the bridge between urban areas and wilderness. Supervision is concerned with policing visitors' behaviour, not with educating people in appropriate behaviour. Osherenko (1992: 282) noted that the alienation of modern "urbanites from the cycle of nature" has created confusion about our relationship with her.

The problems discussed here are all signs of the difficulty of crossing that bridge. The need to use recognisable boundaries, whether lifejackets placed in front of elephant seals or drawing a circle around an injured Weddell seal, indicates that visitors and staff are not cognisant of the natural boundaries that exist. Visitors have missed the point when they want Antarctica to be humanised (unless that means given value). It suggests humans are still thinking about how to use nature.

The guidelines are superficial. They cannot adequately protect a continent or teach visitors the value of wilderness. The guidelines were designed by an industry that was responding to criticisms about its operations, in a way that is consistent with the dominant world view of nature — as a commodity to be used to fulfil human needs. This has not protected wild areas in the past and will not do so in the future.
6.5 CONCLUSIONS

Proper behaviour is a product of a combination of factors: visitors' ethics are shaped by the leadership they receive on their cruise, the quality of the on-shore briefing that orientates them in the natural environment, the degree of supervision and quality of interpretation, the size of the group relative to the type of supervision/interpretation, and the physical site conditions that can exacerbate existing control problems.

The most successful on-shore ship operations are those that provide naturalists rather than supervisors. This type of leadership is more flexible and responsive to changing site conditions, weather, and (importantly) the level of visitor awareness. With interpretation, visitors can enjoy a greater degree of freedom because they will have gained an understanding of appropriate behaviour.
CHAPTER 7

BEYOND GUIDELINES: MANAGEMENT MODELS FOR ANTARCTIC TOURISM

7.1 THE PLANNING CHALLENGE: OPERATORS AND REGULATORS

Thematically Antarctic visitation has been scrutinised from the perspective of managing visitors in a wilderness rather than from that of purely managing tourists. Tourism is concerned with the recreation of leisure society (Pearce 1982: 3); wilderness management focuses on limiting humankind's influence on wild nature.

The issue addressed in this thesis is not — or not only — how to develop a sustainable 'tourist' industry in Antarctica but whether we can escape this dominant nature/humankind paradigm and encourage visitation based on ecocentric precepts.

Guidelines are not an evaluative process born of a wilderness management philosophy. As such, they lack the capacity to deal with values from which consistent protective planning can emanate. The aim of this chapter is to evaluate several management models within the criteria of an ecocentric management position. This position is favoured over the dominant anthropocentric paradigm. The historical reviews contained in Chapters 2 and 3, and the Antarctic visitor data in Chapters 5 and 6, have demonstrated the challenges to conservation this paradigm has generated.

The planning challenge arises from the players within this dominant model: the Antarctic tourism industry and the regulators. These must be considered when creating both a theoretical and a practical visitor management framework.

7.1.1 The Antarctic tourism industry

Currently, most of the tour operators in Antarctica are members of IAATO and as such have devised and enforced their own code of behaviour. They have promised not to land more than 100 individuals ashore at any time or carry more than 400 passengers per trip (IAATO 1993). This is not always done, as the data in Chapter 6 demonstrate. The problem is not that on a few occasions ships will land more passengers ashore than they are supposed to, nor that non-IAATO members may not abide by the same code of conduct, nor even that some ships' naturalists will break a rule, but that the ships are operating essentially under a conflict of interest. The tour companies are businesses, they are not public-sector conservation groups. They may have an interest in keeping the product pristine but their first loyalty is to their customers and their continued business.
Boo (1990: xviii) concluded that, with a few exceptions, tour operators do not make "significant contributions to conservation of natural areas to which they offer tours". The management of Galápagos Islands tourism is not the responsibility of those who come to visit. (In the absence of a single governing body, the Antarctic Treaty Parties through the ATCM are the responsible organisation in Antarctica.) Despite the problems described in Chapter 3, the creation of special zones and the appointment of accredited guides in the Galápagos have prevented much potential damage. In Madagascar, a recent news article focused on the hope that ecotourism could replace mining as a factor in that country's economic development (Nuttall 1995: 7). To facilitate that development, tourist infrastructures have been suggested that would expand the economic opportunities of ecotourism to the local population (Stephenson 1993: 264).

The business of tourism is about providing leisure and recreation services for consumers whose motivations, expectations, and cultural backgrounds may differ significantly, one from the other. Tourism's main emphasis must necessarily be on supplying these services, and not on developing a conservation programme for wilderness areas.

The role of tour companies and the degree to which they give shape to tourism in Antarctica depends very much on the influence regulators allow them to have. For the moment, passengers are largely content with zodiac rides, short walks on land, and animal watching but, with more widespread use of helicopters and the availability of cheap ships in the form of Soviet icebreakers, new activities are developing. The most recent prospect appears to be a tourist camp and it will probably be a reality in the 1995/96 season.

Findings in Chapter 5 indicate that some visitors might indeed be interested in an airport (12%), overnight huts (15%), rest facilities (20%), and a visitor centre (24%). Although tour operators registered in countries participating in the ATS may be required to obtain a permit for their activities, there is nothing prohibiting a company which operates outside it from setting up land-based operations. Furthermore, there are no enforcement provisions to prevent or stop them from engaging in such activities.

Arguments against this type of development are based on what a variety of 'experts' today believe is most likely to happen. Predictions of course are dependent upon economic, political, and logistic factors that are largely unknown. If someone had speculated that the former Soviet Union would break up, and that one repercussion would be a new fleet of Antarctic tour vessels, no one would have thought that likely.

Predictions are the subject of at least one current research project. Bauer (1994: 411) conducted a survey among a group of experts in order to assess the possible course of Antarctic tourism. His initial findings were that over 60% of them believed ship-based tourism would predominate, with possible 'products' such as skiing, ballooning, mountaineering, climbing, walking, and sailing enlarging the current list. It was also
correctly predicted that overflights would return (cf. Section 4.2.3). Finally, Bauer (ibid.) reported that:

A number of panelists stated that the establishment of land-based tourism infrastructure would impact on wildlife and wilderness values in Antarctica.

This version of future Antarctic tourism depends heavily on the lack of any significant change in the economic and/or political arena. Even 'nature tourism' requires an infrastructure that brings with it further development — airports, lodgings, and communication (Boo 1990: 13). Models of mainstream tourist development, such as Butler's (1980, in Pearce 1982: 19), noted an exploratory phase or pioneer stage in development (Miossec 1976, in Pearce 1982: 17), where only an interested few visit a particular location. The nature tourists, who initially come for the remoteness and lack of tourist facilities to 'see it before it is too late', can become a marginal part of the market and be replaced by those seeking a new place, a seventh continent (see Section 3.2.4, Figure 3.1). By virtue of their interest, they focus attention on new areas for the travel industry. These visitors may have a very different regard or even lack concern for the area's protection.

Developing tourism in natural areas depends on an economic argument that currently values the land more for this use than for mining or other industrial uses. The risk is that the value of a natural area is measured not for its intrinsic features, but for what it can generate in the way of direct financial revenues. The essence of the ecocentric management philosophy argument is that nature and its components do not have to be useful to humans to be valuable (Chapters 2 and 3). The valuation of nature has undergone a tremendous change — even during the short period since the ratification of the Antarctic Treaty, and particularly since the adoption of the Environmental Protocol. One only needs to read the part of the early Lindblad brochure (Section 4.2.2) that speculates about development in Antarctica to realise how differently it could have progressed had opportunity, economics, and logistics been different.

In the Australian and New Zealand sub-Antarctic islands, the wilderness has been regarded as a saleable quality and has attracted the interest of tourist developers (Hall and Wouters 1994: 365). Tourism authors Hall and Wouters (ibid.: 369) make clear their position:

Given that ecology alone is not sufficient to give wilderness value, tourism provides a useful economic argument to ensure that the Sub-Antarctic islands are preserved in their relatively pristine state for future generations.

If tourism is allowed to continue in Antarctica, then those wishing to preserve the Antarctic ecosystem will have to protect it against those who argue that its value lies in its economic utility to humankind.
7.1.2 The regulators

The greatest constraint on developing a visitor management plan emanates from the ATCPs. The requirement for consensus, the international character of the Parties, the lack of a Secretariat and full-time staff, and the relatively slow-moving procedural steps for agreeing upon additions or changes to current policy, all contribute to slow action. Even under usual circumstances, i.e. a single political mandate, national parks or reserves have to go through a lengthy planning process to formulate a suitable plan.

The long discussions about tourism and its management highlight the difficulty in agreement among the ATCPs (Sections 4.3.2 and 4.3.3). Non-binding Recommendations have been adopted that urge that more consideration should be given to establishing conservation principles for managing tourist operations (Recommendation 16, ATCPs 1992c: 7) and for the support of research on tourist impacts (Recommendation 17, ibid.) (Section 4.3.2). The most recent, Recommendation XVIII-1 (Kyoto), is an elaborated version of the existing voluntary visitor guidelines (Appendix C). These documents represent the current thinking and agreement on the steps needed to manage Antarctic tourism and suggest that the ATCPs are not ready for any major changes to the existing regime. Because agreement to any proposal is by consensus, and countries differ on whether they wish to promote or restrict tourism (Argentina and Chile are eager to promote tourism, whereas other countries, such as France and the UK, are interested in more restrictive measures), the only acceptable measures will be the least restrictive ones. What may be possible is the introduction through existing channels (IUCN/SCAR) of one or two 'comfortable concepts' (Section 4.1.4) that will form the basis of a future visitor management plan.

7.2 APPLYING THE MODELS

The purpose of this section is to examine three visitor management models and two existing sub-Antarctic management plans for their effectiveness and suitability as a means to manage Antarctic visitation (Table 7.1). This analysis will also expose missing information, and conclude what steps would be needed to effect a practical plan. The models have already been discussed in Chapter 3.

Visitor management planning is only a part of an overall management plan for a wilderness area. In this respect, it must fit into and be directed by the plan's framework which, in Antarctica, is derived from the Treaty and related documents (Chapter 4). The most important elements of such a plan are the goals and objectives, as they are the criteria against which everything else is judged.

Hendee et al.'s (1990a) seminal work on wilderness management provides the fundamental principles. They are set out in Table 7.2 in conjunction with the general plan format outlined in Table 7.3.
<table>
<thead>
<tr>
<th><strong>Management model</strong></th>
<th><strong>Basic purpose</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>Carrying capacity</td>
<td>To identify a number of visitors permitted at a site (cf. Figure 3.1).</td>
</tr>
<tr>
<td>Visitor Impact Management</td>
<td>To provide preventive or corrective strategies for visitors in natural areas (cf. Figure 3.3).</td>
</tr>
<tr>
<td>Limits of Acceptable Change — Recreational Opportunity Spectrum</td>
<td>To define the amount of change acceptable in natural areas using a spectrum of conditions as the standards (cf. Figure 3.4).</td>
</tr>
<tr>
<td>Gough Island</td>
<td>To conserve the indigenous flora and fauna in as natural a state as possible.</td>
</tr>
<tr>
<td>Macquarie Island</td>
<td>To protect and manage the reserve as a natural habitat for indigenous flora and fauna.</td>
</tr>
</tbody>
</table>

Table 7.1. A summary of visitor management models.

Table 7.3 consists of an outline and explanation of an overall wilderness management plan, together with pertinent Antarctic documents that could be used as the basis for writing such a plan. It is provided so that the visitor management models can be viewed within a comprehensive context.

Several planning terminology definitions are useful. These are drawn from the main reference work on wilderness management planning by Hendee and von Koch (1990: 200-201).

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>To manage wilderness as one extreme on the environmental modification spectrum.</td>
</tr>
<tr>
<td>2.</td>
<td>To manage wilderness as a composite resource, not separate parts.</td>
</tr>
<tr>
<td>3.</td>
<td>To manage wilderness and sites within, under a non-degradation concept.</td>
</tr>
<tr>
<td>4.</td>
<td>To manage human influences, a key to wilderness protection.</td>
</tr>
<tr>
<td>5.</td>
<td>To favour wilderness-dependent activities.</td>
</tr>
<tr>
<td>6.</td>
<td>To guide management with written plans that state objectives for specific areas.</td>
</tr>
<tr>
<td>7.</td>
<td>To set carrying capacities as necessary to prevent unnatural change.</td>
</tr>
<tr>
<td>8.</td>
<td>To focus management on threatened sites and damaging activities.</td>
</tr>
<tr>
<td>9.</td>
<td>To apply only the minimum regulations or tools necessary to achieve wilderness area objectives.</td>
</tr>
<tr>
<td>10.</td>
<td>To involve the public as a key to the acceptance and success of wilderness management.</td>
</tr>
<tr>
<td>11.</td>
<td>To monitor wilderness conditions and experience opportunities as a key to long-term wilderness management.</td>
</tr>
<tr>
<td>12.</td>
<td>To manage wilderness in coordination with management of adjacent lands.</td>
</tr>
</tbody>
</table>

Table 7.2. Principles of wilderness management (based on Hendee (1990: 181)).
<table>
<thead>
<tr>
<th>Plan framework and content</th>
<th>Sections pertinent to Antarctica</th>
</tr>
</thead>
<tbody>
<tr>
<td>I. INTRODUCTION</td>
<td></td>
</tr>
<tr>
<td>Description of area, purpose, and organisation of plan.</td>
<td>Area description could be drawn from literature.</td>
</tr>
<tr>
<td>Overview/summary of current conditions affecting management, such as use levels and patterns, special situations, and general management strategy.</td>
<td>No existing summary. Material available in academic writing on use levels and trends. The general management strategy is embodied in the preamble to the Treaty and Protocol, and is best described as what is prohibited — no military activities.</td>
</tr>
<tr>
<td>II. OVERALL GOALS FOR MANAGEMENT AREA</td>
<td>ANTIARCTIC TREATY</td>
</tr>
</tbody>
</table>
| State desired conditions for all aspects of wilderness. | 1. International harmony  
2. Scientific investigations  
3. Peaceful purposes |
| | ENVIRONMENTAL PROTOCOL |
| | 1. Antarctica as natural reserve, devoted to peace and science  
2. Wilderness and aesthetic values  
3. Scientific value — understanding global change  
4. Activities conducted to limit impacts on environment and ecosystems |
| III. OBJECTIVES FOR MANAGEMENT OF WILDERNESS ELEMENTS | |
| State specific objectives for each element within the system. | This is missing from Antarctic policy. No stated objective for tourism — including opportunities to be provided and the level of service. |
| A. Current situation  
   Summary of trends, conditions, and assumptions pertinent to each objective. | Visitor management plan fits here. |
| B. Assumptions  
   Judgements about future trends, pressures, and problems pertinent to each objective. | |
| C. Management policies  
   Guiding policies that — considering current situations and assumptions about the future — are necessary to direct actions toward established objectives. | |

Table 7.3. Wilderness plan framework vis-à-vis current Antarctic planning (based on Hendee and von Koch (1990: 203)).
Objectives are statements of specific conditions to be achieved — reference points, which if attained, will assure progress in the direction of established goals.

Goals are general portraits of ideal ends or effects. They limit the range of potential objectives by providing direction and purpose. Goals are often lofty statements of intent.

Objectives are distinct from goals as they should be attainable in the short term and are more specific than the latter.

Standards serve as performance criteria, indicating acceptable norms or specifications defining desired conditions of achievement.

To facilitate the application of the following visitor management models, certain assumptions are necessary for visitor planning in Antarctica:

1. a written management plan that guides the visitor management plan;
2. written objectives of visitor management that serve the overall goal of being a "natural reserve, devoted to peace and science" and acknowledge that Antarctica's values include "wilderness and aesthetic values" (SCAR 1993: 256);
3. visitation in designated tourist areas and no new areas to be open to visitors without the conditions having been inventoried;
4. prohibition of visitor facilities outside those already provided at research stations;
5. a management committee whose responsibility it is to collect information on conditions at each authorised site and make that information available to all parties; and
6. funds to be available for administration and administrative costs through agreed sources, such as increased appropriation of funds by ATPs and some contribution from the operators.

7.2.1 Carrying capacity

The notion of carrying capacity is popular in Antarctic tourism literature. In the sub-Antarctic, carrying capacity has been fixed by establishing quotas for the maximum ship size (180) and maximum number of tourists (600) per visitor site per season (Sanson 1994: 351). These limits, it was reported, "enabled a quality tourist experience that appears sustainable without longer-term detrimental effect to the islands" (ibid.: 352).

The popularity of carrying capacity is embodied in the IAATO charter. Ships are encouraged to contact each other so that "shore visits can be planned without encountering other ships, or overburdening the carrying capacity of a single site" (ATCPs 1994e: 2). The pledge that members take no more than 100 individuals ashore at one time has already been mentioned. The reliance on carrying capacity does not take into
account that use intensity alone has been found to be a poor indicator of impacts, as light impacts produce substantial changes (Section 3.3.1): a range of variables is more effective in predicting impact (Stankey 1980b: 152).

In tourism development, the concept of carrying capacity is most commonly used to gauge the level of tourist activity at which the facilities are full, and beyond which environmental degradation occurs and visitor enjoyment is diminished (Bull 1991: 81; Pearce 1989: 169).

The carrying capacity model as proposed by Washburne (1982) (cf. Figure 3.2) represents a shift toward monitoring conditions and away from measuring use as the sole standard for management. The following is a summary of how this model could be applied to Antarctic visitation.

Management objectives:
To ensure that the wilderness quality of visitor sites remains high through the regular monitoring of biological, physical, and social site conditions.

Tasks to accomplish these objectives:

1. Planning committee (see Section 7.2, assumption 5) selects standards for acceptable conditions in each of the three indicator categories. Indicators for conditions might include: (a) biological: diversity of species, population levels, and water quality at landing sites; (b) physical conditions: signs of litter, eroded paths, boot prints in plant communities, and other evidence of visitation; and (c) social: passengers encountering another ship while approaching, visiting, or leaving the site, passengers reporting a feeling of crowding, or passengers indicating a low level of satisfaction at the site for various reasons.

2. Planning committee appoints staff to inventory conditions at each site. This monitoring be could accomplished through one of several means:
   (a) train a small group of observers to use the Computerised Monitoring System (CMS) (already in use throughout the RSPB reserve system) that allows an individual to record all site information. Due to the cost and time involved in surveying all sites, observers with monitors could travel on cruise ships and collect information ashore. If done throughout the season by observers on different ships, a good sample of conditions at the most popular sites could be obtained.
   (b) use qualified observers, equipped with cameras and standardised forms, to record site information on chosen indicators such as vegetation cover etc.
(c) begin an inventory databank on these sites, including any historic fieldwork surveys available. Encourage the scientific and tourism communities to provide updates on conditions where known.

3. Engage planning committee to compare standards with inventory and monitor results.

4. Propose protective prescriptions such as rationing or others as required.

5. Compute the numerical capacity in order to implement rationing programme.

6. Repeat monitoring and comparative steps as necessary after time interval.

The carrying capacity model provides some useful information but does have limitations. Without prior long-term research, it would be difficult to link below-standard conditions to specific causes. Visitors may not cause all impacts but their presence may compound existing situations. The main prescription is usually rationing but this may not solve specific problems. For example, if it were determined that the 2,500 site visitors per season caused an animal population to drop or excessive plant trampling to occur, how would a manager compute the number that would allow their recovery? Since even light impact may cause detectable unnatural change, where is the lower limit of impact to be drawn? The site could be closed entirely but the damage would already have been done. Similarly, how would managers compute the numerical capacity of the Peninsula as a whole? Maintaining current numbers would assume that little or no damage had been done thus far. This could be correct but without long-term data it would only be a guess. Hendee's (1990: 187) principles of wilderness management include the use of carrying capacity but stress it is: (i) a relative term and not an absolute number; (ii) established in the field and through management judgement — no instrument can say when carrying capacity has been exceeded; (iii) tied to qualities of the physical–biological environment and human experience; and (iv) part of a planning process, not the central plank, that requires wilderness use to be managed to avoid unnatural changes.

As a model itself, it would not provide any understanding of how use and impact are related in Antarctica. Adapting a model based on numbers could be functional as a judgmental starting-point but determining formal limits would be a difficult matter. Washburne (1981: 163) found in a survey of US wilderness managers that only 21% of the US designated natural areas had established carrying capacities. Within two of the largest relevant US agencies, the National Park Service and the Fish and Wildlife Service, only rough estimates of carrying capacity have been devised, despite the expertise of a cadre of professional wilderness managers who have worked with the concept for twenty years.

Setting limits on the number of visitors has not been successful in the Galápagos and, as Kenchington (1989: 230) concluded, it is likely to be set by the same authority controlling the transport of the tourists. Short of turning visitors away at an entrance gate
(difficult to do in Antarctica), limiting numbers for numbers’ sake is not possible, especially since there are no enforcement capabilities.

A carrying capacity model could certainly be used on a restricted basis and may have popular support but would do little to correct, prevent or explain visitor impacts. Carrying capacity is management by reaction; it can only really be applied after the fact — after damage has been done — because it is little more than a bandage. Thus, in Antarctica, it would be a risky approach to visitor management, putting far too great an emphasis on numbers and not enough on how impacts occur. It might, however, be used in a limited way, as a strategy within an overall management plan.

