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Working Paper No. 102

**Antarctic Tourists, Wildlife
and the Environment: Attractions and
Reactions to Antarctica**

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ANTARCTIC TOURISTS, WILDLIFE AND THE ENVIRONMENT: ATTRactions AND REACTIONS TO ANTARCTICA

Abstract

Provides background on the development and nature of Antarctic tourism and associated environmental issues, as well as agreements and regulations affecting environmental management in Antarctica. Following an outline of the survey methodology and provision of information on the socioeconomic profiles of the respondents, results of a survey of Antarctic tourists on the Russian registered ship the 'Akademik Ioffe' are reported. The importance of Antarctic wildlife as an attraction for these Antarctic tourists is then given particular attention. The study considers amongst other things how important Antarctic wildlife was in convincing these tourists to undertake their trip to Antarctica, the importance to the tourists of seeing different species of wildlife and the relative importance of wildlife compared with other attractions of the tour to Antarctica. Views both prior to and following visits to Antarctica are given. The views of the tourists about selected environmental issues involving Antarctica were canvassed. These are reported and discussed. Amongst the subjects discussed is whether the sampled tourists favour an expansion in tourism to Antarctica and why. An overall assessment completes the study.

ANTARCTIC TOURISTS, WILDLIFE AND THE ENVIRONMENT: ATTRactions AND REactions TO ANTARCTICA

1. Introduction

Antarctica is a relatively large continent but lacks permanent human habitation. It exceeds the area of mainland Australia, is significantly larger than Europe and it easily would encompass the Indian subcontinent. It is almost entirely covered by ice with an average thickness of 2,000 metres and only 20% of it is ice free (Kriwoken and Kruge, 1989). Its climate is harsh. Nevertheless, it has attracted a growing number of tourists in the last 50 years or so. Interest in the subject has grown so much that a large guide book for prospective Antarctic tourists is now available (Rubin, 2000).

What are the main features of tourism to the Antarctic? What attracts tourists to visit it? How important is wildlife as an attraction? What types of environmental problems are arising or are feared as a result of the rapid expansion of Antarctic tourism? These are some of the questions this article addresses.

After providing some general background on Antarctic tourism, this article reports on a survey of tourists who undertook journeys to Antarctica in January 2003. This provides information about the importance of Antarctic wildlife for their journey and their attitudes to several environmental issues involving Antarctica. Views both before the sample of tourists visited Antarctica and following their visit were obtained in order to allow comparative analysis to be completed. The final section of the paper presents a discussion and conclusions.

2. The Development and Nature of Tourism to Antarctica and Associated Environmental Issues

Most tourism to Antarctica is undertaken by ship and is concentrated on the Antarctic Peninsula located to the south of South America (see Figure 1). Ships mainly leave on this cruise from Ushuaia port in southern Argentina. While there are also other ship tours commencing from Christchurch, New Zealand, (those that visit sub-antarctic islands and the Ross Sea), they only account for a small proportion of visitors to Antarctica. Most plane and land tours depart from Punta Arenas in southern Chile but a few leave from Cape Town, South Africa.

The majority of tourists who arrive in Antarctica by ship, land in Antarctica and visit its foreshores in the Antarctic Peninsula area. Some tourist ships do not have landings but merely cruise in the area. Plane journeys (involving subsequent land travel) usually land in the interior of Antarctic and use natural runways of blue ice. Their passengers camp inland. Numbers of tourists doing this are just a few hundred but their potential adverse environmental impact could be considerable. A fourth type of Antarctic journey involves flying over Antarctica without landing.

Table 1 presents the composition of these four types of tourism in Antarctica on the basis of estimates of tourist numbers for the 2003-04 summer tourist season in Antarctica. This season starts in November and ends in March.

Table 1:
Estimates of numbers of tourists utilising Antarctica
in the 2003-04 season by tourism types

Type of tourism	Number	%
Seaborne traditional tourism with landing	20,818	70.9
Seaborne tourism no landing/large ships	5,636	19.2
Air-Land based traditional tourism (ANI and DAP) with landing	330	1.1
Air-Land based non-traditional with landing	200	0.7
Air overflights no landing	2,426	8.2
Total:	29,410	100*

*Does not exactly add to 100 because of rounding

Source: Based on IAATO (2003, p.20)

Although tourist numbers visiting Antarctica are still relatively small, they have grown rapidly. Since 1992-03 tourist landings in Antarctica have more than doubled, and if 2003-04 estimates are accurate, would have more than tripled since 1992-03. In 1992-03, 6,704

tourist landings in Antarctica were reported and this increased to 13,571 in 2002-03. Estimated tourist landings for 2003-04 exceed 20,000 (IAATO, 2003, p.21).

The cost of an Antarctic cruise is quite high, possibly typically around US\$5,000 for a few days. This suggests that around US\$100 million would have been spent on such cruises during the 2003-04 season. Possibly, a similar amount would have been spent on average by tourists in preparing for the tour and travelling by air to Ushuaia. Thus, although the numbers of Antarctic tourists is relatively low, the total expenditure involved in such tourism is quite high.

The majority of tourists engaging in Antarctic tourism are from high income countries, as is evident from the composition shown in Table 2. They also tend to be well educated, fall into the higher income group and to be older in age than the average population of their countries.

Table 2:
Composition of tourists landing in Antarctica by nationality, 2002-03

Country	Number	%
US	5,343	39.37
Germany	1,948	14.35
UK	1,779	13.11
Australia	865	6.37
Japan	450	3.32
Canada	409	3.01
Sweden	395	2.91
Others	1,917	14.13
Unknown	465	3.43
Total:	13,571	100.00

Source: Based on IAATO (2003m p.21)

According to Rubin (2000, p.108) “One of the most important factors in the large increase in Antarctic tourist numbers during the late 1980s and early 90s was the collapse of the Soviet Union”. Many scientific academies leased their ice-strengthened boats to Western tourist companies to earn much needed income. This is why many of today’s Antarctic tour vessels are Russian registered ships.

Environmental questions surrounding increasing tourism to Antarctica remain controversial. Views range from contention that environmental impacts of tourists are minimal and are grossly exaggerated by some of the media and by some environmentalists to the view that these effects are serious, and likely to become more so, and are not sufficiently recognised.

According to Rubin (2000, p.55), for example, “with its extremely harsh climatic conditions, Antarctica has a sensitive ecology. Visitors must respect that sensitivity to ensure that no damage is done... Although tourism to Antarctica is sometimes criticised as being harmful to the Antarctic environment, in truth the impact made by tourists is absolutely minimal when compared to scientific activities on the continent”. He argues that the latter activities account for more than 99 per cent of man days spent in Antarctica and that the permanent scientific stations involve more substantial environmental impacts than Antarctica. While that is a serious environmental issue, it is not a reason for lack of concern about actual and potential environmental impacts of Antarctic tourism.

Adverse effects from Antarctic tourism can come from oil spills, accidents to travel vehicles, trampling in the Antarctic Peninsula, disposal of human wastes and stress placed on some wildlife species by visitors.

The environmental implications of increasing growth and diversity of Antarctic tourism has become of increasing concern to Antarctic Treaty members. Concerns include inadequate insurance by some operators, the possibility that tourists may disrupt scientific work and the risks of cumulative environmental impacts in the absence of good monitoring programmes (Anon, p.42).

Nevertheless, it would be wrong to conclude that no legal framework exists for the control and regulation of the development and conduct of tourism in Antarctica. The Protocol on Environmental Protection added to the Antarctic Treaty, known as the Madrid Protocol, came into effect in 1998.