### 7.2.2 Visitor Impact Management (VIM)

The planning strategy developed by Graefe et al. (1990: 10) relies upon examining the database and uses the existing policies, mandates, and information about users to define the scope of any problems arising from visitation. It shifts the focus away from monitoring conditions and rationing toward identifying the causes of impacts and analysing the most appropriate management strategy to prevent or correct them. In the case of Antarctic tourism, VIM could be used in a preventive capacity, as studies do not yet indicate how current impacts are affecting the environment.

Since step 1, assessing the database, has been carried out in Chapters 3 and 4 (see Figure 3.3 for the outline of the VIM's complete planning process), the next stage would be a review of management objectives. Both of these steps would be undertaken by a management committee.

Graefe et al. (ibid.: 11) stressed that the defect in most plans is the lack of specific objectives. In Antarctica, this is already the case, as no explicit objectives exist for tourism and its activities. Using the principles in Table 7.2 and the ATS references to tourism and its activities, the following might function as objectives:

*Management objectives*

1. To manage visitor sites in Antarctica as wilderness areas in which only wilderness-dependent activities are permitted.

2. To allow visitors to enjoy the aesthetic and wilderness values of Antarctica.

3. To impart to visitors an understanding of the scientific value of Antarctica through authorised visits to national bases.

4. To ensure that visitors do not cause more than a minor or transitory impact to Antarctica and its related ecosystems.
• Selection of key impact indicators and standards (steps 3 & 4)

The selection of key biological impact indicators is indirectly being made through research in the field. Considerably more work is needed to determine biological levels of impacts in the Antarctic region. Typically, the effects of trampling on vegetation are an indicator of use/activity levels but this is not practical at most sites in the Antarctic Peninsula. The identification of human/wildlife impacts are also in need of further development before they can be used reliably as indicators. Social impact indicators are more readily available.

Table 7.4 is a list of possible general biological, physical, and social impacts. Standards for each have still to be set. While biological indicators may frustrate measurement at present, standards could be developed from social impact indicators (Table 7.5). These should restate quantitatively management objectives for the conditions desired. The lack of direction about specific experiences for visitors to be derived from Antarctic Treaty documents makes it difficult to limit impacts caused by a specific activity.

These standards for the conditions desired reflect the concern of management to maintain sites for their aesthetic and wilderness values. Other biological or physical indicator standards might be set in order to curb the disturbance to flora and fauna at sites, depending on the diversity of species, population numbers, the absence or presence of an animal, or the reproductive success of a key species at a site.

The current average number of visits per week — 2.8 (cf. Section 4.2.3) — could become the standard for the level of any kind of visitation in the Peninsula as a whole, or could become the number of visits at specific sites. This would be appropriate if used in a judgmental way as a baseline, so long as the types of activity were examined for their inter-relationships with biological and physical components at each site.

<table>
<thead>
<tr>
<th>Biological impacts</th>
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</thead>
<tbody>
<tr>
<td>1. Change in plant species diversity and composition</td>
</tr>
<tr>
<td>2. Change in wildlife species diversity</td>
</tr>
<tr>
<td>3. Presence/absence of selected species</td>
</tr>
<tr>
<td>4. Water quality at landing site</td>
</tr>
<tr>
<td>5. Wildlife reproduction success</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Physical impacts</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Footprints in snow</td>
</tr>
<tr>
<td>2. Litter dropped ashore</td>
</tr>
<tr>
<td>3. Litter washed ashore</td>
</tr>
<tr>
<td>4. Number of trails</td>
</tr>
<tr>
<td>5. Trampled plants</td>
</tr>
<tr>
<td>6. Visible erosion</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Social impacts</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Encounters with other ships per day</td>
</tr>
<tr>
<td>2. Encounters with other ships per location</td>
</tr>
<tr>
<td>3. Visitor perception of crowding ashore</td>
</tr>
<tr>
<td>4. Visitor perception of impact on site</td>
</tr>
<tr>
<td>5. Visitor satisfaction</td>
</tr>
</tbody>
</table>

Table 7.4. Possible impact indicators in Antarctica.
<table>
<thead>
<tr>
<th>Indicator</th>
<th>Standard</th>
</tr>
</thead>
<tbody>
<tr>
<td>Average number of encounters with other ships per day</td>
<td>&lt; 2</td>
</tr>
<tr>
<td>Average number of encounters with other ships per site</td>
<td>&lt; 1</td>
</tr>
<tr>
<td>Visitor perception of impact on (non-base) site*</td>
<td>None – low</td>
</tr>
<tr>
<td>Visitor perception of crowding ashore†</td>
<td>None – low</td>
</tr>
</tbody>
</table>

Table 7.5. Examples of social standards for desired conditions. * This may serve as a composite indicator that would include litter on site, plant damage etc. Such a standard would need further definition. † Crowding may differ between sites, thus each site may require a different standard.

• **Comparison of standards and existing conditions (step 5)**

At a preventive level, success in monitoring any change in existing conditions would depend upon how accurate the indicators were, how thorough and consistent the monitoring was, and upon a long-term gain in knowledge about Antarctic ecosystems.

• **Identification of probable causes of impacts (step 6)**

If problems were found to exist, the next task for management would be to examine the use patterns and the impact indicators in order to look for probable causes. In the examination of causal factors, the more information management had about visitor use, the more likely it would be that links could be established or ruled out.

• **Identification of management strategies and implementation (steps 7 and 8)**

Management's duty, having identified a problem at a given site, is to decide how to rectify it. The techniques available can hinge on whether visitors or their activities are the cause of a problem or whether they are not linked to it at all. For example, penguin populations may drop significantly at a site, but this may be attributable to a decline in the availability of krill. Management could decide not to close the site to visitors because they are not a cause of the problem, and it is a popular spot, or they could decide that visitation may contribute to unnecessary stress and prohibit visitation, or they could impose a greater distance requirement or other on-site modifications.

Some of the techniques will originate from the philosophy of management for Antarctic wilderness, whether it is anthropocentric or ecocentric (cf. Section 2.1.3). This is why it is so important to establish firm management direction from the beginning. Again, the question that requires an answer is: what quality is being managed — wilderness or a visitor setting?

The VIM model is designed for use in existing protected areas that are experiencing large-scale visitation. As a strongly corrective model, its applicability to the
current state of Antarctic visitation is more attuned to the conceptual process. It introduces the idea of identifying measurable objectives regarding conditions desired, making value judgements about them, adjusting management strategies to meet those objectives, and instituting a system to monitor the success or inadequacy of such actions.

The success and feasibility of such a model would depend upon all Parties agreeing both on the role of visitors in the Antarctic, and on the selection of impact indicators. It would also be necessary to reach agreement on a planning team whose duties would include monitoring these indicators.

7.2.3 Limits of Acceptable Change (LAC)

The LAC process adopts a more pragmatic stance to the problem of user impacts: it accepts that use will produce impacts and exempts certain impacts according to a scale of environment settings in which the impact takes place. Thus, tarmacked trails would be an acceptable form of a direct, site-hardening method within an urban recreational setting, but not in a designated wilderness.

Like the VIM model, the steps are designed to gather information and provide guidance for decision-making (see Figure 3.4). The LAC process also searches for the relationships between existing and desired or 'acceptable' conditions, relies on management judgement for implementing suitable strategies where problems are identified, and institutes a monitoring programme.

*Identify area issues and concerns (step 1)*

An Antarctic visitor management task force would begin by identifying area issues and concerns and relating them to: (i) the unique features in each area; and (ii) how this area fits into the whole of Antarctica as well as the overall recreational spectrum (Stankey et al. 1990b: 221).

This step has already been tackled through the writing of management plans for specific areas under Annex V, Article 5 (cf. Appendix F), of the Environmental Protocol. Article 5 provides that any Party, the Committee (the proposed Committee for Environmental Protection), SCAR, or CCAMLR, may propose an area to be designated as an Antarctic Specially Protected Area (ASPA) or Antarctic Specially Managed Area (ASMA) (see Section 4.1.4a). Naturally, as a part of that process, a description of the values for which special protection is requested must be included (SCAR 1993: 273). Tourists are unlikely to visit ASPAs because of the permit requirements but may visit ASMAs. However, passengers are not prevented from visiting any non-designated areas. This is why the assumption was made that tourist areas be set aside: it is not possible to manage visitors and protect wilderness from unnatural changes in areas not officially acknowledged as managed, because they lack any measure of control. It is not the wilderness that must be controlled, but the human activity within it.
Stankey et al. (1990b: 221) advised that while implementing this step, managers also consider other questions that in Antarctica might include:

1. Are there existing or potential non-conforming uses that will require special attention?
2. Are there international issues that need careful consideration, i.e. will competing claims create special conditions for management?
3. Is the area suitable for more than animal watching? Is hiking or climbing a part of management's plan for the area?
4. Does this area provide critical habitat for any species?

By considering the values of each site, managers can decide what role it serves in the region as a whole and how recreation might or might not fit into that scheme.

*Define and describe the opportunity classes (step 2)*

In this step, managers decide what level of visitor use or development is permitted. (This is referred to as the recreational opportunity spectrum and will be discussed in more detail in the next section.) Recall that Adventure Network International (ANI) (see Section 4.1.4.1) has already established a tourist base at Patriot Hills.

By setting standards for conditions — for example, a wilderness is described as an area of unmodified environment, low interaction among users, no more than 1200 visitors per season, and no overnight camping — users and management will know exactly where they stand.

When devising these descriptions, managers must consider the type of impact, severity of impact, prevalence and extent of impact, and importance of impacts — including how noticeable the impacts are to visitors (Stankey et al. 1990b: 223).

*Select indicators of resource and social conditions (step 3)*

The selection of indicators is difficult to measure qualitatively and quantitatively. The LAC model is issue-driven and must then be guided by indicators that identify how the issue is affecting the area of concern. If in Antarctica, at a typical site, the area issues are visitor perceptions of crowding, adverse environmental impacts, and disturbance of wildlife populations, then the indicators need to address those conditions (Table 7.6).

It must be remembered that the notion of indicators originated in national parks, forests, and private reserves that typically have had a much higher level of visitation and a very different ecological structure. These two attributes point to a different list of indicators.

The issues under consideration and the indicators used to measure their condition are driven by management objectives. Under the LAC model, management objectives are
Table 7.6. Examples of issue and impact indicators.

<table>
<thead>
<tr>
<th>Factors</th>
<th>Indicators</th>
</tr>
</thead>
<tbody>
<tr>
<td>Visitor-perceived crowding</td>
<td>Number of ships seen at site</td>
</tr>
<tr>
<td></td>
<td>Number of visitors at the site</td>
</tr>
<tr>
<td>Human impacts</td>
<td>Rubbish from old bases</td>
</tr>
<tr>
<td></td>
<td>Litter strewn on beach</td>
</tr>
<tr>
<td></td>
<td>Loss of vegetation cover through trampling</td>
</tr>
<tr>
<td>Disturbance to wildlife</td>
<td>Instances of egg-snatching by predators</td>
</tr>
<tr>
<td></td>
<td>Displacement activity by animals</td>
</tr>
<tr>
<td></td>
<td>Birds leaving nest site</td>
</tr>
<tr>
<td></td>
<td>Seals leaving haul-out site</td>
</tr>
</tbody>
</table>

grounded to the type of opportunity class the area is assigned. Thus, in order to know if an area is to be 'pristine' (a value judgement made by managers), the indicators might be quantified in such a way as to relate to that quality, i.e. no other ships seen at site, no more than 100 visitors in a single day, and no more than one landing per week. Some indicators, such as the amount of litter seen (1-5 pieces, 6-10 pieces, more than 10 pieces), might be used to signal that an area is experiencing too much traffic from ships and visitors, and management may decide that action needs to be taken to eliminate or reduce this problem. (In Antarctica, litter may come from passenger or fishing ships and one can sometimes trace their origin — cruise ships generally leave behind more up-market items like spoiled fruit and vegetables, camera parts and film, and tissues, whereas commercial fishing vessels leave nets, styrofoam plates, and plastic shampoo bottles.)

*Inventory existing resource and social conditions (step 4)*

As in the case of the other models, an inventory process must be undertaken. For the LAC model, it is not necessary to inventory all the conditions at each site, although this information would be useful in the future, but the focus is to select conditions that can be defined by the indicators. During this stage, thought should be given to the variables and units of analysis for the indicators chosen.

These resource and social inventories can be stored or mapped, allowing a permanent record to be kept for future needs.

*Specify standards for resource and social indicators for each opportunity class (step 5)*

The function of step 5 is to decide upon the actual quantitative measure for each indicator, thereby establishing the standard. This is a judgmental process but one that can direct the management of an area toward the desired conditions — the opportunity class.
The key to the process is selecting the indicators and the standards, as they are the factors that comprise the definition of each opportunity class.

Because the model is designed for existing areas, the establishment of standards in those areas will be different from those in Antarctica. The lack of development in Antarctica means that the range of 'environmental classes', as described by the ROS process, is different from that for most natural areas. For this reason, some standards may not differ greatly from one class to the next, although the opportunities available in each may be distinct. Stankey et al. (1990b: 227) suggested that standards express the typical situation: that is, the probability that certain conditions will be found in an area.

* **Identify alternative opportunity class allocations reflecting area issues and concerns and existing resource and social conditions (step 6)**

The objective in step 6 is to decide what each area will represent in the wilderness. The information collected in step 4 (the inventory process) and step 1 (area issues and concerns) gives the manager an indication of what should exist given the *status quo* of the area. Input from the public (in this case, the tour operators, visitors and scientists) should be used in the decision process.

In some cases, contradictions will be evident between what exists and what is desired. For example, in Antarctica a site may be viewed by some as highly impacted, because it contains rubbish from earlier expeditions, whereas others see it as a historic site. Managers could describe it as wilderness and remove the rubbish or decide that at least two classes exist in one area: semi-wilderness (including the base) and wilderness.

* **Identify management actions for each alternative (step 7)**

In order to identify the management actions necessary, a comparison must be made between current conditions and the standards set for that area. Managers need to specify those differences and what possible action could be taken to eliminate them. Considerations of cost and appropriateness are important. Some steps may be necessary even in an area where conditions are better than the established standard if it is thought that they are actually deteriorating. The general rule is that of minimum regulation: use the minimal level of control to achieve a specific objective (Stankey et al. 1990b: 228).

* **Evaluate and select a preferred alternative (step 8)**

Managers need to evaluate the situation and select a strategy from the list of prescriptions obtained in step 7.

As management objectives *per se* are not used in this type of planning, managers rely on the class descriptions for each area and how well represented the class may or may not be in the area as a whole. They must also consider the affected user groups, whether certain groups are excluded or favoured, what the area's values are, if they are
diminished, and if there is a difference between standards and existing conditions, and the costs and feasibility of managing areas as prescribed.

Stankey et al. (1990b: 228) reported that because "the LAC focuses on conditions" the public (and in this case tour operators) would be able to see how these alternatives affect their own interests.

• Implement actions and monitor (step 9)

Once the prescription has been selected, the programme must be implemented and its effectiveness monitored. The frequency of monitoring is a function of cost, and some indicators will be more costly than others to monitor. Because of this, the establishment of monitoring priorities is encouraged. Some situations to consider are: (i) the correlation between existing conditions and standards. If they are closer together than at the time of the last evaluation, they may not require immediate monitoring; (ii) where is the rate of change judged to be the highest? (iii) where is the quality of information poorest or lacking? (iv) where is knowledge of conditions most tentative? and (v) have unanticipated changes occurred? (Stankey et al. 1990b: 229).

Monitoring is an essential part of any management planning and allows managers to evaluate the effectiveness of their actions on changing site conditions. It can also alert managers to the fact that assumptions made about inter-relationships may not be accurate.

The LAC framework is a far more complex and inclusive one than either VIM or carrying capacity. It has been developed for application in wilderness and natural areas where recreation or resource needs are threatening to intrude on the values of these areas. It focuses on describing conditions that are acceptable given a particular location within a spectrum of environmental conditions.

The existing recreational conditions in Antarctica are not so well established or complicated that this plan can be developed yet at the level of detail that is possible. However, the underlying supposition of the model, that a spectrum of environmental conditions exists in which conditions can be judged as acceptable or not, provides an excellent starting-point for an Antarctic model of management.

7.2.4 Recreational Opportunity Spectrum (ROS)

An integral part of the LAC process, the development of classes based on environmental conditions or ROS, is a theoretical means of compartmentalising the ways humankind can take recreation in settings ranging from wilderness to urban. These classes define "the resource, social, and managerial conditions considered desirable and appropriate within the wilderness" (ibid.: 222-223). They represent a managerial attempt to assure quality outdoor recreation "through provision of a diverse set of opportunities" (Clarke and Stankey 1979: 4). It retains the slight universalising taste of modernism, that all outdoor pursuits are equal, but attempts to place them in an appropriate area. It is,
therefore, a rational method of arguing for the preservation of some areas at a higher level than others.

In Antarctica, the ROS example could be applied in one of several ways: (i) the entire continent could be zoned as pristine; (ii) divided into two basic zones: urban and pristine; and (iii) zoned into four or five areas with conditions from semi-urban to pristine.

Step 2 of the LAC process concerns defining and describing the opportunity classes. Class definitions emanate from the criteria used to select factors that define the opportunity spectrum. Ideally, they should be measurable, under management control, related to recreationists' desires about areas' uses, and represent a range of conditions (Clarke and Stankey 1979: 8). From these criteria emerge six factors that allow management to devise distinctions for opportunity classes: access, other non-recreational resource uses, on-site management, social interaction, acceptability of visitor impacts, and acceptable levels of regimentation (ibid.).

If the ROS model was applied to existing conditions in Antarctica, then four opportunity classes could be generated, as follows:

**Class 4 - Urban site within wilderness**

- Access is available by ship or inflatable in coastal areas. Airfields are available for visitors only by permission of relevant base.

- Resource use includes scientific studies from nearby bases. Visitor numbers are controlled by base personnel. Number of visits are higher than at other sites and set by base (national programme).

- On-site management is provided by base personnel in addition to ships' naturalists.

- Area may accommodate facilities for tourists, such as existing hotel and gift shop. Specified areas are developed by bases for tourists.

- Area has several buildings used by base personnel.

- Reglementation on-site may include supervision by member of base personnel.

Examples: Sites on King George Island.

**Class 3 - Developed wilderness**

- Access is by ship or inflatable raft at coastal sites. Wheeled-aircraft access inland is available at blue-ice runway. Helicopter flights and landings to inland areas are permitted.

- Resource use may include scientific study in the area by ATP nationals. Skiing, climbing, and inland hiking may be available.

- On-site management may, at certain sites, include personnel from bases.

- Number of visitors limited to aircraft capacity at inland sites.
• Area contains landing strip and facilities for tourists.
• Regimentation is by tour operator staff.

Example: Patriot Hills, Dry Valleys.

**Class 2 - Semi-wilderness**

• Access is by ship or inflatable raft only.
• Resource use may include scientific study in the area by ATP nationals in temporary field camps, visiting historic huts and former whaling stations.
• On-site management may, at certain sites, include personnel from bases or conservation officers from a national programme travelling aboard ship.
• The number of visitors ashore must not exceed 100. At some sites, no more than 160 ashore in a single 24 hour period are permitted.
• Regimentation is by ship staff and base personnel where available.

Examples: Deception Island, Torgersen Island (Palmer Station), Port Lockroy, Scott Base (Ross Island).

**Class 1 - Wilderness**

• Access is by ship or inflatable raft only.
• No other resource use in the area. On-site management is limited to ship-board observers.
• The maximum number of visitors ashore at any one time is 100.
• Visitor activities are confined to walking, animal watching, photography. No visitor facilities of any kind are available.
• No huts or other human artefacts visible on site.
• Regimentation is limited to control by ship naturalists. The ratio of naturalists to visitors is recommended as 20 to 1.

Examples: Hannah Point (Livingston Island), Paradise Harbour.

What distinguishes one class from another is the degree of human intervention and visibility. Ideally, Class 1 should define areas that are free from signs of human habitation, whereas Class 4 is intended to accept a far higher degree of habitation and impacts.

An informal inventory of the visitor sites published by NSF (1994) reveals that exceedingly few sites are free of refuge huts, marked graves, signs of whaling, or other evidence of human presence, emphasising the necessity to protect Class 1 sites from being developed.

This illustrates how the value of Antarctica can shift from wilderness to memorialising every human action. This is not to play down the importance of human activity in Antarctica or to marginalise the ecological lessons that can be learned by
visitors. The danger is that Antarctica's wilderness becomes important for the role it has played in a human drama rather than valued for its own sake.

The establishment of classes or zones of activities is not new, but ROS connects the relationship between visitor expectations and environmental conditions with the problem of carrying capacity. This is an extremely useful concept in Antarctica, where tourism is developing without any guidance about the appropriateness of activities or what the relationship of visitors to the environment is to become.

The LAC and ROS models more readily lend themselves to application in Antarctica. Whereas some aspects, such as the difficulty of selecting site indicators or factors for class definitions may need adjustment to Antarctic conditions, the plan's framework, unifying environmental and recreational concerns, could be useful in devising an appropriate visitor management model.

7.2.5 Existing sub-Antarctic plans: Gough Island and Macquarie Island

Management plans have been written for several of the sub-Antarctic islands: plans for Gough Island (40°21'S, 09°53'W) and Macquarie Island (158°55' E, 54°30'S) are analysed. Both islands are important reserves for sub-Antarctic flora and fauna. Gough has remained one of the least-disturbed islands in the Southern Hemisphere (Cooper and Ryan 1994: iii). In contrast, Macquarie Island has had problems with human impacts and is examining ways to minimise them (Department of Parks 1991: iii). These islands lie outside the Antarctic Treaty System and their plans have been developed for their governments — Tristan da Cunha (a Dependency of the United Kingdom) and Tasmania respectively. This important distinction, that of political and managerial sovereignty, renders any direct transfer of management plans to Antarctica more difficult. The strain of achieving a consensus among the parties in a single country is far less than among the ATCPs.

The issues involved in devising a management plan are similar — the protection of a remote area (with limited access) from resource exploitation and tourism development. To accomplish this goal, both Gough Island (Cooper and Ryan 1994) and Macquarie Island (Department of Parks 1991) have overall plans that state the management objectives, furnish a description and inventory of resources, and address the issue of tourism as one of the concerns.

The outline of the plans is given in Appendices G and H and both incorporate what Graefe et al. (1990) have called a 'preassessment data base review' (step 1 of VIM), and what Lucas and Stankey (1985) have described as an 'inventory of resource and social conditions' (step 4 of LAC).

The management objectives of the two plans are similar (cf. Tables 7.7 and 7.8). They emphasise habitat protection, preservation of historic features, resource management, and the island's importance in a global context.
1. To conserve the indigenous flora and fauna and ecological processes in as natural a state as possible.

2. To maintain geological features and processes and scenic features.

3. To prevent the human-induced introduction of alien flora and fauna, and to eradicate or control, as far as possible, previously introduced and established alien species.

4. To protect historical sites and artefacts when not in contradiction to the previous three objectives.

5. To encourage and facilitate research into the natural sciences that is not in contradiction to the previous four objectives.

6. To prohibit or control human activities ashore that are or may be in contradiction with the previous five objectives.

7. To allow and manage fishing activities that do not cause irreversible change to the marine environment and its biota.

8. To promote an awareness through education of the value and significance of the Gough Island Wildlife Reserve.

9. To register the Gough Island Wildlife Reserve with the Convention for the Protection of the World Cultural and Natural Heritage as a Natural Site.

Table 7.7. Gough Island management objectives (Cooper and Ryan 1994: 27).

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1. To protect and manage the reserve as a natural habitat for its indigenous flora and fauna, and in order to achieve ecosystem conservation.

2. To seek to protect and preserve the marine habitat adjacent to the reserve in so far as it provides access and/or feeding grounds for the majority of the indigenous fauna.

3. To conduct, promote, and encourage research and studies in so far as they have no permanent detrimental effects into the natural and cultural aspects of the reserve, the surrounding seas, and the region.

4. To prevent accidental introductions of alien flora or fauna and, as far as possible, to eradicate or control previously introduced species that affect or endanger native species.

5. To record, protect, and/or preserve any historic localities, artefacts, or relics found in the reserve or adjacent waters.

6. To permit tourist visits under strictly controlled conditions that allow visitors to experience the natural values of the island without compromising them.

7. To publicise and promote the State's successful management of the island as a Nature Reserve and internationally recognised Biosphere Reserve.

Table 7.8. Macquarie Island management objectives ((Tasmania) Department of Parks 1991: 17).
The objectives of the two plans diverge on the subject of tourism and tourism management: Macquarie Island permits limited visits under controlled conditions whereas Gough Island does not. The Gough Island management plan does make recommendations should tourism be considered.

The theme of defining appropriate activities that has figured prominently in the discussions of visitor management is dealt with in some detail in the Gough plan. A case is made for the unsuitability of the island for tourism, due to "the paucity of sheltered landing beaches" (Cooper and Ryan 1994: 47) and the inadequate facilities at the meteorological station. An environmental impact assessment procedure should be followed, if tourism is considered, and Cooper and Ryan (1994: 47-48) have outlined recommendations for appropriate activities, behaviour, and management should tourism be proposed:

• **Access**
  1. Landings should be from small boats only. No helicopter landings are permitted.
  2. Vessels, including yachts, must clear customs, immigration, and health controls at Tristan da Cunha before proceeding to Gough.
  3. Small boats from tourist vessels are allowed to travel along the eastern and northern coastlines outside the surf and kelp zones.

• **Visitor numbers**
  1. Tourist landings should be restricted to parties of 20 or less.

• **Visitor activities**
  1. No collecting any kind (including kelp cuttings) is permitted.
  2. No disturbance of animals, damaging plants, fishing, or littering is permitted.
  3. Southern right whales, southern elephant seals, or dolphins in the water must not be approached at distances of less than 50m.
  4. Boat speeds should not be excessive.
  5. Eating and smoking ashore are not allowed.
  6. On land, penguins and seals should not be approached closer than 5 m.
  7. No feeding of animals is allowed
  8. "Visits deemed to have no environmental management or scientific value and which require overnight stays, such as for recreation, exploration, climbing or amateur ('ham') radio purposes, are not allowed ...".
• Visitor facilities
  1. No toilet facilities are available ashore. All human wastes must be deposited below the high-water mark.
  2. No permanent structures are allowed within the conservation zone.

• Management and supervision
  1. Within the Gough Reserve, tour operators and tourists must follow the instructions of accompanying Conservation Officer and guidelines included in the management plan.
  2. The Conservation Officer will accompany the tourist parties in part to ensure that no exotics are brought ashore.
  3. Visits will be to The Glen only. This area could be established as a tourism zone.
  4. The only signs ashore will be a sign that tourists are entering the Gough Island Wildlife Reserve (with several guidelines) and one boundary marker beside The Glen demarcating the inland limits for tourists. No other signs or interpretative material should be provided ashore "to avoid detracting from a wilderness experience".
  5. A monitoring programme should be set up to examine breeding success and trampling at The Glen. The adjacent Sophora Glen could be used as a control.

Finally, the Tristan da Cunha Conservation Ordinance, 1976, forms a part of the plan, and Section 3(3) prohibits anyone other than a permit holder, to construct any house, hut, shed, jetty, landing strip, road or runway or erect any mast, pole, aerial beacon or any other installation ... (Cooper and Ryan 1994: 71).

In these recommendations, specific visitor objectives are stated unequivocally, and thus avoid ambiguities about appropriate activities.

Macquarie Island's planners have provided for tourism and state that it is one of the management objectives. The tourism policy is much less precise within the plan itself but guidelines are provided in the plan's appendix and may be amended at any time. The policy addresses tourist activities and, to a lesser extent, access:

Tourist visits will be ship-based but limited facilities such as walkways, viewing platforms and interpretation material may be provided in selected areas to protect the wildlife, environment, historical and/or scientific values of the reserve .... A condition of permission to enter the reserve will be that all visitors and/or groups of visitors are self-sufficient while in the reserve (Department of Parks 1991: 23).

Presumably, the reason for providing tourist guidelines in the plan's appendix is to allow managers a more flexible instrument with which to control tourism. The theme of appropriate activities still runs strong in these guidelines, summarised below:
• Access
1. All tourist visits will be ship-based.
2. Visits are permitted between the hours of 07:00 and 19:00 local station time.
3. Landing areas are restricted to those allowed and designated by the Department.
4. Access to areas on land is by foot only and shore parties must be in two-way radio communication with ship and not more than one hour walking time to landing beach.

• Visitor numbers
1. One ship visit per day is allowed.
2. No more than 25 visitors permitted at the station at any time.
3. Shore parties to be organised in groups of no more than 10 people, including the leader/guide.

• Visitor activities
1. No overnight stays, except in emergencies, are permitted.
2. Food consumed ashore must be from unopened, pre-packed, processed food or drinks, previously approved by the Department.
3. No food given to wildlife.
4. No collecting, littering, or disturbance of flora or fauna is permitted.
5. Visitors may not enter field huts or use supplies except in an emergency.

• Visitor facilities
A small outbuilding was used to sell badges and t-shirts during the 1990/91 season. This is not mentioned in the guidelines or policy statement but was observed by the author.

• Management and supervision
1. Ship guides will accompany groups ashore.

During the 1990/91 season, ship supervision was augmented by base personnel, also observed by the author, although this is not specifically mentioned in the appendix.

As a member of a tourist party who visited Macquarie Island during the 1990/91 season, the author overheard some comments from older visitors (over 45-50 years of age) about the high level of supervision. The younger visitors (under 45-50) had fewer complaints about the supervision and were satisfied when the rangers explained their desire to maintain strict environmental standards. Some tour leaders expressed dissatisfaction with the stricter supervision, feeling it was unnecessary.
A study of tourist visits was prepared (Hamilton 1991) and summarised in an informal paper that accompanied the author's copy of the management plan. Additional guidelines were suggested to cover other aspects of visits, although none of the omissions caused any major difficulties during the 1990/91 season. Two of these included the prohibition of helicopters within three nautical miles of the reserve (except in emergencies) and the specification that employees of tourist operators and ships' crews be subject to the same conditions as those applied to tourists.

Both the Gough Island and Macquarie Island management plans place great emphasis on acceptable conditions and activities under which tourism can or could occur. By stipulating the controls on tourism well in advance of significant attention, the planners can avoid many types of impacts for which solutions would later have to be sought. The success of these plans in controlling and preventing visitor impact is being examined by management, and studies like that of Scott and Kirkpatrick (1994), who investigated the effects of trampling on vegetation at Macquarie Island, are under consideration. It is an on-going process.

7.3 THE WAY AHEAD: MELDING A PHILOSOPHY OF VALUE WITH A PRACTICAL APPROACH

7.3.1 Are the current controls adequate?

The current visitor management controls covering Antarctic visitation are a set of behaviour guidelines produced by the tourism industry (Figure 4.5), an unratified Environmental Protocol to the Antarctic Treaty that covers all activities including tourism in so far as it prohibits activities that may have more than a minor or transitory effect, and the economics of time and space.

In the face of tourist development in other natural areas, it is plain that without some further action these circumstances will not safeguard a wilderness from modification. The current controls are signs of good will among the present players, but they do not address the next wave in tourist growth, such as activities and possibly facilities, expanded to accommodate the new visitors. Other factors, now shielded from view, could alter the equilibrium that describes the existing paradigm.

The unique situation of Antarctica, its guardianship by international treaty, will oblige a circumspect approach in applying visitor management. The evolution of tourism regulation has been slow and piecemeal, with the majority of the Parties feeling that the Environmental Protocol and the new Kyoto Recommendation are sufficient. Thus, the introduction of a fully-fledged visitor management model would be unlikely to be successful as the ATCPs are not ready to consider anything so comprehensive. What is in the realm of feasibility is the use of a theoretical and practical framework that is based on those models examined.
7.3.2 Building a visitor management plan for Antarctica

7.3.2.1 Defining management objectives and goals

Drawing on the existing statement of values in the Environmental Protocol, IUCN and COMNAP recommendations, and sub-Antarctic management plans, the following objectives might be proposed:

1. The principal objective of visitor management in Antarctica is the conservation of the Antarctic environment, with its outstanding wilderness qualities and unique dependent and associated ecosystems (IUCN 1991: 65).

2. Antarctica is declared a Heritage Landscape (this being analogous to World Heritage Sites under the World Heritage Convention) as it constitutes "exceptional and universal conservation value" (ATCPs 1992c: 10).

3. "To permit tourist visits under strictly controlled conditions which allow visitors to experience the natural values' of each designated site without compromising them. (Department of Parks 1991: 17).

4. To permit tourists to engage only in wilderness-dependent activities at designated sites that do not require land-based facilities or motorised transport. These activities should not intrude or disturb the flora or fauna but respect that this ecosystem has developed without human interference or presence.

5. "To promote an awareness through education of the value and significance of this unique continent beyond just what it can produce or satisfy for human benefit" (Cooper and Ryan 1994: 27).

6. Access to visitor sites is restricted to boats only, landings by helicopters are not permitted. The landing of non-governmental aircraft is permitted only at Patriot Hills.

7.3.2.2 Designation of visitor sites

The designation of visitor sites has been one of the most frequently encouraged changes in the present system and the most frequently rejected. Throughout the history of the ATS, many have called for special sites of tourist interest to be designated: B.B. Roberts, IUCN, COMNAP, and some ATCPs, to name but a few (cf. Section 4.1.4.1). All recognise that without setting boundaries (even invisible ones), controlling tourist impact and conserving Antarctic ecosystems is impossible. With few exceptions, all parks, reserves, and sanctuaries (including those in the sub-Antarctic and the Galápagos) have done so. The intrinsic values of Antarctica are at risk until this is done because of the desire by tour operators and tourists to set foot on pristine environments and to walk in places that others have not walked. Antarctic tourism is about discovery and exploration, which is a part of what takes visitors there. If Antarctica's wilderness cannot be valued for more than its virginal quality, it will become valueless.

Tour operators are likely to be most resistant to any change in the status quo. Their input on site selection will be crucial to ensure their compliance with this condition. NSF (1994) has published a list of 69 sites currently visited by IAATO cruise members.
Since 10 of these sites absorb over 60% of all visits (cf. Figure 4.1), limiting the number of sites to between 35-40 would not seem too restrictive.

A number of considerations should enter into site selection: popularity with tour operators, accessibility at most times during the season, and biological suitability.

Concern by the tour companies will cover logistical constraints such as suitable harbours and anchorages, accessibility (some sites such as Paulet Island are infrequently visited due to weather conditions), and alternative sites within the same general area when weather conditions and/or the presence of other ships in the area necessitate a change of plan. Expedition leaders and staff also select sites for their unique qualities. They may want to show their passengers elephant seal wallows, fur seals, gentoo, chinstrap, and Adélie penguins, as well as visit bases.

Another important consideration in selecting sites goes back to concerns about adherence to guidelines. If criteria of minimum impact suitability or biological suitability were developed — that is, locating sites that were more user-friendly — some preventive measures could be taken that would not require any new regulations. One of the conclusions in Chapter 6 was that some passengers violated guidelines because not all landing sites afforded conditions that allowed the wildlife on the beach enough space. Landing passengers in front of elephant seal wallows, or on the beach most frequently used by foraging penguins, is unnecessary. Nothing may currently correlate disturbance or failure to thrive with passengers landing; on the other hand, it is an important consideration.

Some examples of possible suitable visitor site criteria:

1. Landings should not be made in areas where passengers would be set down closer than 25 m to aggregations of wildlife.
2. Landings should not be made that would require passengers immediately to traverse an area of moss, lichen, grass, or algae.
3. Boats should not be tied up in such a way as to restrict movement of seals or penguins into or out of the water.
4. Passengers on-site should be able to avoid walking through aggregations of penguins.
5. The area should be of sufficient size to accommodate 100 passengers ashore without surrounding animals or blocking their way to the sea.
6. Sites may be restricted according to species vulnerability during a particular stage of their reproductive cycle. Furthermore, if the sites on the list were assigned a numerical value of robustness, planners could place them within opportunity classes that would ultimately help gauge how many landings (based on activity) per week were considered acceptable.
7.3.2.3 Defining and describing site classes (ROS)

The definition of site classes could be based on their biological and historical conditions and site robustness. This could alternatively be thought of as a likely degree of existing disturbance, remembering the principles of low-impact wilderness recreation: "In popular places, concentrate use and impact. In pristine places disperse use and impact" (Cole and Krumpe 1992: 39). The measure of robustness could be keyed to class, Class 4 being the most robust and Class 1, the least, as designated in Section 7.2.4.

7.3.2.4 Inventory of visitor sites

The inventory of visitor sites should include the same information required in Annex V, Article 5(e), of the Protocol (SCAR 1993: 273):

5(e) (i) the geographical co-ordinates, boundary markers and natural features that delineate the area;

(ii) access to the area by land, sea or air including marine approaches and anchorages, pedestrian and vehicular routes within the area, and aircraft routes and landing areas;

(iii) the location of structures, including scientific stations, research or refuge facilities, both within the area and near to it; and

(iv) the location in or near the area of other Antarctic Specially Protected Areas or Antarctic Specially Managed Areas designated under this Annex, or other protected areas designated in accordance with measures adopted under the components of the Antarctic Treaty System ....

In addition, site surveys of flora and fauna should be included.

7.3.2.5 Selecting indicators of issue and resource conditions

Indicators need to be selected on the basis of the management objectives as they relate to biological, physical, and social conditions. They should be measurable in standard units that can be collected easily by different researchers. Determining these indicators would ideally be done by experts in the science and social science fields.

7.3.2.6 Selecting site standards

Site standards originate from their class and should be specified within a range so that trends, upward or downward, can be detected and management strategies applied before class conditions change.

7.3.2.7 Selecting management prescriptions

In the early stages of visitor management in Antarctica it will be difficult to determine the inter-relationships between visitors and site conditions. As noted by Graefe et al. (1990: 1-2), "most impacts do not exhibit a direct linear relationship with user
density". Certainly decisions can be made to reduce visitation at an affected site, to close it and offer an alternative site, should indicators reveal a downward change in conditions, until other scientifically based strategies can be created. This is where the value of having strong management objectives will be most evident: if the prime objective is conservation and not tourism, then there need be no economic pressure to compromise that goal. The advantage of having objectives that prohibit high-impact recreational activities will be the avoidance of many user conflicts and the associated need for corrective management strategies.

7.3.2.8 Monitoring conditions

The monitoring of conditions should be done in the most economic way possible. As there are likely to be few resources to accomplish this important task, a monitoring system needs to be prioritised, as suggested by Stankey et al. (1990b: 229) in Section 7.2.2 (step 9). Monitoring systems could be set up as suggested in Section 7.2.1.

7.3.3 Interpretation: the adhesive of visitor management

Questions about enforcement of regulations inevitably arise in discussions about visitor behaviour. As established in Chapter 6, problems do occur but transgressions are most often inadvertent or committed as a result of lack of appropriate information, communication, or planning. These problems do not signal the need for stronger, firmer enforcement personnel or more rules, but the need for better interpretation and staff example.

Two of the founding fathers of nature interpretation taught that an interpreter was not a walking encyclopaedia but someone who could arouse the interest of the audience by revealing the "big principles" (Mills, in Regnier et al. 1992: 2) or the "larger truth" (Tilden, in Regnier et al. 1992: 3).

The behavioural problems revealed in Chapters 5 and 6 demonstrate the lack of understanding about the relationships and requirements of much of the flora and fauna at each site. The on-shore briefings did little to bring out any of the larger truths or help passengers understand the reasons for the behavioural guidelines. The most successful visitor guidance supplied by any ship was that of Ships 4 and 5, which arranged for naturalists to take passengers around the site in small groups: these passengers committed fewer violations of the guidelines (cf. Table 6.4). When problems did occur, they were the result of the naturalists' interpretations of the guidelines. IAATO member ships have shown an active interest in improving their environmental awareness and have discussed the need for accreditation schemes for their expedition staff (Enzenbacher 1994: 110). This is a commendable objective and one that could be employed within a developed visitor management programme — currently IAATO has its hands full and few resources to initiate such a scheme. The weak link again is between the regulators (ATCPs) and the
industry, for it is the role of the regulators to set standards and objectives for the industry to follow.

One area that could be improved is that of photography ethics. Almost all rangers or park wardens have horror stories about photographers who, in an effort to get the perfect shot, startle or disturb their subjects. This does seem to be the area where more deliberate violations are committed. Professional photographers are often invited to join the staff of various cruises as their presence attracts a certain type of visitor. Many are responsible and often give presentations on taking better photographs, but passengers have seen some photographers violate the rules designed for all to follow. Conservation organisations such as the National Audubon Society, the American Birding Association, and the RSPB have published guidelines and articles on wildlife photography, and other nature writers and photographers have also made the case for ethical wildlife photography. H.W. Gabriel (1991: 47), a writer, forester, and photographer, admitted that some of the problems are created by the magazines, who publish extreme close-ups and encourage their readers to imitate those impressive shots. He advised photographers to look for other opportunities if the shot will in any way endanger the health or safety of the animal being photographed.

Interpretation and a session on photographic ethics could play a useful role in educating visitors about the value of Antarctica, and reduce the need for greater direct regulation. IAATO could encourage their members to include such a session in their ship programmes.

Other enforcement concerns are not so straightforward. Problems with at least two IAATO member ships who have broken an IAATO by-law, that they will not carry more than 400 passengers per trip (IAATO 1993: Article III, Section A(1), as noted by Enzenbacher (1994: 111) and witnessed in 1993/94 by this author), do cause concern that IAATO may not be able to control the actions of its members. In this respect, they need the strong support of ATCPs to lend credence to their efforts and, in turn, need to continue to demonstrate their willingness to abide by safe environmental practices. The greatest enforcement concern is not a few tourists breaking the distance guideline but the falling away of IAATO member ships and the development of uninformed mass tourism in Antarctica. In this predicament, international formal recognition of Antarctica as a 'Heritage Landscape' or other such designation (as suggested by IUCN) would heighten the awareness of travellers that it is deserving of special treatment and acknowledgement.
CHAPTER 8
CONCLUSIONS

The continent of Antarctica challenges human definitions of wilderness and the traditional human/nature relationship. It could be thought of as wilderness in the biblical sense, a hostile place where wild beasts dwell without offending any native human populations. No peoples live according to its cycles or are dependent upon its members to sustain themselves. It existed outside the sphere of human influence until well into the twentieth century. However, as a result of evolving technology, science, economics, and social conditions, this remote continent and our relationship with it is changing.