However, not all of the many nations (of which India is one) have drawn up supporting laws and regulations to control the activities of their citizens in Antarctica. Countries such as the US, UK, Australia and New Zealand have. Nevertheless, even when such relevant regulations and laws exist, the matter of their enforcement remains problematic. Sovereignty

disputes between a few claimant states (for example, Argentina, Chile and the UK) may be a barrier to regulation in disputed areas. Thirdly, it is one thing to pass laws and regulations and another to monitor compliance with these and enforce them. The cost of policing regulations in Antarctica is high and so even when regulations exist, policing is likely to be very limited. This is not to suggest that the Madrid Protocol has had no impact on environmental protection in Antarctica but rather to suggest that it is of limited effectiveness. For instance, one effect has been for nations with supporting regulations to require environmental impact assessments (EIA) for tourist developments in Antarctica when these are proposed by tourist businesses registered in their country (Kriwoken and Rootes, 2000). Nevertheless such procedures are far from seamless for reasons outlined by Kriwoken and Rootes (2000).

Because of the slow evolution of environmental regulations in Antarctica and shortcomings in these regulations, the International Association of Antarctica Tour Operators (IAATO), an association of tour operators in Antarctica, has adopted a code of environmental conduct for its members. This self-policing system is intended to reduce or better manage the environmental impacts of tourism development in Antarctica. This is a proactive move by IAATO which has increased the focus on environmental issues involving Antarctic tourism.

Nevertheless, self regulation is possibly not the complete solution. While the majority of Antarctic tour operators belong to IAATO, some are not members. Furthermore, the businesses and vessel of some are registered in nations that are not parties to the Antarctic Treaty system. Thirdly, industry codes of conduct are not always complied with by industry members or members of a relevant association. Overall, therefore, environmental regulation in Antarctica seems to have a high degree of uncertainty and lacks precision and rigour.

With that background in mind, let us consider the salient features of a case study of tourism in Antarctica. In doing so, the comparative importance of Antarctic wildlife as an attraction for tourists will be assessed and their views on environmental issues in Antarctica, including those arising from tourism development, will be reported and analysed.

3. Survey Methodology and Respondents

Passengers on board the Antarctic Explorer trip to the Antarctic Peninsula were surveyed in January 2003. The route of this journey is shown in Figure 1. Passengers travelled by the

Russian registered ship the ‘Akademik Ioffe’ on a ten night’s journey leaving from Ushuaia port in Argentina crossing the Drake Passage and then travelling west of the Antarctic Peninsula, visiting islands in the associated archipelago and its west coast, before returning to Ushuaia.