This thesis has pointed out some of the themes of that relationship and traced them to the way humans have managed nature for recreation. The philosophical framework chosen by management preordains the concept of wilderness. An anthropocentric approach favours the alteration of the biological and physical environment to produce the desired setting. Wilderness becomes a stage upon which human activities are conducted. Biocentrism frames the elements differently, subordinating recreational use, among other uses, to the needs of natural systems. As Naess (1990: 88) has said: "The flourishing of human and non-human living beings has value in itself. The value of non-human beings is independent of their usefulness to humans".

The most compelling argument for choosing a biocentric framework for visitor management in Antarctica's wilderness is its uniqueness. Issues inseparable from the usual human/nature relationship — satisfying essential human needs and humankind as a member of the particular ecosystem — are not locally involved.

The justifications for wilderness have been largely utilitarian. Tourism has a utilitarian justification: tourists could use wilderness as a setting for various human activities and advocate its value alongside or over other uses. The result (in North America, for example, as decried by as the Leopold report and others) was the deterioration of the parks themselves. The difficulty was that in soliciting the public and enticing them into the parks, access, accommodation, and facilities were developed to meet the needs of an increasingly urban population.

Even without the encouragement of a government organisation like the National Park Service, or the campaign by Canadian railroad companies to bring more visitors into the
parks, the improvements in technology, population changes, an increase in per capita real income, and increased leisure have brought challenges to visitor management in wilderness areas. Managers in the Galápagos National Park have been forced to respond to an increasing number of visitors as a result of such changes. A handful of visitors has, over a period of twenty-five years, grown to over 50,000. Setting limits to the number of passengers has served as little more than a marker to be surpassed over the next few seasons. As Kenchington (1989: 230) concluded, the capacity of aircraft has had more to do with controlling the number of visitors to the islands. Areas close to transportation centres have experienced more tourism and facilities to serve tourists have been developed.

The response of those concerned with managing visitors and conserving wilderness has been to develop management plans and devise strategies to prevent or mitigate impacts on flora and fauna. These management plans must have objectives, including what experiences visitors are to have, or conflicts arise between user groups and between visitors and management. Information on visitors and visitor use has also been noted as essential for management planning. It is both a diagnostic and a predictive tool.

One important strategy applied to wild areas, both large or small, has been the idea of concentrating use in popular areas and dispersing visitors in lightly used areas. In the large wilderness parks, this concept may take the form of boardwalks or designated trails and, in places like the Galápagos and Madagascar, specific visitor sites have been established. Despite the endorsement of specific visitor sites in Antarctica by Roberts, the IUCN, some ATCPs (France, Chile, Germany, Italy, and Spain), and COMNAP, no visitor management actions of that kind have been taken in Antarctica. The number of sites visited there since the 1989/90 season has nearly doubled from 36 to 69. Without controls of some kind, few areas particularly in the Peninsula, will remain inviolate.

Of the visitor management models, the least effective has been found to be carrying capacity, for it relies on the false assumption that use is a dependable indicator of impacts. Research has shown this assumption to be incorrect. Yet, this approach is the one most frequently mentioned when the issue of limiting impacts is discussed.

The task of creating a visitor management plan, within a wilderness management plan, is a complex and difficult one — perhaps more the pursuit of an ideal than an achievable goal. Nevertheless, the ideal must be pursued and practical measures applied with the aim of approaching that goal. The Antarctic Treaty Consultative Parties have negotiated, in a comparatively short time, several agreements among participating nations for the conservation of fauna and flora, seals, and marine resources in Antarctica. However, in the area of protecting wilderness from visitors' recreational use, no such basic agreements exist. 'Tourists' are voluntarily controlled by three instruments: an unratified Environmental
Protocol that permits all activities so long as there is no more than a transitory impact, a set of industry-devised voluntary guidelines about visitor behaviour, and the Kyoto Recommendations, the ATCPs' version of the voluntary guidelines.

The Protocol addresses many practical issues and offers guidance about the effects of activities. However, it lacks a theoretical framework that can address the changing notions of low impact and appropriate activities. More fundamental questions need to be asked — what specific values are being presented to visitors and how? Are the aesthetic and wilderness values, as stated in the Protocol, achieved by permitting greater visitor access, facilities, and activities?

The management of visitors in a wilderness is more than simply promulgating rules or devising recommendations to address issues of behaviour. The data contained in this thesis has made it clear that voluntary guidelines, although praiseworthy in concept, do little to help urban visitors cross the bridge into wilderness. Violations occurred for various reasons. First, visitors can inadvertently or deliberately violate guidelines. The inadvertent violations result from the lack of information or supervision ashore. These can be addressed through different or better visitor education. Other factors, such as physical and biological on-site conditions, also contribute to difficulties ashore. Landing areas need to be chosen with the knowledge that they may be the most heavily used part of a visitor site — at Hannah Point, 44% of visitor hours were spent on the landing beach. The increasing frequency of average visits in the Peninsula, from 0.7 to 2.8 per week, forces a rethinking of how conditions of visitation might affect wildlife and of what preventive actions might need to be taken. Unloading passengers in front of large aggregations of wildlife may exacerbate existing problems and unnecessarily disturb the wildlife. These problems are manageable: that is, direct strategies can be applied to reduce the likelihood of impact.

The deliberate violations, i.e. harassing a seal or other animal for a good photograph, or breaking the distance guideline, indicate problems with behaviour. These problems are more alarming in that the violations are more likely to be committed by the better-educated passengers. The key may well be not only the type of interpretation available, and the demographic similarity of the interpreter and the group, but also that the interpreter supports the message delivered to the group — contradictions between guidelines and leader behaviour will be counterproductive in eliminating deliberate violations.

Data from visitors on-shore supports these findings: those passengers who received good interpretation ashore, followed a group leader, and were given clear instructions, were more likely to adhere to the guidelines. Visitors who were put ashore with little guidance and understanding of what they were seeing, as well as those who received contradictory messages from staff, had more difficulty with guidelines.
The current strategy of visitor management by way of behavioural guidelines is inadequate to serve as the main tool in safeguarding Antarctica from potential visitor impacts, for the same reason that the Environmental Protocol is inadequate to govern visitor behaviour: it does not address the core issue of what wilderness is to mean to visitors. It provides no underlying framework according to which management can direct visitors and by which they can be guided.

If management encourages tourists to see attractions, and ships' staff act as supervisors — instead of encouraging visitors to see a wilderness, with interpreters to guide them toward an understanding of what that signifies — then Antarctica's values will be lost. The ATCPs must recognise that tourism is an industry and one that wishes to exploit — however benignly — what it sees as the marketable resources of Antarctica. The purpose of visitor management is to manage human use of the wilderness; without a clear agenda of how this is to be done, the use will reflect the fashion of the day.

This thesis offers models for a practical methodology to be applied to visitor management in Antarctica. Both VIM and LAC provide a plan with clear steps for successful implementation. Graefe et al. (1990) stressed that VIM can be used in conjunction with other plans and would therefore provide some practical tools for diagnosing specific site problems. LAC offers a concept for managing human use of wilderness areas with an ecocentric approach, allowing recreation in specified areas, acknowledging the inevitable impacts, and providing standards by which they can be monitored and corrective strategies employed.

The political challenges involved in gaining acceptance for a more comprehensive visitor management plan — as well as the economic considerations of implementation — are acknowledged, and will certainly not be solved immediately. Roberts recognised the need to approach various aspects of Antarctic conservation slowly, and by building a gradual consensus. The success of CCAMLR proves that, despite divergent international views, agreement on the regulation of an economic industry can be achieved and implemented. There will be more challenges ahead. Although it may not be possible to implement a full-scale version of an LAC approach, the Antarctic Treaty Consultative Parties could adopt the basic theoretical outline, and begin to apply the practical elements of ROS in order to put in place a visitor management programme that will contribute to the conservation of Antarctica.

The task is to forge a consensus among the Antarctic Treaty Consultative Parties and IAATO on the most basic elements of such a plan by: (i) designating visitor sites and restricting visitors to these sites; (ii) identifying a cost-effective way to inventory and monitor sites; and (iii) placing a moratorium on the development of land-based tourist operations until specific areas and goals for these areas can be established.
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APPENDIX A
THE ANTARCTIC TREATY

Text of the Antarctic Treaty

The Governments of Argentina, Australia, Belgium, Chile, the French Republic, Japan, New Zealand, Norway, the Union of South Africa, the Union of Soviet Socialist Republics, the United Kingdom of Great Britain and Northern Ireland, and the United States of America,

Recognizing that it is in the interest of all mankind that Antarctica shall continue for ever to be used exclusively for peaceful purposes and shall not become the scene or object of international discord;

Acknowledging the substantial contributions to scientific knowledge resulting from international cooperation in scientific investigation in Antarctica;

Convinced that the establishment of a firm foundation for the continuation and development of such cooperation on the basis of freedom of scientific investigation in Antarctica as applied during the International Geophysical Year accords with the interests of science and the progress of all mankind;

Convinced also that a treaty ensuring the use of Antarctica for peaceful purposes only and the continuance of international harmony in Antarctica will further the purposes and principles embodied in the Charter of the United Nations;

Have agreed as follows:

Article I

1. Antarctica shall be used for peaceful purposes only. There shall be prohibited, inter alia, any measure of a military nature, such as the establishment of military bases and fortifications, the carrying out of military manoeuvres, as well as the testing of any type of weapon.

2. The present Treaty shall not prevent the use of military personnel or equipment for scientific research or for any other peaceful purpose.

Article II

Freedom of scientific investigation in Antarctica and cooperation toward that end, as applied during the International Geophysical Year, shall continue, subject to the provisions of the present Treaty.

Article III

1. In order to promote international co-operation in scientific investigation in Antarctica, as provided for in Article II of the present Treaty, the Contracting Parties agree that, to the greatest extent feasible and practicable:

   a. information regarding plans for scientific programs in Antarctica shall be exchanged to permit maximum economy and efficiency of operations;

   b. scientific personnel shall be exchanged in Antarctica between expeditions and stations;

   c. scientific observations and results from Antarctica shall be exchanged and made freely available.

2. In implementing this Article, every encouragement shall be given to the establishment of cooperative working relations with those Specilized Agencies of the United Nations and other technical organizations having a scientific or technical interest in Antarctica.

Article IV

1. Nothing contained in the present Treaty shall be interpreted as:

   a. a renunciation by any Contracting Party of previously asserted rights of or claims to territorial sovereignty in Antarctica;

   b. a renunciation or diminution by any Contracting Party of any basis of claim to territorial sovereignty in Antarctica which it may have whether as a result of its activities or those of its nationals in Antarctica, or otherwise;

   c. prejudicing the position of any Contracting Party as regards its recognition or non-recognition of any other State's rights of or claim.
or basis of claim to territorial sovereignty in Antarctica.

2. No acts or activities taking place while the present Treaty is in force shall constitute a basis for asserting, supporting or denying a claim to territorial sovereignty in Antarctica or create any rights of sovereignty in Antarctica. No new claim, or enlargement of an existing claim, to territorial sovereignty in Antarctica shall be asserted while the present Treaty is in force.

Article V

1. Any nuclear explosions in Antarctica and the disposal there of radioactive waste material shall be prohibited.

2. In the event of the conclusion of international agreements concerning the use of nuclear energy, including nuclear explosions and the disposal of radioactive waste material, to which all of the Contracting Parties whose representatives are entitled to participate in the meetings provided for under Article IX are parties, the rules established under such agreements shall apply in Antarctica.

Article VI

The provisions of the present Treaty shall apply to the area south of 60° South Latitude, including all ice shelves, but nothing in the present Treaty shall prejudice or in any way affect the rights, or the exercise of the rights, of any State under international law with regard to the high seas within that area.

Article VII

1. In order to promote the objectives and ensure the observance of the provisions of the present Treaty, each Contracting Party whose representatives are entitled to participate in the meetings referred to in Article IX of the Treaty shall have the right to designate observers to carry out any inspection provided for by the present Article. Observers shall be nationals of the Contracting Parties which designate them. The names of observers shall be communicated to every other Contracting Party having the right to designate observers, and like notice shall be given of the termination of their appointment.

2. Each observer designated in accordance with the provisions of paragraph 1 of this Article shall have complete freedom of access at any time to any or all areas of Antarctica.

3. All areas of Antarctica, including all stations, installations and equipment within those areas, and all ships and aircraft at points of discharging or embarking cargoes or personnel in Antarctica, shall be open at all times to inspection by any observers designated in accordance with paragraph 1 of this Article.

4. Aerial observation may be carried out at any time over any or all areas of Antarctica by any of the Contracting Parties having the right to designate observers.

5. Each Contracting Party shall, at the time when the present Treaty enters into force for it, inform the other Contracting Parties, and thereafter shall give them notice in advance, of

a. all expeditions to and within Antarctica, on the part of its ships or nationals, and all expeditions to Antarctica organized in or proceeding from its territory;

b. all stations in Antarctica occupied by its nationals; and

c. any military personnel or equipment intended to be introduced by it into Antarctica subject to the conditions prescribed in paragraph 2 of Article I of the present Treaty.

Article VIII

1. In order to facilitate the exercise of their functions under the present Treaty, and without prejudice to the respective positions of the Contracting Parties relating to jurisdiction over all other persons in Antarctica, observers designated under paragraph 1 of Article VII and scientific personnel exchanged under subparagraph 1(b) of Article III of the Treaty, and members of the staffs accompanying any such persons, shall be subject only to the jurisdiction of the Contracting Party of which they are nationals in respect of all acts or omissions occurring while they are in Antarctica for the purpose of exercising their functions.

2. Without prejudice to the provisions of paragraph 1 of this Article, and pending the adoption of measures in pursuance of subparagraph 1(e) of Article IX, the Contracting Parties concerned in any case of dispute with regard to the exercise of jurisdiction in Antarctica shall immediately consult together with a view to reaching a mutually acceptable solution.

Article IX

1. Representatives of the Contracting Parties named in the preamble to the present Treaty shall meet at the City of Canberra within two months after the date of entry into force of the Treaty, and thereafter at suitable intervals and places, for the purpose of exchanging information, consulting together on matters of common interest.
pertaining to Antarctica, and formulating and considering, and recommending to their Governments, measures in furtherance of the principles and objectives of the Treaty, including measures regarding:

a. use of Antarctica for peaceful purposes only;
b. facilitation of scientific research in Antarctica;
c. facilitation of international scientific cooperation in Antarctica;
d. facilitation of the exercise of the rights of inspection provided for in Article VII of the Treaty;
e. questions relating to the exercise of jurisdiction in Antarctica;
f. preservation and conservation of living resources in Antarctica.

2. Each Contracting Party which has become a party to the present Treaty by accession under Article XIII shall be entitled to appoint representatives to participate in the meetings referred to in paragraph 1 of the present Article, during such times as that Contracting Party demonstrates its interest in Antarctica by conducting substantial research activity there, such as the establishment of a scientific station or the despatch of a scientific expedition.

3. Reports from the observers referred to in Article VII of the present Treaty shall be transmitted to the representatives of the Contracting Parties participating in the meetings referred to in paragraph 1 of the present Article.

4. The measures referred to in paragraph 1 of this Article shall become effective when approved by all the Contracting Parties whose representatives were entitled to participate in the meetings held to consider those measures.

5. Any or all of the rights established in the present Treaty may be exercised as from the date of entry into force of the Treaty whether or not any measures facilitating the exercise of such rights have been proposed, considered or approved as provided in this Article.

Article XII

1. a. The present Treaty may be modified or amended at any time by unanimous agreement of the Contracting Parties whose representatives are entitled to participate in the meetings provided for under Article IX. Any such modification or amendment shall enter into force when the depositary Government has received notice from all such Contracting Parties that they have ratified it.

   b. Such modification or amendment shall thereafter enter into force as to any other Contracting Party when notice of ratification by it has been received by the depositary Government. Any such Contracting Party from which no notice of ratification is received within a period of two years from the date of entry into force of the modification or amendment in accordance with the provision of subparagraph 1(a) of this Article shall be deemed to have withdrawn from the present Treaty on the date of the expiration of such period.

2. a. If after the expiration of thirty years from the date of entry into force of the present Treaty, any of the Contracting Parties whose representatives are entitled to participate in the meetings provided for under Article IX so requests by a communication addressed to the depositary Government, a Conference of all the Contracting Parties shall be held as soon as practicable to review the operation of the Treaty.

   b. Any modification or amendment to the present Treaty which is approved at such a Conference by a majority of the Contracting Parties there
represented, including a majority of those whose representatives are entitled to participate in the meetings provided for under Article IX, shall be communicated by the depositary Government to all Contracting Parties immediately after the termination of the Conference and shall enter into force in accordance with the provisions of paragraph 1 of the present Article.

c. If any such modification or amendment has not entered into force in accordance with the provisions of subparagraph 1a. of this Article within a period of two years after the date of its communication to all the Contracting Parties, any Contracting Party may at any time after the expiration of that period give notice to the depositary Government of its withdrawal from the present Treaty; and such withdrawal shall take effect two years after the receipt of the notice by the depositary Government.

Article XIII

1. The present Treaty shall be subject to ratification by the signatory States. It shall be open for accession by any State which is a Member of the United Nations, or by any other State which may be invited to accede to the Treaty with the consent of all the Contracting Parties whose representatives are entitled to participate in the meetings provided for under Article IX of the Treaty.

2. Ratification of or accession to the present Treaty shall be effected by each State in accordance with its constitutional processes.

3. Instruments of ratification and instruments of accession shall be deposited with the Government of the United States of America, hereby designated as the depositary Government.

4. The depositary Government shall inform all signatory and acceding States of the date of each deposit of an instrument of ratification or accession, and the date of entry into force of the Treaty and of any modification or amendment thereto.

5. Upon the deposit of instruments of ratification by all the signatory States, the present Treaty shall enter into force for those States and for States which have deposited instruments of accession. Thereafter the Treaty shall enter into force for any acceding State upon the deposit of its instruments of accession.

6. The present Treaty shall be registered by the depositary Government pursuant to Article 102 of the Charter of the United Nations.

Article XIV

The present Treaty, done in the English, French, Russian and Spanish languages, each version being equally authentic, shall be deposited in the archives of the Government of the United States of America, which shall transmit duly certified copies thereof to the Governments of the signatory and acceding States.
APPENDIX B

CONVENTIONS TO THE ANTARCTIC TREATY

The following brief outline of major provisions of the Conventions to the Antarctic Treaty is based on Heap (1994).

Agreed Measure for the Conservation of Antarctic Fauna and Flora (Agreed Measures)

The Agreed Measures provide basic protection to fauna and flora in the areas south of 60° South Latitude, including the ice shelves. Article V prohibits the killing, wounding, capturing, or molesting of any native mammal or native birds except by permit. Such permits can be drawn and issued in order to provide indispensable food for men or dogs, and to provide specimens for scientific study, museums, or zoological collections.

Participating governments are also asked to take appropriate measures to minimise harmful interference within the defined area (Article VII). Acts and activities that are considered harmful interference include: allowing dogs free run (dogs are no longer allowed in the Treaty area), flying helicopters or other aircraft in a manner that would unnecessarily disturb bird and seal concentrations or landing closer than 200 m to concentrations of wildlife, using explosives or firearms (within 300 m) near wildlife, and disturbing wildlife colonies while on foot.

Article VIII allows for the designation of a Specially Protected Area (SPA) for areas of outstanding scientific interest and, within such an area, prohibits the collection of any native plant, the driving of vehicles, or entry except by permit. The introduction of non-indigenous flora or fauna is also prohibited.

Entered into force in 1964.

The Convention for the Conservation of Antarctic Seals (CCAS)

CCAS was adopted in 1964 and sought to prevent the over-exploitation of Antarctic seals in the areas South of 60° South Latitude.

From a practical standpoint, the most important article is Article 3 (Annexed Measures) which permits Contracting Parties to adopt future measures with respect to this Convention for purposes of conservation, scientific study and rational and humane
use of seal resources. There are two categories of protection for seals: permissible catch and protected species. For three seals, limits are set as follows:

<table>
<thead>
<tr>
<th>Species</th>
<th>Limit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Crabeater seal <em>Lobodon carcinophagus</em></td>
<td>175,000;</td>
</tr>
<tr>
<td>Leopard seal <em>Hydrurga leptonyx</em></td>
<td>12,000;</td>
</tr>
<tr>
<td>Weddell seal <em>Leptonychotes weddelli</em></td>
<td>5,000.</td>
</tr>
</tbody>
</table>

In the second category, it is forbidden to kill or capture:

- Ross seal *Ommatophoca rossi*;
- Southern elephant seal *Mirounga leonina*;
- Southern fur seals *Arctocephalus sp.*

Further, to protect the adult breeding stock, one year old or older Weddell seals cannot be killed or captured between 1 September and 31 January inclusive.

There is a closed season for sealing for the period between 1 March and 31 August inclusive. Six sealing zones, rotated in a numerical sequence, have also been established. Additionally, seal reserves have been set up where the killing or capturing of seals is forbidden.

*Entered into force in 1972.*

**Convention on the Conservation of Antarctic Marine Living Resources (CCAMLR)**

The concern over the exploitability of marine resources and the importance of krill in the Antarctic marine ecosystem led to the negotiations of CCAMLR from February 1978 until its adoption in May 1980.

A major feature of the Convention is the provision of a Commission, Article VII, whose functions are *inter alia* to:

- (a) facilitate research on Antarctic marine living resources and the Antarctic marine ecosystem;
- (b) compile data on the status and changes in populations there;
- (c) ensure the acquisition of catch and effort statistics on harvested populations;
- (d) disseminate, analyse and publish information on the above;
- (e) identify conservation needs;
- (f) implement a system of observation and inspection; and
- (g) regulate the methods of harvesting.
A Scientific Committee is also provided for in Article XV and shall conduct activities as the Commission may direct in pursuance of the objectives of this Convention.

Entered into force in 1982.

Convention on the Regulation of Antarctic Mineral Resource Activities (CRAMRA)

The question of minerals exploration and exploitation was among the discussion items during the negotiations of the Antarctic Treaty. At the time, it was decided that full consideration would be premature and it was not until 1970 that the Consultative Parties considered the question. Agreement was reached on the importance of a regime but not on how it was to be regulated. In 1988, the final text of the act was agreed. Parties agreed that ice would not be, for the purposes of this Convention, regarded as a mineral resource but the potential impacts of any harvesting would be discussed further.

Article 4 sets forth that no mineral resource activity shall take place until its possible impacts on the Antarctic environment have been determined. The activity in question should not cause any significant: adverse effects on the quality of air or water, changes in atmosphere, terrestrial or marine environments, changes in populations of flora or fauna and endanger any populations or degrade areas of biological, scientific, historic, aesthetic or wilderness significance.

The main features of CCAMLR were the provision of a Commission (Articles 18-22), an Advisory Committee (23-27), and Regulatory Committees (Articles 29-32) to serve as the management section.

Not entered into force.

Protocol on Environmental Protection to the Antarctic Treaty (Protocol)

Article 2 of the Protocol designates Antarctica as a natural reserve, devoted to peace and science. The environmental principles put forth in Article 3 state that activities must avoid: (i) adverse effects on climate, air or water quality; (ii) significant changes in atmospheric, terrestrial, glacial or marine environments; (iii) significant changes in populations; (iv) endangering species or populations; and (v) degrading areas of biological, scientific, historic, aesthetic or wilderness significance.

Article 7 prohibits mineral resource activities.

A Committee for Environmental Protection will be established under Article 11 and its functions are set out in Article 12. The primary function of the Committee will be to provide advice and formulate recommendations to the Parties in connection with the
implementation of the Protocol and other functions referred to it by the Antarctic Treaty Consultative Meetings.

Annexes to the Protocol provide the details on many aspects of conservation and protection. For example, Annex I concerns Environmental Impact Assessment and the conditions under which such an assessment must be conducted. The key phrase is 'if the activity will have a more than transitory impact' for under those cases various assessment procedures must be undertaken.

Annexes II-IV concern protection of flora and fauna, waste disposal and management, and prevention of marine pollution.

Annex V to the Protocol deals with area protection and management, Article 5 of that Annex specifically focuses on management plans and is reproduced in Appendix F.

*Awaiting ratification.*
APPENDIX C

THE KYOTO RECOMMENDATIONS

Recommendation XVIII-1. Tourism and non-Governmental Activities

The Representatives,

Reaffirming the exceptional character of the Antarctic environment given in particular the fragility of its fauna and flora and of the setting which the Antarctic offers for the conduct of scientific activities;

Acknowledging the increase in the development of tourist activities in the Antarctic;

Noting that those who visit the Antarctic and organise or conduct tourism and non-governmental activities in the Antarctic are currently subject to legally binding obligations pursuant to national legislation implementing the Antarctic Treaty and associated legal instruments;

Noting further that such visitors or organisers will be subject to additional legally binding obligations upon entry into force of the Protocol on Environmental Protection to the Antarctic Treaty;

Recognizing the need for visitors and organisers to have practical guidance on how best to plan and carry out any visits to the Antarctic;

Recalling the Final Act of the Eleventh Special Antarctic Treaty Consultative Meeting, at which the Protocol was adopted, in which the signatories of the Final Act decided that the Annexes of the Protocol should be applied in accordance with their legal systems and to the extent practicable;

Desiring to ensure that those who visit the Antarctic carry out their visits or tours strictly in accordance with existing obligations and in so far as is consistent with existing national law, in accordance with the Protocol, pending its entry into force;

Desiring further to facilitate the early entry into force of the Protocol and of the implementation of its provisions in relation to those who visit or organise tours to the Antarctic.

Recommend to their Governments that:

1. They circulate widely and as quickly as possible the Guidance for Visitors to the Antarctic and the Guidance for Those Organising and Conducting Tourism and Non-governmental Activities in the Antarctic annexed to this Recommendation.

2. They urge those intending to visit or organise and conduct tourism and non-governmental activities in the Antarctic to act in accordance with the attached guidance consistent with the relevant provisions of their applicable national law.

Attachment

Guidance for Visitors to the Antarctic

Activities in the Antarctic are governed by the Antarctic Treaty of 1959 and associated agreements, referred to collectively as the Antarctic Treaty system. The Treaty established Antarctica as a zone of peace and science.

In 1991, the Antarctic Treaty Consultative Parties adopted the Protocol on Environmental Protection to the Antarctic Treaty, which designates the Antarctic as a natural reserve. The Protocol sets out environmental principles, procedures and obligations for the comprehensive protection of the Antarctic environment, and its dependent and associated ecosystems. The Consultative Parties have agreed that, pending its entry into force, as far as possible and in accordance with their legal system, the provisions of the Protocol should be applied as appropriate.

The Environmental Protocol applies to tourism and non-governmental activities as well as governmental activities in the Antarctic Treaty Area. It is intended to ensure that these activities do not have adverse impacts on the Antarctic environment, or on its scientific and aesthetic values.

This Guidance for Visitors to the Antarctic is intended to ensure that all visitors are aware of, and are therefore able to comply with, the Treaty and the Protocol. Visitors are, of course, bound by national laws and regulations applicable to activities in the Antarctic.
A. Protect Antarctic Wildlife

Taking or harmful interference with Antarctic wildlife is prohibited except in accordance with a permit issued by a national authority.

1. Do not use aircraft, vessels, small boats, or other means of transport in ways that disturb wildlife, either at sea or on land.
2. Do not feed, touch, or handle birds or seals, or approach or photograph them in ways that cause them to alter their behaviour. Special care is needed when animals are breeding or molting.
3. Do not damage plants, for example by walking, driving, or landing on extensive moss beds or lichen-covered scree slopes.
4. Do not use guns or explosives. Keep noise to the minimum to avoid frightening wildlife.
5. Do not bring non-native plants or animals into the Antarctic (e.g. live poultry, pet dogs and cats, house plants).

B. Respect Protected Areas

A variety of areas in the Antarctic have been afforded special protection because of their particular ecological, scientific, historic or other values. Entry into certain areas may be prohibited except in accordance with a permit issued by an appropriate national authority. Activities in and near designated Historic Sites and Monuments and certain other areas may be subject to special restrictions.

1. Know the locations of areas that have been afforded special protection and any restrictions regarding entry and activities that can be carried out in and near them.
2. Observe applicable restrictions.
3. Do not damage, remove or destroy Historic Sites or Monuments, or any artifacts associated with them.

C. Respect Scientific Research

Do not interfere with scientific research, facilities or equipment.

1. Obtain permission before visiting Antarctic science and logistic support facilities; reconfirm arrangements 24–72 hours before arriving; and comply strictly with the rules regarding such visits.
2. Do not interfere with, or remove, scientific equipment or marker posts, and do not disturb experimental study sites, field camps, or supplies.

D. Be Safe

Be prepared for severe and changeable weather. Ensure that your equipment and clothing meet Antarctic standards. Remember that the Antarctic environment is inhospitable, unpredictable and potentially dangerous.

1. Know your capabilities, the dangers posed by the Antarctic environment, and act accordingly. Plan activities with safety in mind at all times.
2. Keep a safe distance from all wildlife, both on land and at sea.
3. Take note of, and act on, the advice and instructions from your leaders; do not stray from your group.
4. Do not walk onto glaciers or large snow fields without proper equipment and experience; there is a real danger of falling into hidden crevasses.
5. Do not expect a rescue service; self-sufficiency is increased and risks reduced by sound planning, quality equipment, and trained personnel.
6. Do not enter emergency refuges (except in emergencies). If you use equipment or food from a refuge, inform the nearest research station or national authority once the emergency is over.
7. Respect any smoking restrictions, particularly around buildings, and take great care to safeguard against the danger of fire. This is a real hazard in the dry environment of Antarctica.

E. Keep Antarctica Pristine

Antarctica remains relatively pristine, and has not yet been subjected to large scale human perturbations. It is the largest wilderness area on earth. Please keep it that way.

1. Do not dispose of litter or garbage on land. Open burning is prohibited.
2. Do not disturb or pollute lakes or streams. Any materials discarded at sea must be disposed of properly.
3. Do not paint or engrave names or graffiti on rocks or buildings.
4. Do not collect or take away biological or geological specimens or man-made artifacts as a souvenir, including rocks, bones, eggs, fossils, and parts or contents of buildings.
5. Do not deface or vandalize buildings, whether occupied, abandoned, or unoccupied, or emergency refuges.
Guidance for Those Organising and Conducting Tourism and Non-governmental Activities in the Antarctic

Antarctica is the largest wilderness area on earth, unaffected by large scale human activities. Accordingly, this unique and pristine environment has been afforded special protection. Furthermore, it is physically remote, inhospitable, unpredictable and potentially dangerous. All activities in the Antarctic Treaty Area, therefore, should be planned and conducted with both environmental protection and safety in mind.

Activities in the Antarctic are subject to the Antarctic Treaty of 1959 and associated legal instruments, referred to collectively as the Antarctic Treaty system. These include the Convention for the Conservation of Antarctic Seals (CCAS) (1972), the Convention on the Conservation of Antarctic Marine Living Resources (CCAMLR) (1980) and the Recommendations and other measures adopted by the Antarctic Treaty Consultative Parties under the Antarctic Treaty.

In 1991, the Consultative Parties to the Antarctic Treaty adopted the Protocol on Environmental Protection to the Antarctic Treaty. This Protocol sets out environmental principles, procedures and obligations for the comprehensive protection of the Antarctic environment, and its dependent and associated ecosystems. The Consultative Parties have agreed that, pending its entry into force, as far as possible and in accordance with their legal systems, that the provisions of the Protocol should be applied as appropriate.

The Environmental Protocol designates Antarctica as a natural reserve devoted to peace and science, and applies to both governmental and non-governmental activities in the Antarctic Treaty Area. The Protocol seeks to ensure that human activities, including tourism, do not have adverse impacts on the Antarctic environment, nor on its scientific and aesthetic values.

The Protocol states, as a matter of principle, that all activities are to be planned and conducted on the basis of information sufficient to evaluate their possible impact on the Antarctic environment and its associated ecosystems, and on the value of Antarctica for the conduct of scientific research. Organisers should be aware that the Environmental Protocol requires that "activities shall be modified, suspended or cancelled if they result in or threaten to result in impacts upon the Antarctic environment or dependent or associated ecosystems."

Those responsible for organising and conducting tourism and non-governmental activities must comply fully with national laws and regulations which implement the Antarctic Treaty system, as well as other national laws and regulations implementing international agreements on environmental protection, pollution and safety that related to the Antarctic Treaty Area. They should also abide by the requirements imposed on organisers and operators under the Protocol on Environmental Protection and its Annexes, in so far as they have not yet been implemented in national law.

Key Obligations on Organisers and Operators

1. Provide prior notification of, and reports on, their activities to the competent authorities of the appropriate Party or Parties.

2. Conduct an assessment of the potential environmental impacts of their planned activities.

3. Provide for effective response to environmental emergencies, especially with regard to marine pollution.

4. Ensure self-sufficiency and safe operations.

5. Respect scientific research and the Antarctic environment, including restrictions regarding protected areas, and the protection of flora and fauna.

6. Prevent the disposal and discharge of prohibited waste.

Procedures to be Followed by Organisers and Operators

A. When Planning to go to the Antarctic

Organisers and operators should:

1. Notify the competent national authorities of the appropriate Party or Parties of details of their planned activities with sufficient time to enable the Party(ies) to comply with their information exchange obligations under Article VII(5) of the Antarctic Treaty. The information to be provided is listed in Attachment A.

2. Conduct an environmental assessment in accordance with such procedures as may have been established in national law to give effect to Annex I of the Protocol, including, if appropriate, how potential impacts will be monitored.

3. Obtain timely permission from the national authorities responsible for any stations they propose to visit.

4. Provide information to assist in the preparation of: contingency response plans in accordance with Article 15 of the Protocol; waste management plans in accordance with Annex III of the Protocol;
and marine pollution contingency plans in accordance with Annex IV of the Protocol.

5. Ensure that expedition leaders and passengers are aware of the location and special regimes which apply to Specially Protected Areas and Sites of Special Scientific Interest (and on entry into force of the Protocol, Antarctic Specially Protected Areas and Antarctic Specially Managed Areas) and of Historic Sites and Monument and, in particular, relevant management plans.

6. Obtain a permit, where required by national law, from the competent national authority of the appropriate Party or Parties, should they have a reason to enter such areas, or a monitoring site (CEMP Site) designated under CCAMLR.

7. Ensure that activities are fully self-sufficient and do not require assistance from Parties unless arrangements for it have been agreed in advance.

8. Ensure that they employ experienced and trained personnel, including a sufficient number of guides.

9. Arrange to use equipment, vehicles, vessels, and aircraft appropriate to Antarctic operations.

10. Be fully conversant with applicable communications, navigation, air traffic control and emergency procedures.

11. Obtain the best available maps and hydrographic charts, recognising that many areas are not fully or accurately surveyed.

12. Consider the question of insurance (subject to requirements of national law).

13. Design and conduct information and education programmes to ensure that all personnel and visitors are aware of relevant provisions of the Antarctic Treaty system.


B. When in the Antarctic Treaty Area
Organisers and operators should:

1. Comply with all requirements of the Antarctic Treaty system, and relevant national laws, and ensure that visitors are aware of requirements that are relevant to them.

2. Reconfirm arrangements to visit stations 24-72 hours before their arrival and ensure that visitors are aware of any conditions or restrictions established by the station.

3. Ensure that visitors are supervised by a sufficient number of guides who have adequate experience and training in Antarctic conditions and knowledge of the Antarctic Treaty system requirements.

4. Monitor environmental impacts of their activities, if appropriate, and advise the competent national authorities of the appropriate Party or Parties of any adverse or cumulative impacts resulting from an activity, but which were not foreseen by their environmental impact assessment.

5. Operate ships, yachts, small boats, aircraft, hovercraft, and all other means of transport safely and according to appropriate procedures, including those set out in the Antarctic Flight Information Manual (AFIM).

6. Dispose of waste materials in accordance with Annex V of the Protocol. These annexes prohibit, among other things, the discharge of plastics, oil and noxious substances into the Antarctic Treaty Area; regulate the discharge of sewage and food waste; and require the removal of most waste from the area.

7. Co-operate fully with observers designated by Consultative Parties to conduct inspections of stations, ships, aircraft and equipment under Article VII of the Antarctic Treaty, and those to be designated under Article 14 of the Environmental Protocol.

8. Cooperate in monitoring programs undertaken in accordance with Article 3(2) (d) of the Protocol.

9. Maintain a careful and complete record of their activities conducted.

C. On Completion of the Activities
Within three months of the end of the activity, organisers and operators should report on the conduct of it to the appropriate national authority in accordance with national laws and procedures. Reports should include the name, details and state of registration of each vessel or aircraft used and the name of their captain or commander; actual itinerary; the number of visitors engaged in the activity; places, dates and purposes of landings and the number of visitors landed on each occasion; any meteorological observations made, including those made a part of the World Meteorological Organization (WMO) Voluntary Observing Ships Scheme; any significant changes in activities and their impacts from those predicted before the visit was conducted; and action taken in case of emergency.
D. Antarctic Treaty System Documents and Information

Most Antarctic Treaty Parties can provide through their national contact points copies of relevant provisions of the Antarctic Treaty system and information about national laws and procedures, including:

- The Antarctic Treaty (1959)
- Convention for the Conservation of Antarctic Seals (1972)
- Protocol on Environmental Protection to the Antarctic Treaty (1991)
- Recommendations and other measures adopted under the Antarctic Treaty
- Final Reports of Consultative Meetings

Attachment A

Information to be provided in Advance Notice

Organisers should provide the following information to the appropriate national authorities in the format requested.

1. name, nationality, and contact details of the organiser;
2. where relevant, registered name and national registration and type of any vessel or aircraft to be used (including name of the captain or commander, call-sign, radio frequency, IMMARSAT number);
3. intended itinerary including the date of departure and places to be visited in the Antarctic Treaty Area;
4. activities to be undertaken and purpose;
5. number and qualifications of crew and accompanying guides and expedition staff;
6. estimated number of visitors to be carried;
7. carrying capacity of vessel;
8. intended use of vessel;
9. intended use and type of aircraft;
10. number and type of other vessels, including small boats, to be used in the Antarctic Treaty Area;
11. information about insurance coverage;
12. details of equipment to be used, including for safety purposes, and arrangements for self-sufficiency;
13. and other matters required by national laws.
APPENDIX D

THE 1993/94 VISITOR QUESTIONNAIRE

Thank you for taking the time to complete this survey. Could you please record the name of your ship and the dates of your cruise.

Ship ____________________ Cruise dates ____________________

Please tick the appropriate box for questions 1 through 9.

1. Male [ ]          Female [ ]

2. Age:  
   14 & under [ ]  55-64 [ ]
   15-24 [ ]       65-74 [ ]
   25-34 [ ]       75-84 [ ]
   35-44 [ ]       85+ [ ]
   45-54 [ ]

3. What is the country of your birth?
   Argentina [ ]                Italy [ ]
   Australia [ ]                Japan [ ]
   Austria [ ]                  Switzerland [ ]
   Belgium [ ]                  United Kingdom [ ]
   Canada [ ]                   United States [ ]
   France [ ]                   Other [ ]
   Germany [ ]

4. How many previous trips to the Antarctic have you made?
   None [ ]                    Three [ ]
   One [ ]                     Four [ ]
   Two [ ]                     Five or more [ ]

5. Did you choose to travel ...
   On your own [ ]
   With a companion [ ]
   With an organised group [ ]

6. Which of the following areas best describes your current employment? If retired, please indicate the one in which you were employed.
   Art/Music [ ]                  Photography/film maker [ ]
   Banking/investment [ ]         Sales/marketing [ ]
   Business [ ]                   Science [ ]
   Child rearing [ ]              Teaching [ ]
   Law [ ]                        Writer [ ]
   Medicine [ ]                   Other [ ]
   Office Administration [ ]

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7. What category best describes your current employment status? Please choose one.

Full time (35 hours per week or more) [ ]
Part time (35 hours per week or less) [ ]
Retired [ ]
Other ____________________________

8. At what age did you leave school? ____________________________

9. What qualification did you attain?

No formal education [ ]
Rather not disclose [ ]

10. Did the funds for this trip come from:

Savings [ ]
Disposable income [ ]

If there were other financial circumstances concerning this, that you feel comfortable indicating, would you do so.

Other ____________________________

I would prefer not to disclose [ ]

For the next three questions, please indicate the reasons that are most appropriate to you.

11. Why are you visiting the Antarctic?

I am interested in polar regions [ ] Yes [ ] No
I am a nature lover [ ]
This will be my 7th continent [ ]
I am accompanying my travel partner [ ]
I have visited the Arctic [ ]
My interest is in photography/film maker [ ]
I enjoy seeing new places [ ]
Other ____________________________

12. Why did you choose this particular cruise?

Recommended by travel agent [ ] Yes [ ] No
Recommended by family/friend [ ]
Travel brochure looked attractive [ ]
Saw an interesting ad [ ]
Best itinerary [ ]
Most appropriate scheduling [ ]
Other ____________________________

13. What appealed to you most about this particular cruise?

Size of ship [ ] Yes [ ] No [ ] Didn't matter [ ]
Facilities aboard [ ]
Itinerary [ ]
Lecturers as advertised [ ]
Value for price [ ]
Other ____________________________

14. Did you attend the lectures?

None [ ] Some [ ] Most [ ] All [ ]
15. From the lectures you have attended was the following information provided:

<table>
<thead>
<tr>
<th>Information</th>
<th>Yes</th>
<th>No</th>
</tr>
</thead>
<tbody>
<tr>
<td>IAATO voluntary visitor guidelines</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Antarctic Treaty System</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Wildlife likely to be seen</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mining and commercial interests</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Other visitor guidelines</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Protected areas in Antarctica</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Science in Antarctica</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

16. Based on what you knew prior to coming to Antarctica, how did you rate the impacts of the following on the environment: Please circle the appropriate response.

<table>
<thead>
<tr>
<th>Activity</th>
<th>Prior to Antarctica</th>
<th>Now</th>
</tr>
</thead>
<tbody>
<tr>
<td>a) Science?</td>
<td>No opinion</td>
<td>None Low Medium High</td>
</tr>
<tr>
<td>b) Mining?</td>
<td>No opinion</td>
<td>None Low Medium High</td>
</tr>
<tr>
<td>c) Tourism?</td>
<td>No opinion</td>
<td>None Low Medium High</td>
</tr>
</tbody>
</table>

17. Based on what you have learned on this trip, how do you now rate the impacts of the following on the environment: Please circle the appropriate response.