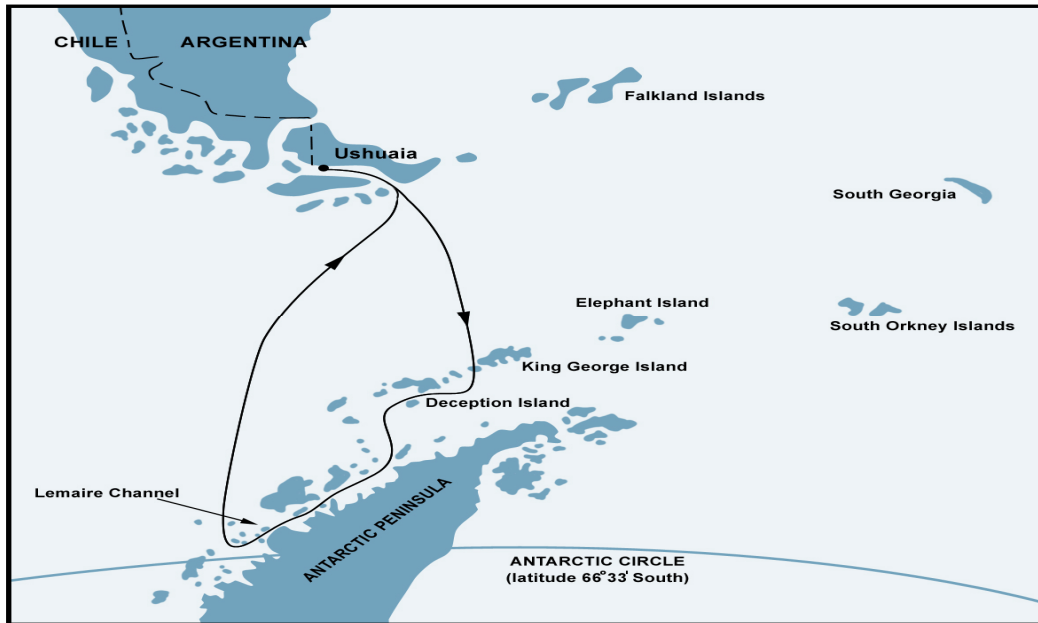


Figure 1: The route of the ‘Antarctic Explorer’ trip undertaken by tourists surveyed for this study

The ‘Akademik Ioffe’ is one of two vessels chartered by the Australian-based Peregrine Adventures tour company, which specialises in promoting ecologically based tours. In relation to this tour, its website (2002) states: “The itinerary focuses on the areas with the greatest promise of wildlife – opportunities abound for viewing and encountering nesting penguins and seals, and whales seem to be everywhere!”.

A questionnaire was administered to passengers on two trips to Antarctica of the ‘Akademik Ioffe’. They were surveyed prior to arriving in the Antarctic and on their departure using similar questionnaires. This was done to detect any possible changes in their responses as a result of their visit to Antarctica. The questionnaires are appended to Tisdell et al (2004).

There were 68 tourists on each voyage. Fifty two survey forms were completed for the outbound journey and 50 on the return journey. The response rate was high because most respondents were accompanied, and only one survey form per touring party was requested.

Table 3 indicates the nationality of respondents. They are all from high income countries but the national composition differs from that in Table 2, probably a reflection of the market contacts of the Australian-based tourist company. Australians account for the highest proportion of the respondents, followed by Swedes and Americans.

Table 3:
In which country do you normally reside? (Pre-visit question)
Distribution of responses

Country	Frequency	% of total
Australia	20	38.5
Sweden	15	28.8
USA	6	11.5
UK	4	7.7
Italy	2	3.8
Switzerland	2	3.8
Austria	1	1.9
France	1	1.9
n/r	1	1.9
Total	52	100

The respondents had a very high level of education. More than 70 per cent had university degrees with over 40 per cent possessing postgraduate degrees. Their levels of family income were high in relation to incomes in their own countries. Sixty five per cent reported an annual income of more than the equivalent AUS\$100,000 per year. Other studies also report that Antarctic tourists are characterised by high levels of education and high levels of income (Kriwoken and Rootes, 2000).

Nevertheless, there were some travellers with relatively low incomes. They seem to consist of ‘enthusiasts’ and older persons using their accumulated assets to complete the journey.

These tourists also tend to fall into the older age group. Almost 70 per cent of respondents were over 50 years of age. They probably belong to a group that has travelled extensively, so

that Antarctica is one of the few travel destinations left for them to explore. Only one respondent had previously visited the South Polar region.

4. The Importance of Antarctic Wildlife for the Surveyed Antarctic Tourists

As is quite evident from Figure 2, the Antarctic tourists surveyed were very interested in Antarctic wildlife. Almost 95% expressed an interest but around 5% had no interest prior to their visit to Antarctica. Following their visit most respondents said they had become more interested in Antarctic wildlife.