<table>
<thead>
<tr>
<th>Activity</th>
<th>Prior to Antarctica</th>
<th>Now</th>
</tr>
</thead>
<tbody>
<tr>
<td>a) Science?</td>
<td>No opinion</td>
<td>None Low Medium High</td>
</tr>
<tr>
<td>b) Mining?</td>
<td>No opinion</td>
<td>None Low Medium High</td>
</tr>
<tr>
<td>c) Tourism?</td>
<td>No opinion</td>
<td>None Low Medium High</td>
</tr>
</tbody>
</table>

18. While on landings did you ever find yourself accidentally:

<table>
<thead>
<tr>
<th>Situation</th>
<th>Yes</th>
<th>No</th>
<th>Don't know</th>
</tr>
</thead>
<tbody>
<tr>
<td>Between a seal and the water</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Between a seal and its young</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Inside the periphery of penguin rookery</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Inside the periphery of a seal colony</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Walking on plants</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

19. While on landings did you ever observe anyone:

<table>
<thead>
<tr>
<th>Activity</th>
<th>Yes</th>
<th>No</th>
</tr>
</thead>
<tbody>
<tr>
<td>Closer than 5 feet (1.5 m) to any wildlife</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Touching wildlife</td>
<td></td>
<td></td>
</tr>
<tr>
<td>For a photograph, cause an animal to move</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Collecting a natural object or artefact</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Smoking or eating on shore</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

20. What additional activities would you like to see offered on an Antarctic trip? If you have participated in any of these during your trip, please tick the last column.

<table>
<thead>
<tr>
<th>Activity</th>
<th>Yes</th>
<th>No</th>
<th>Participated</th>
</tr>
</thead>
<tbody>
<tr>
<td>Day hikes</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fishing</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Climbing</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Snowmobiling</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Skiing</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Camping</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Scuba diving</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Other</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

21. Are there facilities or services that would be useful?

<table>
<thead>
<tr>
<th>Facility</th>
<th>Yes</th>
<th>No</th>
</tr>
</thead>
<tbody>
<tr>
<td>Visitor centre in Antarctic Peninsula</td>
<td></td>
<td></td>
</tr>
<tr>
<td>On site interpreters</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Visitor rest facilities on site</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Small huts for overnight use</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Airport</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Chalet or guest house</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Other</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
22. Did you do any reading for this trip? If so, how many hours? Please tick one box.

None [] 1-5 hours [] 6-10 hours [] 10 hours+ []

23. Were those books about...

<table>
<thead>
<tr>
<th>Topic</th>
<th>Yes</th>
<th>No</th>
</tr>
</thead>
<tbody>
<tr>
<td>History of exploration</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Wildlife</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Geology and glaciers</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Wildlife photography</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Science in Antarctica</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

24. You have been sitting on a rock away from the rest of the group, watching older penguin chicks in a crieche (penguin nursery). One inquisitive chick heads your way. It is tempting to touch it. Would you?

Yes [] No []

25. You and a friend are by yourselves taking photographs at your last landing site in Antarctica. You notice a pile of six large elephant seals with one particularly fine fellow on top. He has been dozing on and off for several minutes but has yet to open his eyes. Would you be tempted to make a noise or otherwise try to attract his attention?

Yes [] No []

26. The ship's naturalist is taking a group to look at a penguin colony. You are observing the distance regulation but the naturalist moves closer and indicates it is okay to do the same.

a. Would you move closer?

Yes [] No []

a. Do you tell the tour director about the distance violation?

Yes [] No []

27. You enter a base built in the 1950s and notice that there are many maps of the base and island lying around. You have had an interest in this base because your friend was stationed here. Since it's not really historic and the map is one of many, would you be tempted to take one for your friend?

Yes [] No []

28. You notice a photographer getting within five feet of a nesting gentoo penguin. You have noticed that skuas have been patrolling the colony so you gently remind him that he is too close and he tells you to mind your own business. Do you mention this to the naturalist?

Yes [] No []

29. Did Antarctica meet your expectations?

Yes [] More than [] No [] Less than []

Please feel free to add any other comments:

Thank you for helping me in my research. I appreciate your time. Please return the form as instructed by your cruise leader.

Pamela B. Davis
APPENDIX E
SIGNIFICANT CHI-SQUARE TEST DATA

The following chi-square tables illustrate the significant relationships found for data discussed in Chapter 5. Each table is defined by its two dimensions of classification, for example, the visitor's sex and an interest in photography. All test statistics are significant at the 99.5% level unless indicated; that is, the probability $p$ that the observed relationship did arise by chance is less than 0.5% ($p < 0.005$). In addition, $n$ is the number of passengers responding to each question and DF is the degrees of freedom for the test. For a detailed description of this test see McClave and Dietrich (1988). Where noted, categories have been combined to avoid expected values of less than five; this is necessary because the results of a chi-square test having such expected values are considered unreliable.

E1. Question 11. Why are you visiting Antarctica?

Table E1.1. Sex / 'Photography / film making'

<table>
<thead>
<tr>
<th>Sex</th>
<th>Yes (Expected)</th>
<th>No (Expected)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Men</td>
<td>89 (77.60)</td>
<td>202 (213.40)</td>
</tr>
<tr>
<td>Women</td>
<td>87 (98.40)</td>
<td>282 (270.60)</td>
</tr>
</tbody>
</table>

$n = 660; \text{DF} = 1; \chi^2 = 4.085 [p < 0.050].$

Table E1.2. Age / 'Nature lover'

<table>
<thead>
<tr>
<th>Age</th>
<th>Yes (Expected)</th>
<th>No (Expected)</th>
</tr>
</thead>
<tbody>
<tr>
<td>15-44</td>
<td>62 (51.29)</td>
<td>16 (26.71)</td>
</tr>
<tr>
<td>45-64</td>
<td>164 (165.72)</td>
<td>88 (86.28)</td>
</tr>
<tr>
<td>65+</td>
<td>210 (218.99)</td>
<td>123 (114.01)</td>
</tr>
</tbody>
</table>

$n = 663; \text{DF} = 2; \chi^2 = 7.655 [p < 0.025].$
Table E1.3. Age / '7th Continent'  

<table>
<thead>
<tr>
<th>Age</th>
<th>Yes</th>
<th>No</th>
</tr>
</thead>
<tbody>
<tr>
<td>15-44</td>
<td>14 (20.77)</td>
<td>64 (57.22)</td>
</tr>
<tr>
<td>45-64</td>
<td>52 (67.10)</td>
<td>200 (184.90)</td>
</tr>
<tr>
<td>65+</td>
<td>110 (88.13)</td>
<td>221 (242.87)</td>
</tr>
</tbody>
</table>

\( n = 661; \text{DF} = 2; \chi^2 = 15.031. \)

Table E1.4. Age / 'Visited Arctic'  

<table>
<thead>
<tr>
<th>Age</th>
<th>Yes</th>
<th>No</th>
</tr>
</thead>
<tbody>
<tr>
<td>15-44</td>
<td>6 (21.44)</td>
<td>72 (56.56)</td>
</tr>
<tr>
<td>45-64</td>
<td>52 (69.01)</td>
<td>199 (181.99)</td>
</tr>
<tr>
<td>65+</td>
<td>124 (91.55)</td>
<td>209 (241.45)</td>
</tr>
</tbody>
</table>

\( n = 662; \text{DF} = 2; \chi^2 = 36.984. \)

Table E1.5. Educational level / 'Enjoy seeing new places'  

<table>
<thead>
<tr>
<th>Educational level</th>
<th>Yes</th>
<th>No</th>
</tr>
</thead>
<tbody>
<tr>
<td>None/not disclose</td>
<td>198 (210.92)</td>
<td>70 (57.08)</td>
</tr>
<tr>
<td>University</td>
<td>174 (167.63)</td>
<td>39 (45.37)</td>
</tr>
<tr>
<td>Post-graduate</td>
<td>149 (142.45)</td>
<td>32 (38.55)</td>
</tr>
</tbody>
</table>

\( n = 662; \text{DF} = 2; \chi^2 = 6.265 [p < 0.050]. \)

Table E1.6. Educational level / '7th Continent'  

<table>
<thead>
<tr>
<th>Educational level</th>
<th>Yes</th>
<th>No</th>
</tr>
</thead>
<tbody>
<tr>
<td>None/not disclosed</td>
<td>54 (70.65)</td>
<td>214 (197.35)</td>
</tr>
<tr>
<td>University</td>
<td>59 (56.15)</td>
<td>154 (156.85)</td>
</tr>
<tr>
<td>Post-graduate</td>
<td>61 (47.19)</td>
<td>118 (131.81)</td>
</tr>
</tbody>
</table>

\( n = 660; \text{DF} = 2; \chi^2 = 11.015. \)
Table E1.7. Ship / 'Enjoy seeing new places'

<table>
<thead>
<tr>
<th>Ship</th>
<th>Yes</th>
<th>No</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ship 1</td>
<td>435 (430.84)</td>
<td>112 (116.16)</td>
</tr>
<tr>
<td>Ship 2</td>
<td>52 (48.53)</td>
<td>10 (13.17)</td>
</tr>
<tr>
<td>Ship 3</td>
<td>36 (43.32)</td>
<td>19 (11.68)</td>
</tr>
</tbody>
</table>

\(n = 664; \text{DF} = 2; \chi^2 = 6.981 [p < 0.050].\)

Table E1.8. Cruise (Ship 1 only) / '7th Continent'

<table>
<thead>
<tr>
<th>Cruise</th>
<th>Yes</th>
<th>No</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cruise 1</td>
<td>67 (82.84)</td>
<td>234 (218.16)</td>
</tr>
<tr>
<td>Cruise 2</td>
<td>40 (32.20)</td>
<td>77 (84.80)</td>
</tr>
<tr>
<td>Cruise 3</td>
<td>43 (34.95)</td>
<td>84 (92.05)</td>
</tr>
</tbody>
</table>

\(n = 545; \text{DF} = 2; \chi^2 = 9.342 [p < 0.010].\)

**E2. Question 12. Why did you choose this particular cruise?**

Table E2.1. Age / 'Recommended by family/friend'

<table>
<thead>
<tr>
<th>Age</th>
<th>Yes</th>
<th>No</th>
</tr>
</thead>
<tbody>
<tr>
<td>15-44</td>
<td>20 (11.79)</td>
<td>55 (63.21)</td>
</tr>
<tr>
<td>45-64</td>
<td>41 (38.66)</td>
<td>205 (207.34)</td>
</tr>
<tr>
<td>65+</td>
<td>41 (51.55)</td>
<td>287 (276.34)</td>
</tr>
</tbody>
</table>

\(n = 649; \text{DF} = 2; \chi^2 = 9.580 [p < 0.050].\)

Table E2.2. Age / 'Travel brochure looked attractive'

<table>
<thead>
<tr>
<th>Age</th>
<th>Yes</th>
<th>No</th>
</tr>
</thead>
<tbody>
<tr>
<td>15-44</td>
<td>18 (30.94)</td>
<td>57 (44.06)</td>
</tr>
<tr>
<td>45-64</td>
<td>90 (101.91)</td>
<td>157 (145.09)</td>
</tr>
<tr>
<td>65+</td>
<td>161 (136.15)</td>
<td>169 (193.85)</td>
</tr>
</tbody>
</table>

\(n = 652; \text{DF} = 2; \chi^2 = 19.306.\)
Table E2.3. Educational level / 'Recommended by family/friend'

<table>
<thead>
<tr>
<th>Educational level</th>
<th>Yes</th>
<th>No</th>
</tr>
</thead>
<tbody>
<tr>
<td>None/not disclosed</td>
<td>29 (40.99)</td>
<td>234 (222.01)</td>
</tr>
<tr>
<td>University</td>
<td>35 (32.26)</td>
<td>172 (174.74)</td>
</tr>
<tr>
<td>Post-graduate</td>
<td>37 (27.74)</td>
<td>141 (150.26)</td>
</tr>
</tbody>
</table>

\(n = 648; \text{DF} = 2; \chi^2 = 8.089 \ [p < 0.025].\)

Table E2.4. Educational level / 'Travel brochure looked attractive'

<table>
<thead>
<tr>
<th>Educational level</th>
<th>Yes</th>
<th>No</th>
</tr>
</thead>
<tbody>
<tr>
<td>None/not disclosed</td>
<td>102 (130.75)</td>
<td>264 (235.25)</td>
</tr>
<tr>
<td>University</td>
<td>86 (74.31)</td>
<td>122 (133.69)</td>
</tr>
<tr>
<td>Post-graduate</td>
<td>81 (63.95)</td>
<td>98 (115.05)</td>
</tr>
</tbody>
</table>

\(n = 651; \text{DF} = 2; \chi^2 = 19.775.\)

Table E2.5. Educational level / 'Saw an interesting ad'

<table>
<thead>
<tr>
<th>Educational level</th>
<th>Yes</th>
<th>No</th>
</tr>
</thead>
<tbody>
<tr>
<td>None/not disclosed</td>
<td>84 (66.92)</td>
<td>178 (195.08)</td>
</tr>
<tr>
<td>University</td>
<td>50 (52.87)</td>
<td>157 (154.13)</td>
</tr>
<tr>
<td>Post-graduate</td>
<td>31 (45.21)</td>
<td>146 (131.79)</td>
</tr>
</tbody>
</table>

\(n = 646; \text{DF} = 2; \chi^2 = 12.062.\)

Table E2.6. Ship / 'Saw an interesting ad'

<table>
<thead>
<tr>
<th>Ship</th>
<th>Yes</th>
<th>No</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ship 1</td>
<td>151 (136.74)</td>
<td>386 (400.26)</td>
</tr>
<tr>
<td>Ship 2</td>
<td>8 (14.77)</td>
<td>50 (43.23)</td>
</tr>
<tr>
<td>Ship 3</td>
<td>6 (13.50)</td>
<td>47 (39.50)</td>
</tr>
</tbody>
</table>

\(n = 648; \text{DF} = 2; \chi^2 = 11.743.\)
Table E2.7. Ship / 'Best itinerary'  

<table>
<thead>
<tr>
<th>Ship</th>
<th>Yes</th>
<th>No</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ship 1</td>
<td>253 (239.65)</td>
<td>286 (299.35)</td>
</tr>
<tr>
<td>Ship 2</td>
<td>15 (25.79)</td>
<td>43 (32.21)</td>
</tr>
<tr>
<td>Ship 3</td>
<td>21 (23.56)</td>
<td>32 (29.44)</td>
</tr>
</tbody>
</table>

\( n = 650; \text{DF} = 2; \chi^2 = 9.968 [p < 0.010] \).  

Table E2.8. Cruise (all ships) / 'Saw an interesting ad'  

<table>
<thead>
<tr>
<th>Ship (Cruise)</th>
<th>Yes</th>
<th>No</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ship 1 (1)</td>
<td>97 (76.37)</td>
<td>202 (222.63)</td>
</tr>
<tr>
<td>Ship 1 (2)</td>
<td>27 (29.37)</td>
<td>88 (85.63)</td>
</tr>
<tr>
<td>Ship 1 (3)</td>
<td>27 (31.42)</td>
<td>96 (91.58)</td>
</tr>
<tr>
<td>Ship 2</td>
<td>8 (14.81)</td>
<td>50 (43.19)</td>
</tr>
<tr>
<td>Ship 3</td>
<td>6 (13.03)</td>
<td>45 (37.97)</td>
</tr>
</tbody>
</table>

\( n = 646; \text{DF} = 4; \chi^2 = 17.875 \).  

Table E2.9. Cruise (all ships) / 'Best itinerary'  

<table>
<thead>
<tr>
<th>Ship (Cruise)</th>
<th>Yes</th>
<th>No</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ship 1 (1)</td>
<td>120 (132.90)</td>
<td>178 (165.10)</td>
</tr>
<tr>
<td>Ship 1 (2)</td>
<td>46 (51.73)</td>
<td>70 (64.27)</td>
</tr>
<tr>
<td>Ship 1 (3)</td>
<td>87 (55.75)</td>
<td>38 (69.25)</td>
</tr>
<tr>
<td>Ship 2</td>
<td>15 (25.87)</td>
<td>43 (32.13)</td>
</tr>
<tr>
<td>Ship 3</td>
<td>21 (22.75)</td>
<td>30 (28.25)</td>
</tr>
</tbody>
</table>

\( n = 646; \text{DF} = 4; \chi^2 = 43.514 \).  

E3. Question 13. What appealed to you most about this particular cruise?  

Table E3.1. Sex / 'Lecturers as advertised'  

<table>
<thead>
<tr>
<th>Sex</th>
<th>Yes</th>
<th>No</th>
<th>Didn't matter</th>
</tr>
</thead>
<tbody>
<tr>
<td>Men</td>
<td>148 (167.27)</td>
<td>12 (11.03)</td>
<td>126 (107.69)</td>
</tr>
<tr>
<td>Women</td>
<td>231 (211.73)</td>
<td>13 (13.97)</td>
<td>118 (136.31)</td>
</tr>
</tbody>
</table>

\( n = 648; \text{DF} = 2; \chi^2 = 9.699 [p < 0.010] \).
Table E3.2. Educational level / 'Lecturers as advertised'

<table>
<thead>
<tr>
<th>Educational level</th>
<th>Yes</th>
<th>No</th>
<th>Didn't matter</th>
</tr>
</thead>
<tbody>
<tr>
<td>None/not disclosed</td>
<td>133 (154.58)</td>
<td>11 (10.17)</td>
<td>120 (99.25)</td>
</tr>
<tr>
<td>University</td>
<td>129 (121.79)</td>
<td>9 (8.01)</td>
<td>70 (78.20)</td>
</tr>
<tr>
<td>Post-graduate</td>
<td>118 (103.64)</td>
<td>5 (6.82)</td>
<td>54 (66.55)</td>
</tr>
</tbody>
</table>

n = 649; DF = 4; $\chi^2 = 13.665$.

Table E3.3. Educational level / 'Value for price'

<table>
<thead>
<tr>
<th>Educational level</th>
<th>Yes</th>
<th>No</th>
<th>Didn't matter</th>
</tr>
</thead>
<tbody>
<tr>
<td>None/not disclosed</td>
<td>117 (140.63)</td>
<td>16 (19.05)</td>
<td>128 (101.32)</td>
</tr>
<tr>
<td>University</td>
<td>119 (112.61)</td>
<td>18 (15.25)</td>
<td>72 (81.13)</td>
</tr>
<tr>
<td>Post-graduate</td>
<td>111 (93.75)</td>
<td>13 (12.70)</td>
<td>50 (67.55)</td>
</tr>
</tbody>
</table>

n = 644; DF = 4; $\chi^2 = 21.107$.

Table E3.4. Ship / 'Ship size'

<table>
<thead>
<tr>
<th>Ship</th>
<th>Yes</th>
<th>No</th>
<th>Didn't matter</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ship 1</td>
<td>121 (151.60)</td>
<td>83 (72.50)</td>
<td>334 (313.90)</td>
</tr>
<tr>
<td>Ship 2</td>
<td>38 (16.91)</td>
<td>1 (8.09)</td>
<td>21 (35.01)</td>
</tr>
<tr>
<td>Ship 3</td>
<td>25 (15.50)</td>
<td>4 (7.41)</td>
<td>26 (32.09)</td>
</tr>
</tbody>
</table>

n = 653; DF = 4; $\chi^2 = 55.666$.

Table E3.5. Ship / 'Facilities aboard'

<table>
<thead>
<tr>
<th>Ship</th>
<th>Yes</th>
<th>No</th>
<th>Didn't matter</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ship 1</td>
<td>128 (134.41)</td>
<td>65 (57.72)</td>
<td>343 (343.86)</td>
</tr>
<tr>
<td>Ship 2</td>
<td>13 (14.80)</td>
<td>2 (6.35)</td>
<td>44 (37.85)</td>
</tr>
<tr>
<td>Ship 3</td>
<td>22 (13.79)</td>
<td>3 (5.92)</td>
<td>30 (35.28)</td>
</tr>
</tbody>
</table>

n = 650; DF = 4; $\chi^2 = 12.544$. 
E4. Question 22. Did you do any reading for this trip?

Table E4.1. Sex / Question 22

<table>
<thead>
<tr>
<th>Sex</th>
<th>0 hours</th>
<th>1-5 hours</th>
<th>6-10 hours</th>
<th>10+ hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>Men</td>
<td>38 (29.06)</td>
<td>105 (98.79)</td>
<td>50 (59.45)</td>
<td>98 (103.71)</td>
</tr>
<tr>
<td>Women</td>
<td>27 (35.94)</td>
<td>116 (122.21)</td>
<td>82 (73.55)</td>
<td>134 (128.29)</td>
</tr>
</tbody>
</table>

n = 650; DF = 3; $\chi^2 = 8.971$ [p < 0.050].

Table E4.2. Ship / Question 22

<table>
<thead>
<tr>
<th>Ship</th>
<th>0-5 hours</th>
<th>6-10 hours</th>
<th>10+ hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ship 1</td>
<td>240 (237.72)</td>
<td>97 (109.78)</td>
<td>202 (191.50)</td>
</tr>
<tr>
<td>Ship 2</td>
<td>20 (26.90)</td>
<td>21 (12.42)</td>
<td>20 (21.67)</td>
</tr>
<tr>
<td>Ship 3</td>
<td>28 (23.38)</td>
<td>15 (10.79)</td>
<td>10 (18.83)</td>
</tr>
</tbody>
</table>

n = 653; DF = 4; $\chi^2 = 16.600$.

Table E4.3. Cruise (Ship 1 only) / Question 22

<table>
<thead>
<tr>
<th>Cruise</th>
<th>0 hours</th>
<th>1-5 hours</th>
<th>6-10 hours</th>
<th>10+ hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cruise 1</td>
<td>33 (30.86)</td>
<td>108 (101.39)</td>
<td>49 (53.45)</td>
<td>107 (111.31)</td>
</tr>
<tr>
<td>Cruise 2</td>
<td>13 (11.95)</td>
<td>45 (39.26)</td>
<td>27 (20.70)</td>
<td>30 (43.10)</td>
</tr>
<tr>
<td>Cruise 3</td>
<td>10 (13.19)</td>
<td>31 (43.35)</td>
<td>21 (22.86)</td>
<td>65 (47.60)</td>
</tr>
</tbody>
</table>

n = 539; DF = 6; $\chi^2 = 18.760$.

E5. Question 23. Were those books about ...?

Table E5.1. Sex / 'Science in Antarctica'

<table>
<thead>
<tr>
<th>Sex</th>
<th>Yes</th>
<th>No</th>
</tr>
</thead>
<tbody>
<tr>
<td>Men</td>
<td>140 (121.53)</td>
<td>117 (135.47)</td>
</tr>
<tr>
<td>Women</td>
<td>139 (157.47)</td>
<td>194 (175.53)</td>
</tr>
</tbody>
</table>

n = 590; DF = 1; $\chi^2 = 9.435$. 
Table E5.2. Educational level / 'Geology and glaciers'

<table>
<thead>
<tr>
<th>Educational level</th>
<th>Yes</th>
<th>No</th>
</tr>
</thead>
<tbody>
<tr>
<td>None/not disclosed</td>
<td>96 (110.78)</td>
<td>133 (118.22)</td>
</tr>
<tr>
<td>University</td>
<td>91 (91.43)</td>
<td>98 (97.57)</td>
</tr>
<tr>
<td>Post-graduate</td>
<td>96 (80.79)</td>
<td>71 (86.21)</td>
</tr>
</tbody>
</table>

\( n = 585; \text{ DF } = 2; \chi^2 = 9.373 \ [p < 0.010]. \)

Table E5.3. Educational level / 'Science in Antarctica'

<table>
<thead>
<tr>
<th>Educational level</th>
<th>Yes</th>
<th>No</th>
</tr>
</thead>
<tbody>
<tr>
<td>None/not disclosed</td>
<td>89 (109.52)</td>
<td>143 (122.48)</td>
</tr>
<tr>
<td>University</td>
<td>92 (89.70)</td>
<td>98 (100.30)</td>
</tr>
<tr>
<td>Post-graduate</td>
<td>98 (79.78)</td>
<td>71 (89.22)</td>
</tr>
</tbody>
</table>

\( n = 591; \text{ DF } = 2; \chi^2 = 15.277. \)

Table E5.4. Ship / 'History of exploration'

<table>
<thead>
<tr>
<th>Ship</th>
<th>Yes</th>
<th>No</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ship 1</td>
<td>376 (375.07)</td>
<td>112 (112.93)</td>
</tr>
<tr>
<td>Ship 2</td>
<td>53 (45.35)</td>
<td>6 (13.65)</td>
</tr>
<tr>
<td>Ship 3</td>
<td>26 (34.59)</td>
<td>19 (10.41)</td>
</tr>
</tbody>
</table>

\( n = 592; \text{ DF } = 2; \chi^2 = 14.803. \)

Table E5.5. Ship / 'Geology and glaciers'

<table>
<thead>
<tr>
<th>Ship</th>
<th>Yes</th>
<th>No</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ship 1</td>
<td>221 (233.68)</td>
<td>262 (249.32)</td>
</tr>
<tr>
<td>Ship 2</td>
<td>44 (28.58)</td>
<td>15 (30.45)</td>
</tr>
<tr>
<td>Ship 3</td>
<td>19 (21.77)</td>
<td>26 (23.23)</td>
</tr>
</tbody>
</table>

\( n = 587; \text{ DF } = 2; \chi^2 = 18.228. \)
Table E5.6. Ship / 'Science in Antarctica'

<table>
<thead>
<tr>
<th>Ship</th>
<th>Yes</th>
<th>No</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ship 1</td>
<td>214 (230.77)</td>
<td>273 (256.23)</td>
</tr>
<tr>
<td>Ship 2</td>
<td>39 (27.96)</td>
<td>20 (31.04)</td>
</tr>
<tr>
<td>Ship 3</td>
<td>28 (22.27)</td>
<td>19 (24.73)</td>
</tr>
</tbody>
</table>

n = 593; DF = 2; \( \chi^2 = 13.406 \).

**E6. Question 15. From the lectures you have attended was the following information provided?**

Table E6.1. Age / 'IAATO lecture'

<table>
<thead>
<tr>
<th>Age</th>
<th>Yes</th>
<th>No</th>
</tr>
</thead>
<tbody>
<tr>
<td>15-44</td>
<td>62 (54.52)</td>
<td>8 (15.48)</td>
</tr>
<tr>
<td>45-64</td>
<td>202 (190.82)</td>
<td>43 (54.18)</td>
</tr>
<tr>
<td>65+</td>
<td>222 (240.66)</td>
<td>87 (68.34)</td>
</tr>
</tbody>
</table>

n = 624; DF = 2; \( \chi^2 = 14.149 \).

Table E6.2. Educational level / 'IAATO lecture'

<table>
<thead>
<tr>
<th>Educational level</th>
<th>Yes</th>
<th>No</th>
</tr>
</thead>
<tbody>
<tr>
<td>None/not disclosed</td>
<td>180 (196.58)</td>
<td>72 (55.42)</td>
</tr>
<tr>
<td>University</td>
<td>169 (155.24)</td>
<td>30 (43.76)</td>
</tr>
<tr>
<td>Post-graduate</td>
<td>137 (134.18)</td>
<td>35 (37.82)</td>
</tr>
</tbody>
</table>

n = 623; DF = 2; \( \chi^2 = 12.179 \).

Table E6.3. Educational level / 'Antarctic Treaty System'

<table>
<thead>
<tr>
<th>Educational level</th>
<th>Yes</th>
<th>No</th>
</tr>
</thead>
<tbody>
<tr>
<td>None/not disclosed</td>
<td>197 (210.17)</td>
<td>65 (51.83)</td>
</tr>
<tr>
<td>University</td>
<td>174 (165.25)</td>
<td>32 (40.75)</td>
</tr>
<tr>
<td>Post-graduate</td>
<td>148 (143.59)</td>
<td>31 (35.41)</td>
</tr>
</tbody>
</table>

n = 647; DF = 2; \( \chi^2 = 7.199 \) [\( p < 0.050 \)].
Table E6.4. Educational level / 'Science in Antarctica'

<table>
<thead>
<tr>
<th>Educational level</th>
<th>Yes</th>
<th>No</th>
</tr>
</thead>
<tbody>
<tr>
<td>None/not disclosed</td>
<td>195 (207.70)</td>
<td>57 (44.30)</td>
</tr>
<tr>
<td>University</td>
<td>166 (163.19)</td>
<td>32 (34.81)</td>
</tr>
<tr>
<td>Post-graduate</td>
<td>150 (140.11)</td>
<td>20 (29.89)</td>
</tr>
</tbody>
</table>

\(n = 620; \text{ DF} = 2; \chi^2 = 8.659 \ [p < 0.025].\)

Table E6.5. Ship / 'IAATO lecture'

<table>
<thead>
<tr>
<th>Ship</th>
<th>Yes</th>
<th>No</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ship 1</td>
<td>420 (400.51)</td>
<td>94 (113.49)</td>
</tr>
<tr>
<td>Ship 2</td>
<td>38 (48.31)</td>
<td>24 (13.69)</td>
</tr>
<tr>
<td>Ship 3</td>
<td>29 (38.18)</td>
<td>20 (10.82)</td>
</tr>
</tbody>
</table>

\(n = 625; \text{ DF} = 2; \chi^2 = 24.260.\)

Table E6.6. Ship / 'Antarctic Treaty System'

<table>
<thead>
<tr>
<th>Ship</th>
<th>Yes</th>
<th>No</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ship 1</td>
<td>453 (429.48)</td>
<td>82 (105.52)</td>
</tr>
<tr>
<td>Ship 2</td>
<td>38 (49.77)</td>
<td>24 (12.33)</td>
</tr>
<tr>
<td>Ship 3</td>
<td>30 (41.74)</td>
<td>22 (10.26)</td>
</tr>
</tbody>
</table>

\(n = 658; \text{ DF} = 2; \chi^2 = 37.399.\)

Table E6.7. Ship / 'Mining/commercial interest'

<table>
<thead>
<tr>
<th>Ship</th>
<th>Yes</th>
<th>No</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ship 1</td>
<td>275 (239.97)</td>
<td>237 (272.03)</td>
</tr>
<tr>
<td>Ship 2</td>
<td>8 (29.06)</td>
<td>54 (32.94)</td>
</tr>
<tr>
<td>Ship 3</td>
<td>9 (22.97)</td>
<td>40 (26.03)</td>
</tr>
</tbody>
</table>

\(n = 623; \text{ DF} = 2; \chi^2 = 54.333.\)
Table E6.8. Ship / 'Science in Antarctica'

<table>
<thead>
<tr>
<th>Ship</th>
<th>Yes</th>
<th>No</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ship 1</td>
<td>419 (398.74)</td>
<td>96 (116.26)</td>
</tr>
<tr>
<td>Ship 2</td>
<td>27 (48.0)</td>
<td>35 (14.0)</td>
</tr>
<tr>
<td>Ship 3</td>
<td>41 (40.260)</td>
<td>11 (11.74)</td>
</tr>
</tbody>
</table>

E7. Question 18. While on landings did you ever find yourself accidentally ...?

* Indicates that the 'don't know' responses were combined with this category for statistical purposes.

Table E7.1. Age / 'Between a seal and the water'

<table>
<thead>
<tr>
<th>Age</th>
<th>Yes</th>
<th>No*</th>
<th>Yes*</th>
<th>No</th>
</tr>
</thead>
<tbody>
<tr>
<td>15-44</td>
<td>27 (22.07)</td>
<td>50 (54.97)</td>
<td>27 (21.12)</td>
<td>50 (55.80)</td>
</tr>
<tr>
<td>45-64</td>
<td>85 (70.79)</td>
<td>162 (176.21)</td>
<td>81 (67.74)</td>
<td>166 (179.26)</td>
</tr>
<tr>
<td>65+</td>
<td>74 (93.14)</td>
<td>251 (231.86)</td>
<td>70 (89.14)</td>
<td>255 (235.86)</td>
</tr>
</tbody>
</table>

n = 649; DF = 2; χ² = 11.059.

Table E7.2. Educational level / 'Inside a penguin colony'

<table>
<thead>
<tr>
<th>Educational level</th>
<th>Yes*</th>
<th>No</th>
<th>Yes</th>
<th>No*</th>
</tr>
</thead>
<tbody>
<tr>
<td>None/not disclosed</td>
<td>75 (90.63)</td>
<td>184 (168.37)</td>
<td>70 (84.59)</td>
<td>189 (174.41)</td>
</tr>
<tr>
<td>University</td>
<td>67 (72.08)</td>
<td>139 (133.92)</td>
<td>61 (67.28)</td>
<td>145 (138.72)</td>
</tr>
<tr>
<td>Post-graduate</td>
<td>83 (62.29)</td>
<td>95 (115.71)</td>
<td>79 (58.13)</td>
<td>99 (119.87)</td>
</tr>
</tbody>
</table>

n = 643; DF = 2; χ² = 15.295. n = 643; DF = 2; χ² = 15.728.
### Table E7.3. Educational level / 'Walking on plants'

<table>
<thead>
<tr>
<th>Educational Level</th>
<th>Yes</th>
<th>No</th>
<th>Don’t Know</th>
</tr>
</thead>
<tbody>
<tr>
<td>None/not disclosed</td>
<td>65 (89.31)</td>
<td>173 (151.16)</td>
<td>25 (22.53)</td>
</tr>
<tr>
<td>University</td>
<td>80 (68.59)</td>
<td>105 (116.10)</td>
<td>17 (17.31)</td>
</tr>
<tr>
<td>Post-graduate</td>
<td>73 (60.10)</td>
<td>91 (101.73)</td>
<td>13 (15.16)</td>
</tr>
</tbody>
</table>

\[ n = 642; \text{DF} = 4; \chi^2 = 17.213. \]

### Table E7.4. Ship / 'Between a seal and the water'

<table>
<thead>
<tr>
<th>Ship</th>
<th>Yes*</th>
<th>No</th>
<th>Yes</th>
<th>No*</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ship 1</td>
<td>148 (153.95)</td>
<td>390 (384.05)</td>
<td>141 (147.33)</td>
<td>397 (390.67)</td>
</tr>
<tr>
<td>Ship 2</td>
<td>32 (16.88)</td>
<td>27 (42.12)</td>
<td>31 (16.16)</td>
<td>28 (42.84)</td>
</tr>
<tr>
<td>Ship 3</td>
<td>6 (15.17)</td>
<td>47 (37.43)</td>
<td>6 (14.51)</td>
<td>47 (38.49)</td>
</tr>
</tbody>
</table>

\[ n = 650; \text{DF} = 2; \chi^2 = 27.044. \]

### Table E7.5. Ship / 'Inside periphery of penguin colony'

<table>
<thead>
<tr>
<th>Ship</th>
<th>Yes*</th>
<th>No</th>
<th>Yes</th>
<th>No*</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ship 1</td>
<td>162 (186.41)</td>
<td>370 (345.59)</td>
<td>150 (174.03)</td>
<td>382 (357.97)</td>
</tr>
<tr>
<td>Ship 2</td>
<td>52 (21.02)</td>
<td>8 (38.98)</td>
<td>50 (19.63)</td>
<td>10 (40.37)</td>
</tr>
<tr>
<td>Ship 3</td>
<td>12 (18.51)</td>
<td>41 (34.43)</td>
<td>11 (17.34)</td>
<td>42 (35.66)</td>
</tr>
</tbody>
</table>

\[ n = 645; \text{DF} = 2; \chi^2 = 78.759. \]

### Table E7.6. Ship / 'Walking on plants'

<table>
<thead>
<tr>
<th>Ships</th>
<th>Yes*</th>
<th>No</th>
<th>Yes</th>
<th>No*</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ship 1</td>
<td>224 (227.25)</td>
<td>309 (305.75)</td>
<td>175 (181.80)</td>
<td>358 (351.20)</td>
</tr>
<tr>
<td>Ship 2</td>
<td>43 (25.16)</td>
<td>16 (33.84)</td>
<td>40 (20.12)</td>
<td>19 (38.88)</td>
</tr>
<tr>
<td>Ship 3</td>
<td>8 (22.60)</td>
<td>45 (30.40)</td>
<td>5 (18.08)</td>
<td>48 (34.92)</td>
</tr>
</tbody>
</table>

\[ n = 645; \text{DF} = 2; \chi^2 = 38.586. \]

\[ n = 645; \text{DF} = 2; \chi^2 = 44.536. \]
Table E7.7. Cruise (Ship 1 only) / 'Between a seal and its young'

<table>
<thead>
<tr>
<th>Cruise</th>
<th>Yes*</th>
<th>No</th>
<th>Yes</th>
<th>No*</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cruise 1</td>
<td>127 (81.70)</td>
<td>170 (215.30)</td>
<td>124 (77.84)</td>
<td>173 (219.16)</td>
</tr>
<tr>
<td>Cruise 2</td>
<td>9 (31.91)</td>
<td>107 (84.09)</td>
<td>7 (30.40)</td>
<td>109 (85.60)</td>
</tr>
<tr>
<td>Cruise 3</td>
<td>12 (34.39)</td>
<td>113 (90.61)</td>
<td>10 (32.76)</td>
<td>115 (92.24)</td>
</tr>
</tbody>
</table>

\[ n = 538; \text{DF} = 2; \chi^2 = 77.440. \]

Table E7.8. Cruise (Ship 1 only) / 'Walking on plants'

<table>
<thead>
<tr>
<th>Cruise</th>
<th>Yes</th>
<th>No</th>
<th>Don't know</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cruise 1</td>
<td>121 (96.48)</td>
<td>155 (171.34)</td>
<td>19 (27.17)</td>
</tr>
<tr>
<td>Cruise 2</td>
<td>26 (36.96)</td>
<td>70 (65.63)</td>
<td>17 (10.41)</td>
</tr>
<tr>
<td>Cruise 3</td>
<td>27 (40.56)</td>
<td>84 (72.02)</td>
<td>13 (11.42)</td>
</tr>
</tbody>
</table>

\[ n = 532; \text{DF} = 4; \chi^2 = 24.704. \]

Table E7.9. Cruise (Ship 1 only) / 'Inside the periphery of a penguin colony'

<table>
<thead>
<tr>
<th>Cruise</th>
<th>Yes*</th>
<th>No</th>
<th>Yes</th>
<th>No*</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cruise 1</td>
<td>52 (90.14)</td>
<td>244 (205.86)</td>
<td>46 (83.46)</td>
<td>250 (212.54)</td>
</tr>
<tr>
<td>Cruise 2</td>
<td>49 (39.11)</td>
<td>63 (77.89)</td>
<td>47 (31.58)</td>
<td>65 (80.42)</td>
</tr>
<tr>
<td>Cruise 3</td>
<td>61 (37.76)</td>
<td>63 (86.24)</td>
<td>57 (34.96)</td>
<td>67 (89.04)</td>
</tr>
</tbody>
</table>

\[ n = 532; \text{DF} = 2; \chi^2 = 53.120. \]

Table E8.1. Age / 'Touching wildlife'

<table>
<thead>
<tr>
<th>Age</th>
<th>Yes</th>
<th>No</th>
</tr>
</thead>
<tbody>
<tr>
<td>15-44</td>
<td>11 (6.71)</td>
<td>67 (71.29)</td>
</tr>
<tr>
<td>45-64</td>
<td>29 (21.42)</td>
<td>220 (227.58)</td>
</tr>
<tr>
<td>65+</td>
<td>16 (27.87)</td>
<td>308 (296.13)</td>
</tr>
</tbody>
</table>

\[ n = 651; \text{DF} = 2; \chi^2 = 11.469. \]

Table E8.2. Age / 'For a photograph, cause an animal to move'

<table>
<thead>
<tr>
<th>Age</th>
<th>Yes</th>
<th>No</th>
</tr>
</thead>
<tbody>
<tr>
<td>15-44</td>
<td>35 (17.48)</td>
<td>43 (71.29)</td>
</tr>
<tr>
<td>45-64</td>
<td>59 (55.13)</td>
<td>187 (190.87)</td>
</tr>
<tr>
<td>65+</td>
<td>51 (72.39)</td>
<td>272 (250.61)</td>
</tr>
</tbody>
</table>

\[ n = 647; \text{DF} = 2; \chi^2 = 31.124. \]
Table E8.3. Age / 'Collecting a natural object or artefact'

<table>
<thead>
<tr>
<th>Age</th>
<th>Yes</th>
<th>No</th>
</tr>
</thead>
<tbody>
<tr>
<td>15-44</td>
<td>19</td>
<td>(11.30)</td>
</tr>
<tr>
<td>45-64</td>
<td>42</td>
<td>(35.78)</td>
</tr>
<tr>
<td>65+</td>
<td>33</td>
<td>(46.93)</td>
</tr>
</tbody>
</table>

n = 649; DF = 2; $\chi^2 = 12.241$.

Table E8.4. Ship / 'Closer than 5 feet'

<table>
<thead>
<tr>
<th>Ship</th>
<th>Yes</th>
<th>No</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ship 1</td>
<td>409 (394.58)</td>
<td>132 (146.42)</td>
</tr>
<tr>
<td>Ship 2</td>
<td>53 (43.76)</td>
<td>7 (16.24)</td>
</tr>
<tr>
<td>Ship 3</td>
<td>15 (38.66)</td>
<td>38 (14.34)</td>
</tr>
</tbody>
</table>

n = 654; DF = 2; $\chi^2 = 62.642$.

Table E8.5. Ship / 'For a photograph, cause an animal to move'

<table>
<thead>
<tr>
<th>Ship</th>
<th>Yes</th>
<th>No</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ship 1</td>
<td>108 (119.71)</td>
<td>427 (415.29)</td>
</tr>
<tr>
<td>Ship 2</td>
<td>23 (13.65)</td>
<td>38 (47.35)</td>
</tr>
<tr>
<td>Ship 3</td>
<td>14 (11.64)</td>
<td>38 (40.36)</td>
</tr>
</tbody>
</table>

n = 648; DF = 2; $\chi^2 = 10.347 [p < 0.010]$.

Table E8.6. Ship / 'Collecting a natural object or artefact'

<table>
<thead>
<tr>
<th>Ship</th>
<th>Yes</th>
<th>No</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ship 1</td>
<td>67 (77.51)</td>
<td>469 (458.49)</td>
</tr>
<tr>
<td>Ship 2</td>
<td>23 (8.82)</td>
<td>38 (52.18)</td>
</tr>
<tr>
<td>Ship 3</td>
<td>4 (7.66)</td>
<td>49 (45.34)</td>
</tr>
</tbody>
</table>

n = 650; DF = 2; $\chi^2 = 30.357$.