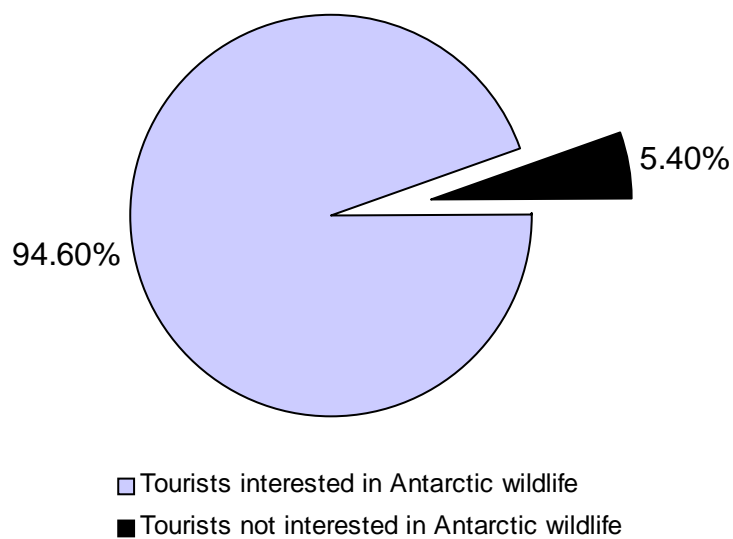


Figure 2: Most respondents said in their pre-visit survey that they are interested in Antarctic wildlife

Both pre-visit and post-visit respondents expressed greatest interest in penguins, whales and dolphins. Seals were of next greatest interest pre-visit followed by polar seabirds (other than penguins) but this was reversed in the post-visit survey. The tour seems to have enhanced the interest of tourists in polar seabirds other than penguins.

The majority of respondents suggested that a special feature of Antarctic wildlife is that most species do not occur elsewhere. The proportion saying this was about the same before and following their visit. Prior to the visit about 40 per cent of respondents said that Antarctic wildlife can be easily seen in large numbers whereas after their visit this rose to 54 per cent.

While the majority of respondents stated on the outbound journey that the adaptations of Antarctic wildlife would be a special attraction, only a half said this on the return journey. As for other features and comments, on the outward journey some respondents said they would be able to get close to the wildlife and many thought that it would be a special attraction to see Antarctic wildlife in its natural environment. Getting close was not, however, mentioned in the post-visit survey responses but seeing wildlife in their own environment was. One respondent said that the journey enabled him/her to see several new bird species for the first time.

Following their cruise, 94 per cent of respondents said that they had learnt more about Antarctica and its wildlife as a result of their cruise and 76 per cent said that they had become more aware of conservation issues involving Antarctica wildlife. Nearly all (94 per cent) were in favour of conserving Antarctic wildlife, none expressed opposition to it but 6 per cent did not respond.

The importance of Antarctic wildlife as an attraction to Antarctic tourists is evident from responses to a pre-visit question. Respondents were asked: 'If there was no wildlife to be seen in the South Polar Region, would you have still decided to come on this cruise, given your present costs'. The majority (61.5 per cent) said 'No', 34.6 per cent said 'Yes', and 3.8 per cent did not respond. Furthermore, 53.1 per cent of those said 'No' would not even come on this cruise even if it were much cheaper should there be no Antarctic wildlife.

Figure 3 summarises the distribution of responses of the sample of Antarctic tourists about the importance to them for their trip of Antarctic wildlife. Wildlife are regarded by most respondents as important and the percentage saying so rises post-visit compared to pre-visit. Following their journey almost all respondents stated that wildlife was an important part of their trip.

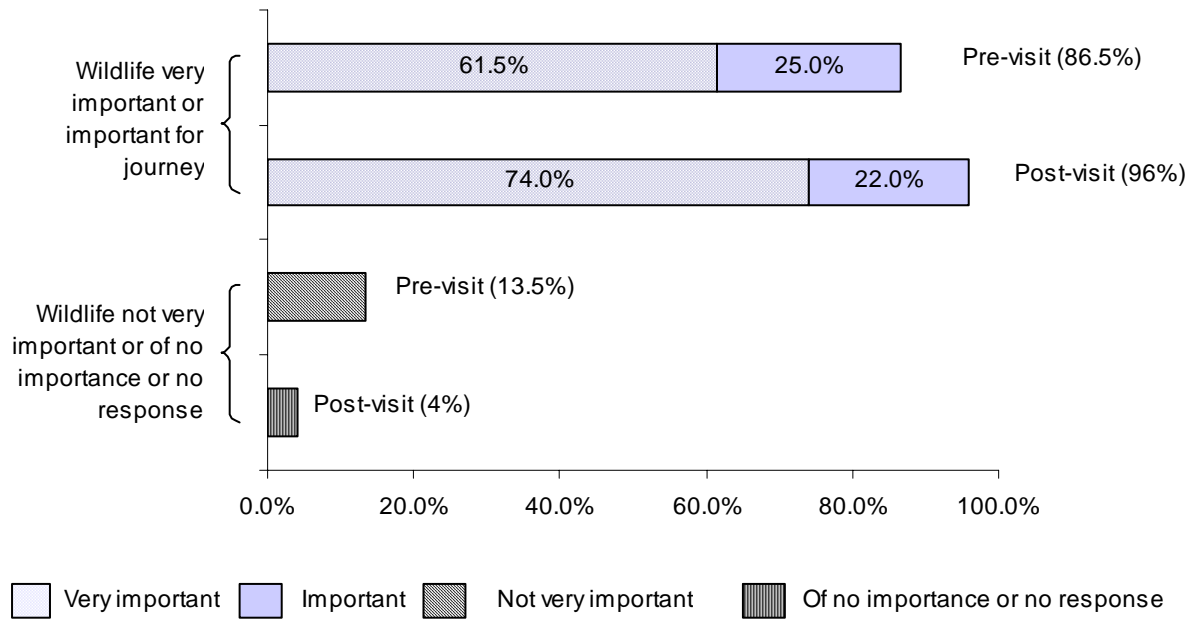


Figure 3: The percentage of respondents saying that seeing Antarctic/Sub-Antarctic wildlife is important for their Antarctic journey is higher post-visit than pre-visit to Antarctica

A further indication of the importance of Antarctic wildlife for tourism can be obtained by considering the comparative importance placed on various features or attributes of Antarctica by respondents. These features are listed in Table 4. Respondents could rank those as ‘very important’, ‘important’, ‘not very important’ and ‘of no importance’. Using a weighted average index based on the weights noted at the foot of Table 4, the features are ranked in declining level of importance. These rankings remain unchanged following the visit of respondents to Antarctica.

Table 4:
Average weighted indices of importance to respondents of features or
attributes of Antarctica/Sub-Antarctica prior to and following their visit.

Changes in indices are also shown.

Features	Pre- Visit Index	Post- Visit Index	Change in value of index	% variation in index
Landscapes and seascapes	2.75	2.74	-0.01	-0.36
Wildlife	2.60	2.56	-0.04	-1.54
Different or unique environment	2.58	2.52	-0.06	-2.33
Unspoilt wilderness	2.58	2.48	-0.1	-3.88
Antarctic summer	2.12	1.94	-0.18	-8.49
The thrill of expedition	1.98	1.90	-0.08	-4.04
Continent without permanent human habitations	1.69	1.82	0.13	+7.69
Few others have visited it	1.50	1.52	0.02	+1.33
Connections with explorers	1.40	1.40	0	0.00
Ship cruise pleasures	0.73	1.20	0.47	+64.38

Index of importance calculated using the following weights:

3 - Very important; 2 – Important; 1 - Not very important; 0 - Of no importance/No response

From Table 4, it can be seen that respondents ranked Antarctic landscapes and seascapes as the most important feature (both pre- and post-visit) followed by wildlife. Various Antarctic cruise features are ranked in Table 4 by the index of importance given to them by respondents before their Antarctic visit. On average, the rank ordering by respondents remained the same after their visits as before their visits. While most indices of importance showed little change before and after the Antarctic visit by respondents, a few showed substantial variation. Appreciation of ship cruise pleasures increased by a comparatively large amount and the fact that Antarctica is a continent without permanent human habitation also increased as did, to a small extent, the realisation that few others have visited Antarctica. Most other items showed only small declines in their ratings of importance. However, the importance of the Antarctic summer as an attraction showed a decline of around eight per cent, as measured by the index of importance.