Table E8.7. Cruise (Ship 1 only) / 'Closer than 5 feet'

<table>
<thead>
<tr>
<th>Cruise</th>
<th>Yes</th>
<th>No</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cruise 1</td>
<td>239 (226.05)</td>
<td>60 (72.95)</td>
</tr>
<tr>
<td>Cruise 2</td>
<td>80 (89.21)</td>
<td>38 (28.79)</td>
</tr>
<tr>
<td>Cruise 3</td>
<td>90 (93.74)</td>
<td>34 (30.26)</td>
</tr>
</tbody>
</table>

n = 541; DF = 2; $\chi^2 = 7.552 [p < 0.025]$. 

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Table E8.8. Cruise (Ship 1 only) / 'Touching wildlife'

<table>
<thead>
<tr>
<th>Ship</th>
<th>Yes (%)</th>
<th>No (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ship 1.1</td>
<td>49 (30.0)</td>
<td>250 (268.93)</td>
</tr>
<tr>
<td>Ship 1.2</td>
<td>0 (11.56)</td>
<td>115 (103.44)</td>
</tr>
<tr>
<td>Ship 1.3</td>
<td>5 (12.37)</td>
<td>118 (110.63)</td>
</tr>
</tbody>
</table>

n = 537; DF = 2; χ² = 30.993.

Table E8.9. Cruise (Ship 1 only) / 'Smoking/eating ashore'

<table>
<thead>
<tr>
<th>Ship</th>
<th>Yes (%)</th>
<th>No (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ship 1.1</td>
<td>74 (44.26)</td>
<td>222 (251.74)</td>
</tr>
<tr>
<td>Ship 1.2</td>
<td>3 (17.20)</td>
<td>112 (97.80)</td>
</tr>
<tr>
<td>Ship 1.3</td>
<td>3 (18.54)</td>
<td>121 (105.46)</td>
</tr>
</tbody>
</table>

n = 535; DF = 2; χ² = 52.590.


Based on what you knew prior to coming to Antarctica, how did you rate the impacts of the following on the environment.

Table E9.1. Sex / 'Impact of mining'

<table>
<thead>
<tr>
<th>Sex</th>
<th>No opinion (%)</th>
<th>None (%)</th>
<th>Low (%)</th>
<th>Medium (%)</th>
<th>High (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Men</td>
<td>66 (80.56)</td>
<td>73 (60.88)</td>
<td>47 (39.82)</td>
<td>16 (16.02)</td>
<td>58 (62.71)</td>
</tr>
<tr>
<td>Women</td>
<td>110 (95.44)</td>
<td>60 (72.12)</td>
<td>40 (47.18)</td>
<td>19 (18.98)</td>
<td>79 (74.29)</td>
</tr>
</tbody>
</table>

n = 568; DF = 4; χ² = 12.342 [p < 0.025].

Based on what you have learned on this trip, how do you now rate the impacts of the following on the environment.

Table E9.2. Sex / 'Impact of mining'

<table>
<thead>
<tr>
<th>Sex</th>
<th>No opinion (%)</th>
<th>None (%)</th>
<th>Low (%)</th>
<th>Medium (%)</th>
<th>High (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Men</td>
<td>55 (58.42)</td>
<td>86 (70.20)</td>
<td>34 (33.93)</td>
<td>18 (19.32)</td>
<td>68 (79.15)</td>
</tr>
<tr>
<td>Women</td>
<td>69 (65.58)</td>
<td>63 (78.80)</td>
<td>38 (38.08)</td>
<td>23 (21.68)</td>
<td>100 (88.85)</td>
</tr>
</tbody>
</table>

n = 554; DF = 4; χ² = 10.244 [p < 0.050].
E10. Ethical questions.

Table E10.1. Sex / 'Would you harass a seal for a photograph?'

<table>
<thead>
<tr>
<th>Sex</th>
<th>Yes</th>
<th>No</th>
</tr>
</thead>
<tbody>
<tr>
<td>Men</td>
<td>45 (31.03)</td>
<td>244 (257.97)</td>
</tr>
<tr>
<td>Women</td>
<td>25 (38.97)</td>
<td>338 (324.03)</td>
</tr>
</tbody>
</table>

n = 652; DF = 2; $\chi^2 = 12.661$.

Table E10.2. Educational level / 'Would you harass a seal for a photograph?'

<table>
<thead>
<tr>
<th>Educational level</th>
<th>Yes</th>
<th>No</th>
</tr>
</thead>
<tbody>
<tr>
<td>None/not disclosed</td>
<td>14 (28.45)</td>
<td>251 (236.55)</td>
</tr>
<tr>
<td>University</td>
<td>29 (22.44)</td>
<td>180 (186.56)</td>
</tr>
<tr>
<td>Post-graduate</td>
<td>27 (19.11)</td>
<td>151 (158.89)</td>
</tr>
</tbody>
</table>

n = 652; DF = 2; $\chi^2 = 14.021$.

Table E10.3. Ship / 'Would you harass a seal for a photograph?'

<table>
<thead>
<tr>
<th>Ship</th>
<th>Yes</th>
<th>No</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ship 1</td>
<td>52 (58.35)</td>
<td>494 (487.65)</td>
</tr>
<tr>
<td>Ship 2</td>
<td>14 (6.09)</td>
<td>43 (50.91)</td>
</tr>
<tr>
<td>Ship 3</td>
<td>4 (5.56)</td>
<td>48 (46.44)</td>
</tr>
</tbody>
</table>

n = 655; DF = 2; $\chi^2 = 12.758$.

Table E10.4. Ship / 'Question 26a. Naturalist okays distance'

<table>
<thead>
<tr>
<th>Ship</th>
<th>Yes</th>
<th>No</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ship 1</td>
<td>260 (253.46)</td>
<td>261 (267.54)</td>
</tr>
<tr>
<td>Ship 2</td>
<td>32 (26.76)</td>
<td>23 (28.24)</td>
</tr>
<tr>
<td>Ship 3</td>
<td>14 (25.78)</td>
<td>39 (27.22)</td>
</tr>
</tbody>
</table>

n = 629; DF = 2; $\chi^2 = 12.817$. 
Table E10.5. Sex / 'Question 27. Would you take a map?'

<table>
<thead>
<tr>
<th>Sex</th>
<th>Yes</th>
<th>No</th>
</tr>
</thead>
<tbody>
<tr>
<td>Men</td>
<td>53 (37.57)</td>
<td>229 (244.43)</td>
</tr>
<tr>
<td>Women</td>
<td>32 (47.43)</td>
<td>324 (308.57)</td>
</tr>
</tbody>
</table>

\( n = 638; \text{DF} = 1; \chi^2 = 13.101. \)

E11. Question 20. What additional activities would you like to see offered on an Antarctic trip? If you have participated in any of these during your trip, please tick the last column.

Table E11.1. Sex / 'Scuba diving'

<table>
<thead>
<tr>
<th>Sex</th>
<th>Yes</th>
<th>No</th>
</tr>
</thead>
<tbody>
<tr>
<td>Men</td>
<td>45 (34.69)</td>
<td>212 (227.31)</td>
</tr>
<tr>
<td>Women</td>
<td>31 (41.31)</td>
<td>275 (264.69)</td>
</tr>
</tbody>
</table>

\( n = 563; \text{DF} = 1; \chi^2 = 6.514. \)

Table E11.2. Age / 'Day hikes'

<table>
<thead>
<tr>
<th>Age</th>
<th>Yes</th>
<th>No</th>
<th>Participated</th>
</tr>
</thead>
<tbody>
<tr>
<td>15-44</td>
<td>45 (32.00)</td>
<td>16 (37.82)</td>
<td>14 (5.19)</td>
</tr>
<tr>
<td>45-64</td>
<td>109 (99.41)</td>
<td>108 (117.48)</td>
<td>16 (16.11)</td>
</tr>
<tr>
<td>65+</td>
<td>99 (121.59)</td>
<td>175 (143.70)</td>
<td>11 (19.70)</td>
</tr>
</tbody>
</table>

\( n = 593; \text{DF} = 4; \chi^2 = 49.404. \)

Table E11.3. Age / 'Climbing'*

<table>
<thead>
<tr>
<th>Age</th>
<th>Yes</th>
<th>No</th>
</tr>
</thead>
<tbody>
<tr>
<td>15-44</td>
<td>28 (13.27)</td>
<td>43 (57.73)</td>
</tr>
<tr>
<td>45-64</td>
<td>42 (41.88)</td>
<td>182 (182.12)</td>
</tr>
<tr>
<td>65+</td>
<td>36 (50.85)</td>
<td>236 (221.15)</td>
</tr>
</tbody>
</table>

\( n = 567; \text{DF} = 2; \chi^2 = 25.430. \)

*Numbers for 'participated in' were combined with 'yes' for statistical purposes. A total of 40 passengers answered that they had participated in hiking.
Table E11.4. Age / 'Skiing'

<table>
<thead>
<tr>
<th>Age</th>
<th>Yes</th>
<th>No</th>
</tr>
</thead>
<tbody>
<tr>
<td>15-44</td>
<td>11 (6.73)</td>
<td>60 (64.27)</td>
</tr>
<tr>
<td>45-64</td>
<td>25 (21.41)</td>
<td>201 (204.59)</td>
</tr>
<tr>
<td>65+</td>
<td>18 (25.86)</td>
<td>255 (247.14)</td>
</tr>
</tbody>
</table>

n = 570; DF = 2; $\chi^2 = 6.305 \ [p < 0.050]$.  

Table E11.5. Age / 'Camping'

<table>
<thead>
<tr>
<th>Age</th>
<th>Yes</th>
<th>No</th>
</tr>
</thead>
<tbody>
<tr>
<td>15-44</td>
<td>18 (8.70)</td>
<td>54 (63.30)</td>
</tr>
<tr>
<td>45-64</td>
<td>30 (27.07)</td>
<td>199 (196.93)</td>
</tr>
<tr>
<td>65+</td>
<td>21 (33.23)</td>
<td>254 (241.77)</td>
</tr>
</tbody>
</table>

n = 571; DF = 2; $\chi^2 = 16.788$.  

Table E11.6. Age / 'Scuba diving'*

<table>
<thead>
<tr>
<th>Age</th>
<th>Yes</th>
<th>No</th>
</tr>
</thead>
<tbody>
<tr>
<td>15-44</td>
<td>23 (9.57)</td>
<td>48 (61.43)</td>
</tr>
<tr>
<td>45-64</td>
<td>32 (30.32)</td>
<td>193 (194.68)</td>
</tr>
<tr>
<td>65+</td>
<td>21 (36.11)</td>
<td>247 (231.89)</td>
</tr>
</tbody>
</table>

n = 564; DF = 2; $\chi^2 = 29.214$.  

*In scoring the questionnaire it appeared as though one respondent had either ticked that he had participated in scuba diving or ticked 'yes' for 'other'.

Table E11.7. Educational level / 'Day hikes'

<table>
<thead>
<tr>
<th>Educational level</th>
<th>Yes</th>
<th>No</th>
<th>Participated</th>
</tr>
</thead>
<tbody>
<tr>
<td>None/not disclosed</td>
<td>85 (101.94)</td>
<td>140 (119.60)</td>
<td>13 (16.46)</td>
</tr>
<tr>
<td>University</td>
<td>91 (80.95)</td>
<td>82 (94.98)</td>
<td>16 (13.04)</td>
</tr>
<tr>
<td>Post-graduate</td>
<td>78 (71.10)</td>
<td>76 (83.42)</td>
<td>12 (11.48)</td>
</tr>
</tbody>
</table>

n = 593; DF = 4; $\chi^2 = 12.051$.  

266
Table E11.8. Educational level / 'Skiing'

<table>
<thead>
<tr>
<th>Educational level</th>
<th>Yes</th>
<th>No</th>
</tr>
</thead>
<tbody>
<tr>
<td>None/not disclosed</td>
<td>14 (21.92)</td>
<td>217 (209.08)</td>
</tr>
<tr>
<td>University</td>
<td>18 (16.89)</td>
<td>160 (161.11)</td>
</tr>
<tr>
<td>Post-graduate</td>
<td>22 (15.18)</td>
<td>138 (144.82)</td>
</tr>
</tbody>
</table>

\[ n = 569; \text{DF} = 2; \chi^2 = 6.623 \text{ [p < 0.050].} \]

E12. Question 21. Are there facilities or services that would be useful?

Table E12.1. Sex / 'Visitor rest facilities'

<table>
<thead>
<tr>
<th>Sex</th>
<th>Yes</th>
<th>No</th>
</tr>
</thead>
<tbody>
<tr>
<td>Men</td>
<td>68 (55.19)</td>
<td>203 (215.81)</td>
</tr>
<tr>
<td>Women</td>
<td>55 (67.81)</td>
<td>278 (265.19)</td>
</tr>
</tbody>
</table>

\[ n = 604; \text{DF} = 1; \chi^2 = 6.776 \text{ [p < 0.050].} \]

Table E12.2. Sex / 'Airport'

<table>
<thead>
<tr>
<th>Sex</th>
<th>Yes</th>
<th>No</th>
</tr>
</thead>
<tbody>
<tr>
<td>Men</td>
<td>41 (30.69)</td>
<td>225 (235.31)</td>
</tr>
<tr>
<td>Women</td>
<td>28 (38.31)</td>
<td>304 (293.69)</td>
</tr>
</tbody>
</table>

\[ n = 608; \text{DF} = 2; \chi^2 = 7.049. \]

Table E12.3. Age / 'On-site interpreters'

<table>
<thead>
<tr>
<th>Age</th>
<th>Yes</th>
<th>No</th>
</tr>
</thead>
<tbody>
<tr>
<td>15-44</td>
<td>20 (40.40)</td>
<td>155 (134.96)</td>
</tr>
<tr>
<td>45-64</td>
<td>56 (54.23)</td>
<td>181 (182.77)</td>
</tr>
<tr>
<td>65+</td>
<td>86 (67.73)</td>
<td>210 (228.27)</td>
</tr>
</tbody>
</table>

\[ n = 608; \text{DF} = 2; \chi^2 = 19.475. \]
Table E12.4. Age / 'Small huts for overnight use'

<table>
<thead>
<tr>
<th>Age</th>
<th>Yes</th>
<th>No</th>
</tr>
</thead>
<tbody>
<tr>
<td>15-44</td>
<td>18 (11.22)</td>
<td>190 (177.41)</td>
</tr>
<tr>
<td>45-64</td>
<td>40 (34.38)</td>
<td>196 (201.62)</td>
</tr>
<tr>
<td>65+</td>
<td>30 (42.40)</td>
<td>261 (248.60)</td>
</tr>
</tbody>
</table>

n = 604; DF = 2; χ² = 10.115.

Table E12.5. Educational level / 'On-site interpreters'

<table>
<thead>
<tr>
<th>Educational level</th>
<th>Yes</th>
<th>No</th>
</tr>
</thead>
<tbody>
<tr>
<td>None/not disclosed</td>
<td>52 (64.59)</td>
<td>59 (65.78)</td>
</tr>
<tr>
<td>University</td>
<td>61 (51.51)</td>
<td>132 (141.49)</td>
</tr>
<tr>
<td>Post-graduate</td>
<td>49 (45.90)</td>
<td>123 (126.10)</td>
</tr>
</tbody>
</table>

n = 607; DF = 2; χ² = 6.016 [p < 0.050].

Table E12.6. Educational level / 'Airport'

<table>
<thead>
<tr>
<th>Educational level</th>
<th>Yes</th>
<th>No</th>
</tr>
</thead>
<tbody>
<tr>
<td>None/not disclosed</td>
<td>19 (27.99)</td>
<td>224 (215.01)</td>
</tr>
<tr>
<td>University</td>
<td>18 (21.77)</td>
<td>171 (167.23)</td>
</tr>
<tr>
<td>Post-graduate</td>
<td>32 (19.24)</td>
<td>135 (147.76)</td>
</tr>
</tbody>
</table>

n = 599; DF = 2; χ² = 13.573.
APPENDIX F

PROTOCOL ON ENVIRONMENTAL PROTECTION TO THE ANTARCTIC TREATY

Annex 5. Area Protection and Management

Article 5

Management Plans

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

2. The area proposed for designation shall be of sufficient size to protect the values for which the special protection or management is required.

3. Proposed Management Plans shall include, as appropriate:
   a. a description of the value or values for which special protection or management is required;
   b. a statement of the aims and objectives of the Management Plan for the protection or management of those values;
   c. management activities which are to be undertaken to protect the values for which special protection or management is required;
   d. a period of designation, if any;
   e. a description of the area, including:
      (i) the geographical co-ordinates, boundary markers and natural features that delineate the area;
      (ii) access to the area by land, sea or air including marine approaches and anchorages, pedestrian and vehicular routes within the area, and aircraft routes and landing areas;
      (iii) the location of structures, including scientific stations, research or refuge facilities, both within the area and near to it; and
      (iv) the location in or near the area of other Antarctic Specially Protected Areas or Antarctic Specially Man-

aged Areas designated under this Annex, or other protected areas designated in accordance with measures adopted under other components of the Antarctic Treaty System;

f. the identification of zones within the area, in which activities are to be prohibited, restricted or managed for the purpose of achieving the aims and objectives referred to in subparagraph b. above;

g. maps and photographs that show clearly the boundary of the area in relation to surrounding features and key features within the area;

h. supporting documentation;

i. in respect of an area proposed for designation as an Antarctic Specially Protected Area, a clear description of the conditions under which permits may be granted by the appropriate authority regarding:
   (i) access to and movement within or over the area;
   (ii) activities which are or may be conducted within the area, including restrictions on time and place;
   (iii) the installation, modification, or removal of structures;
   (iv) the location of field camps;
   (v) restrictions on materials and organisms which may be brought into the area;
   (vi) the taking of or harmful interference with native flora and fauna;
   (vii) the collection or removal of anything not brought into the area by the permit holder;
   (viii) the disposal of waste;
   (ix) measures that may be necessary to ensure that the aims and objectives of the Management Plan can continue to be met; and
(x) requirements for reports to be made to the appropriate authority regarding visits to the area;

j. in respect of an area proposed for designation as an Antarctic Specially Managed Area, a code of conduct regarding:

(i) access to and movement within or over the area;

(ii) activities which are or may be conducted within the area, including restrictions on time and place;

(iii) the installation, modification, or removal of structures;

(iv) the location of field camps;

(v) the taking of or harmful interference with native flora and fauna;

(vi) the collection or removal of anything not brought into the area by the visitor;

(vii) the disposal of waste; and

(viii) any requirements for reports to be made to the appropriate authority regarding visits to the area; and

k. provisions relating to the circumstances in which Parties should seek to exchange information in advance of activities which they propose to conduct.
APPENDIX G

MANAGEMENT PLAN OUTLINE FOR GOUGH ISLAND

1. Summary
2. Introduction
3. Description and resource inventory
   3.1 Position, national and conservation status, and applicable legislation
   3.2 General description and access
   3.3 Discovery, derivation of name and history of human activity
   3.4 Geology, geomorphology and soils
   3.5 Bathymetry and oceanography
   3.6 Climate
   3.7 Terrestrial flora and vegetation
   3.8 Terrestrial fauna, including population estimates of seals and birds
   3.9 Marine and littoral biota
   3.10 Present human activities, structures and artefacts
   3.11 Resource significance
4. Management policy statement and objectives
   4.1 Management policy statement
   4.2 Management objectives
5. Prescriptions for Management
   5.1 Preamble
   5.2 Administrative authority
   5.3 Access and use of boats and aircraft
   5.4 Management zoning system and allowed activities
   5.5 Protection of historical sites and artefacts
   5.6 Protection of terrestrial, littoral and marine biota
   5.7 Resource inventories and monitoring
   5.8 Scientific research, collection of specimens and provision of archives
   5.9 Management and policing of marine resources
   5.10 Code of conduct
   5.11 Control of imported material
   5.12 Alien biota control and monitoring
   5.13 Treatment of human-derived wastes and pollution prevention
   5.14 Fires and fire control
   5.15 Paths, erosion and peat slips
   5.16 Erection of temporary structures
   5.17 Safety and rescue provisions
   5.18 Tourism policy
   5.19 Application and issuing of permits
   5.20 Contraventions and penalties
   5.21 Environmental impact assessment procedures
   5.22 Education and awareness
   5.23 Availability of the management plan
APPENDIX H

MANAGEMENT PLAN OUTLINE FOR MACQUARIE ISLAND

1. Account of Area
   1.1 Boundaries
   1.2 Area and topography
   1.3 Tenure and conservation status
   1.4 Regional context and access
   1.5 History and development
   1.6 Geology and geomorphology
   1.7 Oceanic circulation and hydrology
   1.8 Climate
   1.9 Flora and vegetation
   1.10 Fauna
   1.11 Limnology
   1.12 Flora and fauna of the offshore islands and seastacks
   1.13 Marine
   1.14 Economic resources
   1.15 Administration and staffing
   1.16 Buildings, structures and facilities
   1.17 Resource significance
   1.18 Conservation considerations

2. Objects of Management

3. Prescriptions for management
   3.1 Access to reserve
   3.2 Management zones
   3.3 Rubbish and sewage disposal
   3.4 Fuel supply and storage
   3.5 Vehicle, boat and aircraft use
   3.6 Tourist and non-study visits
   3.7 Research
   3.8 Historical
   3.9 Prevention of introductions of exotic species
   3.10 Wildlife management
   3.11 Marine zone
   3.12 Administration and staffing
   3.13 Monitoring and revision of the plan
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