The pre-visit survey of Antarctic tourists revealed that 96 per cent of respondents were advocates of nature conservation but 4 per cent were neutral towards this subject. In the post-visit survey, no neutral responses were obtained about advocacy of nature conservation, only

advocacy and non-responses were received. Analysis suggests a strengthening of advocacy of nature conservation by the respondents following their visit (see Tisdell et al, 2004).

5. Reactions of Respondents to Selected Environmental Issues Involving Antarctica

Antarctic tourists participating in our survey were asked both prior and following their visit to Antarctica various questions involving Antarctica environmental issues. Let us consider their responses to some of these questions.

Krill is harvested by some countries in Antarctica but it can deprive some Antarctic wildlife of an important link in their food chain. Approximately 75 per cent of respondents both prior and following their visit to Antarctica said that they are opposed to this harvesting. However, a much higher proportion of respondents oppose the exploitation of Antarctica’s non-living (physical) resources.

Over 90 per cent of respondents (92% pre-visit and 94% post-visit) were opposed to Antarctica’s vast non-living natural resources (eg. petroleum, minerals, water) being commercially exploited for consumptive use. This is evident from Table 5.

Table 5:

Are you in favour of Antarctica’s vast resources (eg. petroleum,, minerals, water) being exploited? Distribution of responses

Response	Pre-Visit Relative frequency %	Post-Visit Relative frequency %
Yes	0	2
No	92.3	94
n/r	7.7	4
Total	100	100

Furthermore, over 90 per cent of respondents wanted Antarctica to be preserved in a pristine state (see Table 6), a slight rise being evident following the visits by respondents. The most frequently given reason was because Antarctica was seen as unique (see Table 7). The mere knowledge that Antarctica would remain unspoilt was also frequently mentioned as a reason for preserving it in a pristine state, as well as its influence on the Earth’s climate, an indirect use value. The desire to retain the uniqueness and unspoilt character of Antarctica reflects non-use values. *Use values* such as tourism potential and conservation of resources for future

use were mentioned very infrequently as a reason for wanting to conserve Antarctica in a pristine state. Bequest and altruistic values ('I would like my children and others to enjoy it') were mentioned relatively frequently. No major changes (between responses on the outward journey and the return one) occurred in the relative frequencies with which the reasons were given for wanting to conserve Antarctica in a pristine state. There was very little support for conservation of its resources for the purpose of future (consumptive) use.

Table 6:

Do you want Antarctica (including wildlife, plant life and its landscape) to be preserved in its pristine state? Distribution of responses

Response	Pre-Visit Relative frequency %	Post-Visit Relative frequency %
Yes	92.3	94
No	1.9	4
n/r	5.8	2
Total	100	100

Table 7:

The distribution of reasons given by those who said they want Antarctica (including its wildlife, plant life and its landscape) to be preserved in its pristine state

Reason	Pre-Visit		Post-Visit	
	Frequency	% of Total responses	Frequency	% of Total responses
It is unique	46	28.9	47	29.2
It has a large influence on the Earth's climate	38	23.9	37	23
I would like to know that it could remain unspoilt	36	22.6	37	23
I would like my children and others to enjoy it	26	16.4	28	17.4
It has tourism potential	7	4.4	7	4.3
It has great resources that could be used in the future	6	3.8	5	3.1
Total	159	100	161	100

Opinions were somewhat divided about whether there should be increased tourism activity in Antarctica. Around half of respondents were against it whereas about 40 per cent favoured it. The results are summarised in Table 8.

Table 8:
Are you in favour of increased tourism in Antarctica?
Distribution of responses

Response	Pre-Visit	Post-Visit
	Relative frequency %	Relative frequency %
Yes	40.4	38
No	50	54
n/r	9.6	8
Total	100	100

Comments by those respondents who favoured increased tourism into Antarctica included the following:

- It is inevitable, need to be proactive in developing an action plan;
- Public awareness;
- If environmental impact is managed;
- Good education;
- Controlled tourism allows populations to experience this wilderness and will motivate them to help preserve it;
- To give others the opportunity to experience Antarctica as we have;
- People who have seen Antarctica will probably be in favour of preserving it;
- Awareness;
- The unique experience;
- Done in sensitive ways to inform the world about this treasure;
- Learning;
- It was great to see it;
- If controlled;
- To get to understand it; and
- To encourage more donations and better protection of wildlife.

Comments by respondents who opposed increased tourism to Antarctica included the following:

- Inevitable damage;
- Difficult to control;
- Increased tourism can only mean increased impact on wildlife and environment;
- Not to disturb wildlife;

- Increased activity likely to result in increased impact;
- Limit the numbers to preserve wilderness;
- Would spoil it;
- More people than come now could have an adverse effect;
- Seems to be well managed at existing tourism levels;
- At present there seems to be no impact analysis;
- Consequences;
- Not to damage and disturb wildlife;
- Save the nature;
- Mass tourism will damage some spots at least;
- Damage;
- Not to spoil Antarctica;
- More chance of damage;
- Pollution;
- Environmental issue;
- To maintain environment;
- Greater risk of pollution and damage to ecosystems;
- Disturbance of wildlife;
- Keep it pristine/pure; and
- Destruction to environment.

A high proportion of respondents (around 90 per cent) favour the Antarctic continent and surrounding seas being declared a world park and for it to be managed under the auspices of the United Nations and/or by the twelve Antarctic Treaty Nations. These are the original parties to the 'treaty' nations and do not include all current Antarctic Treaty Nations. Although there was some increase in opposition to this in the post-visit survey, no major change is apparent (see Table 9).

Table 9:

Are you in favour of the Antarctic continent and surrounding seas being declared a world park and managed under the auspices of the United Nations and/or by the twelve Antarctic Treaty nations? Distribution of responses

Response	Pre-Visit	Post-Visit
	Relative frequency %	Relative frequency %
Yes	90.4	88
No	1.9	6
n/r	7.7	6
Total	100	100

6. Discussion and Conclusions

While some measures have been taken to improve environmental management in Antarctica, institutional factors and practical difficulties of monitoring and policing environmental regulations limit the degree of environmental management at present. IAATO has adopted a voluntary code of conduct to limit possible adverse environmental consequences of tourism development and conduct in Antarctica. While this is welcome, not all Antarctic tour operators belong to IAATO and one can never be sure how closely industry or association codes of conduct are followed by members. Not only the increasing numbers of Antarctic tourists but the growing diversity of their activities is increasing environmental risks from Antarctic tourism. Furthermore, most tourists mainly visit the same attractions. This means that Antarctic tourism is concentrated in limited areas. Nesting wildlife such as penguins and seals with young may be disturbed by tourist visits and affected by rubbish that might be left by some humans. Possible oil spills are also a serious risk. Noise pollution can in addition also be a problem for breeding birds.

The survey results reported on in this article support the finding of other studies (eg. Kriwoken and Rootes, 2000) that Antarctic tourists are very well educated and mostly have high incomes. They are of an older age than the bulk of tourists. They are also very interested in nature and the viewing of Antarctic wildlife and their likely encounter with it is a prime reason for their visiting Antarctica. Results from our survey suggests that nearly all are advocates of nature conservation and most are opposed to the commercial exploitation of Antarctica's natural resources. Nearly all want Antarctica to be preserved in a pristine state,

and are in principle willing to support the concept of it being declared a world park as a step towards making this a reality.

A slight majority of respondents opposed increased tourism to Antarctica because they fear its environmental consequences. Those who favour increased tourism thought that it might increase support for Antarctic conservation and protection of its wildlife. Some qualified these answers by adding “if the environmental impact is managed”. The majority of the tourists sampled were aware and concerned about the environmental risks posed by an expansion in Antarctic tourism.

The Antarctic tourists surveyed by us are, on the whole, environmentally very aware and concerned. Even before their visit to Antarctica, they were very supportive of its conservation in a pristine state. Overall, our survey results indicate that their support (resolve) for this conservation cause was strengthened by their tourist visit to Antarctica.

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